ComAp
The heart of smart control

InteliATS2 70

Automatic Transfer Switch Controller

SW version 1.2.0

Global Guide

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1 Document information

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1.1 Clarification of Notation

Note: *This type of paragraph calls the reader's attention to a notice or related theme.*

> **IMPORTANT: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.**

> **WARNING: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.**

> **Example:** This type of paragraph contains information that is used to illustrate how a specific function works.

1.2 About this Global Guide

This manual contains important instructions for InteliATS2 70 family controllers which must be followed during installation and maintenance of the controllers.

This manual provides general information how to install and operate InteliATS2 70 controllers.

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Security Risk Disclaimer

Pay attention to the following recommendations and measures to increase the level of security of ComAp products and services.

Please note that possible cyber-attacks cannot be fully avoided by the below mentioned recommendations and set of measures already performed by ComAp, but by following them the cyber-attacks can be considerably reduced and thereby to reduce the risk of damage. ComAp does not take any responsibility for the actions of persons responsible for cyber-attacks, nor for any damage caused by the cyber-attack. However, ComAp is prepared to provide technical support to resolve problems arising from such actions, including but not limited to restoring settings prior to the cyber-attacks, backing up data, recommending other preventive measures against any further attacks.

Warning: Some forms of technical support may be provided against payment. There is no legal or factual entitlement for technical services provided in connection to resolving problems arising from cyber-attack or other unauthorized accesses to ComAp's Products or Services.

1.3.1 General security recommendations and set of measures

1. Production mode
   - Disable production mode BEFORE the controller is put into regular operation.
2. User accounts
   - Change password for the existing default administrator account or replace that account with a completely new one BEFORE the controller is put into regular operation mode.
   - Do not leave PC tools (e.g. InteliConfig) unattended while a user, especially administrator, is logged in.
3. AirGate Key
   - Change the AirGate Key BEFORE the device is connected to the network.
   - Use a secure AirGate Key – preferably a random string of 8 characters containing lowercase, uppercase letters and digits.
   - Use a different AirGate Key for each device.
4. MODBUS/TCP
   - The MODBUS/TCP protocol (port TCP/502) is an instrumentation protocol designed to exchange data between locally connected devices like sensors, I/O modules, controllers etc. By it's nature it does not contain any kind of security – neither encryption nor authentication. Thus it is intended to be used only

in closed private network infrastructures.

> Avoid using MODBUS/TCP in unprotected networks (e.g. Internet).

5. SNMP

> The SNMP protocol (port UDP/161) version 1 and version 2 are not encrypted. They are intended to be used only in closed private network infrastructures.

> Avoid using SNMP v1 and v2 in unprotected networks (e.g. Internet).

1.3.2 Used open source software

Name of software	License name	License condition web address
Mbed TLS	Apache 2.0	license
Aladin MD5	Zlib	license
EmbOS	Segger License Agreement v. 150515	license
emFile	Segger License Agreement	license
emUSB Device	Segger License Agreement	license
emUSB-Host	Segger License Agreement	license
Tiny Mersenne Twister (tinymt32)	BSD 3	license

1.4 General warnings

1.4.1 Remote control and programming

Controller can be controlled remotely. In the event of maintenance or programming of controller, check the following points to ensure that system cannot be affected.

Make sure:

> Disconnect remote control

> Disconnect binary outputs

1.4.2 SW and HW versions compatibility

Be certain to use the proper combination of SW and HW versions.

1.4.3 Dangerous voltage

Under no circumstances should you touch the terminals for voltage and current measurement!

Always connect grounding terminals!

Under no circumstances should you disconnect controller CT terminals!
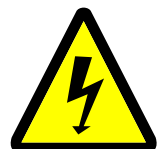
1.4.4 Adjusting the setpoints

All parameters are adjusted to their typical values. However the setpoints must be checked and adjusted to their real values before the first use.

Note: The controller contains a large number of configurable setpoints, because of this it is impossible to describe all of its functions. Some functions can be changed or have different behavior in different SW versions. Always check the Global guide and New feature list for SW version which is used in a controller. This manual only describes the product and is not guaranteed to be set for your application.

IMPORTANT: Be aware that the binary outputs can change state during and after software reprogramming (before the controller is used again ensure that the proper configuration and setpoint settings are set in the controller).

The following instructions are for qualified personnel only. To avoid personal injury do not perform any action not specified in related guides for product.

1.5 Functions and protections

Support of functions and protections as defined by ANSI (American National Standards Institute):

Description	ANSI code	Description	ANSI code
Master unit	1	Incomplete sequence relay	48
Stopping device	5	Overcurrent	50/50TD
Multi-function device	11	Breaker failure	50BF
Starting-to-running transition contactor	19	Overcurrent IDMT	51
Synchronizing-check	25	AC circuit breaker	52
Undervoltage	27	Overvoltage	59
Aux Battery Under Voltage	27X	Aux Over Voltage	59X
Annunciator	30	Reclosing relay	79
Overload (real power)	32P	Overfrequency	81O
Master sequence device	34	Underfrequency	81U
Current unbalance	46	Auto selective control/transfer	83
Voltage unbalance/Negative sequence voltage	47		
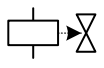
1.6 Certifications and standards

- CE
- EN 61000-6-2
- EN 61000-6-4
- EN 61010-1
- EN 60068-2-1 (-20 °C/16 h)
- EN 60068-2-2 (70 °C/16 h)

- EN 60068-2-6 (2÷25 Hz / ±1,6 mm; 25÷100 Hz / 4.0 g)
- EN 60068-2-27 (a=500 m/s^2; T=6 ms)
- EN 60068-2-30:2005 25/55°C, RH 95%, 48hours
- EN 60529 (front panel IP65, back side IP20)
- UL 1008

1.7 Document history

Revision number	Related sw. version	Date	Author
4	1.2.0	27.4.2023	Michal Slavata
3	1.1.0	16.12.2022	Jan Liptak
2	1.0.1	6.4.2022	Jan Liptak
1	1.0.0	30.9.2021	Jan Liptak

1.8 Symbols in this manual

	3 x Phases		Connector – male		Grounding		RS232 male
	Active current sensor		Contact		GSM		RS232 female
	AirGate		Contactor		GSM modem		Source 1
	Alternating current		Controller simplified		Jumper		Source 2
	Analog modem		Module simplified		Load		Starter
	Battery		Current measuring		Mains		Switch – manually operated
	Binary output		Current measuring		Mains		Transformer
	Breaker contact		Diode		Mobile provider		USB type B male
	Breaker contact		Ethernet male		Passive current sensor		USB type B female
	Breaker		Ethernet female		Pick - up		Voltage measuring
	Breaker		Fuel solenoid		Relay coil		Wi-fi / WAN / LAN
	Breaker		Fuse		Relay coil of slow-operating		
	Capacitor		Fuse switch		Resistor		
	Coil		Generator		Resistor adjustable		
	Connector – female		Generator schematic		Resistive sensor RPTC		

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2 System overview

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2.1 General description

This manual describes the InteliATS2 70 controller which is designed for automatic transfer switch applications and provides general information on how to install and operate the InteliATS2 70 controller.

This manual is dedicated for

> Automatic transfer switch panel builders

> Operators of remote engines (started remotely from InteliATS2 70)

> For everybody who is concerned with installation, operation and maintenance of the engine

2.1.1 The key features of InteliATS2 70

> Easy-to-use operation and installation. The factory default configuration covers most applications.

> Various customizations are possible thanks to its configurability

> Excellent remote communication capabilities

> High reliability

2.2 True RMS measurement

This controller measures AC values based on True RMS principle. This principle corresponds exactly to the physical definition of alternating voltage effective values. Under normal circumstances the mains voltage should have a pure sinusoidal waveform. However some nonlinear elements connected to the mains produce harmonic waveforms with frequencies of multiples of the basic mains frequency and this may result in deformation of the voltage waveforms. The True RMS measurement gives accurate readings of effective values not only for pure sinusoidal waveforms, but also for deformed waveforms.

2.3 Configurability and monitoring

One of the key features of the controller is the system's high level of adaptability to the needs of each individual application and wide possibilities for monitoring. This can be achieved by configuring and using the powerful PC/mobile tools.

2.3.1 Supported configuration and monitoring tools

> InteliConfig – complete configuration and single Source 2 monitoring tools

> WebSupervisor – web-based system for monitoring and controlling

>> WebSupervisor mobile – supporting application for smart-phones

> WinScope 1000 – special graphical monitoring software

Note: *Use the InteliConfig PC software to read, view and modify configuration from the controller or disk and write the new configuration to the controller or disk.*

The firmware of the controller contains a large number of logical binary inputs and outputs needed for all necessary functions available. However, not all functions are required at the same time; also the controller hardware does not have so many input and output terminals. One of the main tasks of the configuration is mapping of "logical" firmware inputs and outputs to the "physical" hardware inputs and outputs.

2.3.2 Configuration parts

> Mapping of logical binary inputs (functions) or assigning alarms to physical binary input terminals

> Mapping of logical binary outputs (functions) to physical binary output terminals

> Selection of peripheral modules, which are connected to the controller, and performing the same functions (as mentioned above) for them

> Changing the language of the controller interface
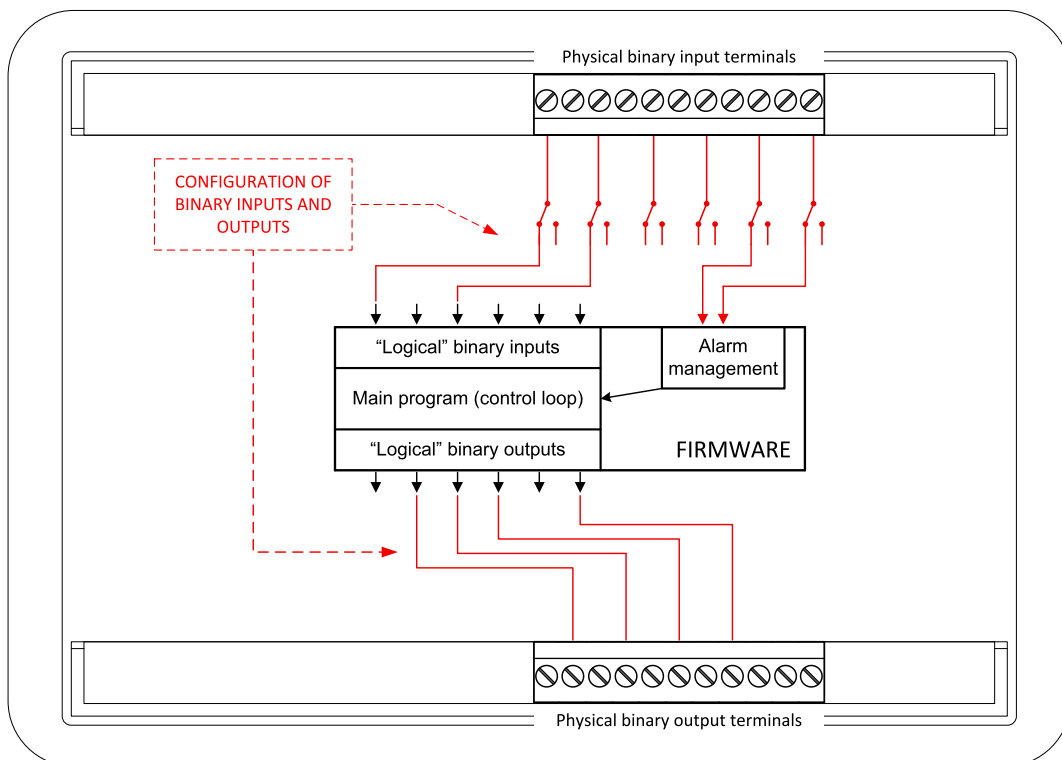
Image 2.1 Principle of binary inputs and outputs configuration

The controller is shipped with a default configuration, which should be suitable for most standard applications. This default configuration can be changed only by using a PC with the InteliConfig software. See InteliConfig documentation for details.

Once the configuration is modified, it can be saved to a file for later usage with another controller or for backup purposes. The file is called archive and has the file extension .aia2. An archive contains a full image of the controller at the time of saving (if the controller is online for the PC) except the firmware. Besides configuration it also contains current adjustment of all setpoints, all measured values, a copy of the history log and a copy of the alarm list.

The archive can be easily used for cloning controllers, i.e. preparing controllers with identical configuration and settings.

2.4 PC Tools

2.4.1 InteliConfig

Configuration and monitoring tool. See more in InteliConfig Reference Guide.

This tool provides the following functions:

> Direct or internet communication with the controller
> Offline or online controller configuration
> Controller firmware upgrade
> Reading/writing/adjustment of setpoints
> Reading of measured values
> Browsing of controller history records
> Exporting data into an XLS file
> Controller language translation

2.4.2 WebSupervisor

Web-based system for monitoring and controlling of controllers. See more at the WebSupervisor webpage.

This tool provides the following functions:

> Site and fleet monitoring
> Reading of measured values
> Browsing of controller history records
> On-line notification of alarms
> Email notification
> Also available as a smart-phone application
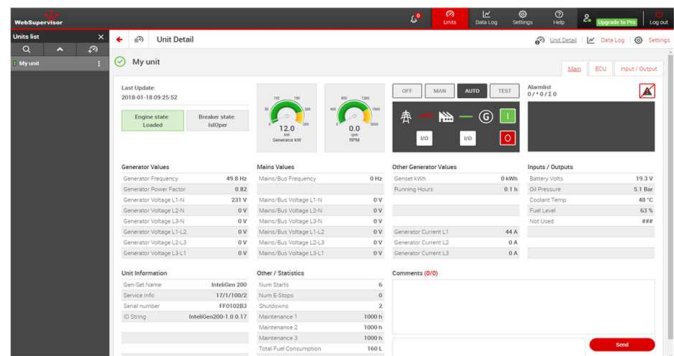
WebSupervisor available at: www.websupervisor.net

Demo account:

> Login: comaptest
> Password: ComAp123

2.4.3 WinScope 1000

Special graphical controller monitoring software used mainly for commissioning and Source 2 troubleshooting. See more in the WinScope 1000 Reference guide.

This tool provides the following functions:

> Monitoring and archiving of ComAp controller's parameters and values
> View of actual / historical trends in controller
> On-line change of controller's parameters for easy regulator setup
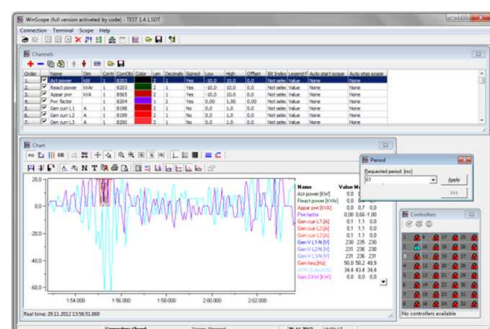
2.5 Plug-in Modules

2.5.1 CM3-Ethernet

Internet/Ethernet module.

> 0/100 Mbit interface over RJ45 socket
> Remote control and monitoring of the controller via InteliConfig, WebSupervisor
> Modbus TCP support
> Full SNMP support including traps (v1 & v2c)
> Active e-mail sending
> AirGate 2.0 technology support for easy connection – no need of public and static IP address
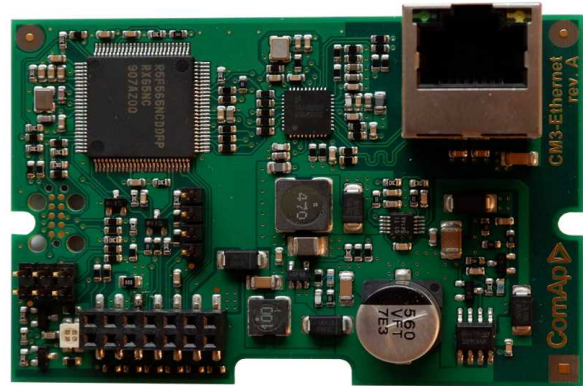
2.5.2 CM2-4G-GPS

GSM/4G module

> GSM/4G Internet module and GPS locator
> Global 4G (LTE) module with 3G/2G backup
> Remote control and monitoring of the controller via InteliConfig, WebSupervisor
> Active e-mail and SMS support
> AirGate 2 technology support for easy connection – no need of public and static IP address
> Tracking via GNSS (GPS,GLONASS) module
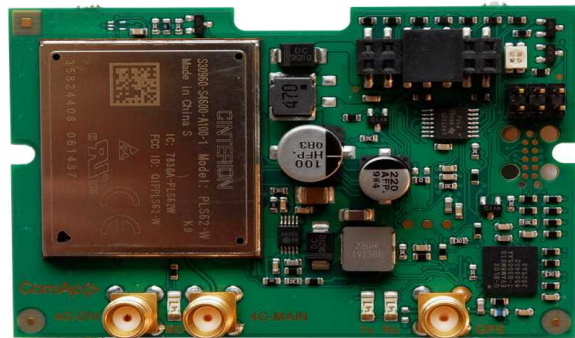
2.5.3 CM-RS232-485

Communication module with two communication ports.

> RS232 and RS485 interface
> Modbus
> Serial connection to InteliConfig
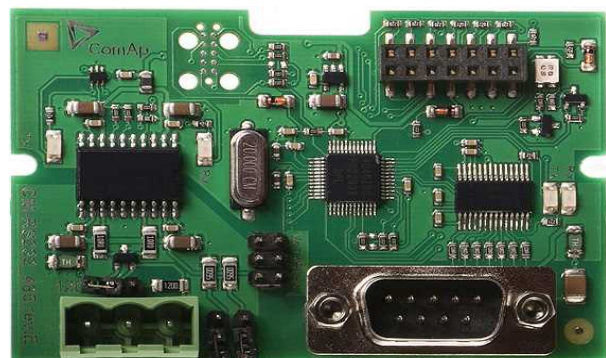
2.5.4 EM-BIO8-EFCP

Input and binary input/output extension module.

> Up to 8 additional configurable binary inputs or outputs
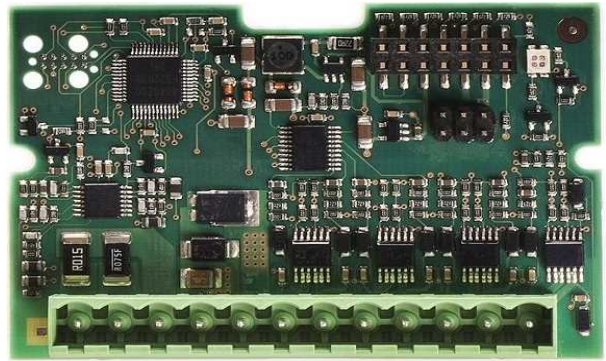
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3 Applications overview

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3.1 Mains-Mains/Gen

The InteliATS2 70 firmware comes with 2 archives. One archive is dedicated for Mains-Gen (MG) application. The second one is dedicated for Mains-Mains (MM) application.

The name of the firmware contains abbreviation MG or MM for choosing correct archive. To switch between the archives the user has to use InteliConfig ->Firmware Upgrade button.

Image 3.1 InteliATS2 70 MG/MM archives

3.2 Mains-Gen

The typical schematic of Mains-Gen application is shown below. The controller controls two breakers – a Source 1 breaker and a Source 2 breaker. Feedback from both breakers is not necessary. InteliATS2 70 controllers can also work without breaker feedback.
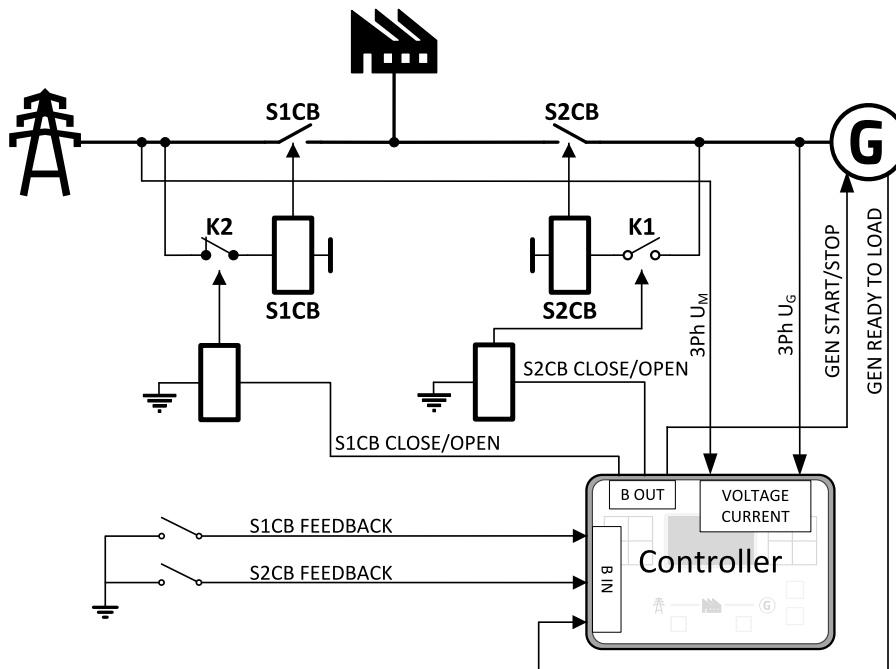
Image 3.2 Mains-Gen application overview

3.3 Mains-Mains

The typical schematic of Mains-Mains application is shown below. The controller controls two breakers – a Source 1 breaker and a Source 2 breaker. Feedback from the breaker is not necessary. InteliATS2 70 controllers can also work without breaker feedback.
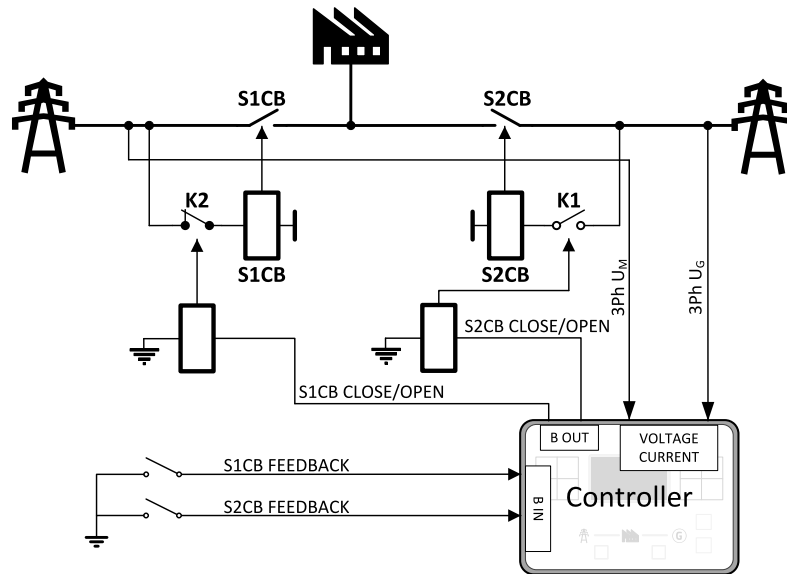
Image 3.3 Mains-Mains application overview

3.4 Applications using Automatic Transfer Switch

3.4.1 Two position ATS with feedback

Automatic remote engine start when the Source 1 fails (AUTO mode, application Mains-Gen)

> Automatic transfer of the load when the Source 1 fail (AUTO mode, application Mains-Mains)

> Two-position ATS control with feedback

> Transfer with power interruption on Source 1 failure

> Return transfer with power interruption on Source 1
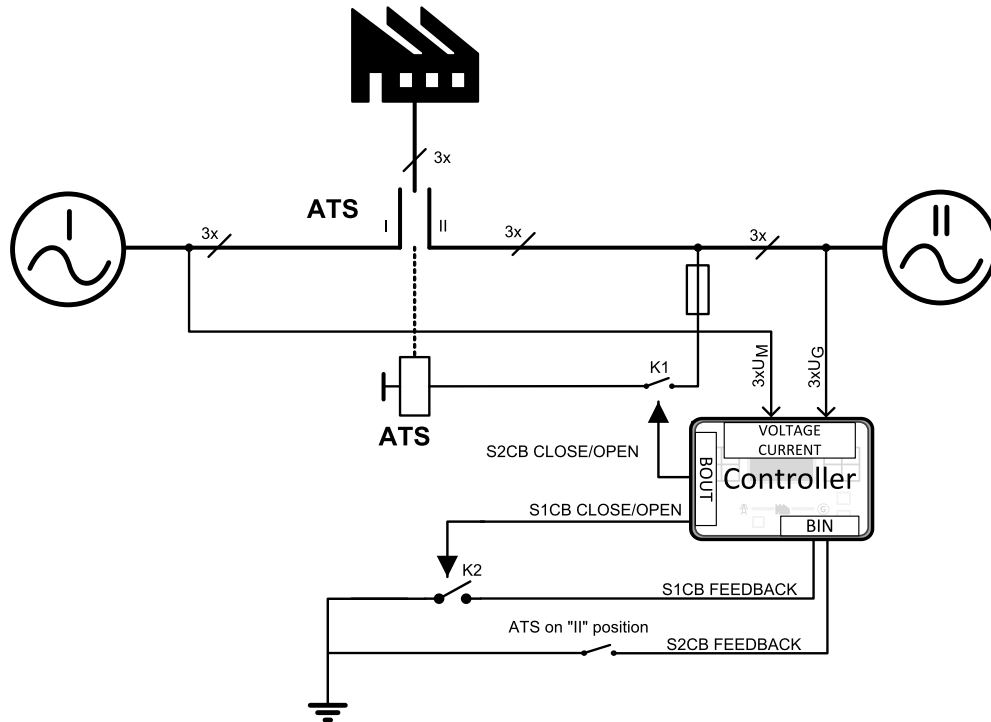
Image 3.4 Two positions ATS with feedback

3.4.2 Three positions ATS with feedback without Neutral control

Automatic remote engine start when the Source 1 fails (AUTO mode, application Mains-Gen)

> Automatic transfer of the load when the Source 1 fail (AUTO mode, application Mains-Mains)

> Three-position ATS control with feedbacks, pass through neutral position

> Transfer with power interruption on Source 1 failure

> Return transfer with power interruption on Source 1

> LBO **S1CB CLOSE/OPEN (PAGE 373)** Contact Type = Normally Open
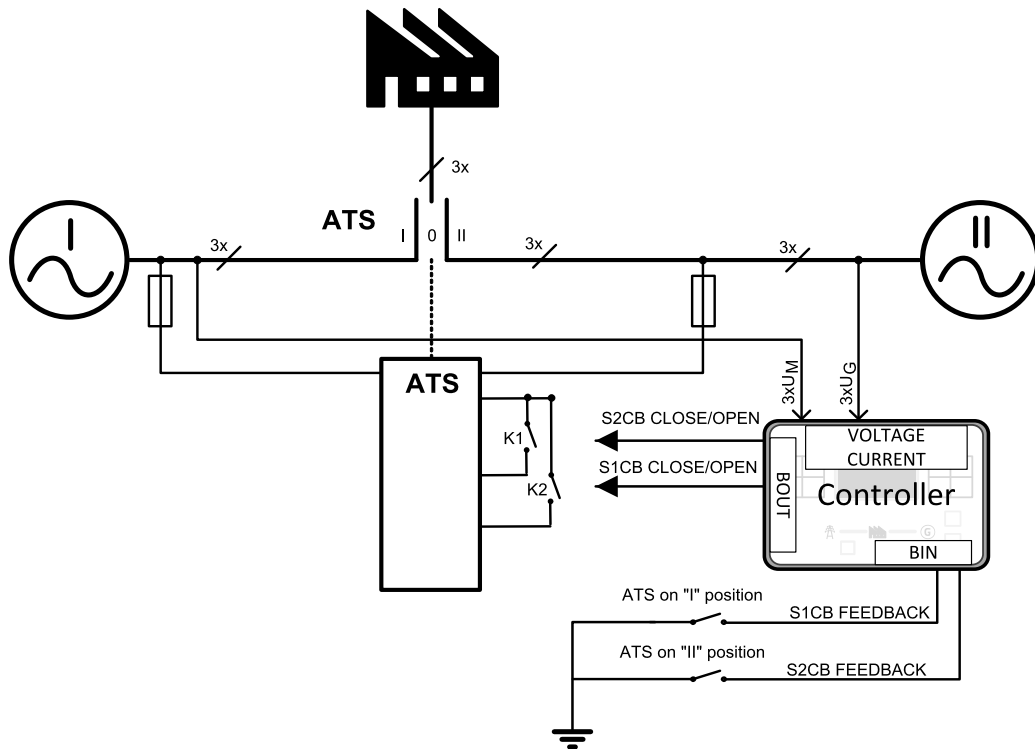
Image 3.5 Three positions ATS with feedback without Neutral control

3.4.3 Three positions ATS with feedback with Neutral control

Automatic remote engine start when the Source 1 fails (AUTO mode, application Mains-Gen)

> Automatic transfer of the load when the Source 1 fail (AUTO mode, application Mains-Mains)

> Three-position ATS control with feedbacks

> Transfer with power interruption on Source 1 failure

> Return transfer with power interruption on Source 1

> LBO **S1CB CLOSE/OPEN (PAGE 373)** Contact Type = Normally Open
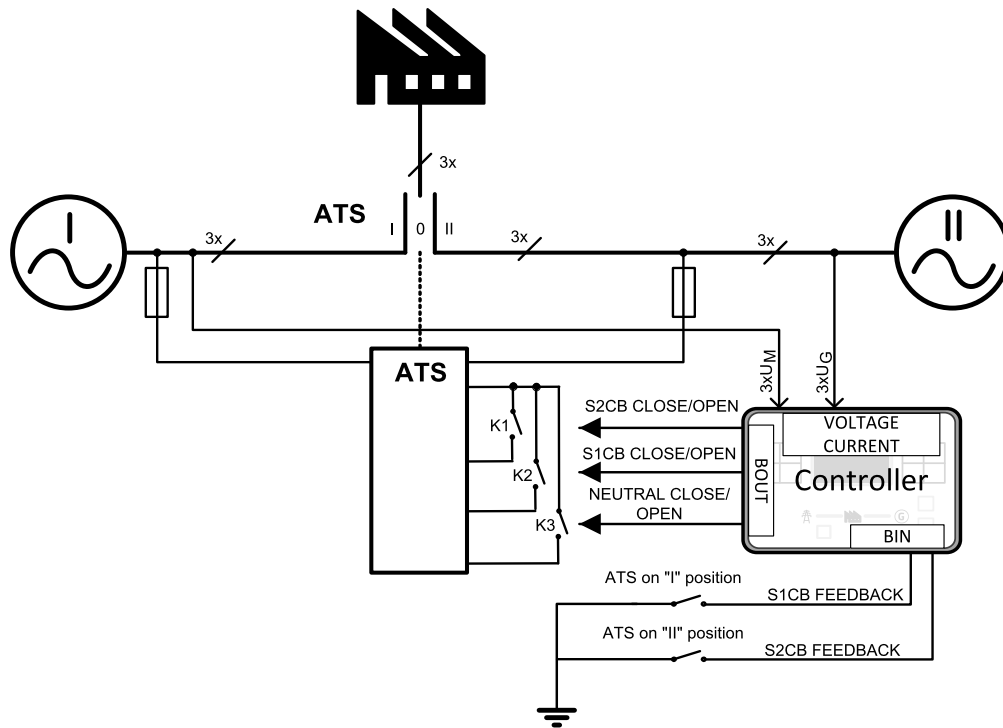
Image 3.6 Three positions ATS with feedback with Neutral control

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4 Installation and wiring

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4.1 Package content

The package contains:

> Controller

> Mounting holders

> Terminal blocks

Note: The package does not contain any communication or extension modules. The required modules should be ordered separately.

4.2 Controller installation

4.2.1 Dimensions
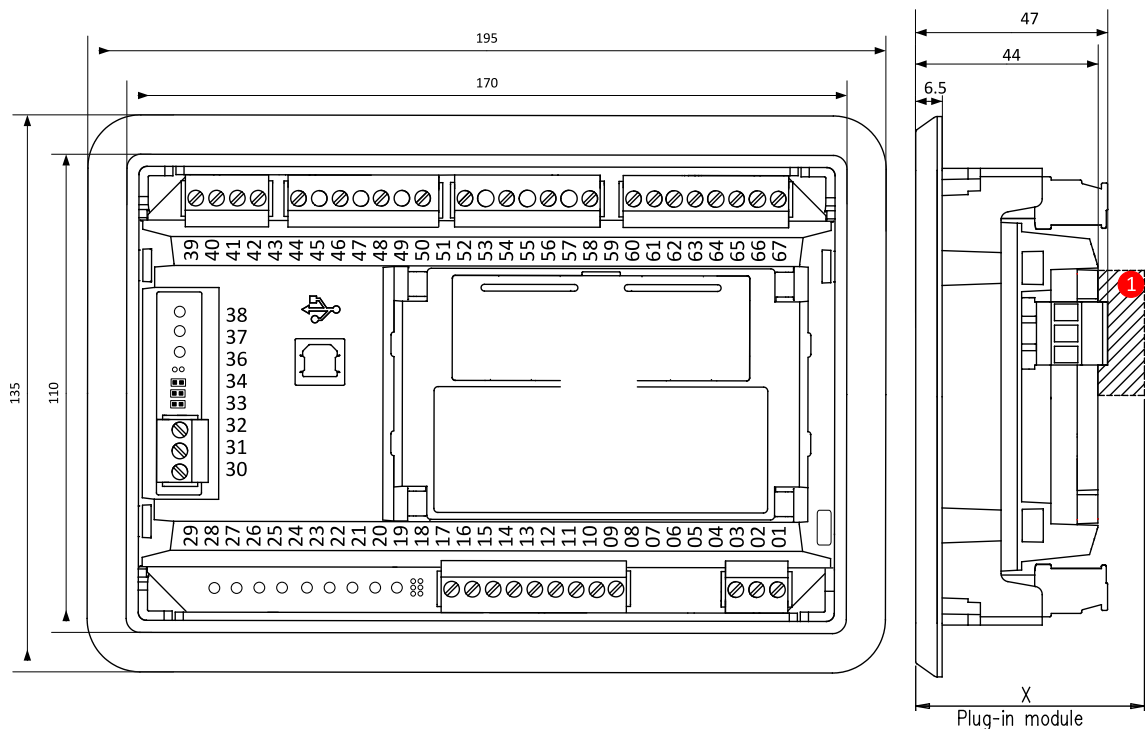
❶ Plug-in module

Note: Dimension "X" depends on plug-in module.

Note: Dimensions are in millimeters.

Cutout for
Controller

172 mm × 112 mm
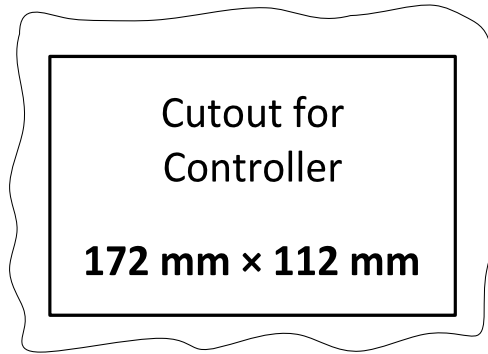
4.2.2 Mounting

The controller should be mounted onto the switchboard door. Requested cutout size is 172 × 112 mm. Use the screw holders delivered with the controller to fix the controller into the door as described in pictures below. Recommended torque for holders is 0.15 N·m.

Panel door mounting
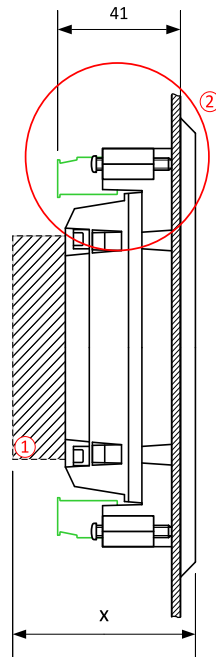
Note: Enclosure Type rating with mounting instruction – For use on a Flat surface of a type 1 enclosure.

4.3 Terminal Diagram

❶ CURRENT MEASUREMENT		❷ SOURCE2 VOLTAGE MEASUREMENT		❸ SOURCE1 VOLTAGE MEASUREMENT		❹ BINARY INPUTS	
T39	COM	T44	N	T52	N	T60	BIN1
T40	L1	T46	L1	T54	L1	T61	BIN2
T41	L2	T48	L2	T56	L2	T62	BIN3
T42	L3	T50	L3	T58	L3	T63	BIN4
						T64	BIN5
						T65	BIN6
						T66	BIN7
						T67	BIN8
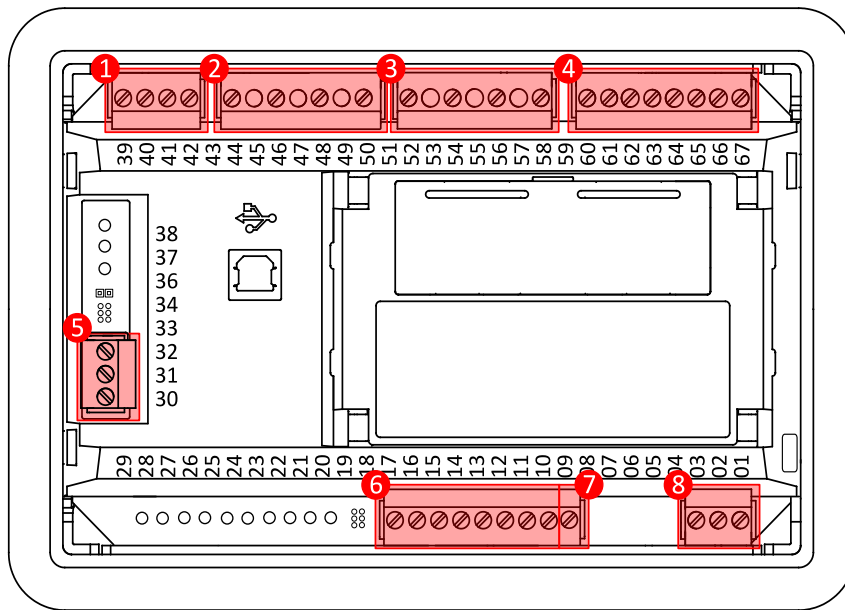
Image 4.1 Terminal diagram for InteliATS2 70

❺ RS485		❻ BINARY OUTPUTS		❼ E-STOP	
T30	B	T10	BOUT1	T09	E-STOP
T31	COM	T11	BOUT2		
T32	A	T12	BOUT3	❽ POWER SUPPLY	
		T13	BOUT4	T01	BATT -
		T14	BOUT5	T03	BATT +
		T15	BOUT6		
		T16	BOUT7		
		T17	BOUT8		

4.4 Recommended wiring
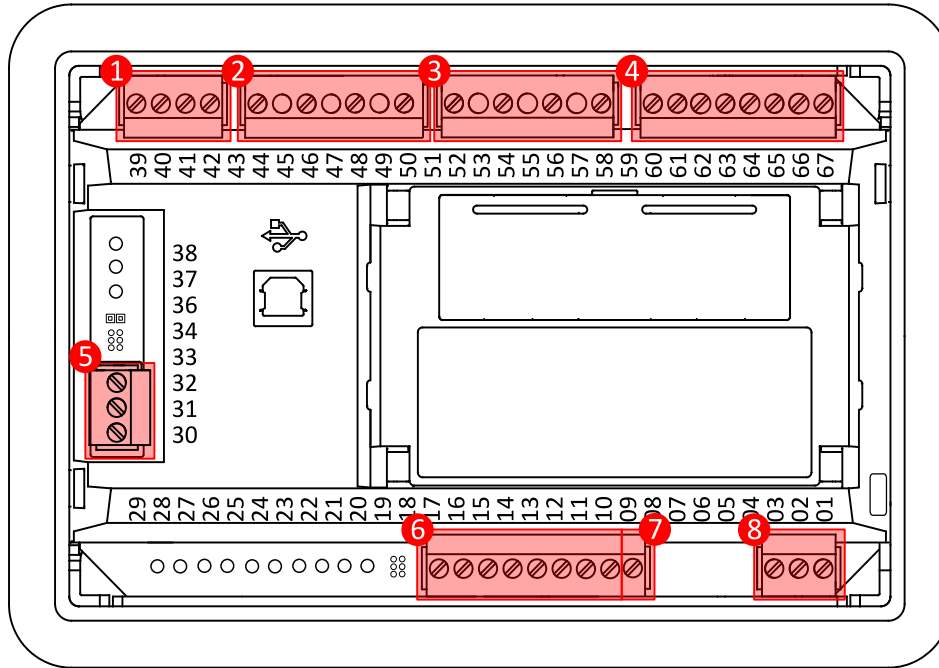
1	Current inputs	39-42	**Current measurement wiring (page 25)**
2	Voltage inputs	44, 46, 48, 50	**Voltage measurement wiring (page 28)**
3	Voltage inputs	52, 54, 56, 58	**Voltage measurement wiring (page 28)**
4	Binary inputs	60-67	**Binary inputs (page 36)**
5	RS485	B, COM, A	**RS485 wiring (page 39)**
6	Binary outputs	08-15	**Binary outputs (page 37)**
7	E-Stop	09	**E-Stop (page 38)**
8	Power supply	"+", "-"	**Power supply (page 23)**

Note: Wiring terminal markings to included tightening torque: 0.5 N-m (4.5 lb-in)., and wire size: 2 mm^2 (12-26 AWG).

4.4.1 General

To ensure proper function:

> Use grounding terminals.

> Wiring for binary inputs must not be run with power cables.

> Analog and binary inputs should be wired with shielded cables, especially when the length is more than 3 m.

Tightening torque, allowable wire size and type, for the Field-Wiring Terminals:	
For Mains Voltage, Generator Voltage and Current terminals	
	Specified tightening torque is 0.56 Nm (5.0 In-lbs)
	use only diameter 0.5 - 2.0 mm (12 - 26 AWG) conductor, rated for 90 °C minimum.
For other controller field wiring terminals	
	Specified tightening torque 0.79 nm (7.0 In-lb)
	Use only diameter 0.5 - 2.0 mm (12 - 26 AWG) conductor, rated for 75 °C minimum.
	Use copper conductors only
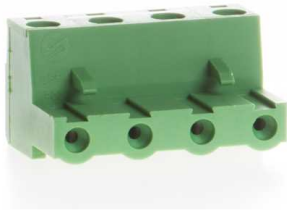
4.4.2 Grounding

The shortest possible length of wire should be used for controller grounding. Use cable min. 2.5 mm^2.

The negative "−" battery terminal must be properly grounded.

Switchboard and engine must be grounded at common point. Use the shortest possible cable to the grounding point.

4.4.3 Power supply

To ensure proper function:

> Use power supply cable min. 1.5 mm^2

Maximum continuous DC power supply voltage is 36 V. The controller's power supply terminals are protected against large pulse power disturbances. When there is a potential risk of the controller being subjected to conditions outside its capabilities, an outside protection device should be used.

It is necessary to ensure that potential difference between current COM terminal and battery "−" terminal is maximally ±2 V. Therefore it is strongly recommended to interconnect these two terminals together.

Note: The controller should be grounded properly in order to protect against lighting strikes. The maximum allowable current through the controller's negative terminal is 4 A (this is dependent on binary output load).

Note: Recommended fusing is 4 A fuse.

Note: In case of the dip to 0 V the high-side binary outputs will be temporarily switched off and after recovering to 4 V back on.

IMPORTANT: When the controller is powered up only by USB and the USB is disconnected then the actual statistics can be lost.

Note: Suitable conductor protection shall be provided in accordance with NFPA 70, Article 240.

Note: Low voltage circuits (35 volts or less) shall be supplied from the engine starting battery or an isolated secondary circuit.

Power supply fusing

The controller should never be connected directly to the battery. A 4 A fuse should be connected in-line with the battery positive terminal to the controller. Fuse value and type depends on the number of connected devices and wire length. Recommended fuse (not fast) type – T4 A. Not fast types are recommended due to internal capacitors charging during power up.

IMPORTANT: 4 A fuse is calculated without BOUT consumption. Real value of fuse depends on consumption of binary outputs.

4.4.4 Measurement wiring

Use 1.5 mm^2 cables for voltage connection and 2.5 mm^2 for current transformers connection. Adjust **Connection type (page 167)**, **Nominal Voltage Ph-N (page 168)**, **Nominal Voltage Ph-Ph (page 168)**, **Nominal Current (page 166)**, **Source 2 VT Ratio (page 169)**, **Source 1 VT Ratio (page 168)** and **Gen CT Ratio Prim (page 166)** to appropriate setpoints in the Basic Settings group.

IMPORTANT: Risk of personal injury due to electric shock when manipulating voltage terminals under voltage. Be sure the terminals are not under voltage before touching them.
Do not open the secondary circuit of current transformers when the primary circuit is closed. Open the primary circuit first.

CT Location

CT Location is fixed on Load position.
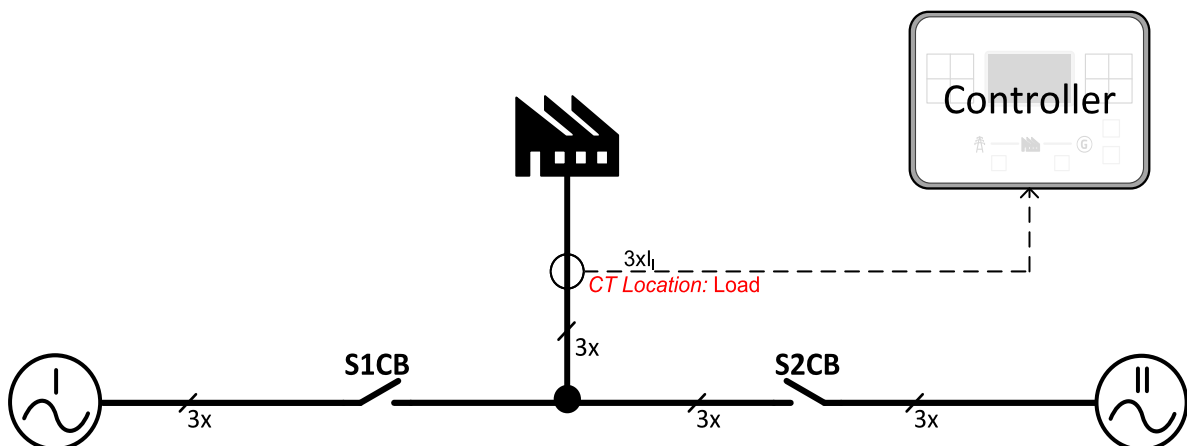
Image 4.2 CT Location

Current measurement wiring

The number of CT's is automatically selected based on selected value of setpoint **Connection type (page 167)** [3Ph4W / 3Ph3W / High Leg D / 3Ph3Wire / SplPhL1L2 / SplPhL1L3 / Mono Ph].

Currents and power measurement are suppressed if current level is bellow <1 % of CT range.

To ensure proper function:

> Use cables of 2.5 mm^2

> Use transformers to 5 A

> Connect CT according to following drawings:

3Ph4W / 3Ph3W / High Leg Delta application
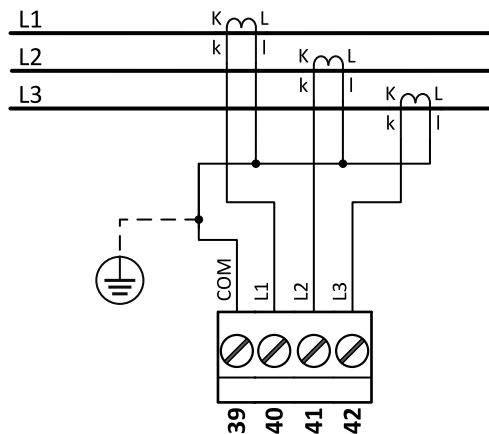
Image 4.3 3Ph4W / 3Ph3W / High Leg Delta application

IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so ground properly both terminals.
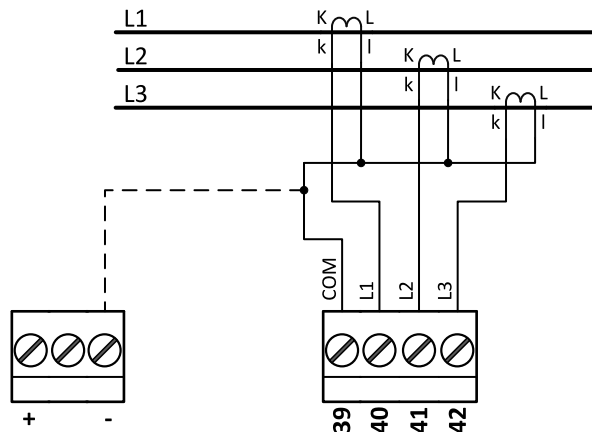
Image 4.4 3Ph4W / 3Ph3W / High Leg Delta application

IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so interconnect these two terminals.

Note: This wiring is recommended for Indian market.

SplPhL1L2 application
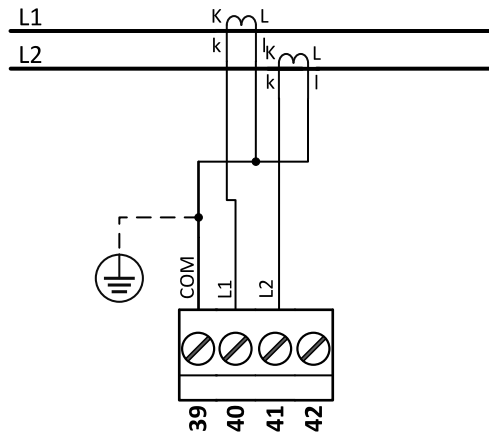
Image 4.5 SplPhL1L2 application

> **IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so ground properly both terminals.**

Image 4.6 SplPhL1L2 application

> **IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so interconnect these two terminals.**

Note: This wiring is recommended for Indian market.
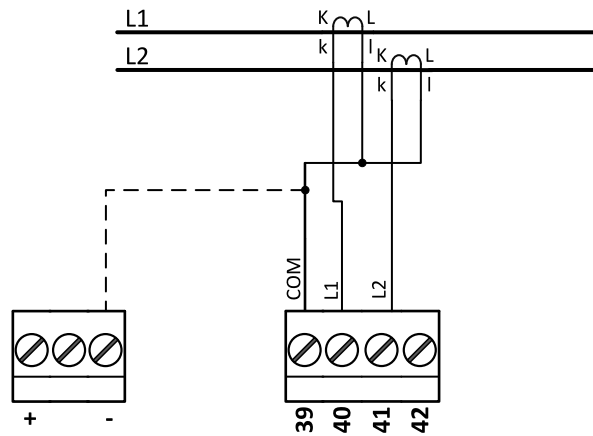
SplPhL1L3 application
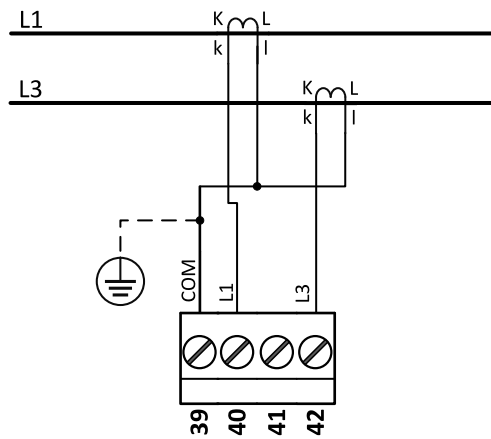
Image 4.7 SplPhL1L3 application

> **IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so ground properly both terminals.**
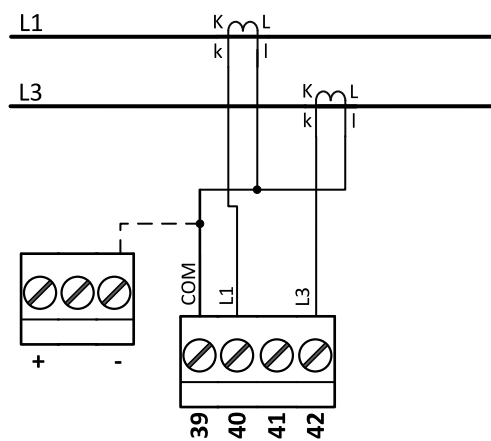
Image 4.8 SplPhL1L3 application

> **IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so interconnect these two terminals.**

Note: This wiring is recommended for Indian market.

> **IMPORTANT: The second phase of split phase connection is connected to the terminal, where the third phase is normally connected.**

Mono phase application

Connect CT according to following drawings. Terminals phase 2 and phase 3 are opened.
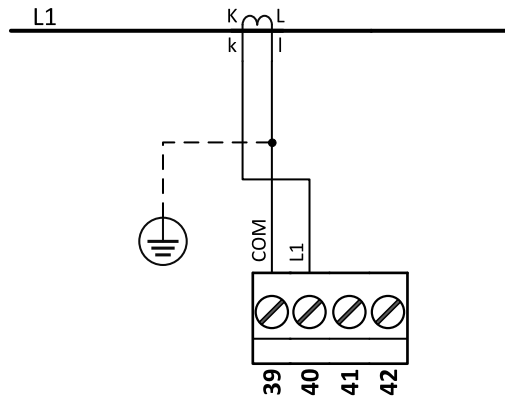
Image 4.9 Mono phase application

> **IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so ground properly both terminals.**
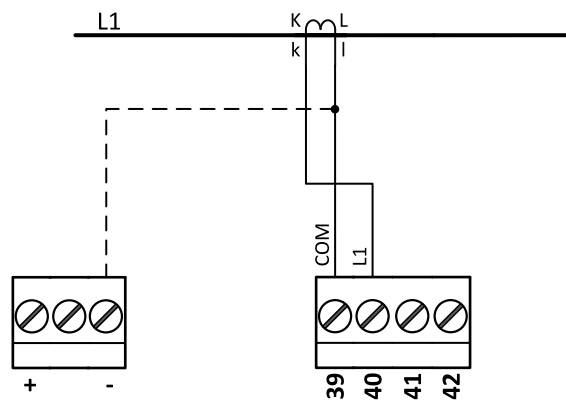
Image 4.10 Mono phase application

> **IMPORTANT: It is necessary to ensure that potential difference between current COM terminal and power supply "–" terminal is maximally ±2 V. To do so interconnect these two terminals.**

Note: This wiring is recommended for Indian market.

Voltage measurement wiring

There are 6 voltage measurement Connection Type (setpoint **Connection type (page 167)** [3Ph4Wire / High Leg D / 3Ph3Wire / SplPhL1L2 / SplPhL1L3 / Mono Ph] options, each type matches to corresponding generator connection type.

Note: For fusing of voltage measurement input use T1A or T2A fuse.

The generator protections are evaluated from different voltages based on **Connection type (page 167)** setting:

> 3Ph 4W – Ph-Ph voltage, Ph-N voltage
> High Leg D – Ph-Ph voltage, Ph-N voltage
> 3Ph 3W – Ph-Ph voltage

> SplPhL1L2 – Ph-N voltage

> SplPhL1L3 – Ph-N voltage

> Mono Ph – Ph-N voltage

Connection Type: 3 Phase 4 Wires
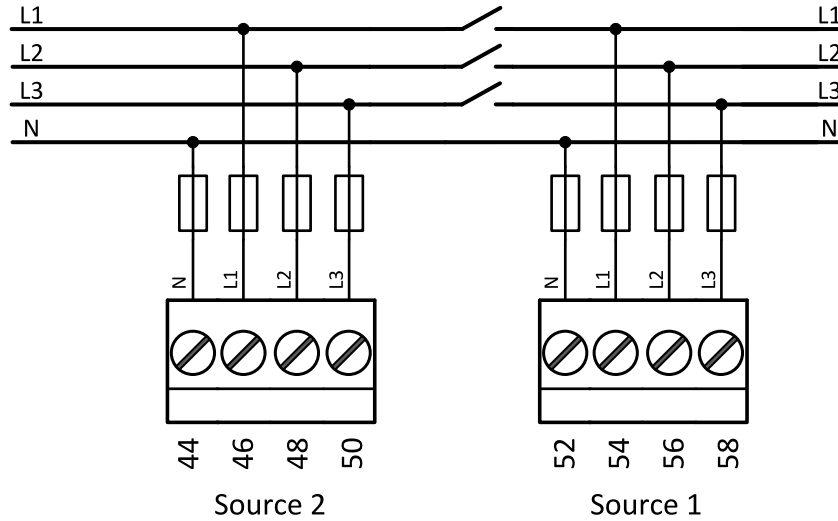
Image 4.11 3 phase application with neutral

Note: *Fuse on "N" wire is not obligatory but recommended.*
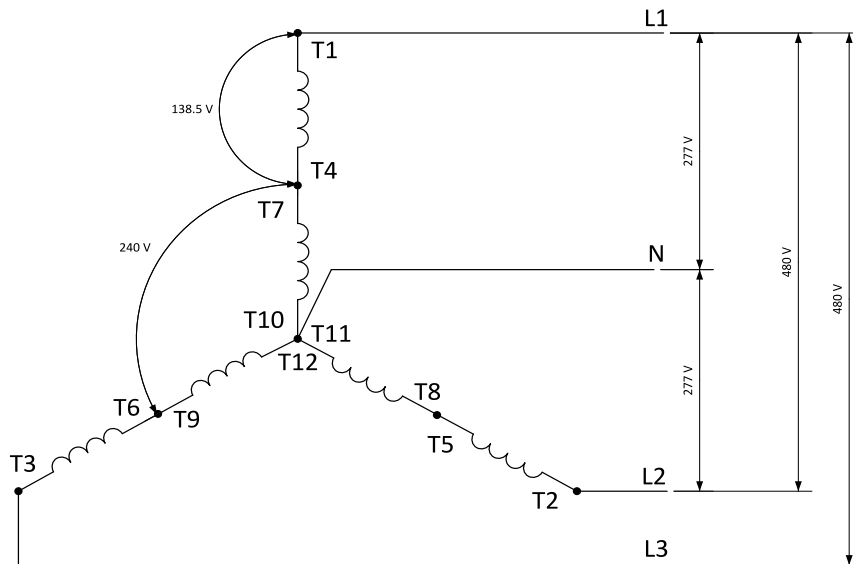
Image 4.12 Typical 3 Phase 4 Wires generator wiring, also known as 3ph High Y
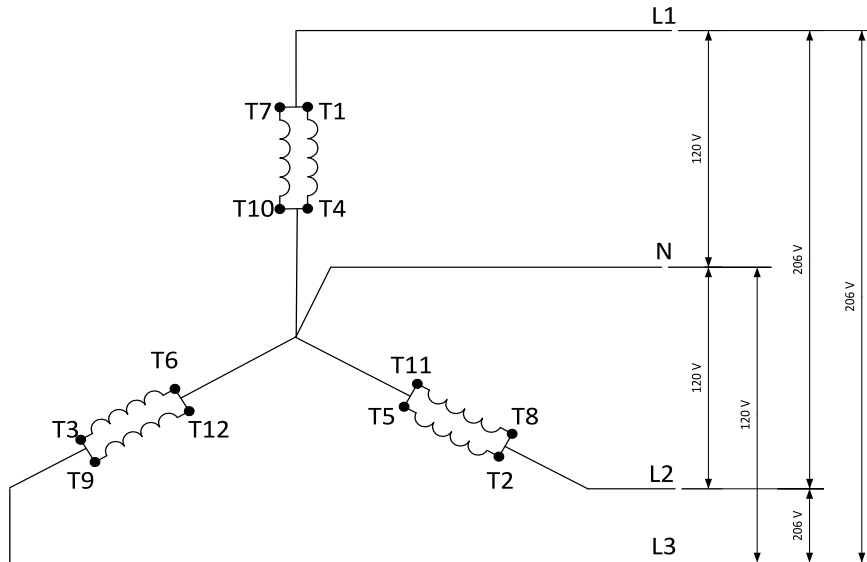
Image 4.13 3 Phase 4 Wires generator wiring, also known as 3ph Low Y

Connection Type: High Leg D
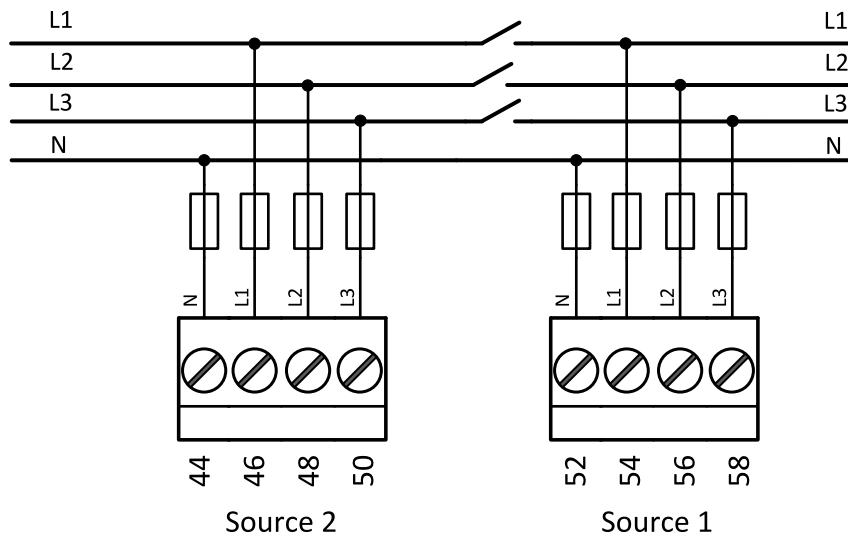
Image 4.14 High Leg Delta application

Note: *Fuse on "N" wire is not obligatory but recommended.*
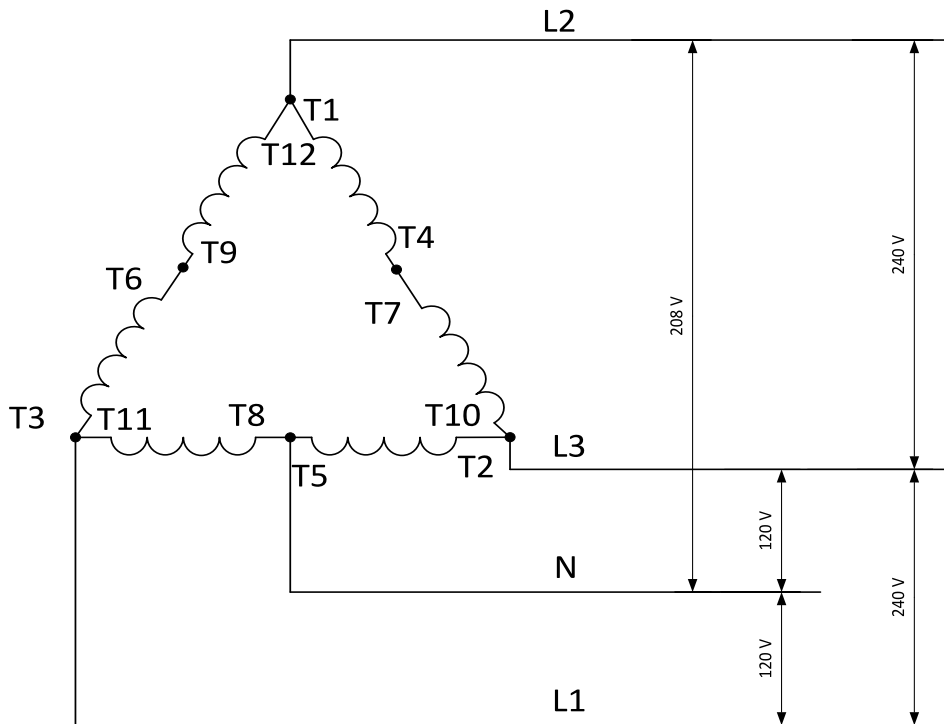
Image 4.15 Typical High Leg D generator wiring

Connection Type: 3 Phase 3 Wires
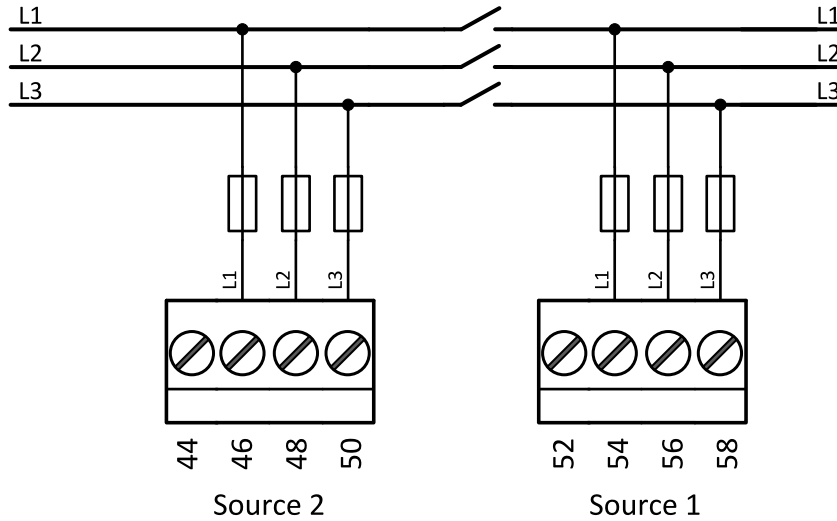
Image 4.16 3 phase application without neutral
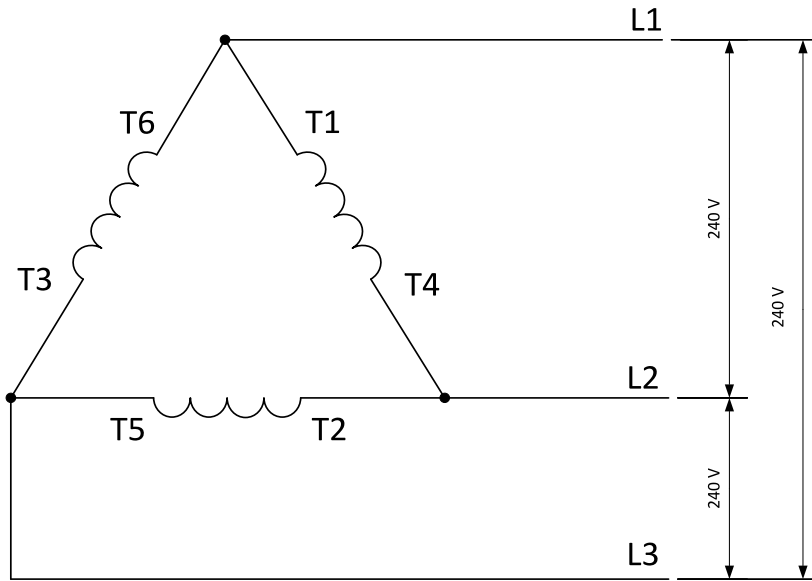
Image 4.17 Typical 3 Phase 3 Wires generator wiring

Connection Type: SplPhL1L2
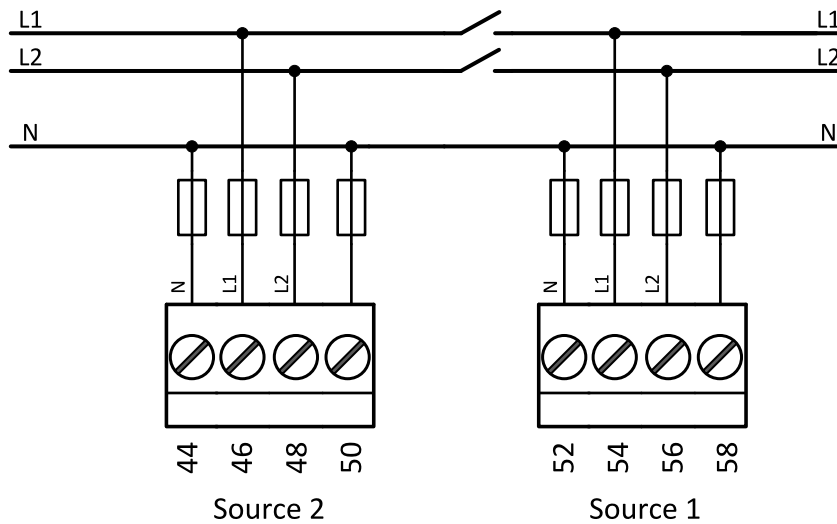
Image 4.18 Split phase L1L2 application

Note: *Fuse on "N" wire is not obligatory but recommended.*

DOUBLE DELTA Connection
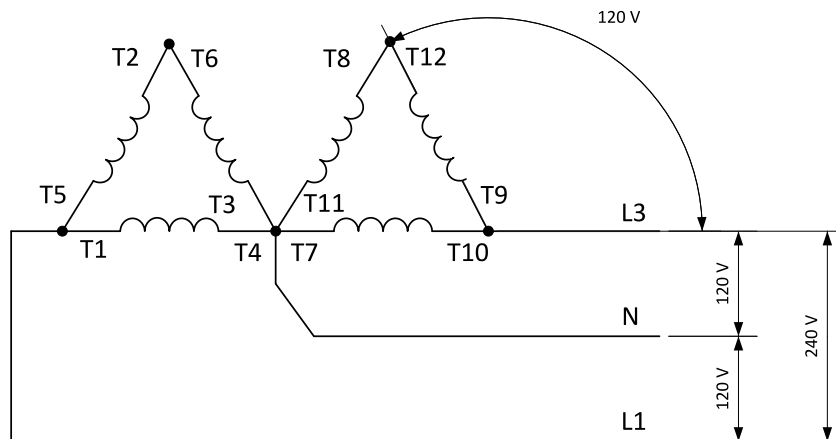
Image 4.19 Typical Split Phase generator wiring

ZIG ZAG (DOG LEG) Connection
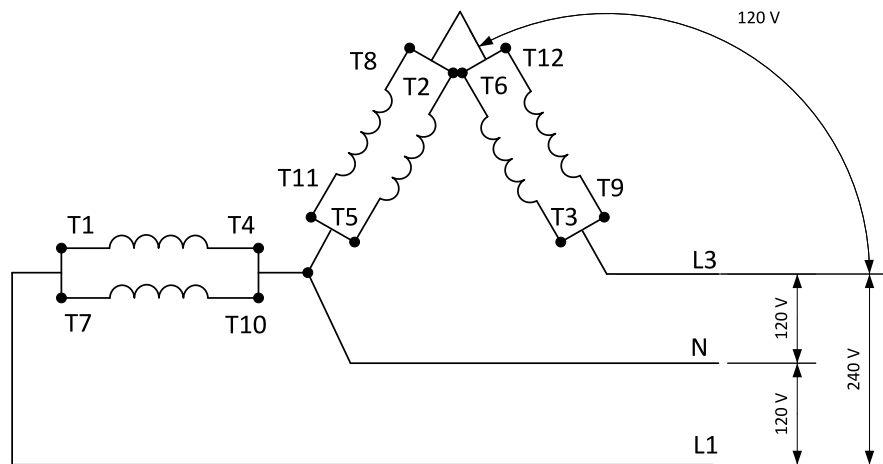
Image 4.20 Typical Split Phase generator wiring

Connection Type: SplPhL1L3
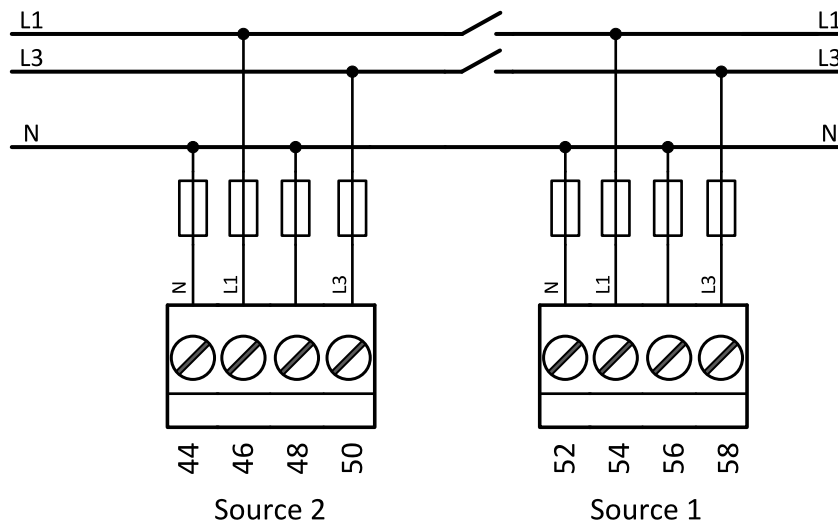
Image 4.21 Split phase L1L3 application

Note: *Fuse on "N" wire is not obligatory but recommended.*

DOUBLE DELTA Connection
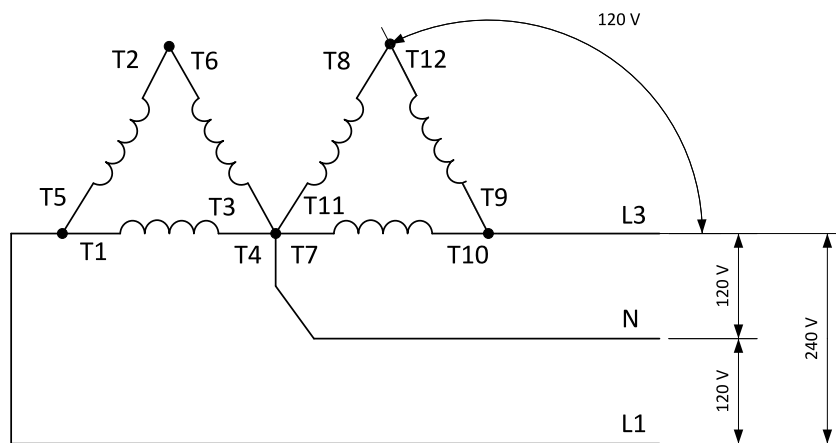
Image 4.22 Typical Split Phase generator wiring

ZIG ZAG (DOG LEG) Connection
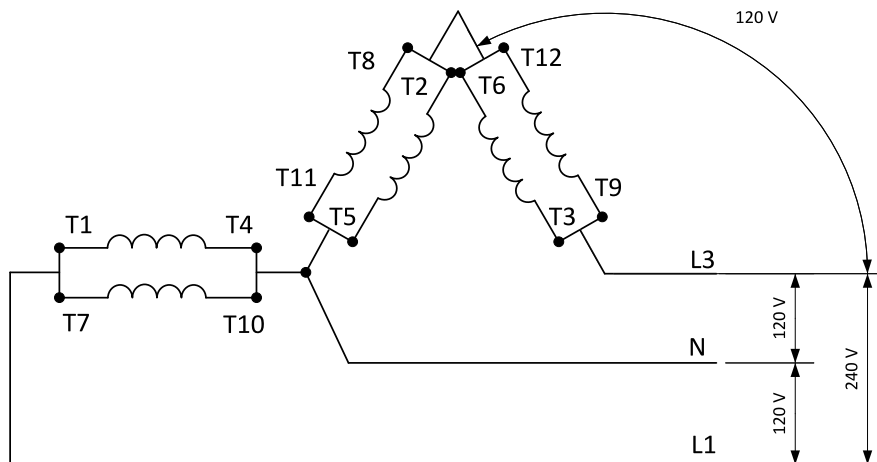
Image 4.23 Typical Split Phase generator wiring

Connection Type: Mono Phase
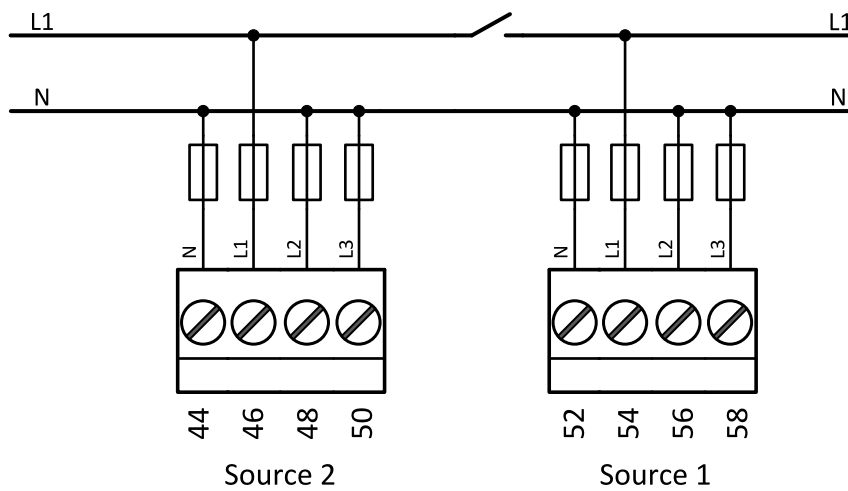
Image 4.24 Mono phase application

Note: *Fuse on "N" wire is not obligatory but recommended.*
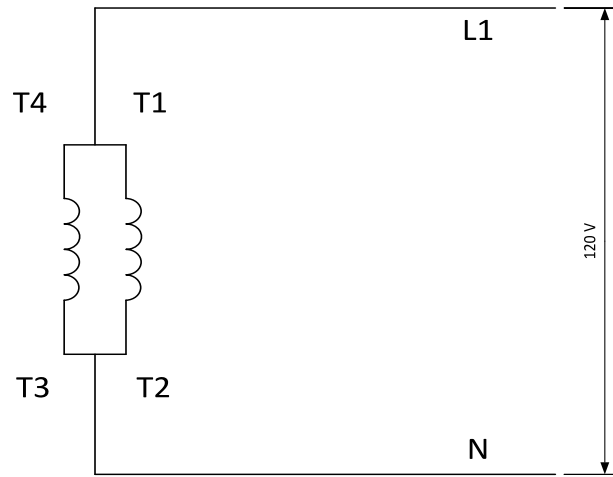
Image 4.25 Typical Mono Phase generator wiring

4.4.5 Binary inputs

Use minimally 1 mm^2 cables for wiring of Binary inputs.
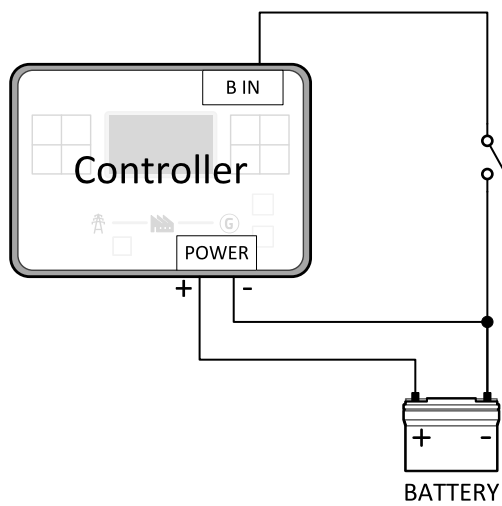
Image 4.26 Wiring binary inputs

Note: *The name and function or alarm type for each binary input must be assigned during the configuration.*

4.4.6 Binary outputs

Use min. 1 mm^2 cables for wiring of binary outputs. Use external relays as indicated on the schematic below for all outputs except those where low-current loads are connected (signalization etc.).

> **IMPORTANT: Use suppression diodes on all relays and other inductive loads!**
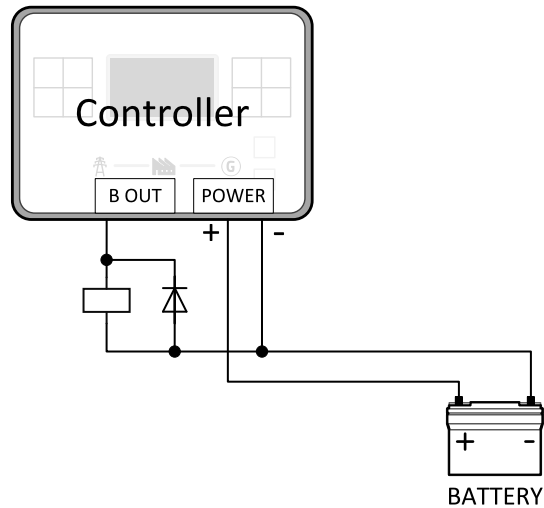
Image 4.27 Binary outputs wiring

> *Note: Every single low current binary output can provide up to 0.5 A of steady current.*

> **IMPORTANT: When operating temperature is higher than 60 °C it is strongly recommended to limit output current of high current binary outputs to 4 A (each).**
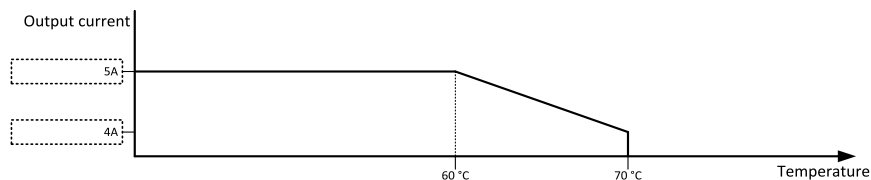
4.4.7 E-Stop

E-Stop has dedicated terminal T09. Power supply of binary output 1 and binary output 2 is internally connected (in controller) to E-Stop terminal. It means higher security and faster disconnection of these outputs. More information about E-Stop functions **see E-Stop on page 89**.

Note: This function has the same behavior as binary input EMERGENCY STOP (PAGE 348).
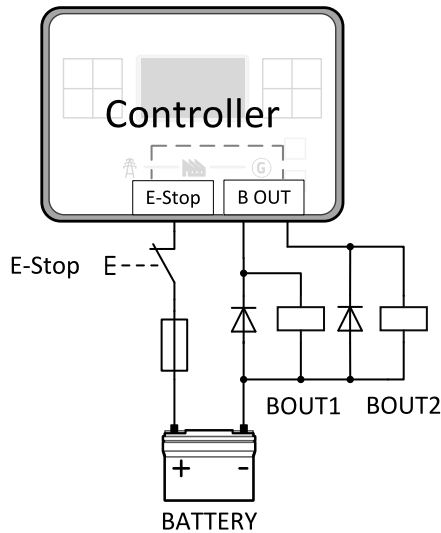
Image 4.28 E-Stop wiring

Note: Recommended fusing is 10 A fuse.

Note: Grey dashed line symbolizes internal connection between E-Stop and binary outputs 1 and 2.

Note: For proper functionality of E-Stop, the terminal T09 must be always wired. Terminal can be connected to battery+ or to terminal T03 (BATT+)

> IMPORTANT: Suppression diodes are not indicated, but required.

4.4.8 Total Stop and Emergency Stop

LBI TOTAL EMERGENCY STOP (PAGE 358) and EMERGENCY STOP (PAGE 348) can be configured on any physical input. There are 2 ways how to make a wiring:

> Connecting a normally closed "mushroom-type" button to the binary input. This is a purely software solution.

> A hard-wired solution, where the button also disconnects the power supply from the controller outputs.
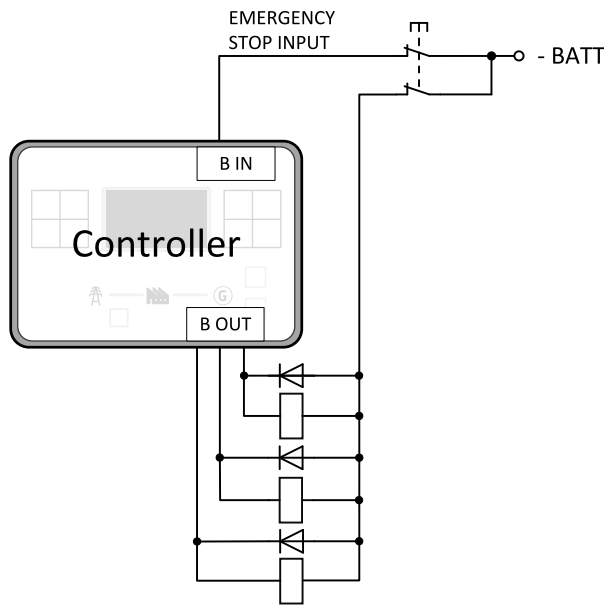
Image 4.29 Hard-wired emergency stop

> **IMPORTANT: Suppression diodes are not indicated, but required.**

4.4.9 RS485 wiring

The wiring of the RS485 communication should be provided in such a way that the following rules are followed:

> Standard maximum bus length is 1000 m.

> Shielded cable[1] must be used, and shielding must be connected to the terminal T01 (Grounding).

> External units can be connected on the RS485 line in any order, but keeping the line arrangement (no tails, no star) is necessary.

> The line must be terminated by 120Ω resistors at both ends.

> For shorter distances (connection within one building)
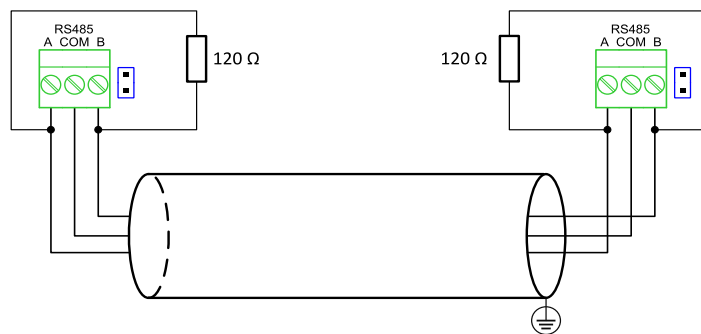
Image 4.30 RS485 wiring for shorter distances

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[1]Recommended data cables: BELDEN (http://www.belden.com) – for shorter distances: 3105A Paired – EIA Industrial RS-485 PLTC/CM (1x2 conductors); for longer distances: 3106A Paired – EIA Industrial RS-485 PLTC/CM (1x2+1 conductors)

> For longer distances or in case of surge hazard (connection out of building, in case of storm etc.)
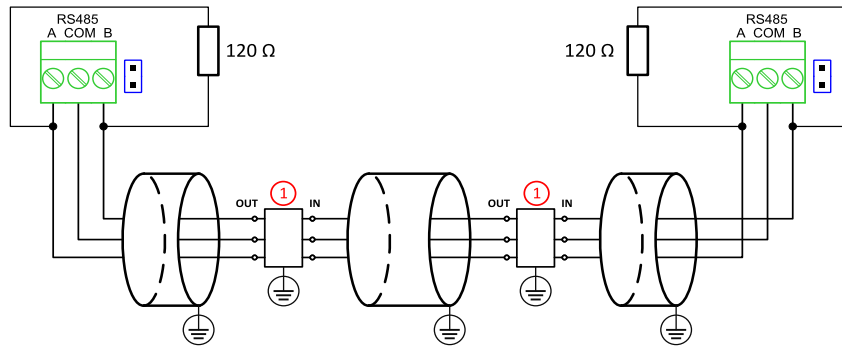
Image 4.31 RS485 wiring for longer distances

① Recommended PT5HF-5DC-ST[1]

Note: Communication circuits shall be connected to communication circuits of Listed equipment.

Onboard RS485 description

Balancing resistors

The transmission bus into the RS485 port enters an indeterminate state when it is not being transmitted to. This indeterminate state can cause the receivers to receive invalid data bits from the noise picked up on the cable. To prevent these data bits, force the transmission line into a known state. By installing two 620Ω balancing resistors at one node on the transmission line, a voltage divider is created that forces the voltage between the differential pair to be less than 200 mV, which is the threshold for the receiver. Install these resistors on only one node. The figure below shows a transmission line using bias resistors. Balancing resistors are placed directly on the PCB of controller. Use the jumpers PULL UP/PULL DOWN to connect the balancing resistors.
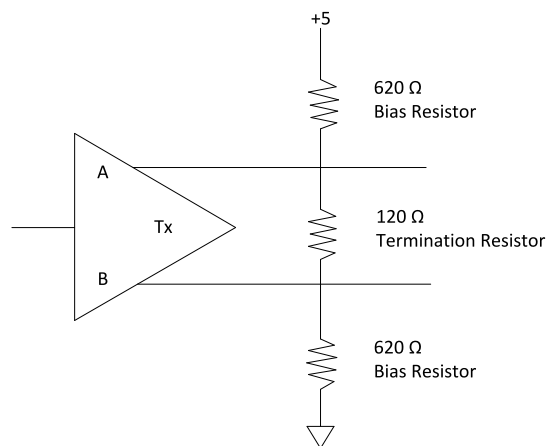
Image 4.32 Balancing resistors

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[1]Recommended protections: Phoenix Contact (http://www.phoenixcontact.com): PT 5-HF-5DC-ST with PT2x2-BE (base element)(or MT-RS485-TTL) or Saltek (http://www.saltek.cz): DM-006/2 R DJ
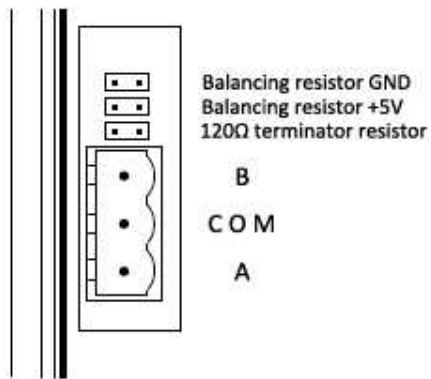
Image 4.33 RS485 on board

4.4.10 USB

This is required for computer connection. Use the shielded USB A-B cable.
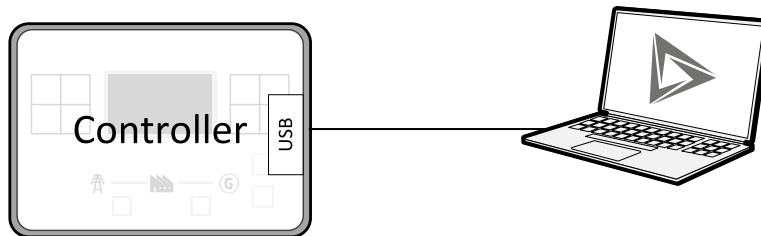
Image 4.34 USB connection

Controller can be also powered by USB (only for service purpose like an uploading firmware, change of configuration etc.).

> **IMPORTANT: Power supply by USB is only for service purpose. Binary inputs and outputs are in logical 0. Also plug-in modules are not working.**

4.5 Plug-in module installation

4.5.1 Installation

> **IMPORTANT: Any manipulation with plug-in module shall be done with disconnected power supply to controller.**

Remove the back cover. To do this, press four holders which are located in corners.
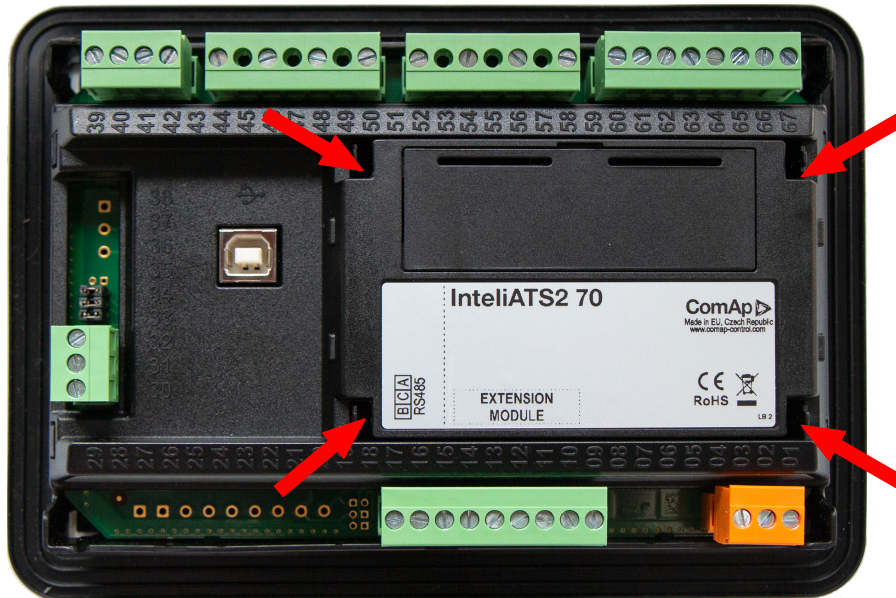
After removing the back cover insert the plug-in module. The plug-in module must be inserted under holders. Start with holders marked by arrows. There are also arrows on the controller for better navigation. After inserting plug-in module under holders press it down. This locks the module in place.

4.6 Maintenance

4.6.1 Backup battery replacement

This battery serves to maintain the run of RTC (real time clock) so that controller does not lose information about time and date when disconnected from power supply.

The internal backup battery lifetime is approx. 6 years. If replacement of backup battery is needed, follow these instructions:

> Connect the controller to a PC and save an archive for backup purposes (not necessary but recommended).
> Disconnect all terminals from the controller and remove the controller from the switchboard.
> Remove the back cover and all plug-in modules.

> Release the rear cover using a flat screwdriver or another suitable tool.

> The battery is located in a holder on the circuit board. Remove the old battery with a small sharp screwdriver and push the new battery into the holder using a finger.
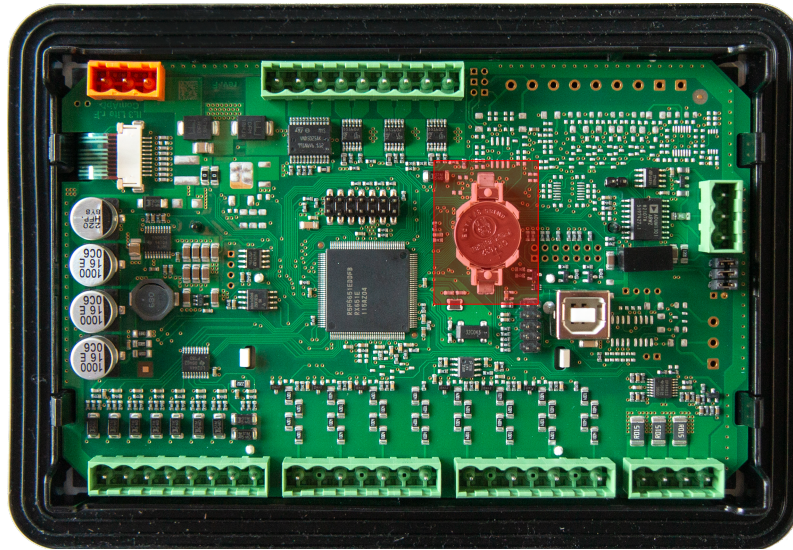
> Replace the rear cover. Use slight pressure to lock the snaps into the housing. Pay attention that the cover is in correct position and not upside down!
> Replace the plug-in modules and back cover.
> Power the controller on, adjust date and time and check all setpoints.

⬆ **back to Installation and wiring**

5 Controller setup

⬆ **back to Table of contents**

5.1 Default configuration

5.1.1 Binary inputs

Number	Description	Configured function
BIN1	Circuit breaker feedback	**S1CB FEEDBACK (PAGE 354)**
BIN2	Circuit breaker feedback	**S2CB FEEDBACK (PAGE 355)**
BIN3	Source 1 Fail Block	**S1 FAIL BLOCK (PAGE 354)**
BIN4	Source 2 Switch Block	**S2 BLOCK (PAGE 355)**
BIN5	Transfer to Source 2	**TRANSFER TO S2 (PAGE 358)**
BIN6	Total Emergency Stop	**TOTAL EMERGENCY STOP (PAGE 358)**
BIN7	Switch controller to the OFF mode	**REMOTE OFF (PAGE 352)**
BIN8	Switch controller to the AUTO mode	**REMOTE AUTO (PAGE 351)**

5.1.2 Binary outputs

Number	Description	Function
BOUT1	Signal for engine to Start or Stop	**GEN START/STOP (PAGE 368)**
BOUT2	Control signal for Source 1 breaker	**S1CB CLOSE/OPEN (PAGE 373)**
BOUT3	Indication of Source 1 condition	**S1 HEALTHY (PAGE 372)**
BOUT4	Control signal for Source 2 breaker	**S2CB CLOSE/OPEN (PAGE 377)**
BOUT5	Indication of Source 2 condition	**S2 HEALTHY (PAGE 377)**
BOUT6	Controller not in AUTO mode	**NOT IN AUTO (PAGE 371)**
BOUT7	Indication of alarm	**ALARM (PAGE 365)**
BOUT8	Acoustic indication of alarm	**HORN (PAGE 368)**

5.2 Controller configuration and PC tools connection

⬟ **back to Controller setup**

This chapter contains brief introduction into the specifics of firmware and archive upload, as well as the connection of various PC tools to the controller. If you require detailed information on each PC tool please use the included Help in those PC tools or download their Global Guides.

5.2.1 USB

You may connect to the controller using the USB port. In this case standard USB A to B cable should be used.

Connection using InteliConfig
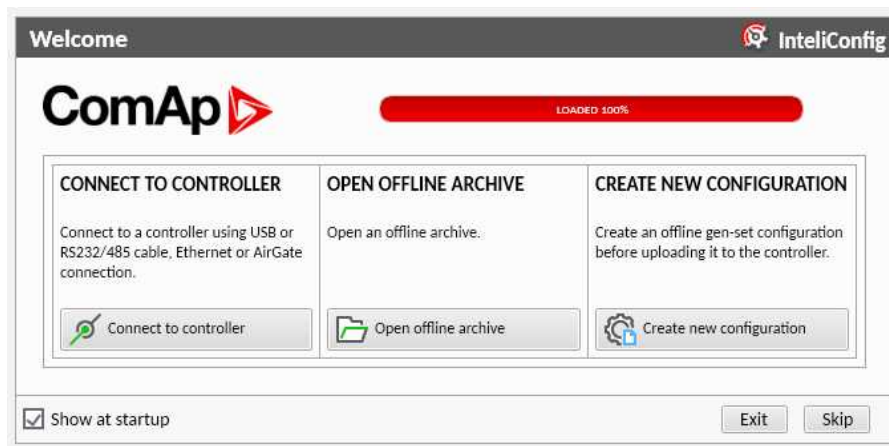
Image 5.1 First screen of InteliConfig – select connect to controller

Image 5.2 Second screen of InteliConfig – select detected controllers

Connection using WinScope 1000
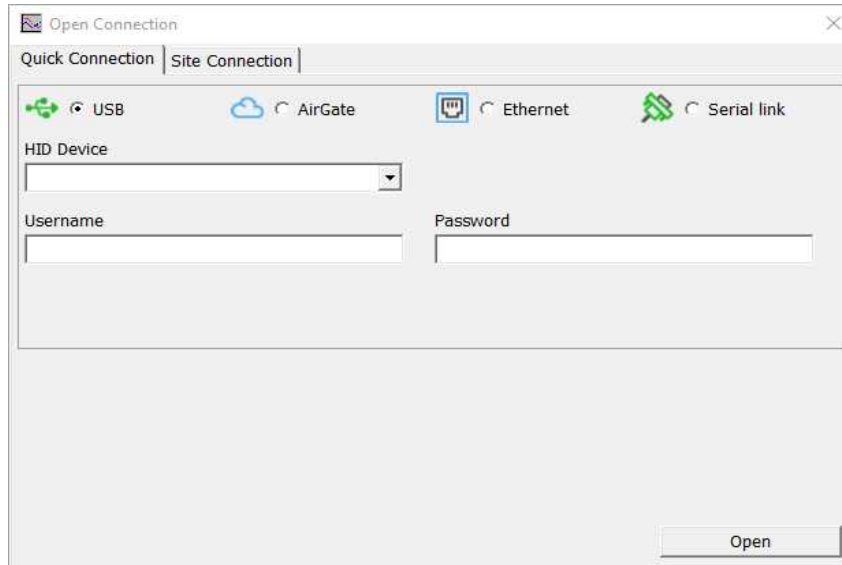
Image 5.3 WinScope 1000 screen – select USB connection

Select your controller from the HID Device drop-down list.

Note: Username and password are not mandatory.

5.2.2 RS232/RS485

It is possible to connect to the controller using RS232 or RS485 direct connection (serial port or USB to RS232/RS485 converter may be used). The following settings should be checked in the controller:

> **COM1 Mode (page 266)** = Direct
> **Controller Address (page 182)** must be set

Connection using InteliConfig
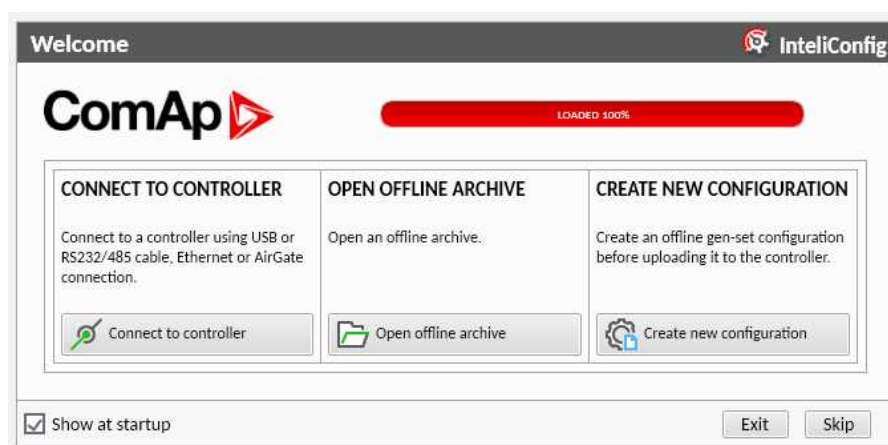
Image 5.4 First screen of InteliConfig – select connect to controller
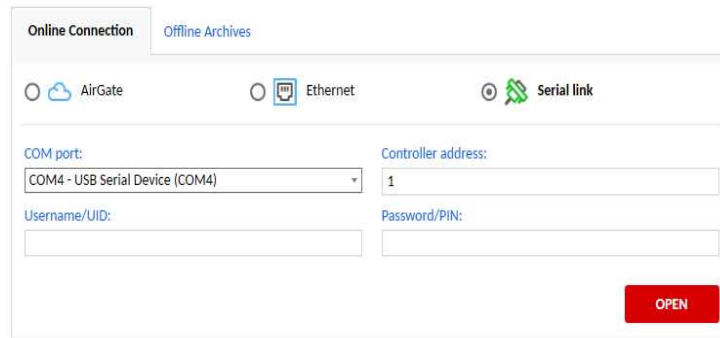
Image 5.5 Second screen of InteliConfig – select Serial link

Connection using WinScope 1000
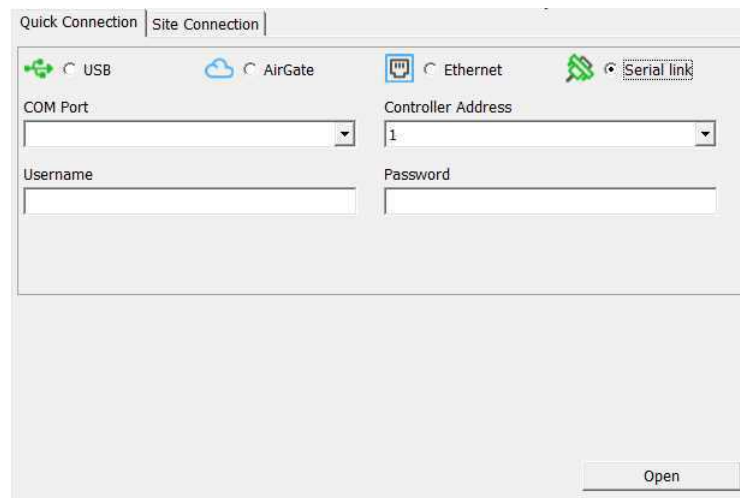
Image 5.6 WinScope 1000 screen – select serial link

Note: Username and password are not mandatory.

5.2.3 Ethernet

It is possible to connect to the controller using Ethernet port either directly or using ComAp's AirGate service.

Direct connection

If you use a direct connection the controller needs to be reachable directly from the PC you use (i.e. one LAN or WAN without any firewalls and other points that may not allow the connection). The following settings should to be checked in the controller:

> **Controller Address (page 182)** must be set to the same value as in the PC tool

> **IP Address Mode (page 290)** can be set to AUTOMATIC when there is DHCP service available. Otherwise it should be set to FIXED

> **IP Address (page 291)** is either set automatically or it can be adjusted to a specific requested value

> **Subnet Mask (page 291)** is either set automatically or it can be adjusted to a specific requested value

> **Gateway IP (page 292)** can be set here when it is used

Connection using InteliConfig
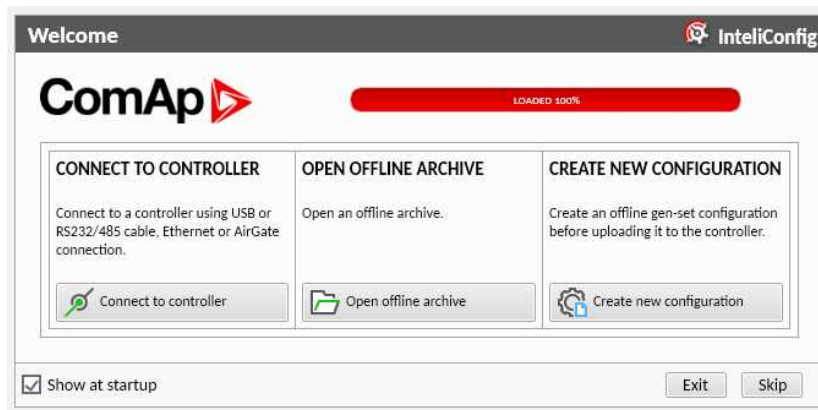
Image 5.7 First screen of InteliConfig – select connect to controller
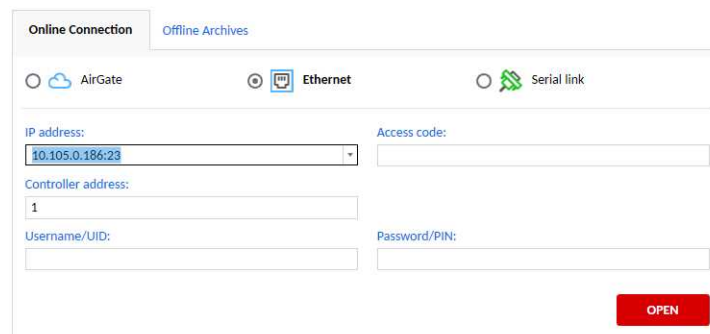
Image 5.8 Second screen of InteliConfig – select Internet / Ethernet

Connection using WinScope 1000
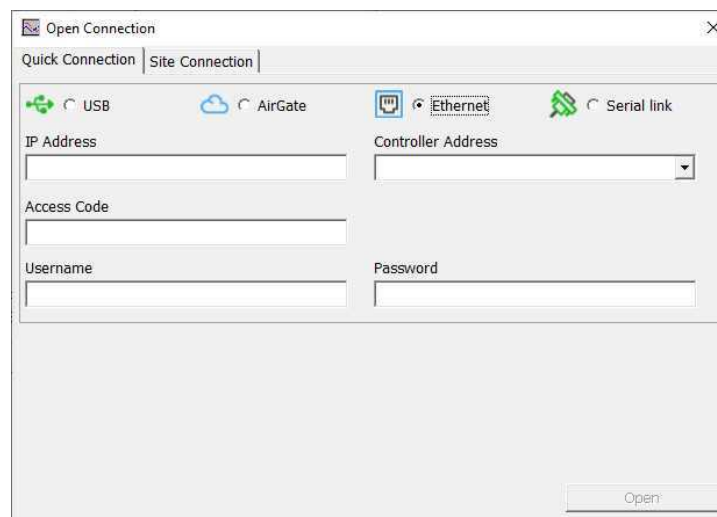
Image 5.9 WinScope 1000 screen – select Ethernet

Following information has to be filled to establish connection:

> IP address

> Controller address

> User name and Password

AirGate connection

You can use ComAp's AirGate service that allows you to connect to any controller via the internet regardless of the restrictions of the local network (as long as the controller can connect to the internet AirGate service will work). The following setpoints must be adjusted:

> **Controller Address (page 182)** has to be set to the same value as in the PC tool

> **IP Address Mode (page 290)** must set to AUTOMATIC when there is DHCP service available. Otherwise it should be set to FIXED

> **IP Address (page 291)** is either set automatically or it can be adjusted to a specific requested value

> **Subnet Mask (page 291)** is either set automatically or it can be adjusted to a specific requested value

> **Gateway IP (page 292)** can be set here when it is used

> **AirGate Connection (page 294)** must be set to Enabled

> **AirGate Address (page 295)** currently there is one AirGate server running at URL global.airgate.link (enter this URL into the setpoint)

> **IMPORTANT: AirGate Key has to be configured. User with administrator rights has a possibility to set up or change AirGate Key via InteliConfig using Tools -> Access Administration -> Change AirGate Key.**

> **IMPORTANT: Controller has to be connected to the Internet.**

Connection using InteliConfig

In order to connect to InteliConfig following information have to be filled out:

> **AirGate ID (page 338)**

> AirGate Server → **AirGate Address (page 295)**

> **Controller Address (page 182)**

> User name and Password

> AirGate Key

> **IMPORTANT: AirGate Key has to be configured. User with administrator rights has a possibility to set up or change AirGate Key via InteliConfig using Tools -> Access Administration -> Change AirGate Key.**

Image 5.10 First screen of InteliConfig – select connect to controller
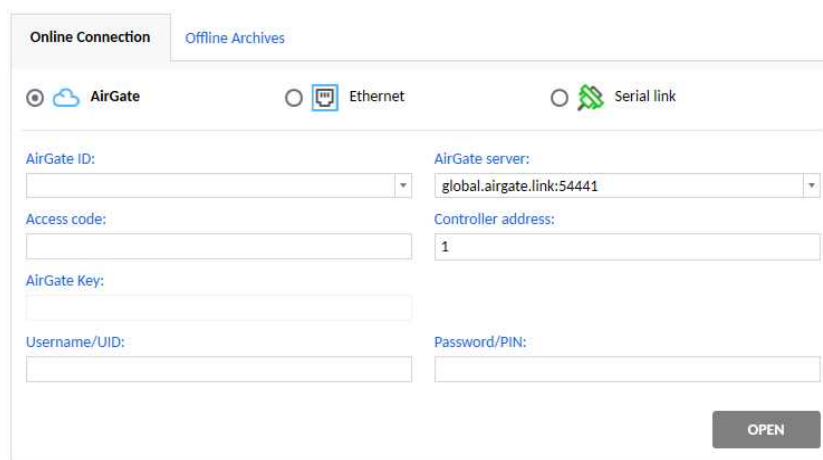
Image 5.11 Second screen of InteliConfig – AirGate

Connection using WinScope 1000

In order to connect to WinScope 1000 following information have to be filled out:

> **AirGate ID (page 338)**
> AirGate Server → **AirGate Address (page 295)**
> **Controller Address (page 182)**
> User name and Password
> Device Access Key →AirGate Key

IMPORTANT: AirGate Key has to be configured. User with administrator rights has a possibility to set up or change AirGate Key via InteliConfig using Tools -> Access Administration -> Change AirGate Key.
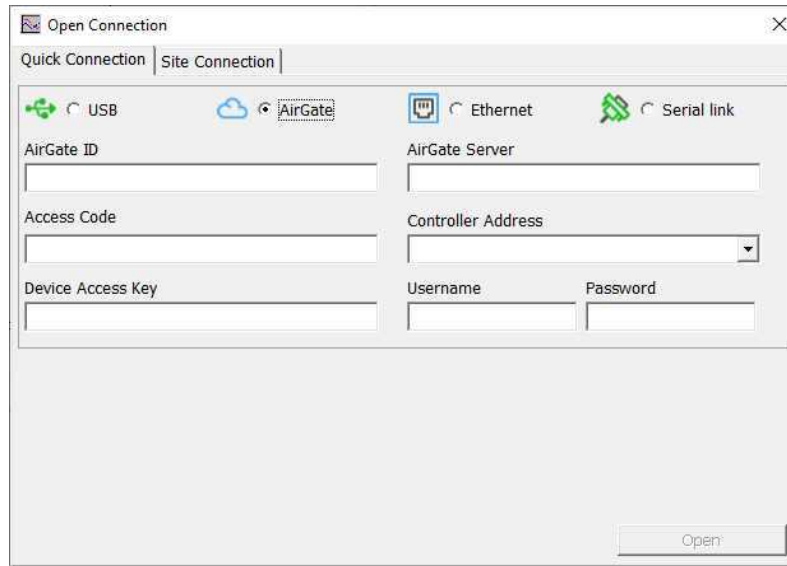
Image 5.12 WinScope 1000 screen – select AirGate

5.3 Operator Guide

5.3.1 Front panel elements
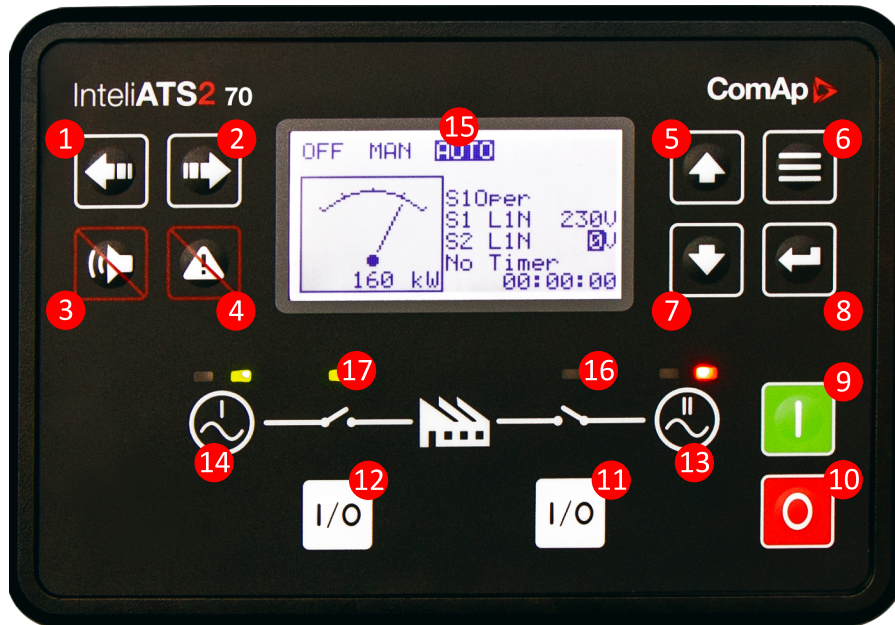
Image 5.13 Operator interface of InteliATS2 70

Control buttons		
Position	**Picture**	**Description**
1		**LEFT** button. Use this button to move left or to change the mode. The button can change the mode only if the main screen with the indicator of currently selected mode is displayed. *Note: This button will not change the mode if the controller mode is forced by one of binary inputs listed in the Reference Guide – "Operating modes" chapter.*
2		**RIGHT** button. Use this button to move right or to change the mode. The button can change the mode only if the main screen with the indicator of currently selected mode is displayed. *Note: This button will not change the mode if the controller mode is forced by one of binary inputs listed in the Reference Guide – "Operating modes" chapter.*
3		**HORN RESET** button. Use this button to deactivate the horn output without acknowledging the alarms.
4		**FAULT RESET** button. Use this button to acknowledge alarms and deactivate the horn output. Inactive alarms will disappear immediately and status of active alarms will be changed to "confirmed" so they will disappear as soon as their reasons dismiss.
5		**UP** button. Use this button to move up or increase value.

⑥	☰	**PAGE** button. Use this button to switch over display pages.
⑦	⬇	**DOWN** button. Use this button to move down or decrease value.
⑧	⏎	**ENTER** button. Use this button to finish editing a setpoint or moving right in the history page.
⑨	I	**START** button. Works in MAN mode and in Mains-Gen application. Press this button to initiate the start sequence of the engine.
⑩	O	**STOP** button. Works in MAN mode and in Mains-Gen application. Press this button to initiate the stop sequence of the Source 2.
⑪	I/O	**S2CB** button. Works in MAN mode only. Press this button to open or close the S2CB.
⑫	I/O	**S1CB** button. Works in MAN mode only. Press this button to open or close the S1CB.

Indicators and others

Position	Description
⑬	**Source 2** status indicator. There are two states – Source 2 OK (indicator is green) and Source 2 failure (indicator is red). Green LED is on if the Source 2 voltage and frequency is present and within limits. Red LED is activated when Source 2 failure occurs.
⑭	**Source 1** status indicator. There are two states – Source 1 OK (indicator is green) and Source 1 failure (indicator is red). Green LED is on, if Source 1 is present and within limits. Red LED is activated when Source 1 failure occurs.
⑮	Graphic B/W display, 132 × 64 px.
⑯	**S2CB Status**. Green LED is on if S2CB is closed. It is driven by S2CB CLOSE/OPEN output or by S2CB feedback signal.
⑰	**S1CB Status**. Green LED is on if S1CB is closed. It is driven by S1CB CLOSE/OPEN output or by S1CB feedback signal.

5.3.2 Display screens

The displayed information is structured into "pages" and "screens". Use the PAGE button to switch over the pages.

> The page Measurement consists of screens which display measured values such as voltages, current etc.; computed values such as Source 2 power, statistic data and the alarm list on the last screen.
> The page setpoints contains all setpoints organized to groups and also a special group for a user to log in.
> The page History log shows the history log with the most recent record displayed first.

Main Screen
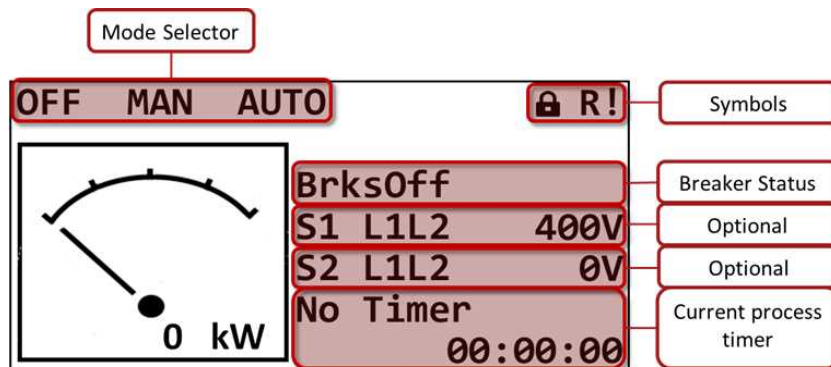
Symbols

> Padlock – active when LBI ACCESS LOCK is active
> R – active when there is active remote connection to controller
> Exclamation mark – active when there is any alarm in alarm list

Optional

> Value can be chosen via setpoints **Main Screen Line 1 (page 181)** and **Main Screen Line 2 (page 181)**.

Measurement Screens
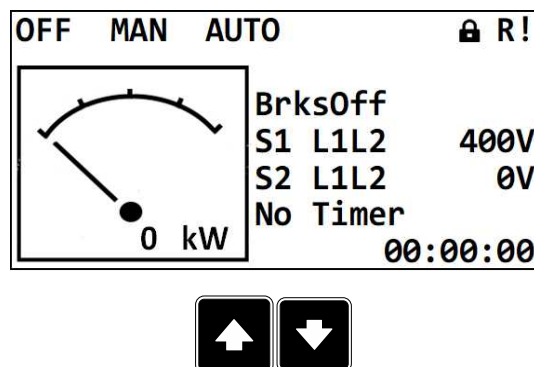
Note: Use the Up and Down buttons to move between measurement pages.

```
       Source 1 Voltage
L1N      230V    L1L2      400V
L2N      230V    L2L3      400V
L3N      230V    L3L1      400V
Source1 Freq              50.0Hz
```
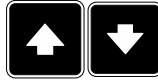
Note: *Use the Up and Down buttons to move between measurement pages.*

```
       Source 2 Voltage
L1N      230V    L1L2      400V
L2N      230V    L2L3      400V
L3N      230V    L3L1      400V
Source2 Freq              50.0Hz
```
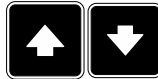
Note: *Use the Up and Down buttons to move between measurement pages.*

```
        Load Current
L1       130A
L2       130A
L3       130A
```
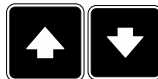
Note: *Use the Up and Down buttons to move between measurement pages.*

```
      Binary Inputs      1/2
          00000000
1 Input                      0
2 Input                      0
3 Input                      0
4 Input                      0
5 Input                      0
```

Note: *Use the Up and Down buttons to move between measurement pages.*

```
        Binary Inputs    2/2
            00000000
6 Input                      0
7 Input                      0
8 Input                      0
   E-STOP                    0
```
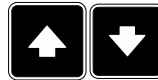
Note: Use the Up and Down buttons to move between measurement pages.

```
        Binary Outputs   1/2
            00000000
1 Output                     0
2 Output                     0
3 Output                     0
4 Output                     0
5 Output                     0
```
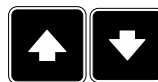
Note: Use the Up and Down buttons to move between measurement pages.

```
        Binary Outputs   2/2
            00000000
6 Output                     0
7 Output                     0
8 Output                     0
```

Note: Use the Up and Down buttons to move between measurement pages.

```
        EM-BIO8-EFCP     1/2
            00000000
       unused BIO1           0
       unused BIO2           0
       unused BIO3           0
       unused BIO4           0
       unused BIO5           0
```

Note: Use the Up and Down buttons to move between measurement pages.

Note: Available only with plug-in module.

```
EM-BIO8-EFCP        2/2
        00000000
    unused BIO6         0
    unused BIO7         0
    unused BIO8         0
```
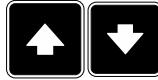
Note: Use the Up and Down buttons to move between measurement pages.

Note: Available only with plug-in module.

```
        Source 1 Power
            kW    PF    kVA
L1          0   0.00      0
L2          0   0.00      0
L3          0   0.00      0

Σ           0   0.00      0
```
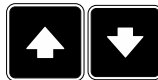
Note: Use the Up and Down buttons to move between measurement pages.

Note: Source 1 Power screen is shown when S1CB breaker is closed.

```
        Source 2 Power
            kW    PF    kVA
L1          0   0.00      0
L2          0   0.00      0
L3          0   0.00      0

Σ           0   0.00      0
```

Note: Use the Up and Down buttons to move between measurement pages.

Note: Source 2 Power screen is shown when S2CB breaker is closed.

```
┌─────────────────────────────────────┐
│            Statistics               │
│ Source1 kWh                       0 │
│ Source1 kVArh                     0 │
│ Source2 kWh                       0 │
│ Source2 kVArh                     0 │
│                                     │
│                                     │
└─────────────────────────────────────┘
```
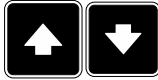
Note: *Use the Up and Down buttons to move between measurement pages.*

```
┌─────────────────────────────────────┐
│ CM-4G-GPS                      1/2  │
│ Signal Strength                93% │
│ Net Status                       0 │
│ Net Name                         0 │
│ Net Mode                        4G │
│ Status                           0 │
│ IPAddr          123.123.123.123 │
└─────────────────────────────────────┘
```
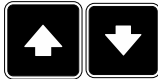
Note: *Use the Up and Down buttons to move between measurement pages.*

Note: *Available only with plug-in module.*

```
┌─────────────────────────────────────┐
│ CM-4G-GPS                      2/2  │
│ GPS Status                          │
│ Latitude                    0.1234 │
│ Longitude                   0.1234 │
│ HomePosDist                    4km │
│ Active Satellites                0 │
│                                     │
└─────────────────────────────────────┘
```

Note: *Use the Up and Down buttons to move between measurement pages.*

Note: *Available only with plug-in module.*

```
            CM-Ethernet

Current IP Address
                123.123.123.123
ETH Interface Status
                    Disconnected
```
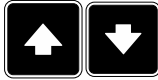
⬆ ⬇

Note: Use the Up and Down buttons to move between measurement pages.

Note: Available only with plug-in module.

```
             AirGate
            CM-4G-GPS
AirGate ID          123456789
Status
            CM-Ethernet
AirGate ID          123456789
Status
```
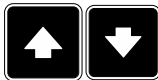
⬆ ⬇

Note: Use the Up and Down buttons to move between measurement pages.

Note: Available only with plug-in module.

```
         Plug-in Modules
Slot A:  Enabled
Empty


```

⬆ ⬇
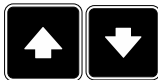
Note: Use the Up and Down buttons to move between measurement pages.

```
         Alarmlist        3
* Wrn Source1 Undervoltage
* BOS S2CB Fail
  MPR S1CB Fail


```

⬆ ⬇
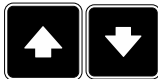
Note: Use the Up and Down buttons to move between measurement pages.

Note: From all of these pages it is possible to switch seamlessly to the setpoint group page by pressing Page button.

Note: There can be some additional screens and also some screens can be hidden. Screen's visibility depends on actual configuration (usage of extension or communication modules, ECU etc.).

Setpoint Screens
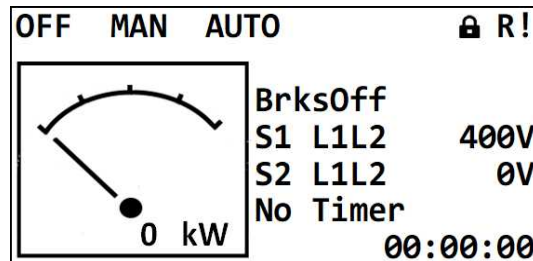
```
OFF  MAN  AUTO              🔒 R!
┌─────────────┐ BrksOff
│             │ S1 L1L2      400V
│             │ S2 L1L2        0V
│             │ No Timer
│      0 kW   │        00:00:00
└─────────────┘
```

≡

Note: From all measurement pages you can easily go to the setpoint group page by pressing the Page button.

```
          Login
     Basic Settings
  Communication Setting
        Source 1
        Source 2
      Load Shedding
       Scheduler
```

⬆

⬇

Note: Use Up and Down button to select required setpoint group.

↵

Note: Use the Enter button to enter selected setpoint group.

```
      Nominal Power
   Default      Current
   value        value
    200          120
Range 1÷5000              kW
◄▮▮▮▮░░░░░░░░░░░░►
```

⬆

⬇

Note: Use Up and Down button to select required setpoint.

◄▮▮ ▮▮►

Note: Use the Left and the Right button to select required setpoint.

↵

Note: Use the Enter button to enter selected setpoint.

```
          Nominal Power
      Default            New
      value             value
       200               120
    Range 1÷5000
    ◄ ▬▬ ▬▬▬▬▬▬▬▬▬▬ ►
```
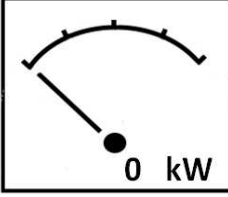
Note: Use Up and Down button to set required value of selected setpoint.

Note: Use the Enter button to confirm adjusted value of setpoint.

Note: Use the Page button to discard changes, to set setpoint to previous value and to return to the list of setpoints of selected group.

History Log

```
OFF   MAN   AUTO           🔒 R!

                   BrksOff
                   S1 L1L2      400V
                   S2 L1L2        0V
                   No Timer
         0  kW           00:00:00
```

Note: From all measurement pages you can easily go to the setpoint group page by pressing the Page button.

```
              Login
         Basic Settings
      Communication Setting
             Source 1
             Source 2
          Load Shedding
            Scheduler
```

Note: From setpoint group page we can fluently go to the history log pages by pressing the Page button.

```
 No. Reason
 000 S1CB Closed
-001 S2CB Opened
-002 S2CB Opened


11:05:45          12/3/2021
```

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

```
Time         Date
10:30:52     04/03/2021
07:03:28     04/03/2021
09:05:12     04/03/2021
22:26:48     03/03/2021
15:49:35     03/03/2021
-001 S2CB Opened
```

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

```
 Mode      P        P1
 AUTO      15       5
 AUTO      30       10
 MAN       0        0
 MAN       50       10
 OFF       90       30
-001 S2CB Opened
```

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

```
 P2        P3        S
 5         15        17
 10        10        35
 0         0         0
 10        30        51
 30        30        98
-001 S2CB Opened
```

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

Q	PF	LChr
3	0.95	C
5	0.85	C
0	0.00	
2	1.00	C
5	0.85	C
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

IL1	IL2	IL3
50	50	50
150	150	150
0	0	0
130	130	130
30	30	30
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

S1frq	S1V1	S1V2
50.1	230	230
50.2	232	232
0.0	0	0
49.5	230	230
50.0	230	230
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

S1V3	S1V12	S1V23
230	400	400
232	403	403
0	0	0
230	398	398
230	402	402
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

S1V31	S2frq	S2V1
400	50.1	232
403	0.0	0
0	0	0
398	49.5	230
402	50.0	231
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

S2V2	S2V3	S2V12
232	232	400
0	0	0
228	228	403
230	230	398
231	231	400
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

S2V23	S2V31	VBat
400	400	23.3
0	0	24.2
403	403	22.8
398	398	23.9
400	400	24.1
-001 S2CB Opened		

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

BIN	BOUT
00000000	00110011
00110010	01110011
01010101	10101100
01010101	10000110
01010101	01110101
-001 S2CB Opened	

Note: Use the Up and the Down button to select required alarm reason.

Note: Use the Enter button to move to the next page of history log.

IMPORTANT: The records are numbered in reverse order, i.e. the latest (newest) record is "0" and older records have "-1", "-2" etc.

5.3.3 Browsing alarms
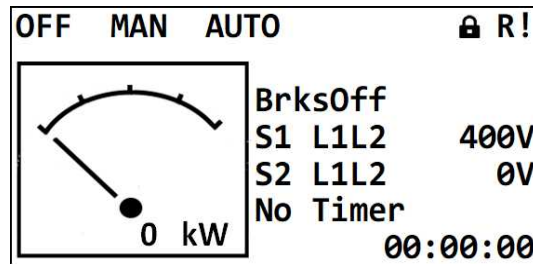
> Active alarms are displayed as white text on black background. It means the alarm is still active, i.e. the appropriate alarm conditions are still present.

> Inactive alarms are displayed as black text on white background. It means the alarm is not active, i.e. the appropriate alarm conditions are gone.

> Unconfirmed alarms are displayed with an asterisk. This means the alarm is still not acknowledged (confirmed).
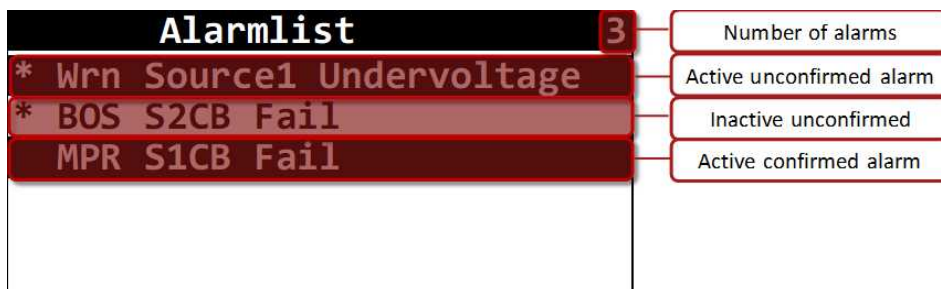
User access management alarms

The controller comes to the customer with Production mode turned on, the default administrator password installed and with no prefilled email address for password reset. For security purposes, the following user access management alarms will appear. Detailed description of situation when the alarms are active is provided below:

> **Wrn Production Mode** is present in the alarm list any time the production mode is turned on. To turn off the Production mode go to User management and uncheck the checkbox Production mode or go to Production Mode display screen and select disable.

> **Wrn Default Password** appears in alarm list when the default administrator password is set and communication module is plugged in the controller. The purpose of alarm is to inform that the controller

might be or is connected to an untrusted interface and cybersecurity rules are not fulfilled because there is default administrator password.

> **Wrn Password reset e-mail address is not set** appears in alarm list when there is no email address set and the administrator password is not the default one. The purpose of alarm is to inform that there is possibility that the controller might not be accessible by administrator password due to a forgotten password. The password reset procedure cannot be performed without a filled email address. To fill out email address, the administrator password is required.

5.3.4 Login
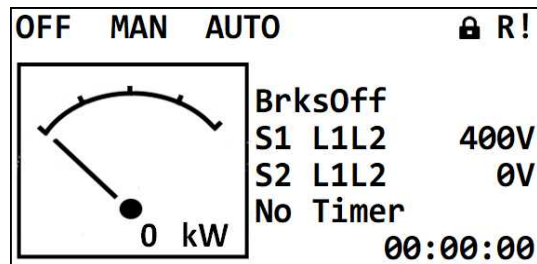
```
OFF  MAN  AUTO          🔒 R!
 ┌─────────┐ BrksOff
 │    ╱     │ S1 L1L2      400V
 │   ╱      │ S2 L1L2        0V
 │  ●       │ No Timer
 │    0 kW  │        00:00:00
 └─────────┘
```

≡

Note: *From all measurement pages you can easily go to the setpoint group page by pressing the Page button.*

```
┌──────────────────────────┐
│          Login           │
│     Basic Settings       │
│  Communication Setting   │
│        Source 1          │
│        Source 2          │
│     Load Shedding        │
│       Scheduler          │
└──────────────────────────┘
```

⬆

⬇
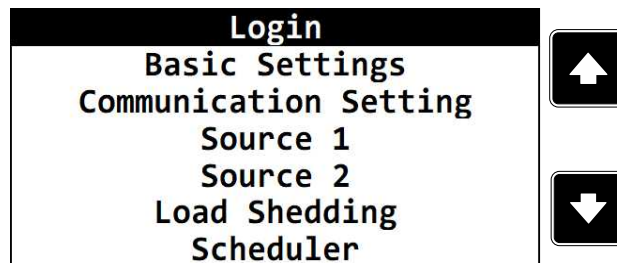
Note: *Use the Up and the Down button to select setpoint group Login.*

←

Note: *Use the Enter button to enter setpoint group Login.*

```
┌──────────────────────────┐
│                          │
│          Login           │
│     Production Mode      │
│                          │
│                          │
└──────────────────────────┘
```

⬆

⬇
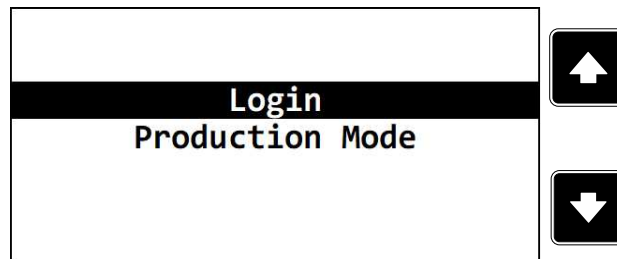
Note: *Use the Up and the Down Button to select Login.*

←

Note: *Use the Enter button to enter Login.*

```
┌──────────────────────────┐
│          Login           │
│                          │
│                          │
│    UserID  0 0 0 0       │
│       PIN  0 0 0 0       │
│                          │
│                          │
└──────────────────────────┘
```
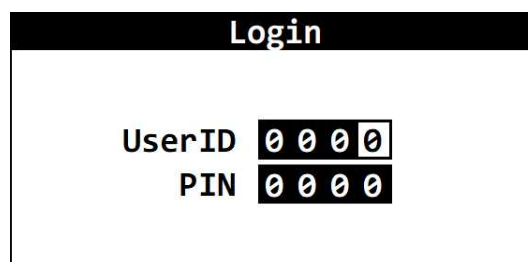
UserID Edit

Login

UserID `0 0 0 1`
PIN `0 0 0 0`

Note: Use the Up and the Down Button to change the digit.

Note: Use the Left and the Right buttons to move between digits.

Login

UserID `0 0 0 0`
PIN `0 0 0 0`

Note: Use the Enter button to confirm the UserID or Page button to cancel entering Login.

PIN Edit

Login

UserID `0 0 0 1`
PIN `0 0 1 0`

Note: Use the Up and the Down Button to change the digit.

Note: Use the Left and the Right buttons to move between digits.

Login

UserID `0 0 0 1`
PIN `0 0 1 0`

Note: Use the Enter button to confirm the PIN and Login or the Page button to cancel entering the Login.
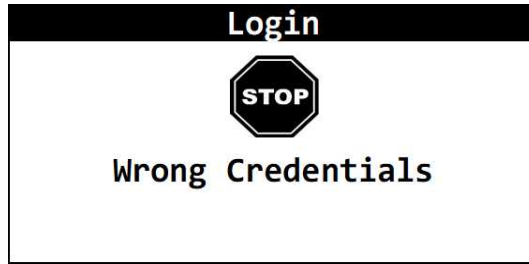
Note: *In case that invalid UserID or PIN are entered, the controller shows Wrong Credentials screen. Use the Enter button to enter Login again or the Page Button to go back to menu.*

5.3.5 Production mode

```
OFF   MAN   AUTO            🔒 R!
┌─────────────────────────────────┐
│        ⌒⌒⌒      BrksOff          │
│      ╱      ╲   S1 L1L2    400V  │
│     │        │  S2 L1L2      0V  │
│      ╲    ●  ╱  No Timer         │
│        0  kW           00:00:00  │
└─────────────────────────────────┘
```

≡
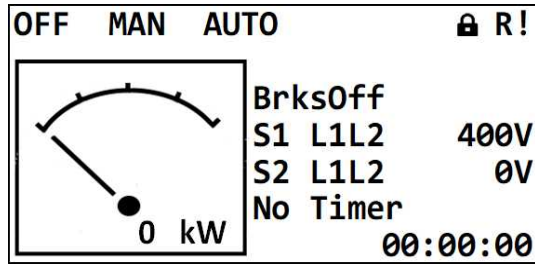
Note: From all measurement pages you can fluently go to the setpoint group page by pressing the Page button.

```
┌─────────────────────────────────┐
│            Login                 │
│        Basic Settings            │
│     Communication Setting        │
│           Source 1               │
│           Source 2               │
│         Load Shedding            │
│          Scheduler               │
└─────────────────────────────────┘
```

⬅

Note: Use the Enter button to enter setpoint group Login.

```
┌─────────────────────────────────┐
│                                  │
│                                  │
│            Login                 │
│        Production Mode           │
│                                  │
│                                  │
└─────────────────────────────────┘
```

⬆ ⬇
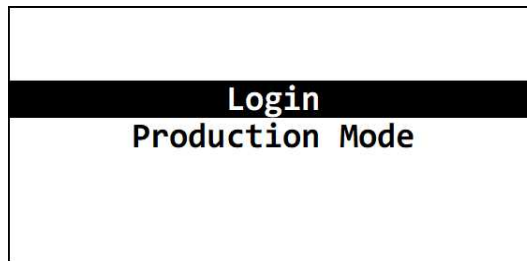
Note: Use the Up and the Down Button to select Production Mode

⬅

Note: Use the Enter button to enter the Production Mode.

```
 Production Mode

       Disabled
       Enabled
```

⬆
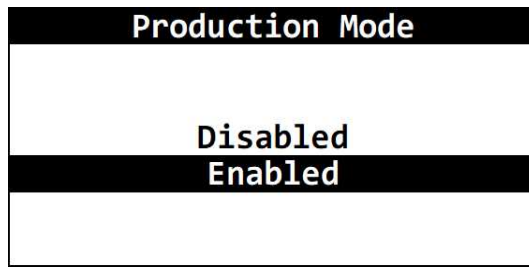
Note: Use the Up and the Down Button to change to disabled

```
 Production Mode


       Disabled
       Enabled
```

⬇

↵
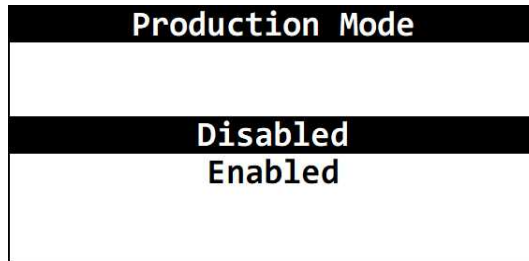
Note: Use the Enter button to disable the Production Mode.

```
 Production Mode


       Disabled
```
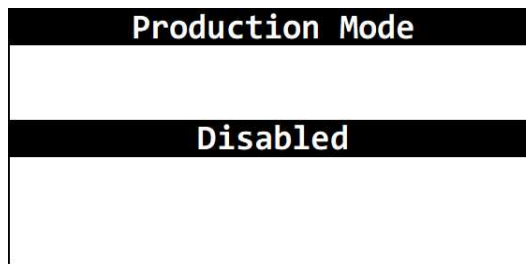
Note: Once Disabled is confirmed by Enter button the option Enabled is no longer on the screen and therefore it is not possible to enable Production mode by HMI display screen. Use InteliConfig to enable the Production mode.

5.3.6 Information screen
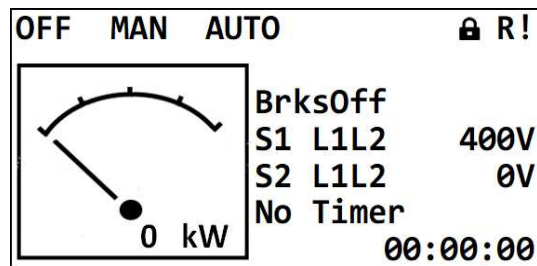
```
OFF   MAN   AUTO              🔒 R!
┌──────────┐ BrksOff
│          │ S1 L1L2        400V
│          │ S2 L1L2          0V
│          │ No Timer
│    0  kW │           00:00:00
└──────────┘
```

↵ + ☰

Note: On Main measurement screen press the Enter and the Page button together. The Enter button has to be pressed first.

```
        InteliATS2

          ComAp

   www.comap-control.com
```

☰

Note: Use the Page button to move to the next page.

```
    About Controller    1/2
        InteliATS2
          ComAp
      Controller Name

Application                50
Branch                Standard
```

☰

Note: Use the Page button to move to the next page.

```
    About Controller    2/2
SW Version          1.0.0.00
HW Version               1.0
Serial              12345678
UserID                  1234
Access level               3
```

⬆
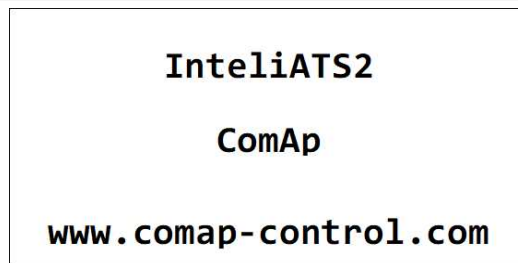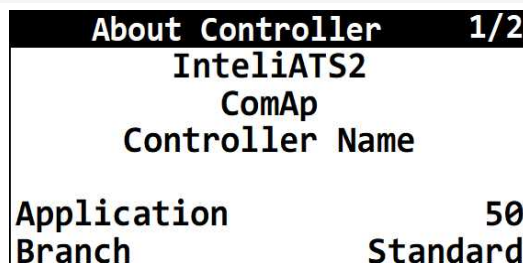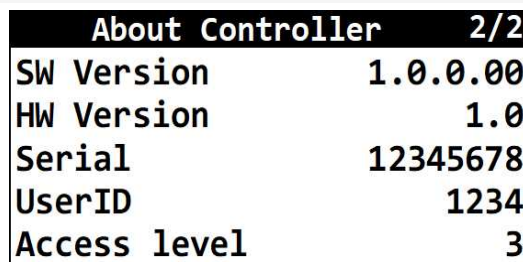
Note: Use the Up button to move back to main measurement screen.

5.3.7 Language selection
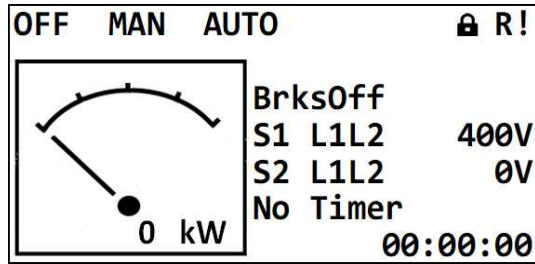
```
OFF   MAN   AUTO              🔒 R!
┌─────────────┐  BrksOff
│             │  S1 L1L2      400V
│             │  S2 L1L2        0V
│             │  No Timer
│      0  kW  │        00:00:00
└─────────────┘
```

⏎ + ☰

Note: *On Main measurement screen press the Enter and the Page button together. The Enter button has to be pressed first.*

```
        InteliATS2

          ComAp


    www.comap-control.com
```

☰

Note: *Use the Page button to move to the next page.*

```
     About Controller    1/2
           InteliATS2
             ComAp
        Controller Name

  Application              50
  Branch             Standard
```

☰

Note: *Use the Page button to move to the next page.*

```
     About Controller    2/2
  SW Version        1.0.0.00
  HW Version             1.0
  Serial            12345678
  UserID                1234
  Access level             3
```

☰
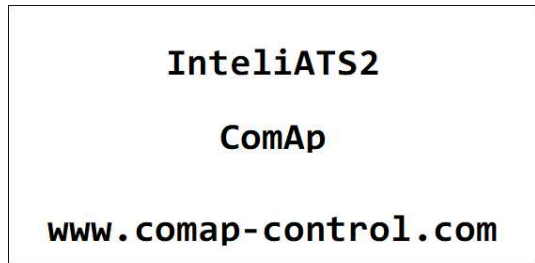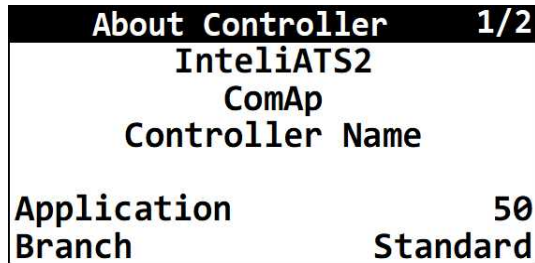
Note: *Use the Page button to move to the next page.*
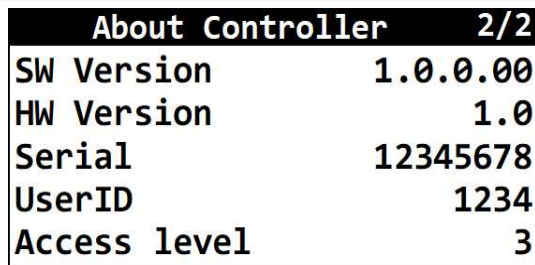
Languages

Language1
Language2
Language3

Note: Use the Up and the Down button to select required language.

Note: Use the Enter button to confirm the selected language.

5.3.8 Display contrast adjustment

```
OFF   MAN   AUTO            🔒 R!
  ┌──────────────┐ BrksOff
  │   ╱───────╲  │ S1 L1L2      400V
  │  ╱    │    ╲ │ S2 L1L2        0V
  │       │      │ No Timer
  │    0  kW     │       00:00:00
  └──────────────┘
```

⏎ + ▼   **⏎ + ▲**
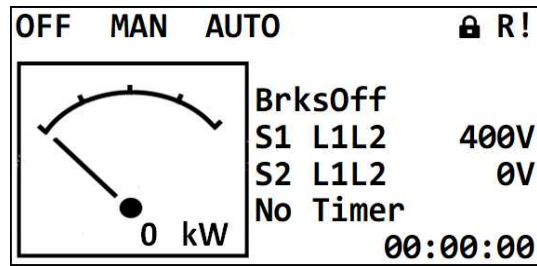
Note: On any measurement screen press the Enter and the Up button together for higher contrast.

Note: On any measurement screen press the Enter and the Down button together for lower contrast.

```
OFF   MAN   AUTO            🔒 R!
  ┌──────────────┐ BrksOff
  │   ╱───────╲  │ S1 L1L2      400V
  │  ╱    │    ╲ │ S2 L1L2        0V
  │       │      │ No Timer
  │    0  kW     │       00:00:00
  └──────────────┘
```

```
OFF   MAN   AUTO            🔒 R!
  ┌──────────────┐ BrksOff
  │   ╱───────╲  │ S1 L1L2      400V
  │  ╱    │    ╲ │ S2 L1L2        0V
  │       │      │ No Timer
  │    0  kW     │       00:00:00
  └──────────────┘
```
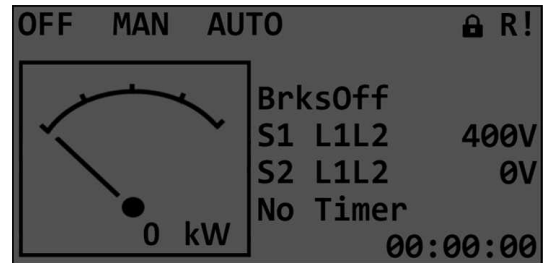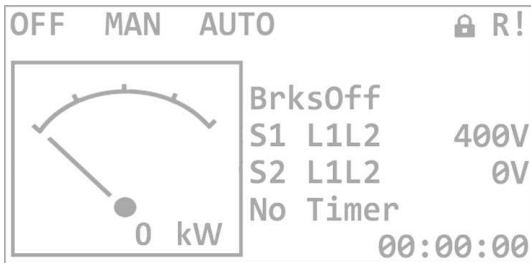
Note: After setting the contrast, no another action is needed.

5.4 Functions

🔺 **back to Controller setup**

5.4.1 Analog switches

There are logical analog function dedicated for analog switches. Each analog switch has setpoints for level ON and level OFF and logical binary output.

Analog switch	Setpoints	Binary output
AIN Sᴡɪᴛᴄʜ 01 (ᴘᴀɢᴇ 385)	AIN Switch01On (page 238) AIN Switch01 Off (page 239)	AIN Sᴡɪᴛᴄʜ01 (ᴘᴀɢᴇ 361)
AIN Sᴡɪᴛᴄʜ 02 (ᴘᴀɢᴇ 385)	AIN Switch02 On (page 240) AIN Switch02 Off (page 241)	AIN Sᴡɪᴛᴄʜ02 (ᴘᴀɢᴇ 361)

The behavior of the switch depends on the adjustment of the setpoints.
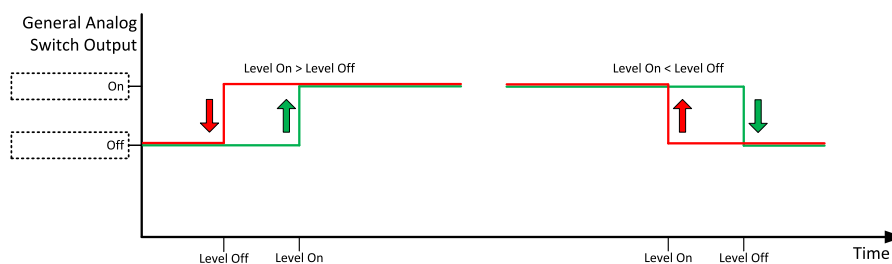
Image 12.1 Principle of analog switch

5.4.2 Breaker control

The following power switches are controlled by the controller:

> The Source 2 circuit breaker or contactor – S2CB

> The Source 1 circuit breaker or contactor – S1CB

It is possible to use either a motorized circuit breaker or contactor. Below is a list of available control outputs that should fit all types of contactors or breakers. The following rules must be followed when designing the wiring of power switches:

> The control outputs must be configured and wiring of the power switches must be provided in such a way, that the controller has full control over the breakers – i.e. the controller can open and close the breaker at any time.

IMPORTANT: The breaker must respond within 2xS1CB Close Latency seconds or 2xS2CB Close Latency seconds to close command. The breaker must respond within 2xS1CB Open Latency seconds or 2xS2CB Open Latency seconds to open command.

> After opening the breaker, there is an internal 1s delay before closing the breaker.

Breaker control outputs

LBO	Output type	Description
S1CB CLOSE/OPEN (PAGE 373)	Close/Open	An output for control of a contactor (2 position switch) or 3 positions switch. Its state represents the contactor or 3 positions switch position requested by the controller. The contactor or 3 positions switch must react 2xS1CB Close Latency seconds or 2xS2CB Close Latency seconds to close command, otherwise an alarm is issued.. The contactor or 3position switch must react within 2xS1CB Open Latency seconds or 2xS2CB Open Latency seconds to open command.
S2CB CLOSE/OPEN (PAGE 377)		
NEUTRAL CLOSE/OPEN (PAGE 371)		
S1CB ON COIL (PAGE 374)	ON coil	An output giving a 2xS1CB Close Latency or 2xS2CB Close Latency seconds pulse used for control of close coils.
S2CB ON COIL (PAGE 379)		
NEUTRAL ON COIL (PAGE 371)		
S1CB OFF COIL (PAGE 374)	OFF coil	An output giving minimum 2xS1CB Open Latency or 2xS2CB Open Latency seconds pulse, or until the feedback deactivates it. Used for open coils.
S2CB OFF COIL (PAGE 379)		
S1CB UV COIL (PAGE 376)	UV coil	The S2CB UV coil in Mains-Gen application is active when the engine is running (after **Minimal Stabilization Time (page 202)**). The S2CB UV coil in Mains-Mains application is active when the controller is switched on. The **S1CB UV COIL (PAGE 376)** output is active when the controller is switched on. The output is deactivated for at least 2xS1CB Open Latency or 2xS2CB Open Latency seconds in the moment the breaker has to be switched off.
S2CB UV COIL (PAGE 380)		
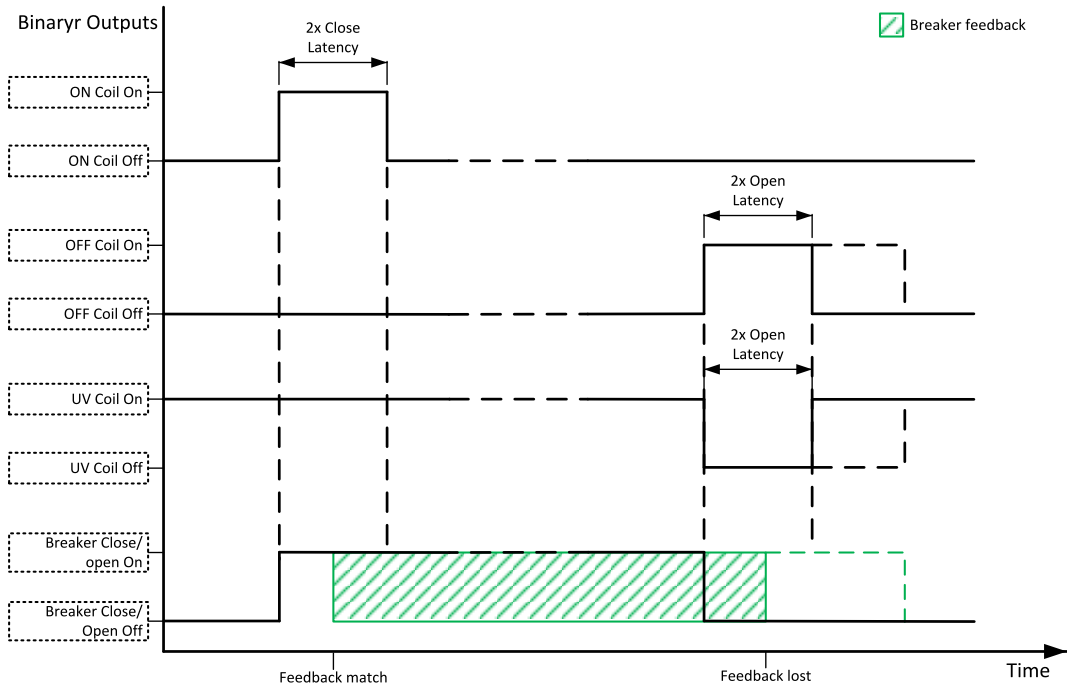
Image 12.2 Breaker control outputs

Outputs controlling 3 positions switch

	Breaker state	Output activation
	S1 Oper	S1CB Close/Open S1CB ON Coil
	Breakers Off	Neutral Close/Open Neutral On Coil
	S2 Oper	S2CB Close/Open S2CB ON Coil

Breaker failure detection

Breaker fail detection is based on binary output breaker close/open comparing with binary input breaker feedback.

> IMPORTANT: It is necessary to configure breaker feedback to use this function.

> IMPORTANT: Also it is possible to use breakers without feedbacks. In this case there is no check of breaker real state.

There are three different time delays for breaker failure detection – see following diagrams.

When binary output breaker close/open is in steady open state and breaker feedback is changed to closed state the failure is detected immediately (no delay).
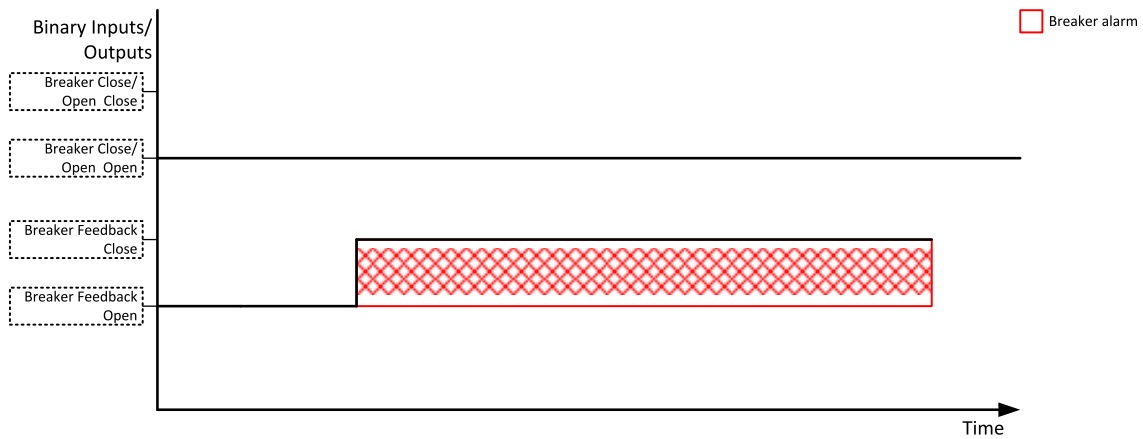
Image 12.3 Breaker failure – breaker close/open in steady position – open

When binary output breaker close/open is in steady closed state and breaker feedback is changed to opened state the binary output close/open changes to open the 2x open latency time. After this delay binary output close/open is closed again. If the feedback doesn't change from opened to closed state, the breaker failure is detected.
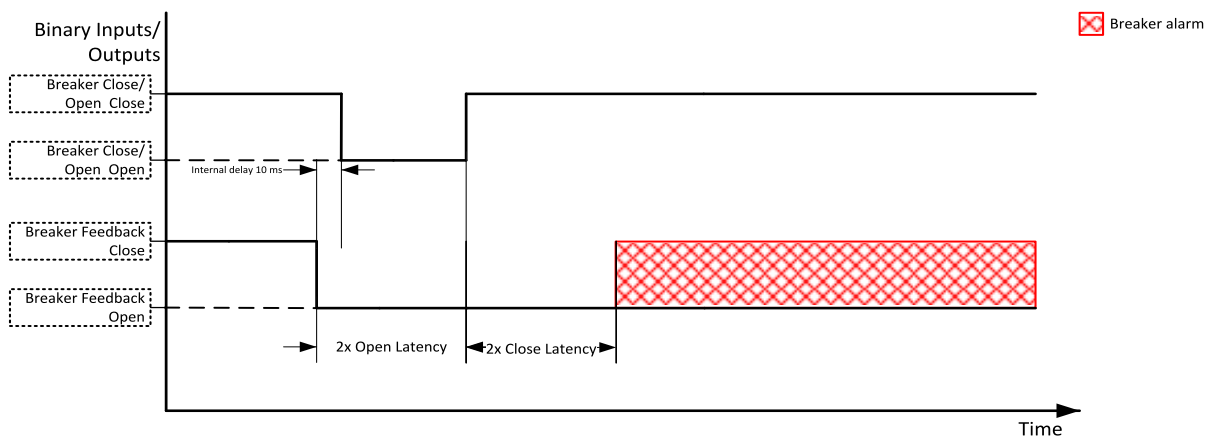
Image 12.4 Breaker failure – breaker close/open in steady position – close

When binary output breaker close/open opens there is 2x open latency time delay for breaker failure detection.
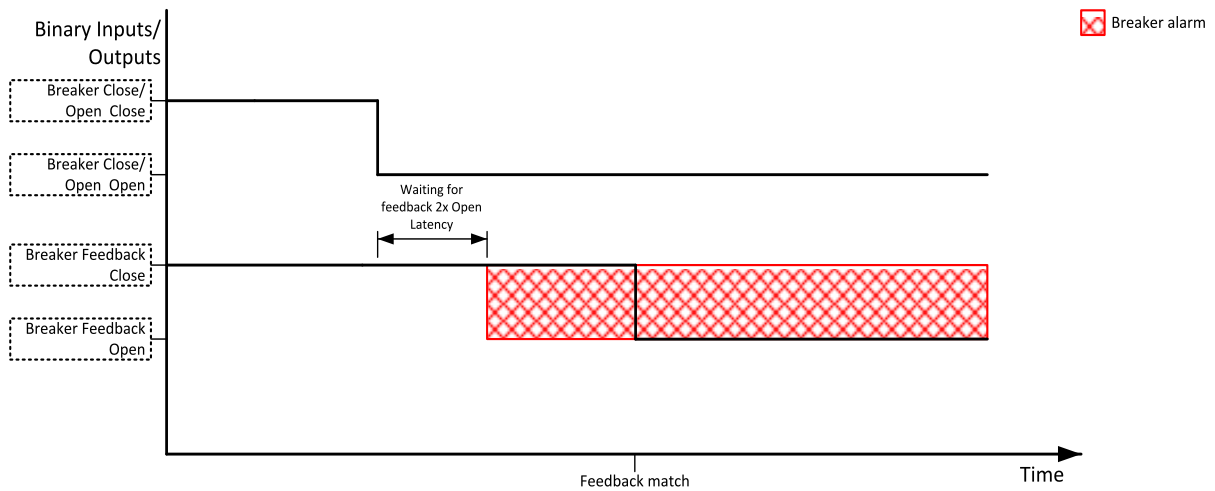
Image 12.5 Breaker failure – breaker close/open opens

When binary output breaker close/open closes there is 2x close latency delay for breaker failure detection.
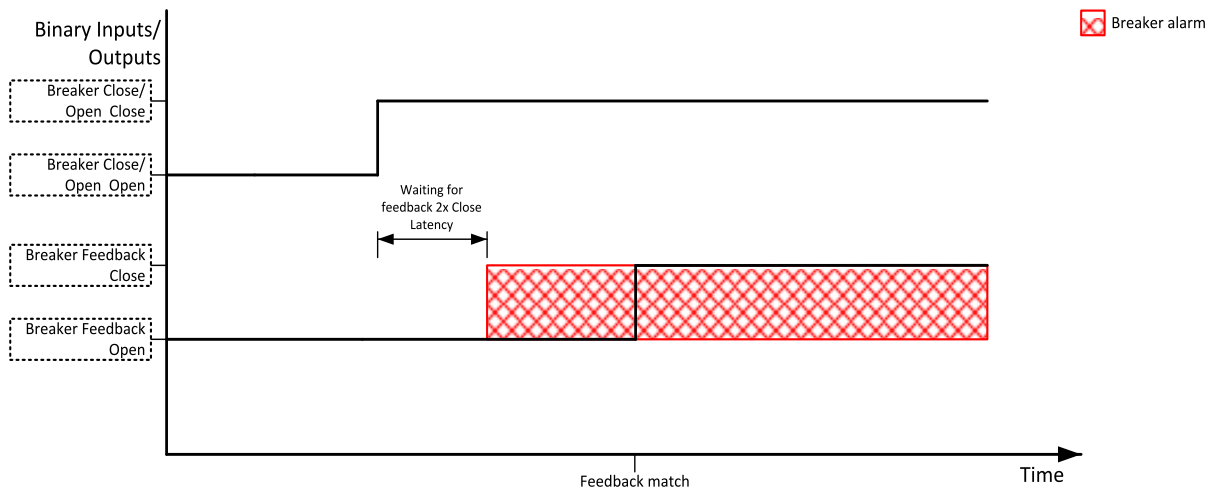
Image 12.6 Breaker failure – breaker close/open closes

5.4.3 Elevator Switch

Elevator switch functionality consists of:

> Setpoints: **Elevator Switch (page 176)**, **Pre Elevator Delay (page 176)**, **Post Elevator Delay (page 177)**

> LBO: **ELEVATOR SWITCH (PAGE 366)**

LBO **ELEVATOR SWITCH (PAGE 366)** is activated before predicted transfer of the load from one source to another.

Pre Elevator Delay (page 176) is adjusting the time how long **ELEVATOR SWITCH (PAGE 366)** is activated before the breaker will open and power will be lost for an elevator. The LBO is active during the transfer and is deactivated once the **Post Elevator Delay (page 177)** has elapsed. **Post Elevator Delay (page 177)** starts when the opposite breaker is closed.

Predicted transfer happens when:

> LBI T<small>RANSFER</small> <small>TO</small> S2 (<small>PAGE</small> 358) is activated or deactivated.

> The load was transferred to Source 2 due to the Source 1 failure and returns back to Source 1.

Note: If during the Pre Elevator Delay (page 176) timing the source which supplies the load goes to failure, LBO E<small>LEVATOR</small> S<small>WITCH</small> (<small>PAGE</small> 366) is deactivated.

Note: Following pictures stands for both applications (Mains-Gen, Mains-Mains). For Mains-Mains application Minimal Stabilization Time, Start Time and Stop Time are not valid.
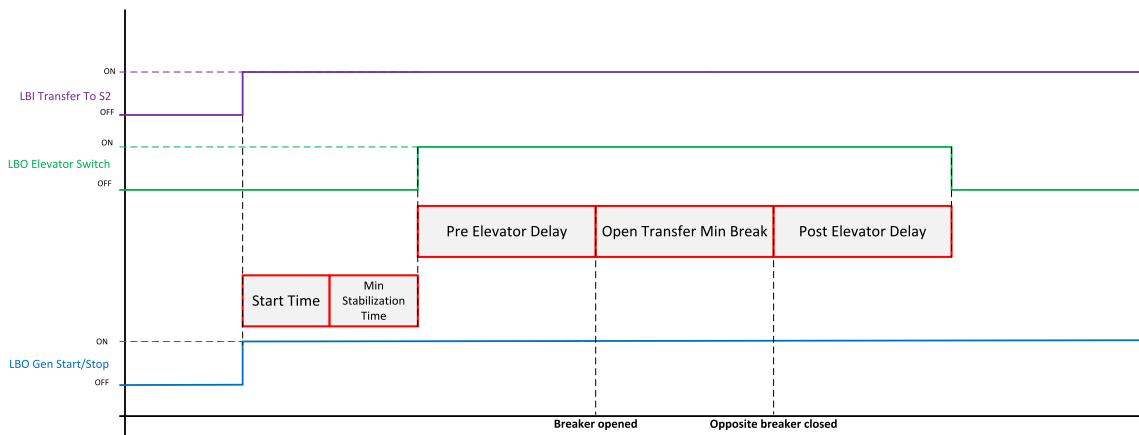
Image 12.7 Elevator switch when LBI T<small>RANSFER</small> <small>TO</small> S2 (<small>PAGE</small> 358) is activated
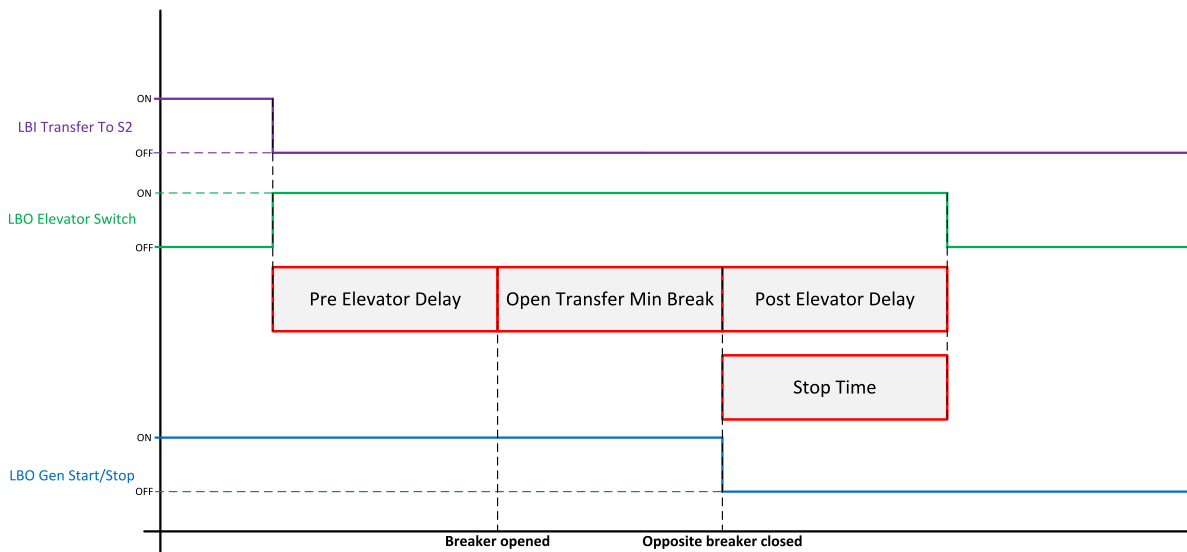
Image 12.8 Elevator switch when LBI T<small>RANSFER</small> <small>TO</small> S2 (<small>PAGE</small> 358) is deactivated
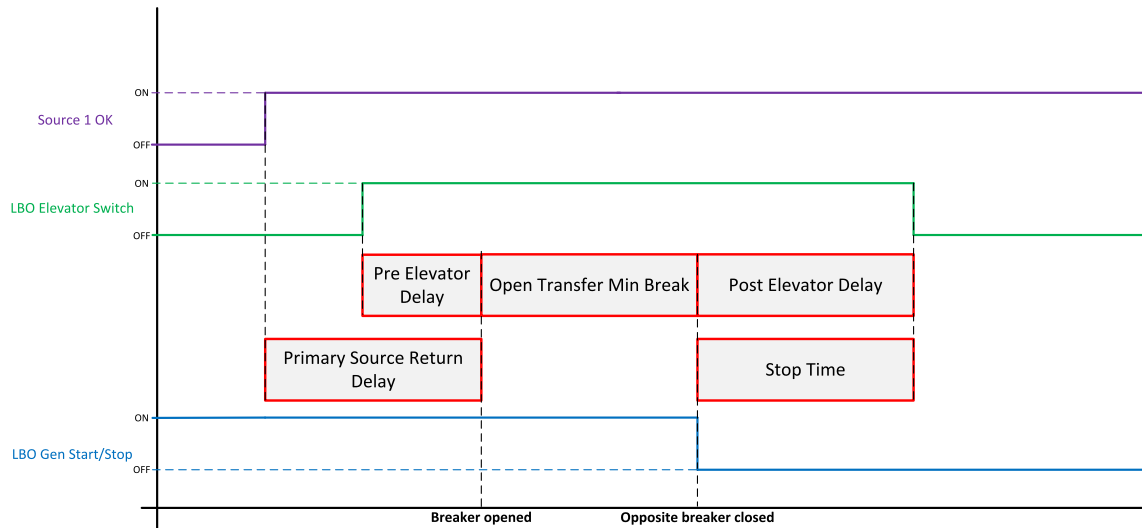
Image 12.9 Elevator switch when Source 1 returns

5.4.4 Evaluation of sources

Evaluation of sources depends on how the setpoints **Source 1 Measurement (page 189)** and **Source 2 Measurement (page 204)** are set and if LBIs Source 1 Ready To Load (page 355) and Source 2 Ready To Load (page 356) are configured

Setpoint Source Measurement	Description
Enabled	The measured source voltages and frequency are considered for evaluation of the engine conditions.
Disabled	The measured source voltages and frequency are not considered for evaluation of the engine conditions. Evaluation is based only on state of appropriate LBI.

LBI Source Ready To Load	Description
Configured	The LBI is considered for evaluation of the source conditions.
Not configured	The LBI is not considered for evaluation of the source conditions.

Additional conditions for engines

Running engine conditions

> Generator voltages are within the limits defined by setpoints: **Source 2 Overvoltage (page 205)**, **Source 2 Undervoltage (page 208)**, **Source 2 Voltage Unbalance (page 212)**

> Generator frequency is within the limits defined by setpoints: **Source 2 Overfrequency (page 213)**, **Source 2 Underfrequency (page 215)**

> LBI Source 2 Ready To Load (page 356) is active - if configured

Stop engine conditions

> Any generator voltage Ph-N < 10 V or

> Any generator voltage Ph-Ph < 17 V or

> LBI Source 2 Ready To Load (page 356) not active - if configured

5.4.5 Exercise timers

The exercise (general-purpose) timers in controller are intended for scheduling of any operations such as periodic tests of the Source 2, scheduled transfer of the load to the Source 2 prior to an expected disconnection of the mains etc.

Related setpoints for timer 1 are:

- Timer 1 Function (page 245)
- Timer 1 Repetition (page 246)
- Timer 1 First Occur. Date (page 246)
- Timer 1 First Occur. Time (page 247)
- Timer 1 Duration (page 247)
- Timer 1 Repeated (page 248)
- Timer 1 Repeat Day (page 248)

- Timer 1 Day (page 249)
- Timer 1 Repeated Day In Week (page 249)
- Timer 1 Repeat Day In Month (page 249)
- Timer 1 Repeat Week In Month (page 250)
- Timer 1 Refresh Period (page 251)
- Timer 1 Weekends (page 252)
- Timer 1 Setup (page 246)

Related setpoints for timer 2 are:

- Timer 2 Function (page 253)
- Timer 2 Repetition (page 254)
- Timer 2 First Occur. Date (page 254)
- Timer 2 Setup (page 254)
- Timer 2 Duration (page 255)
- Timer 2 Repeated (page 256)
- Timer 2 Repeat Day (page 256)

- Timer 2 Day (page 257)
- Timer 2 Repeated Day In Week (page 257)
- Timer 2 Repeat Day In Month (page 257)
- Timer 2 Repeat Week In Month (page 258)
- Timer 2 Refresh Period (page 259)
- Timer 2 Weekends (page 260)
- Timer 2 Setup (page 254)

Available modes of each timer:

Once	This is a single shot mode. The timer will be activated only once at preset date/time for preset duration.
Daily	The timer is activated every "x-th" day. The day period "x" is adjustable. Weekends can be excluded. E.g. the timer can be adjusted to every 2nd day excluding Saturdays and Sundays.
Weekly	The timer is activated every "x-th" week on selected weekdays. The week period "x" is adjustable. E.g. the timer can be adjusted to every 2nd week on Monday and Friday.
Monthly	The timer is activated every "x-th" month on the selected day. The requested day can be selected either as "y-th" day in the month or as "y-th" weekday in the month. E.g. the timer can be adjusted to every 1st month on 1st Tuesday.
Short period	The timer is repeated with adjusted period (hh:mm). The timer duration is included in the period.

Once mode

Set-up via InteliConfig

To set-up timer via InteliConfig go to the setpoint ribbon, setpoint group scheduler and setpoint *Timer 1 Setup*.

*Note: First, the timer functions must be adjusted via setpoint **Timer 1 Function** (page 245).*
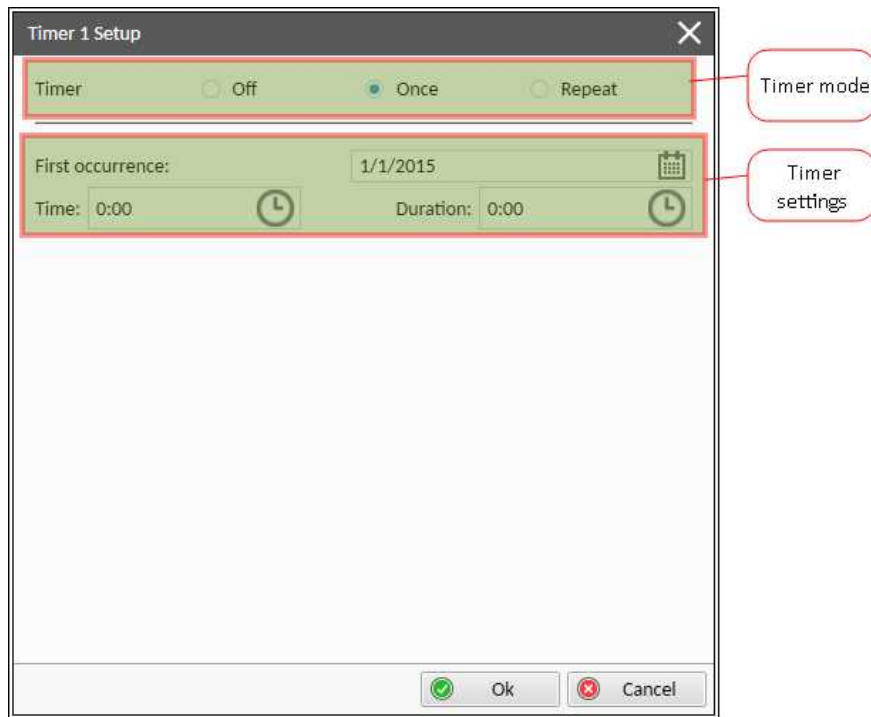
Image 12.10 Once mode – InteliConfig

In timer mode select Once. In timer settings adjust date and time of occurrence of timer. Also adjust the duration of timer.

Set-up via controller interface

In controller go to the Scheduler setpoint group. Select the function of timer via **Timer 1 Function (page 245)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 246)** setpoint select Once mode. Then adjust **Timer 1 First Occur. Date (page 246)**, **Timer 1 First Occur. Time (page 247)** and **Timer 1 Duration (page 247)**.

Note: Use the Left and the Right buttons to move between timer setpoints.

Daily mode

Set-up via InteliConfig

To set-up timer via InteliConfig go to the setpoint ribbon, setpoint group scheduler and setpoint *Timer 1 Setup*.

Note: First, the timer functions must be adjusted via setpoint Timer 1 Function (page 245).
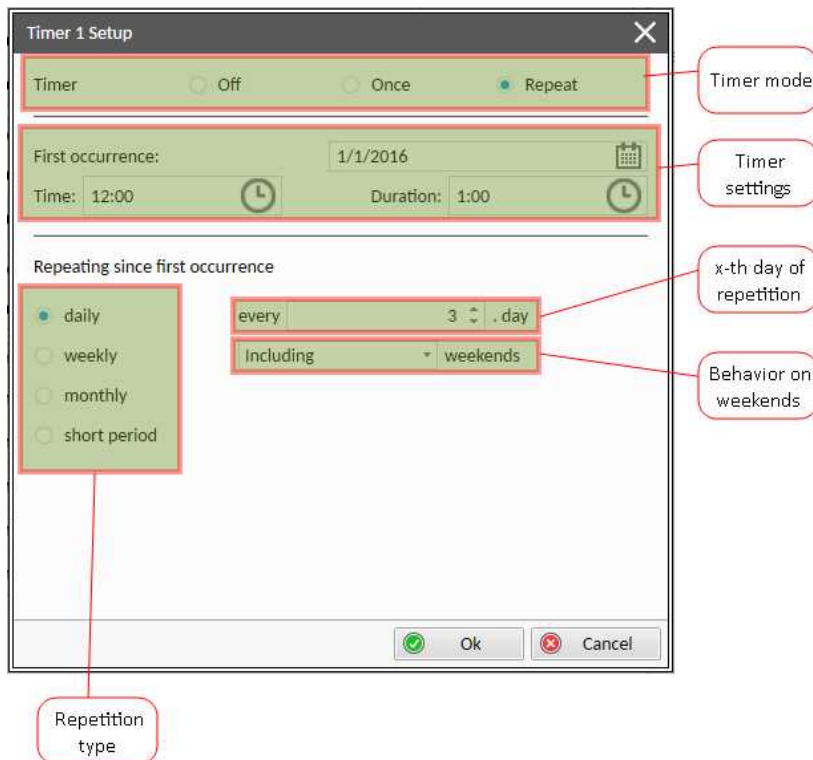
Image 12.11 Daily mode – InteliConfig

In timer mode select Repeat. In repetition type select Daily. In timer settings adjust date and time of first occurrence of timer. Also adjust the duration of each occurrence of timer. Then select the xth day of repetition (**Timer 1 Refresh Period (page 251)**) and behavior of timer on weekends (**Timer 1 Weekends (page 252)**).

Example: On image example first start of timer will be 1/1/2016 at 12:00. Duration will be 1 hour. Timer will be activated again every 3rd day at 12:00 for 1 hour including weekends.

Set-up via controller interface

In controller go to the Scheduler setpoint group. Select the function of timer via **Timer 1 Function (page 245)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 246)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 246)**, **Timer 1 First Occur. Time (page 247)** and **Timer 1 Duration (page 247)**. In setpoint **Timer 1 Repeated (page 248)** select Daily and adjust **Timer 1 Refresh Period (page 251)** (xth day of repetition) and **Timer 1 Weekends (page 252)** (behavior of timer on weekends).

Note: Use the Left and the Right buttons to move between timer setpoints.

Weekly mode

Set-up via InteliConfig

To set-up timer via InteliConfig go to the setpoint ribbon, setpoint group scheduler and setpoint *Timer 1 Setup*.

Note: First, the timer functions must be adjusted via setpoint Timer 1 Function (page 245).
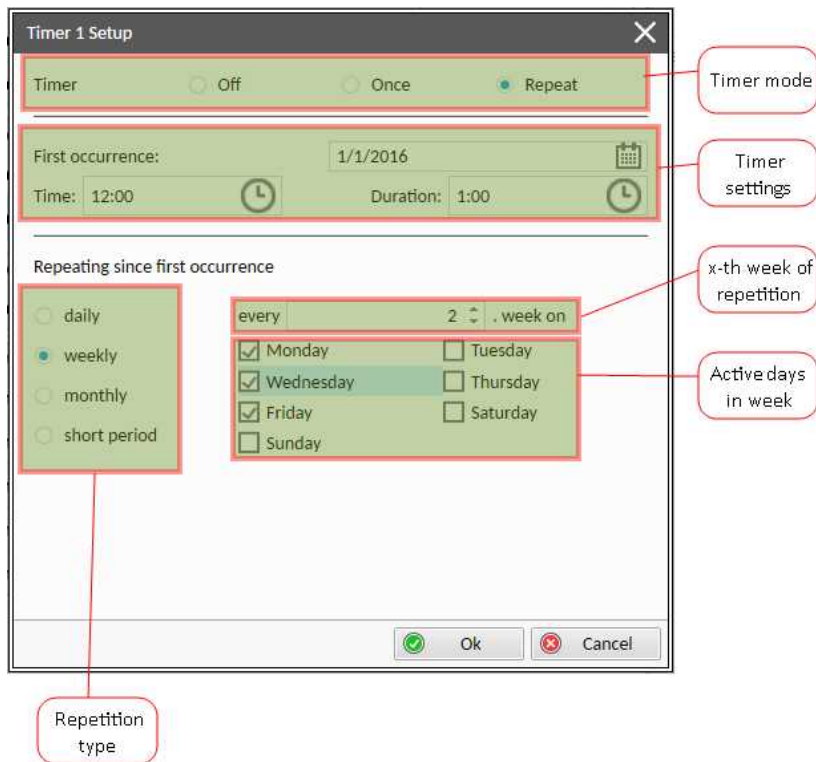
Image 12.12 Weekly mode – InteliConfig

In timer mode select Repeat. In repetition type select Weekly. In timer settings adjust date and time of first occurrence of timer. Also adjust the duration of each occurrence of timer. Then select the xth week of repetition (**Timer 1 Refresh Period (page 251)**) and days when timer should be active (**Timer 1 Day (page 249)**).

> **Example:** On image example first start of timer will be 1/1/2016 at 12:00. Duration will be 1 hour. Timer will be again activated every 2nd week on Monday, Wednesday and Friday at 12:00 for 1 hour.

Set-up via controller interface

In controller go to the Scheduler setpoint group. Select the function of timer via **Timer 1 Function (page 245)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 246)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 246)**, **Timer 1 First Occur. Time (page 247)** and **Timer 1 Duration (page 247)**. In setpoint **Timer 1 Repeated (page 248)** select Weekly and adjust **Timer 1 Day (page 249)** (days when timer should be active) and **Timer 1 Refresh Period (page 251)** (xth week of repetition).

Note: Use the Left and the Right buttons to move between timer setpoints.

Monthly mode

Set-up via InteliConfig

To set-up timer via InteliConfig go to the setpoint ribbon, setpoint group scheduler and setpoint *Timer 1 Setup*.

Note: First, the timer functions must be adjusted via setpoint Timer 1 Function (page 245).

There are two types of monthly repetition. The first is based on repeating one day in month.
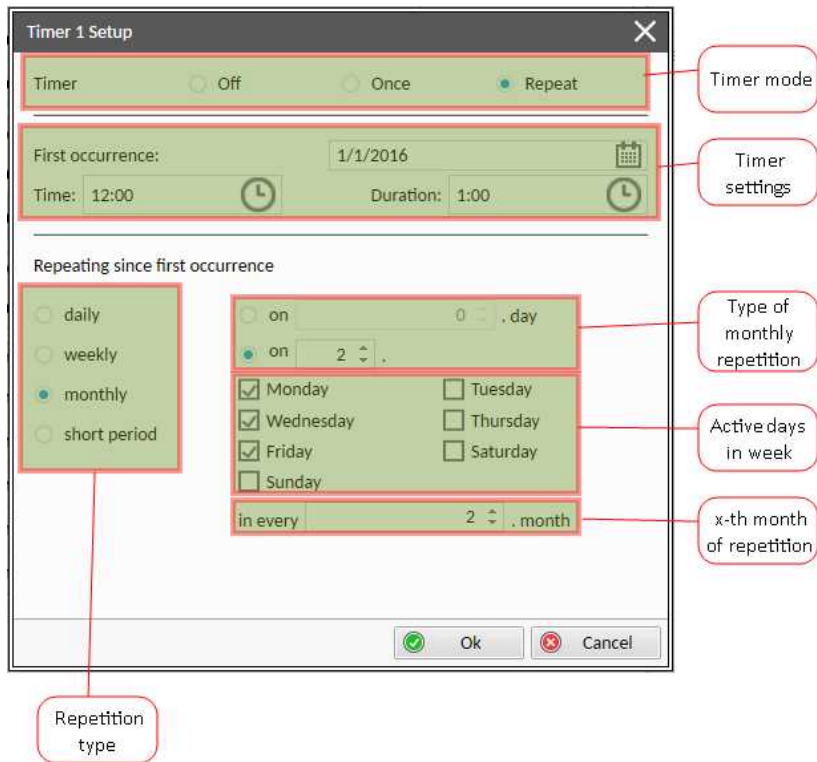
Image 12.13 Monthly mode – InteliConfig

In timer mode select Repeat. In repetition type select Monthly. In timer settings adjust date and time of first occurrence of timer. Also adjust the duration of each occurrence of timer. Then select the type of monthly repetition and the xth day of repetition (**Timer 1 Repeat Day In Month (page 249)**). Than select the xth month of repetition.

Example: On image example first start of timer will be 1/1/2016 at 12:00. Duration will be 1 hour. Timer will be activated again every 2nd day in 2nd month at 12:00 for 1 hour.

Second type of monthly repetition is based on repeating days in week in month.
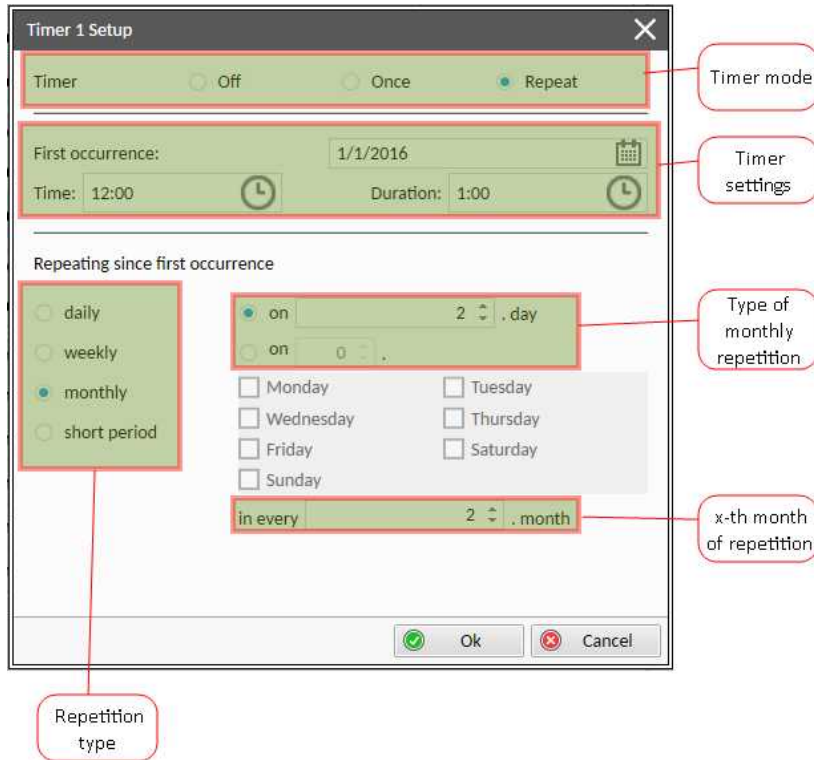
Image 12.14 Monthly mode – InteliConfig

In timer mode select Repeat. In repetition type select Monthly. In timer settings adjust date and time of first occurrence of timer. Also adjust the duration of each occurrence of timer. Then select the type of monthly repetition, the xth week of repetition and days in week. Than select the xth month of repetition.

> **Example:** On image example first start of timer will be 1/1/2016 at 12:00. Duration will be 1 hour. Timer will be activated again every 2nd week in 2nd month on Monday, Wednesday and Friday at 12:00 for 1 hour.

Set-up via controller interface

There are two types of monthly repetition. The first is based on repeating one day in month.

In controller go to the Scheduler setpoint group. Select the function of timer via **Timer 1 Function (page 245)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 246)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 246)**, **Timer 1 First Occur. Time (page 247)** and **Timer 1 Duration (page 247)**. In setpoint **Timer 1 Repeated (page 248)** select Monthly and adjust type of monthly repetition via **Timer 1 Repeat Day (page 248)**, **Timer 1 Refresh Period (page 251)** (xth month of repetition) and **Timer 1 Repeat Day In Month (page 249)** (concrete day in repeated months).

The second type of monthly repetition is based on repeating on certain days of the week in a month.

In controller go to the Scheduler setpoint group. Select the function of timer via **Timer 1 Function (page 245)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 246)** setpoint select Repeated mode. Than adjust **Timer 1 First Occur. Date (page 246)**, **Timer 1 First Occur. Time (page 247)** and **Timer 1 Duration (page 247)**. In setpoint **Timer 1 Repeated (page 248)** select Monthly and adjust type of monthly repetition via **Timer 1 Repeat Day (page 248)**, **Timer 1 Refresh Period (page 251)** (xth month of repetition), **Timer 1 Repeated Day In Week (page 249)** (days in week when timer is active) and **Timer 1 Repeat Week In Month (page 250)** (concrete week in repeated months).

> *Note: Use the Left and the Right buttons to move between timer setpoints.*

Short period mode

Set-up via InteliConfig

To set-up timer via InteliConfig go to the setpoint ribbon, setpoint group scheduler and setpoint *Timer 1 Setup*.

*Note: First, the timer functions must be adjusted via setpoint **Timer 1 Function (page 245)**.*
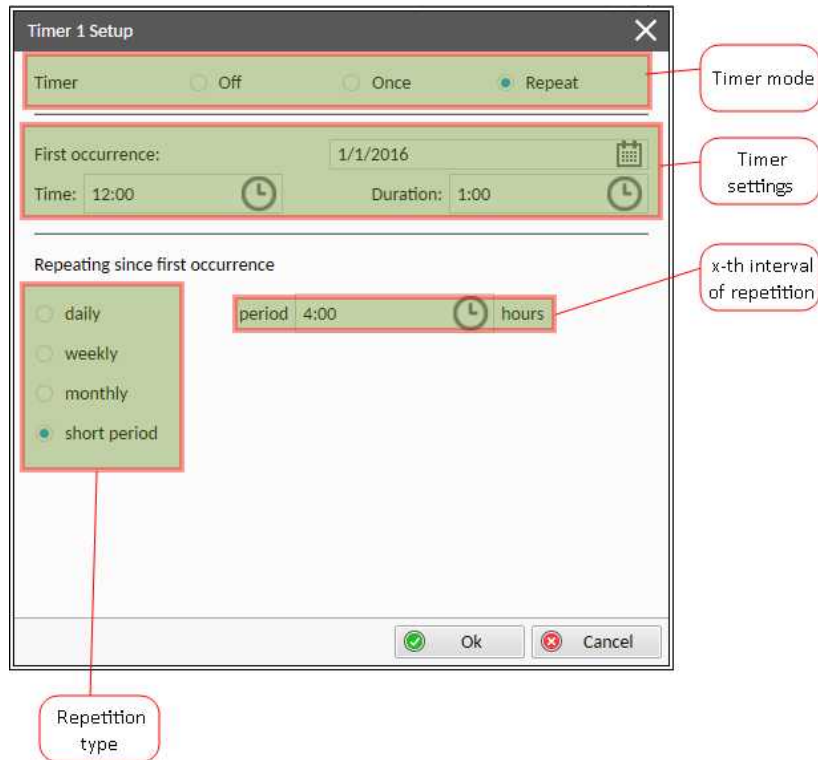
Image 12.15 Short period mode – InteliConfig

In timer mode select Repeat. In repetition type select Short period. In timer settings adjust date and time of first occurrence of timer. Also adjust the duration of each occurrence of timer. Then select the interval of repetition (shorter than 1 day).

> **Example:** On image example first start of timer will be 1/1/2016 at 12:00. Duration will be 1 hour. Timer will be activated again every 4th hour for 1 hour.

Set-up via controller interface

In controller go to the Scheduler setpoint group. Select the function of timer via **Timer 1 Function (page 245)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 246)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 246)**, **Timer 1 First Occur. Time (page 247)** and **Timer 1 Duration (page 247)**. In setpoint **Timer 1 Repeated (page 248)**, select Short Period and adjust **Timer 1 Refresh Period (page 251)** (interval of repetition).

Note: Use the Left and the Right buttons to move between timer setpoints.

5.4.6 E-Stop

Binary outputs for the control of some essential functions are internally wired as "safe", meaning that their deactivation is directly bound with the dedicated Input E-STOP (not evaluated as the LBI in the controller). These BO are fully configurable and are used e.g. for the Starter and Fuel control.

> The emergency stop circuit must be secured.

> The power supply of the associated binary outputs (BOUT1 and BOUT2) is supplied by the E-STOP input, not by the + battery voltage.

Note: There is no difference in the way of configuration of all binary outputs. Binary outputs BO1 (Starter), BO2 (Fuel Solenoid) are intended for these functions (not dedicated).

There is a measurement of E-STOP input voltage analogically and setting the binary value (representing emergency stop input level) based on comparison of the measured voltage to two analog levels, which are derived from the controller supply voltage (battery voltage) perceptually.
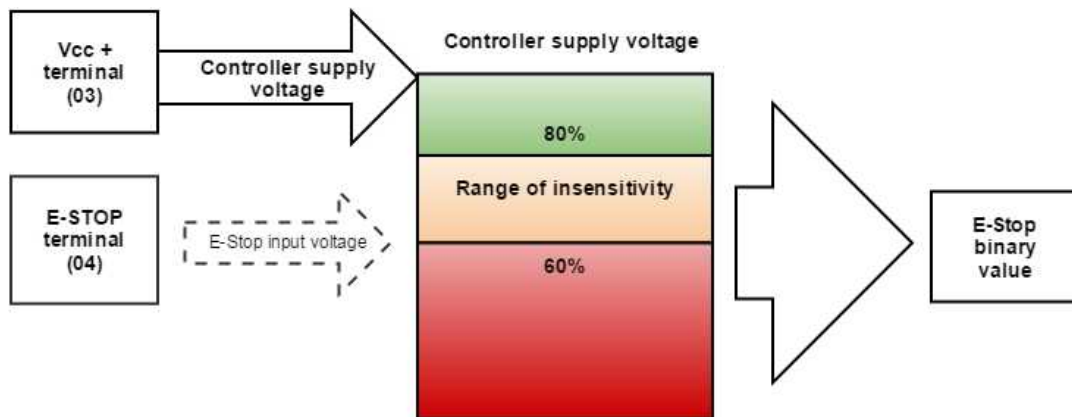
Image 12.16 SW principle of E-STOP

> If the input voltage of E-stop is higher than high comparison level (ex. higher than 80% of the supply voltage), then E-stop is not activated.

> If the input voltage of E-stop is lower than low comparison level (ex. lower than 60% of the supply voltage), then E-stop is activated.

If the input voltage of E-stop is located somewhere between low and high comparison levels (ex. between 60 and 80 %of the supply voltage, then E-stop binary value will remain in its previous state (meaning the E-Stop binary value will not change).

Visualization on CU screen

> 1 – E-STOP has voltage – state is OK

> 0 – E-STOP has no voltage – protection is active

For more information about connection **see E-Stop on page 38**.

5.4.7 Firewall

The firewall function allows to restrict the access to the controller application services (ComAp/TCP server, MODBUS/TCP server etc.) or to the specific computers or networks. Firewall can be activated on Ethernet port.

> **Example:**
> **Adress:** 192.168.1.0
> **Netmask:** 255.255.255.0
> **Port:** 23
> Any computer with IP address from the network range 192.168.1.0 – 192.168.1.255 can connect to ComAp/TCP server (= connect to the controller with InteliConfig via Ethernet).

> **Example:**
> **Adress:** 192.168.1.100
> **Netmask:** 255.255.255.255
> **Port:** 502
> Only the single computer with IP address 192.168.1.100 can connect to MODBUS/TCP server

> IMPORTANT: When enabling the firewall, If the rules are not set up properly and the connection is made remotely, loss of connection can happen.

5.4.8 Geo-fencing

Geo-fencing function (available with CM2-4G-GPS) is kind of protection that evaluates whether the actual GPS location is within a predefined area, then based on this evaluation takes an action (sends SMS message, stops engine, make history record etc.). This function is enabled by setpoint **Geo-Fencing (page 261)** or by logical binary input GEO-FENCING ENABLE (PAGE 349).

Using InteliConfig, it is possible to set two concentric geo-circles within which the unit is allowed to be located. Each geo-circle is defined as a circular geographic area with its center (common for both geo-circles) named Home Position. This point is adjusted via setpoints **Home Latitude (page 261)** and **Home Longitude (page 262)** and radius named Fence Radius adjusted via setpoints **Fence Radius 1 (page 263)** and **Fence Radius 2 (page 265)**.

The Protection can be different for both circles and are adjusted via setpoints **Fence 1 Protection (page 263)** and **Fence 2 Protection (page 264)**.

It is also possible to see the current position of the controller in WebSupervisor map view.

5.4.9 History log

The history log is an area in the controller's non-volatile memory that records "snapshots" of the system at moments when important events occur. The history log is important especially for diagnostics of failures and problems. When the history file is full, the oldest records are removed.

Each record has the same structure and contains:

> The event which caused the record (e.g. "Overvoltage alarm" or "S1CB closed")

> The date and time when it was recorded

> All important data values such as p, voltages, etc. from the moment that the event occurred.

Record structure

Name	Abbreviation	Description
Number	No.	Row number (0 corresponds to the last record, -1 to the previous one, etc.)
Time	Time	Time
Date	Date	Date
Controller Mode	Mode	Mode of the controller
Active power	P	Source 1 or Source 2 Ph1+Ph2+Ph3 active power
Active power L1	P1	Source 1 or Source 2 Ph1 active power
Active power L2	P2	Source 1 or Source 2 Ph2 active power
Active power L3	P3	Source 1 or Source 2 Ph3 active power

Reactive power	Q	Source 1 or Source 2 reactive power
Apparent power	S	Source 1 or Source 2 apparent power
Power Factor	PF	Source 1 or Source 2 power factor
Load Character	LChr	Source 1 or Source 2 load character
Load Current L1	IL1	Source 1 or Source 2 Ph1 current
Load Current L2	IL2	Source 1 or Source 2 Ph2 current
Load Current L3	IL3	Source 1 or Source 2 Ph3 current
Source 1 Frequency	S1fr	Source 1 Frequency
Source 1 Voltage L1	S1V1	Source 1 Voltage Ph1
Source 1 Voltage L2	S1V2	Source 1 Voltage Ph2
Source 1 Voltage L3	S1V3	Source 1 Voltage Ph3
Source 1 Voltage L1L2	S1V12	Source 1 Voltage Ph12
Source 1 Voltage L2L3	S1V23	Source 1 Voltage Ph23
Source 1 Voltage L3L1	S1V31	Source 1 Voltage Ph31
Source 2 Frequency	S2fr	Source 2 Frequency
Source 2 Voltage L1	S2V1	Source 2 Voltage Ph1
Source 2 Voltage L2	S2V2	Source 2 Voltage Ph2
Source 2 Voltage L3	S2V3	Source 2 Voltage Ph3
Source 2 Voltage L1L2	S2V12	Source 2 Voltage Ph12
Source 2 Voltage L2L3	S2V23	Source 2 Voltage Ph23
Source 2 Voltage L3L1	S2V31	Source 2 Voltage Ph31
Voltage Battery	VBat	Battery or power supply voltage
Binary Inputs	BIN	Controller binary inputs
Binary Outputs	BOUT	Controller binary outputs

Note: When some setpoint is changed, its number of the communication object is written in the history log.

5.4.10 Load shedding

The Load shedding is the controlled disconnection of less important load groups (circuits) when the object consumption is too high.

Load shedding stages

The Load Shedding function consists of 2 stages which are numbered 1-2. Stages are disconnected in ascending order up to the last configured stage. Reconnecting of stages is in descending order and starts with higher configured stage. A stage is considered configured when the respective Load Shedding Output is configured. Highest activated load shedding stage is stored in value **Load Shedding Status (page 324)**.

Load shedding outputs

Stage	LBO
Stage 1	**LOAD SHEDDING STAGE 1 (PAGE 369)**
Stage 2	**LOAD SHEDDING STAGE 2 (PAGE 370)**

How the Load shedding controls the Load shedding outputs

The load shedding function is active in all controller modes except OFF if setpoint **Load Shedding Active (page 226)** = ENABLED.

Load shedding has 2 steps and each step is linked with its own binary output, Load Shedding Stage 1 (page 369), Load Shedding Stage 2 (page 370).

The Load shedding outputs can be activated one by one in the order 1, 2. The conditions for activation are defined by setpoints **Load Shedding Level (page 227)** and **Load Shedding Delay (page 227)**.

The Load shedding outputs are deactivated one by one according to the conditions given by the setpoints **Load Reconnection Level (page 228)**, **Load Reconnection Delay (page 228)**, Auto Load Reconnection (page 229).

If manual reconnection of the load is desired the **Auto Load Reconnection (page 229)** setpoint must be disabled and the Manual Load Reconnection (page 350) binary input must be configured.
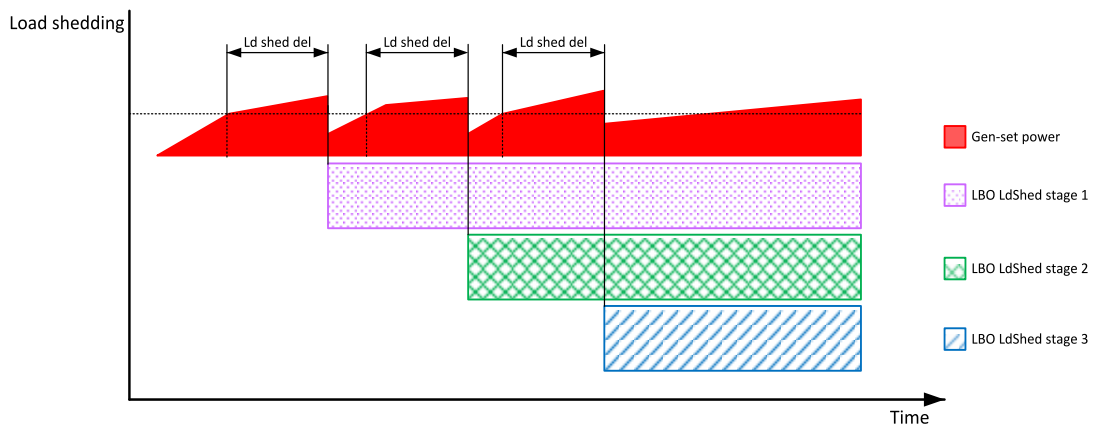
Image 12.17 Load shedding
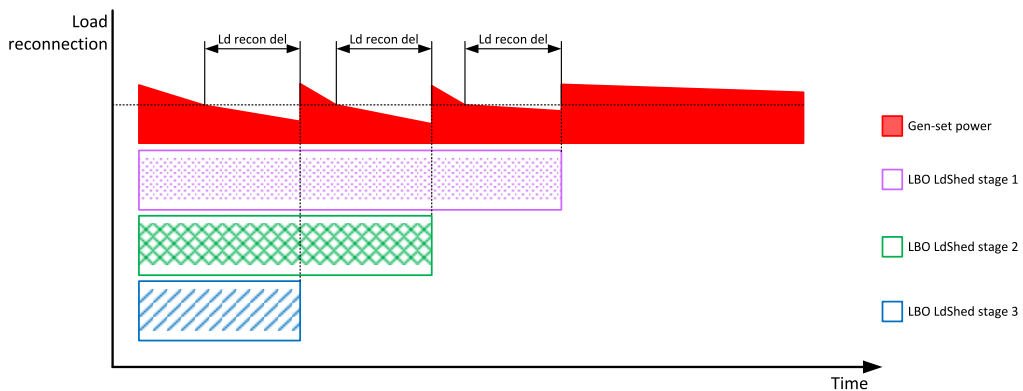
Image 12.18 Load reconnection
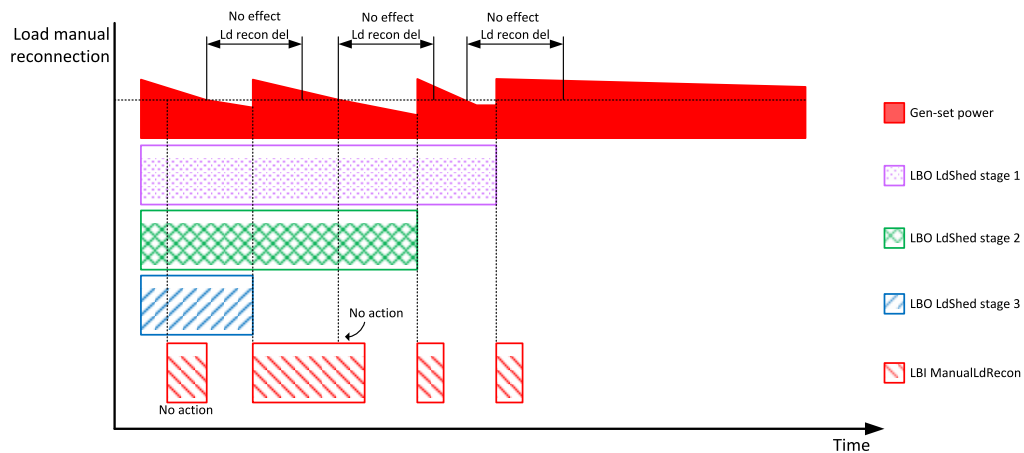
Image 12.19 Load manual reconnection

5.4.11 Load Transfers

The controller is capable of providing the following three different types of changeover (transition):

> Open transition

> Open in-phase transition with passive synchronization

> Closed short-time (100ms) parallel transition with passive synchronization

Open Transition

Automatic Mains Failure (AMF) (or the Automatic Transfer Switch (ATS)) function works in AUTO mode and performs the load transfer between two power sources with the power interruption (blackout) based on three events:

> The load is supplied by Source 1 and Source 1 failure occurs.

> The load is supplied by Source 2 and Source 1 failure disappears.

> Activation or deactivation of binary input TRANSFER TO S2 (PAGE 358).

AMF Mains-Gen

Source 1 Fail

When the Source 1 failure is detected, the following steps are performed:

> If the setpoint S1CB Opens On (page 188) is set to S1 Fail:

   » The S1CB is opened

   » The timer for automatic start of the Secondary Source Switch (page 185) begins to count down.

   » After the timer has elapsed, the binary output GEN START/STOP (PAGE 368) is activated together with the timer Start Time (page 200).

   » During the Start Time (page 200) the controller waits for parameters to be in the limits. Which parameters are taken into account depends on the setpoint Source 2 Measurement (page 204). Once the parameters are OK, Minimal Stabilization Time (page 202) counts down.

   » During this time parameters have to be stable. If not, the count is aborted and it starts again when the conditions are fulfilled.

   » After Minimal Stabilization Time (page 202) has elapsed, the S2CB breaker is closed.
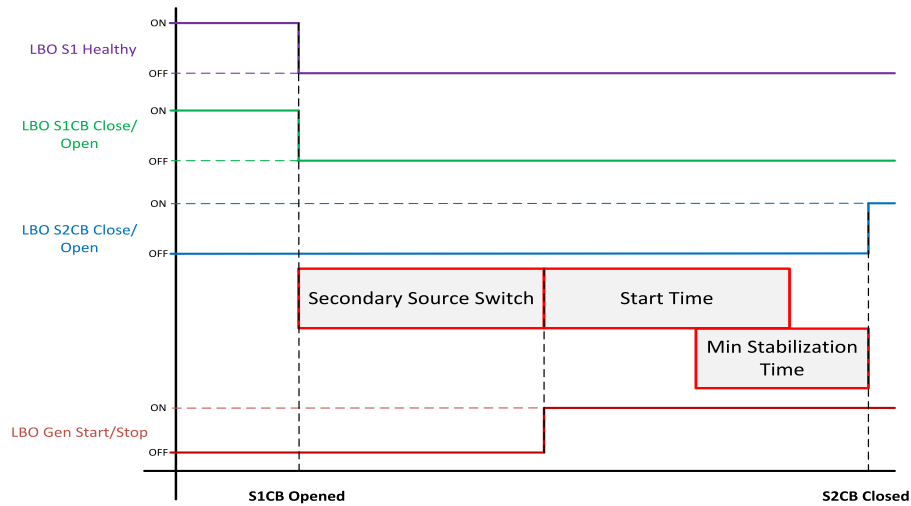
Image 12.20 Mains-Gen Source 1 Fail, S1CB Opens On = S1 Fail

❯ If the setpoint **S1CB Opens On (page 188)** is set to S2 OK:

  » The timer for automatic start of the **Secondary Source Switch (page 185)** begins to count down.

  » After the timer has elapsed, the binary output GEN START/STOP (PAGE 368) is activated together with the timer Start time.

  » During the Start time the controller waits for parameters to be in the limits. Which parameters are taken into account depends on the setpoint **Source 2 Measurement (page 204)**. Once the parameters are OK, **Minimal Stabilization Time (page 202)** counts down.

  » During this time parameters have to be stable. If not, the count is aborted and it starts again when the conditions are fulfilled.

  » The S1CB is opened once the **Minimal Stabilization Time (page 202)** has elapsed.

  » When S1CB opens, **Open Transfer Min Break (page 186)** has to count down in order to close the S2CB.
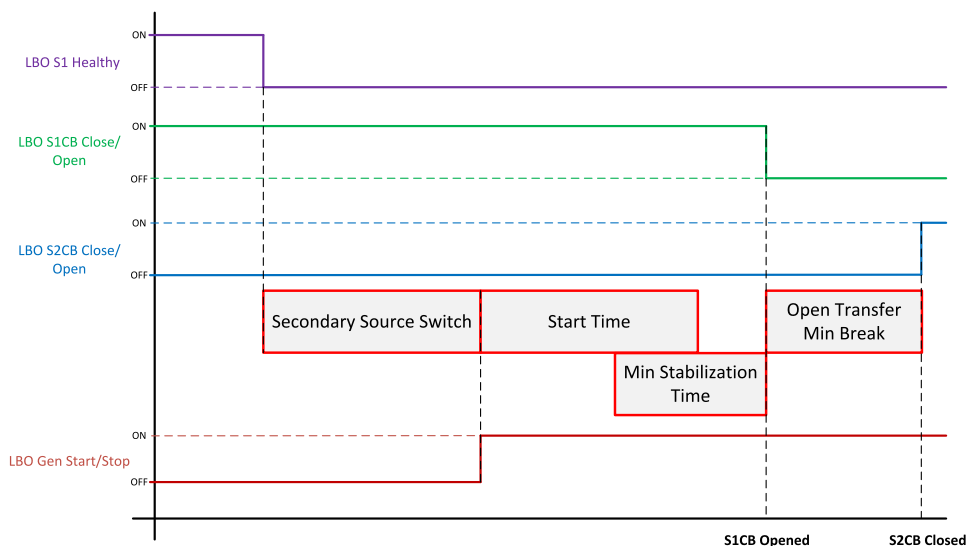
Image 12.21 Mains-Gen Source 1 Fail, S1CB Opens On = S2 OK

Source 1 Return

When the Source 1 is restored to normal,

> the timer **Primary Source Return Delay (page 185)** begins to count down.

> Once it is elapsed, the S2CB opens and **Open Transfer Min Break (page 186)** starts to count.

> The S1CB closes after the **Open Transfer Min Break (page 186)** count is finished.

> After the S1CB is closed the binary output GEN START/STOP (PAGE 368) is deactivated and the timer **Stop Time (page 200)** begins to count

During the **Stop Time (page 200)** the controller waits for disappearing of running engine indications.

In the moment the running engine indications have disappeared, the controller waits 2 more seconds to make sure the engine is really stopped

If no running indications are present for this 2s period, counting of the **Stop Time (page 200)** is finished
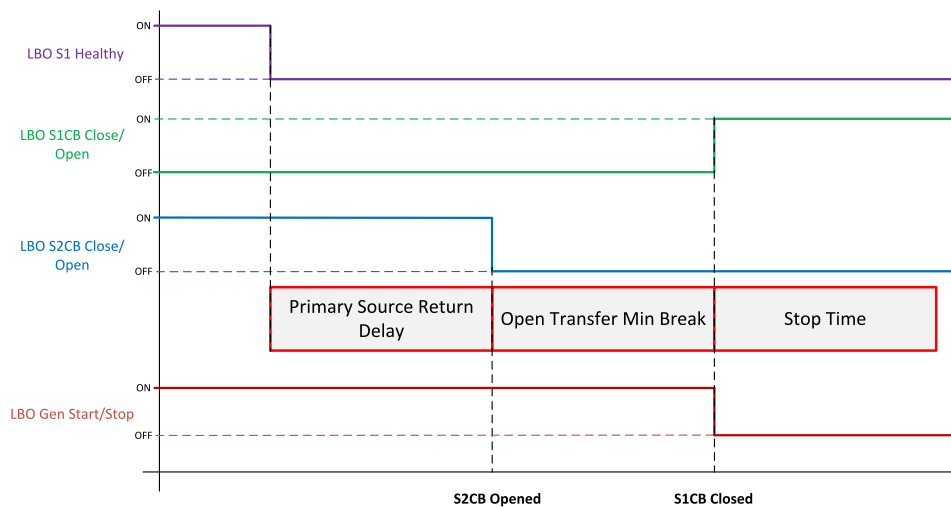
Image 12.22 Mains-Gen Source 1 Return

AMF Mains-Mains

Source 1 Fail

When the Source 1 failure is detected

> If the setpoint **S1CB Opens On (page 188)** is set to S1 Fail:
>> The S1CB is opened.
>> The timers **Open Transfer Min Break (page 186)** is counting down.
>> The S2CB closes after the timer has elapsed.

> If the setpoint **S1CB Opens On (page 188)** is set to S2 OK:
>> The S2CB opens depends on Source 2 is healthy or not.
>> In case Source 2 is healthy, the timer **Open Transfer Min Break (page 186)** is counting down.
>> The S2CB closes after the timer has elapsed.
>> The timer **Open Transfer Min Break (page 186)** starts to count down in the moment the S1CB opens which depends when Source 2 becomes healthy.

Source 1 Return

When the Source 1 is restored to normal:

> The timer **Primary Source Return Delay (page 185)** begins to count down.

> Once it is elapsed, the S2CB opens and **Open Transfer Min Break (page 186)** starts to count.

> The S1CB closes after the **Open Transfer Min Break (page 186)** count is finished.
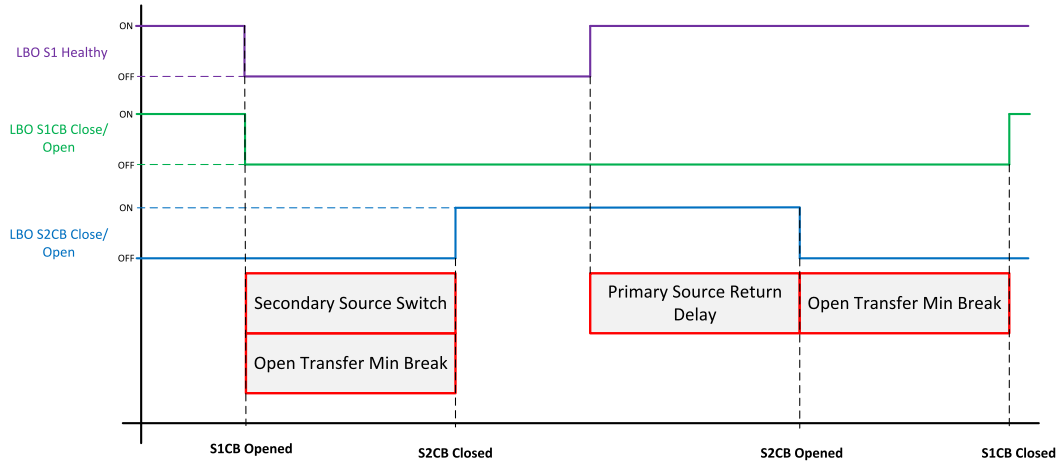
Image 12.23 AMF Mains-Mains Load Transfer

Passive synchronization transfers

f_1-f_2 < Frequency Window
$U_1(L_1,L_2,L_3)$-$U_2(L_1,L_2,L_3)$ < Voltage Window
$f_1 \neq f_2$
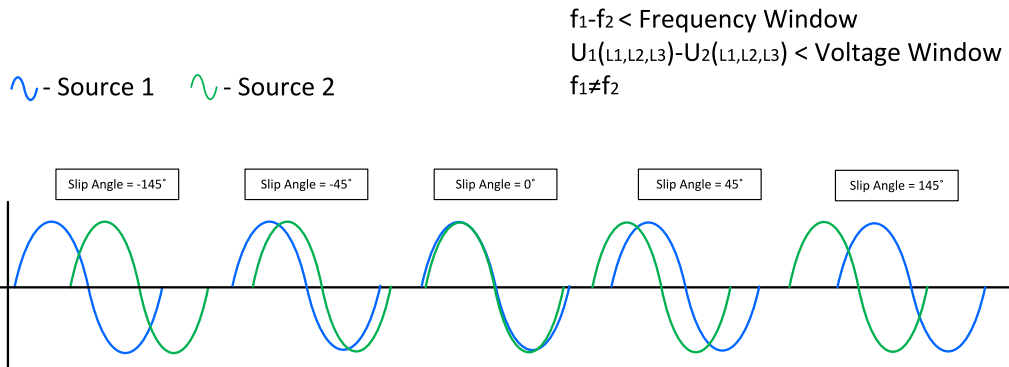
$\sim$ - Source 1 $\sim$ - Source 2

Image 12.24 Passive synchronization

Passive synchronization

The passive synchronization offers possibility to "synchronize" Source 1 and Source 2 without the need to use the speed regulation. The controller waits for both sources to get in phase. In fact, it calculates the moment when **Slip Angle (page 315)** is going to within the window adjusted by setpoint **Phase Window (page 174)**. It is necessary to use fast breakers/contactors with known closing/opening times. Breakers/contactors switching times are used as parameters (**S1CB Close Latency (page 171)**, **S1CB Open Latency (page 171)**, **S2CB Close Latency (page 172)**, **S2CB Open Latency (page 172)**) for issuing the opening (In-phase transition) / closing (Closed transition) commands at the right moment.

There must be three conditions fulfilled to perform the transition with passive synchronization

1. The difference of voltages on each phase between two sources has to be lower than **Voltage Window (page 173)**.

2. The difference of frequencies on each phase between two sources has to be lower than **Frequency Window (page 173)**.

3. Voltage phase shift on each phase between two Sources gets within the **Phase Window (page 174)** before **Synchronization Timeout (page 174)** expires.
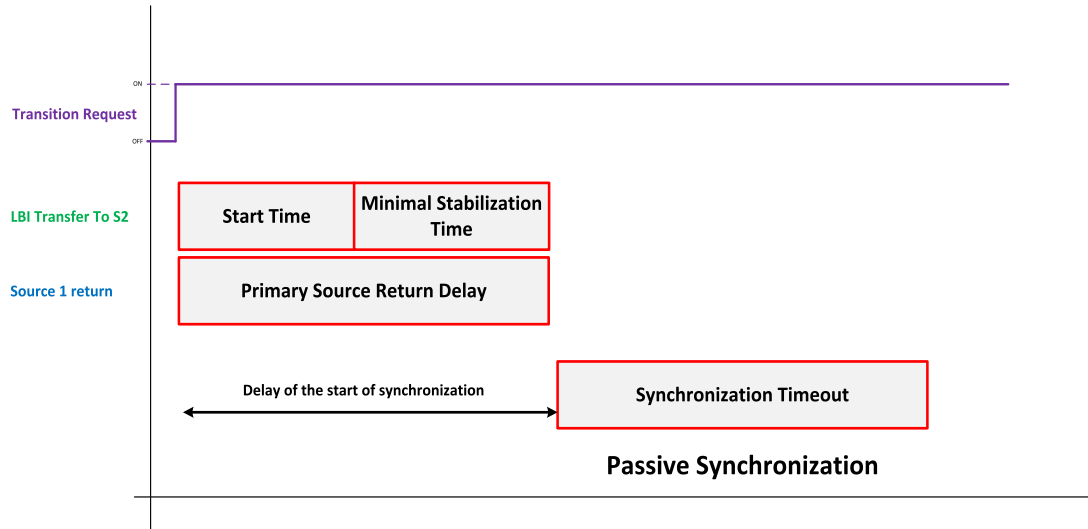
Image 12.25 Passive synchronization

Note: *Breakers with max speed 100 ms are recommended to be used.*

In-phase transition

Open In-phase Transition represents special kind of open transition where the delay during the changeover is reduced to minimal possible value. This value depends on the closing latency of the breaker/contactor. The transition is performed only when the 3 conditions of passive synchronization are fulfilled. It is recommended to use as fast switches as possible (overall switching time <<200 ms). The faster the better to ensure real in-phase transition. When the Source is disconnected from the load at the calculated synchronization moment, electrical parameters of the load are changing dynamically and could fall out of synchronization rapidly.
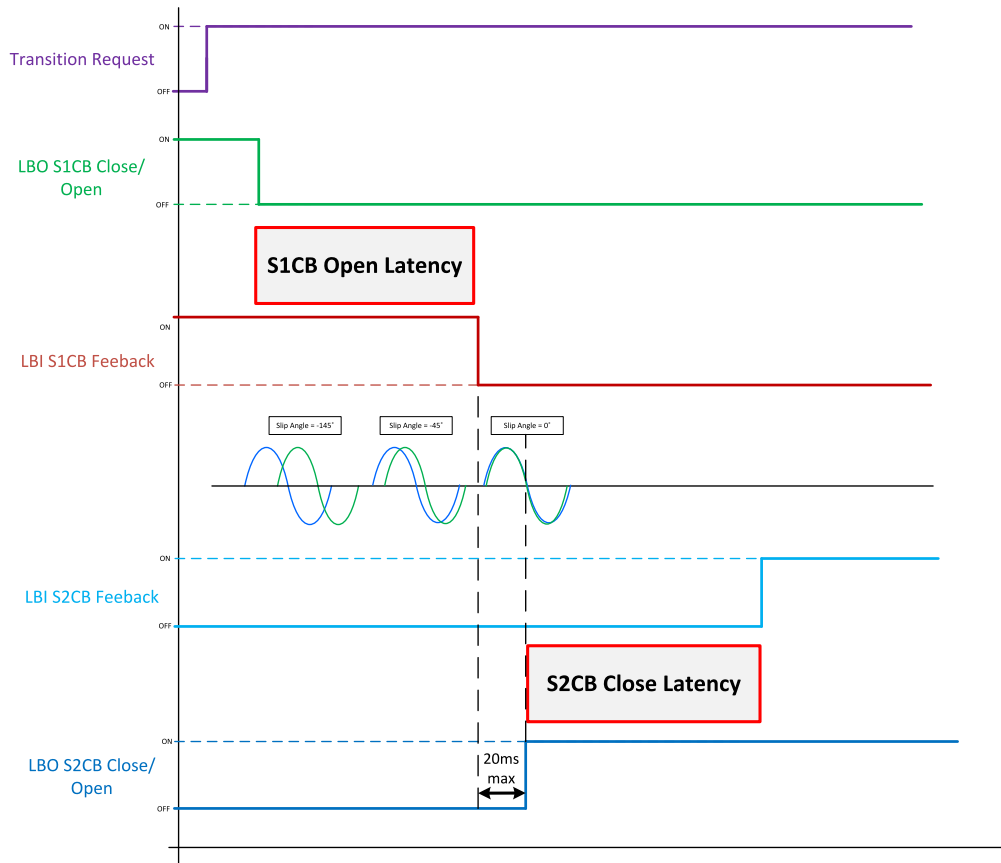
Image 12.26 In-Phase Transition

Note: *Transition Request = common name for predictive transfer (LBI TRANSFER TO S2 (PAGE 358) activated or deactivated, Source 1 return).*

Note: *The picture describes transfer from Source 1 to Source 2. For the opposite transfer S1CB is replaced by S2CB and S2CB is replaced by S1CB.*

Note: *The picture describes transfer when Phase Window (page 174) is adjusted to 0,0°.*

Closed transition

Closed Transition presents transition type where both breakers/contactors overlap for 100 ms. The transition initiates only when 3 conditions of passive synchronization are fulfilled. It is required to use fast breakers/contactors (opening time < 200 ms). If parallel run exceeds 200 ms both breakers/contactors are opened and alarm **Parallel Work (page 428)** is activated.
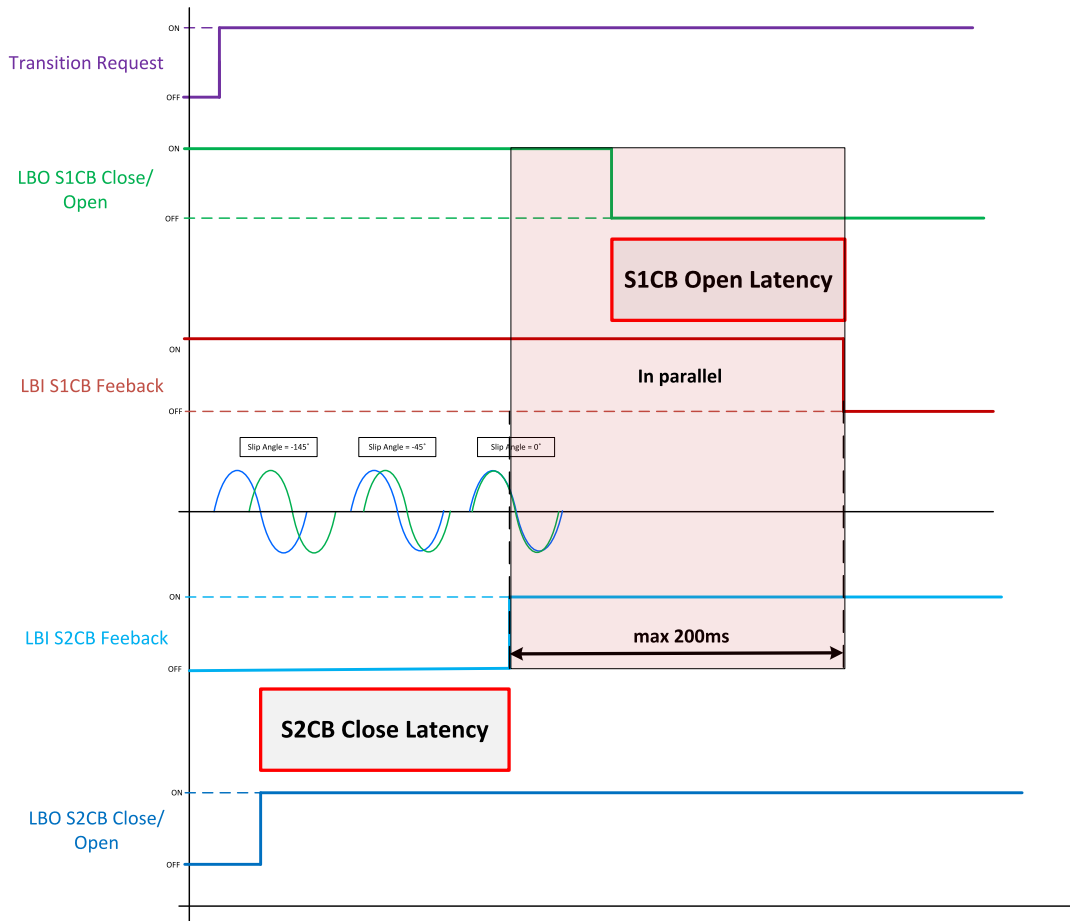
Image 12.27 Closed transition

Note: Transition Request = common name for predictive transfer (LBI TRANSFER TO S2 (PAGE 358) activated or deactivated, Source 1 return).

Note: The picture describes transfer from Source 1 to Source 2. For the opposite transfer S1CB is replaced by S2CB and S2CB is replaced by S1CB.

Note: The picture describes transfer when Phase Window (page 174) is adjusted to 0,0°.

5.4.12 Operating Modes

Selecting the operating mode is done with the Left ⬅ and the Right ➡ buttons on the front panel or by changing the **Controller Mode (page 178)** setpoint (from the front panel or remotely).

Note: If this setpoint is configured as password-protected, the correct password must be entered prior to attempting to change the mode.

Note: The mode cannot be changed if Access Lock input is active.

The following binary inputs can be used to force one respective operating mode independent of the mode setpoint selection:

> **Remote OFF (page 352)**

> **Remote MAN (page 352)**

> **Remote AUTO (page 351)**

If the respective input is active the controller will change the mode to the respective position according to the active input. If multiple inputs are active, the mode will be changed according to priorities of the inputs. The priorities match the order in the list above. If all inputs are deactivated, the mode will return to the original position given by the setpoint.

Mains-Gen Operating Modes

OFF mode – Mains-Gen

Starting of the engine is not possible and AMF function cannot be performed.

If the setpoint **Activity At OFF (page 189)** is enabled, the S1CB is opened/closed depending on whether the mains is present or not.

If the setpoint **Activity At OFF (page 189)** is disabled, the S1CB is opened permanently.

The buttons S1CB [I/O], S1CB [I/O], Start [I] and Stop [O] including the appropriate binary inputs for external buttons are not active.

Note: When S2CB breaker is closed or LBI REMOTE START/STOP (PAGE 353) is active, it is not possible to switch the controller to OFF mode.

MAN mode – Mains-Gen

The engine can be started and stopped manually using the Start [I] and Stop [O] buttons (or the external buttons wired to the appropriate binary inputs). When the engine is running, S2CB can be closed. The S1CB can be closed and opened manually using the S1CB button [I/O], regardless of whether the mains is present or not. AMF function cannot be performed.

Any active Source 1 protection doesn't open the closed S1CB breaker or doesn't block to close the S1CB breaker. Any active Source 2 level 2 protection opens the closed S2CB breaker and stops the engine.

Note: The controller provides interlock between S2CB and S1CB, it means it is never possible to close both CB together.

If the setpoint **Transition Type (page 170)** = Open, the controller provides interlock between S2CB and S1CB, it means it is never possible to close both CB together. Otherwise pressing the button of the breaker which is not closed initiates the closed or in phase transition (depends what option is selected for the setpoint **Transition Type (page 170)**).

AUTO mode – Mains-Gen

The controller does not respond to the buttons Start [I], Stop [O], S1CB ON/OFF [I/O] and S2CB ON/OFF [I/O]. Engine start/stop request is evaluated from Mains failure/return or by active LBI **TRANSFER TO S2 (PAGE 358)** or LBI **REMOTE START/STOP (PAGE 353)**.

Mains-Mains Operating Modes

OFF mode – Mains-Mains

If the setpoint **Activity At OFF (page 189)** is enabled, the S1CB is opened/closed depending on whether the mains is present or not.

If the setpoint **Activity At OFF (page 189)** is disabled, the S1CB is opened permanently.

The buttons S1CB ⌑, S2CB ⌑, Start 🟩 and Stop 🟥 including the appropriate binary inputs for external buttons are not active and AMF function cannot be performed.

Note: When S2CB breaker is closed, it is not possible to switch the controller to OFF mode.

MAN mode – Mains-Mains

S1CB can be closed and opened manually using the S1CB button ⌑ even if Source 1 is in fail state. S2CB can be closed and opened manually using the S2CB button ⌑ even if Source 2 is in fail state.

Any active Source 1 protection doesn't open the closed S1CB breaker or doesn't block to close the S1CB breaker. Any active Source 2 protection doesn't open the closed S2CB breaker or doesn't block to close the S2CB breaker and AMF function cannot be performed.

Note: The controller provides interlock between S1CB and S2CB, it means it is never possible to close both CB together.

If the setpoint **Transition Type (page 170)** = Open, the controller provides interlock between S2CB and S1CB, it means it is never possible to close both CB together. Otherwise pressing the button of the breaker which is not closed initiates the closed or in phase transition (depends what option is selected for the setpoint **Transition Type (page 170)**).

AUTO mode – Mains-Mains

The controller does not respond to the buttons Start 🟩, Stop 🟥, S1CB ON/OFF ⌑ and S2CB ON/OFF ⌑ .The AMF function is enabled

5.4.13 PLC

PLC Editor is a powerful tool which helps you to create your own PLC scheme. It has a graphical interface to make user interface easy to use.
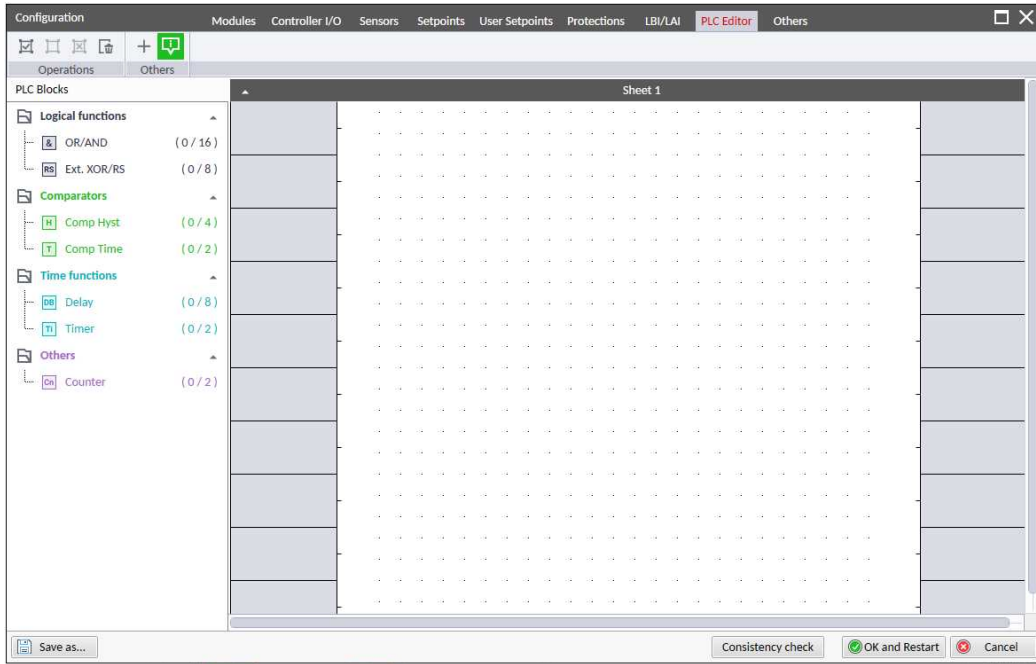
Image 12.28 PLC Editor main page

List of available PLC blocks

PLC block	Number of blocks
OR/AND	32
XOR/RS	16
Comparator with hysteresis (Comp Hyst)	4
Comparator with delay (Comp Time)	4
Timer	2
Delay	8
Counter	2
Decomp	4

Working with the editor

If the currently opened archive does not contain any PLC program, then an empty drawing is created automatically when you select the PLC Editor. The procedure of creation of a PLC drawing (program) contains the following essential steps:

> Adjust the sheet to your needs. See **Working with sheets (page 104)** for more information.

> Add PLC blocks into the sheets. See **Adding PLC blocks (page 106)** for more information.

> Define inputs and outputs of the PLC program. See **Define inputs and outputs (page 107)** for more information.

> Create connections between inputs, blocks and outputs. See **Creating wires (page 109)** for more information.

> Adjust properties of the blocks. See **List of PLC blocks (page 386)** for more information about blocks.

Working with sheets

Drag the sheet edges to re-size the sheet according to your needs.
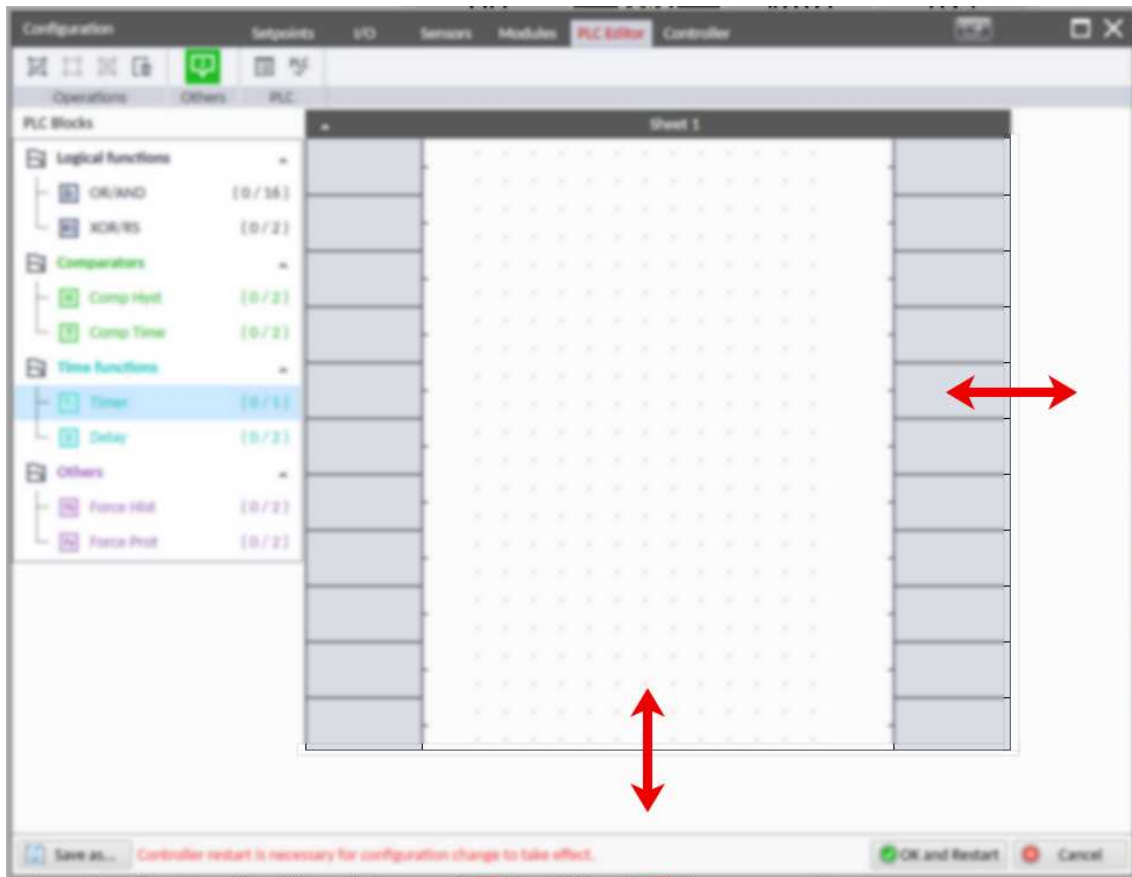
Image 12.29 Adjusting PLC sheet

Multisheet

There is support of Multisheet functionality. It is possible create more sheets, for example each sheet for specific functionality.

Each sheet could have user editable name and note. Just doubleclick on header of sheet. When Hints are enabled, by place mouse cursor to header, name and note is displayed.

It is possible add new PLC Sheet, Delete selected PLC sheet (including its content) and move PLC Sheet up and down.

When there is need to use value representing output of PLC block located on another PLC Sheet, it is not necessary connect this output to right ladder to be able use it in different PLC Sheet. On any PLC Sheet it is possible use any existing value with supported data type.
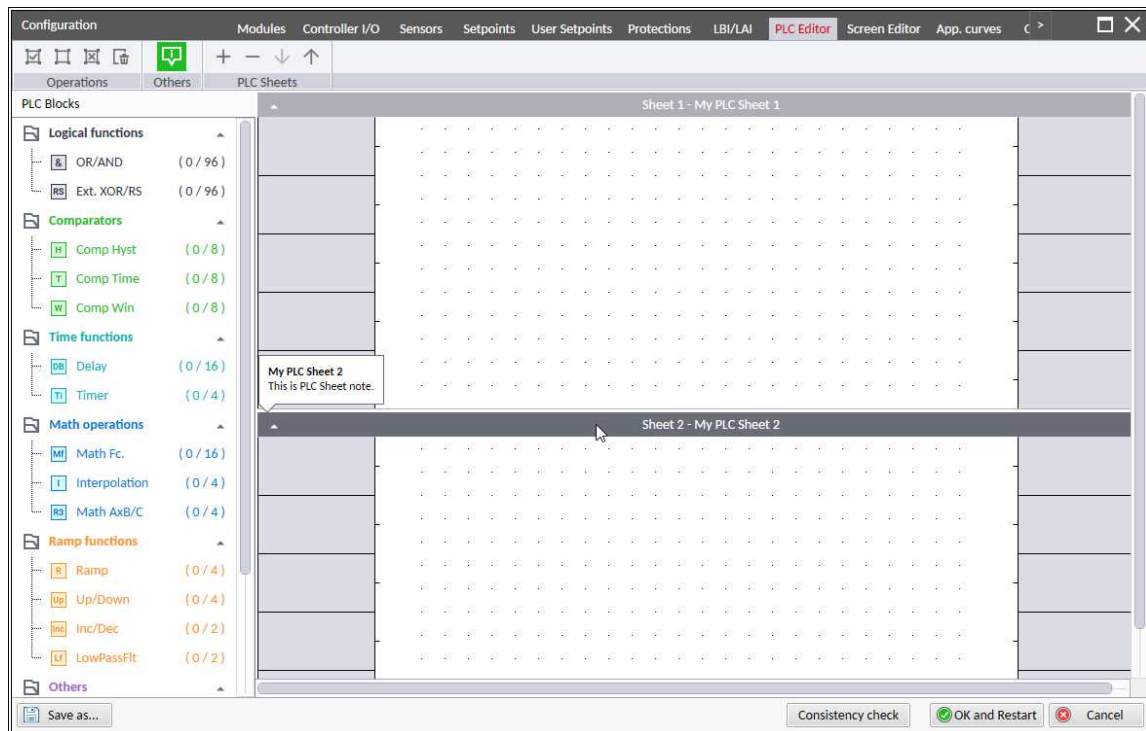
Image 12.30 Management of PLC sheets

Note: Multisheet functionality is connected only with right version of InteliConfig. It is not conditioned by the controller version.

Import/Export

It is possible Export selected PLC sheet into file. This file can be used to import this PLC sheet into different configuration.

When importing file into selected PLC sheet, user is asked to confirm that current content of PLC sheet will be deleted.

During process this data are imported:

> All PLC blocks including their settings.

> Wiring between PLC blocks

> Sheet name and description

> Connection to LBI/LAI if this LBI/LAI is not already connected to any source

Data not imported:

> Source signals from rest of configuration including other PLC sheets

> Connection to physical outputs

Note: When PLC sheet is exported, all connection are defined by communication object numbers. Not all objects may exist in the target configuration or may have a different meaning. Due this, connection to rest of configuration is not imported. But we are working on some improvement in this area.

IMPORTANT: You can get unexpected error message when connecting to controller or opening configuration with more PLC sheets in configuration from older version of InteliConfig (without support of PLC Multisheet). In this case download and install latest version of InteliConfig (PLC Multisheet is supported from version 2.17.0).

Adding PLC blocks

Adding a PLC block is simple and intuitive. Follow the procedure below to add PLC block.

> Select the required block from the list of available PLC blocks at the left and drag it into the sheet.

> Double-click on the block and adjust the properties of the block. See **List of PLC blocks (page 386)** for more information about blocks.

> Connect the block inputs and outputs by drawing wires in the sheet. See **Define inputs and outputs (page 107)** for more information. It is also possible to connected inputs and outputs via properties of selected PLC block.
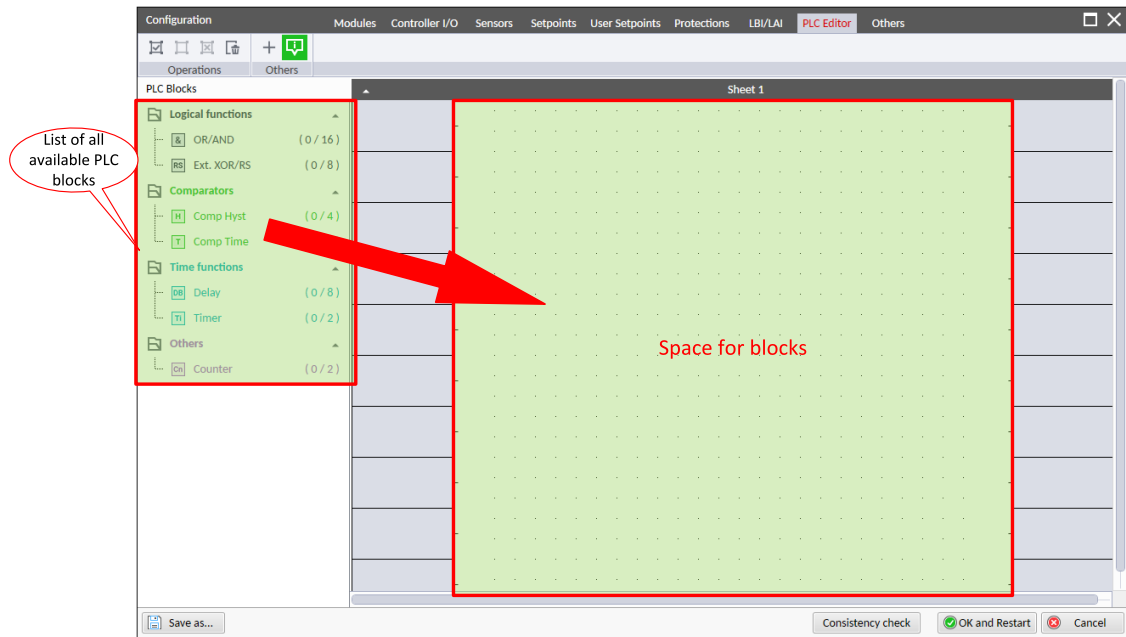
Image 12.31 Adding PLC blocks

Note: *To delete a PLC block just click on it and press delete button. Also the delete selection function can be used.*

Note: *To see context help for selected PLC block just press the F1 button.*

Define inputs and outputs
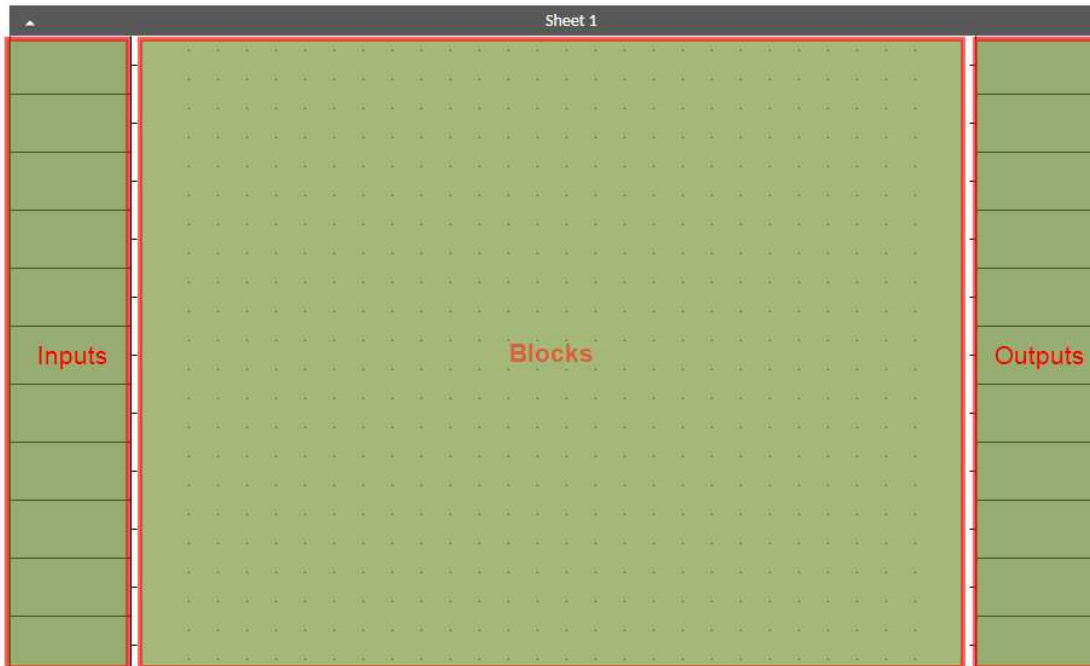
Image 12.32 Blank sheet of PLC Editor

Inputs

Sheet inputs are located at the left side of a sheet. Follow the procedure below to add or edit an input.

> Double-click on a free input position or existing input to add new input or edit the existing one.

> Select the source for the input.

>> If you create a binary input, you can select a source from the following categories:

- Bin. values – this category contains all binary values available in the controller as binary inputs, logical binary outputs, fixed protection states, user buttons, user protection states.

- PLC outputs – this category contains all PLC blocks binary outputs available in the controller.

>> If you create an analog input, you can select a source from the following categories:

- Ana. values – this category contains all analog values available in the controller as analog inputs, electrical values, values from ECU etc.

- All setpoints – this category contains all setpoints of the controller except the dedicated PLC setpoints. Names, resolutions and dimensions of these setpoints can not be modified.
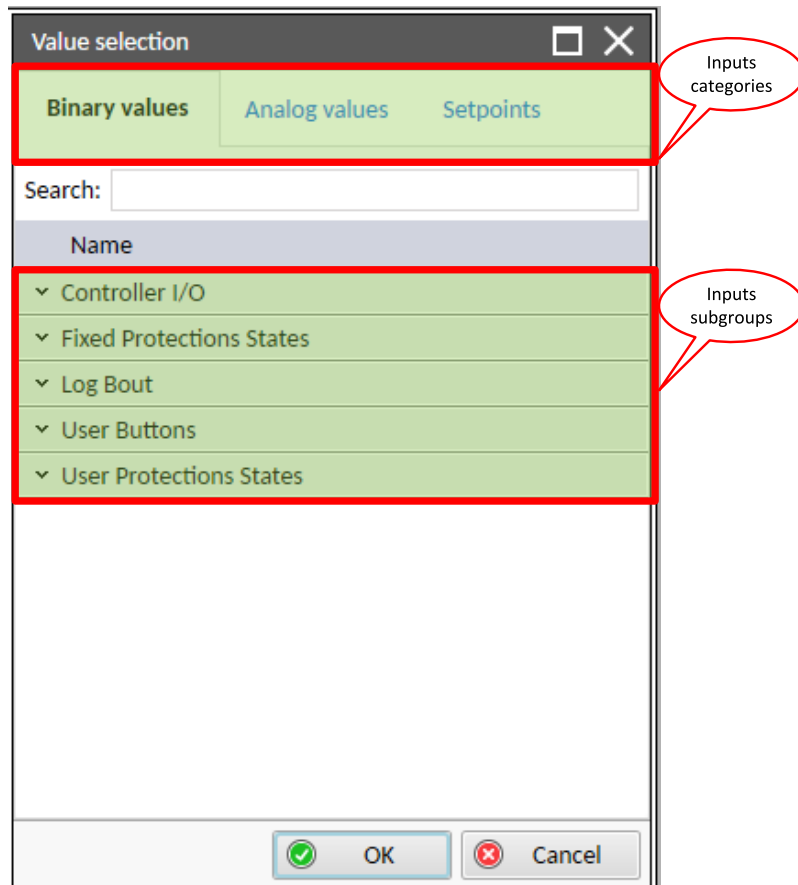
Image 12.33 PLC inputs

Outputs

Sheet outputs are located at the right side of a sheet. Follow the procedure below to add or edit an input.

> Double-click on a free output position to add a new sheet output.

> Double-click on an already created output to configure the output onto a controller output terminal or a logical binary input (first some PLC block output must be connected to this output to enable configuration of output).

Name of output

Current connection of output

Connect or disconnect PLC output to selected physical binary output or logical binary input

PLC Binary Output

Name: PLC-BOUT 1.1

Connected to:

+ Connect   — Disconnect

Available physical outputs / logical inputs:

Item	Name	Used as (Source)
Logical inputs		
Controller		
BO1	Starter 1	Starter 1
BO2	Fuel Solenoid	Fuel Solenoid
BO3	GCB Close/Open	GCB Close/Open
BO4	MCB Close/Open	MCB Close/Open
BO5	Prestart	Prestart
BO6	Ready To Load	Ready To Load
BO7	Alarm	Alarm
BO8	Not Used	

OK   Cancel

Available physical outputs or logical inputs

Current function of physical outputs or logical inputs

Current source of physical outputs or logical inputs

Image 12.34 PLC outputs

> **IMPORTANT: It is necessary to click on Connect button after selecting the output. Otherwise PLC output is not connected to output.**

Creating wires

Wires can be created between PLC inputs and PLC blocks and between PLC blocks and PLC outputs.

> **IMPORTANT: Keep the order of starting and finishing connection points. Wires between inputs and blocks have to start from inputs. Wires between blocks and outputs have to start from blocks.**

Follow the procedure below to create wire:

> Situate the mouse pointer over the starting point of the wire. If the area under the mouse pointer is a connection point, the pointer will change color (fill of pointer will be white).

> Press and hold the left mouse button and drag the wire to the destination of required connection point. If you point over a valid connection point, the connection point will be marked with a red circle.

> Release the left mouse button to create a wire between the two points. The wire is routed automatically.

Note: It is possible to make connection only between the outputs and inputs with the same type of value (binary or analog). Binary values are marked by black pointer, analog values are marked with green pointer.

Note: To delete wire just click on it and press the Delete button. Also the Delete selection function can be used.

PLC logic execution rules

The PLC program is executed every 100 ms. The blocks are executed in order according to block numbers (item numbers), which are indicated in each block. Block numbers are assigned automatically according to their position on sheet.
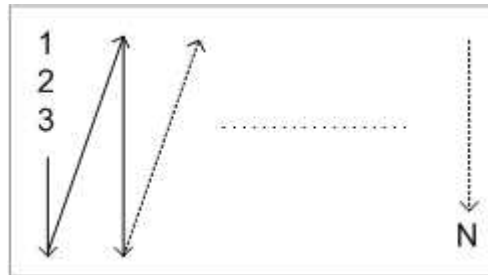
Image 12.35 PLC execution logic

> **IMPORTANT: Please always check that the blocks are ordered correctly, especially if you use direct feedbacks from outputs to inputs within one sheet. Wrong order may lead to incorrect results!!!**
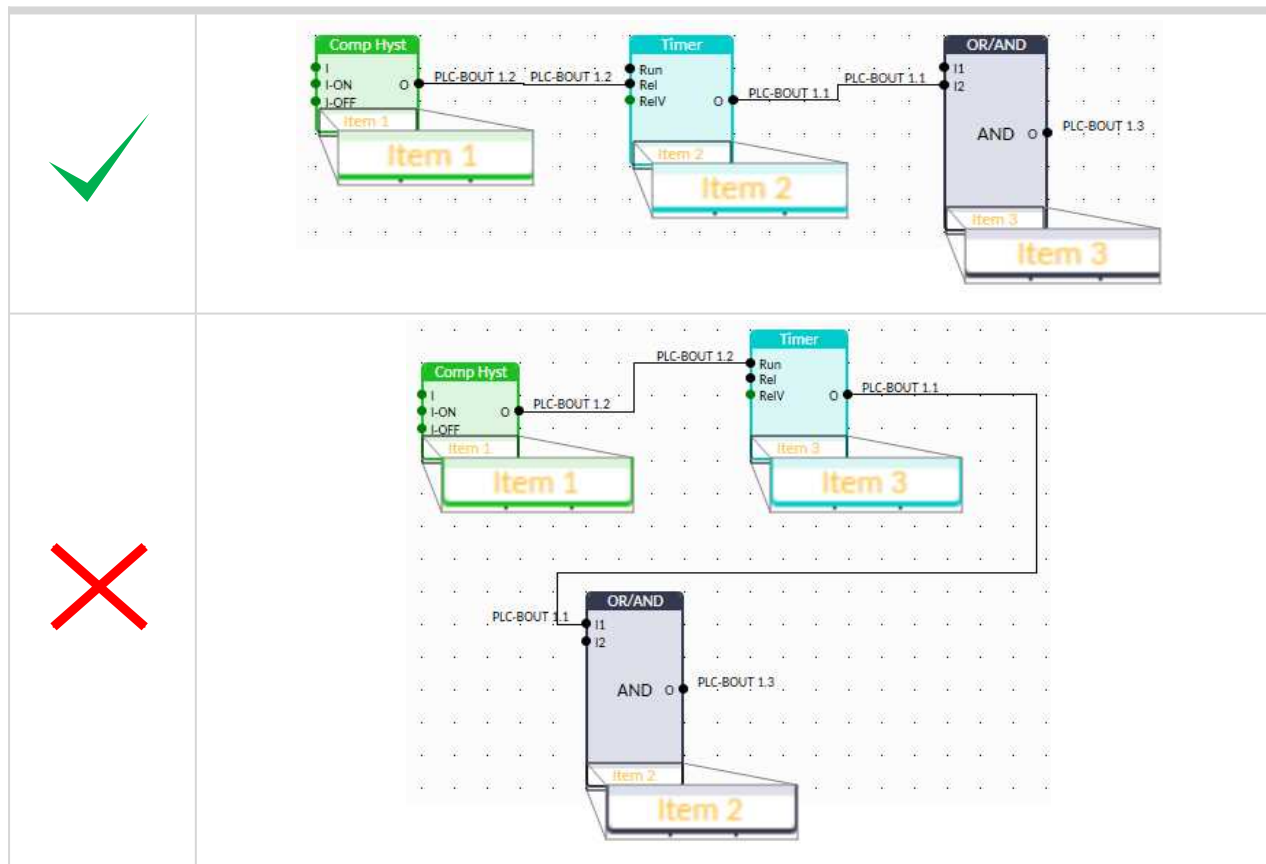
PLC – Export/Import

Export

Each PLC sheet can be exported to file. Exported is name of PLC sheet, description, content of sheet (PLC blocks, its settings, wiring, layout...).

It is possible export only one sheet at once. There is no option to export all PLC sheets into one file.

Import

It is possible import PLC sheet definition inot selected PLC sheet. When PLC sheet is not empty, the user is warned that its contents will be overwritten.

Imported are only some definitions from saved file.

This is not imported:

> Inputs of PLC blocks which are connected to any object out of this PLC sheet
> Outputs of PLC blocks which are connected any I/O
>> Connections to LAI/LBI are imported when exists in configuration and are not already assigned to other source

Other functions

Consistency check

Use this function to check if all inputs and outputs of PLC block are connected.

Delete whole content of sheet

Use this function to delete the whole content of sheet (including blocks, wires, inputs, outputs, etc...).

Hints

Use this function to enable or disable quick hints for blocks (controller help is not affected by this function).

PLC monitor

PLC Monitor is a powerful tool for monitoring your PLC. Just click on PLC Monitor button on main InteliConfig page to see your PLC. Active inputs and outputs are a blue color. Also wires with active signals are blue color.

> **IMPORTANT: It is not possible to edit PLC in PLC Monitor tool.**

5.4.14 Protections

Fixed Protections

Fixed protections are built in protections for Source 1 and Source 2 or for other functionalities (battery voltage etc…). Their purpose is to inform or perform actions when the malfunction is detected.

Fixed Protection types

Name	Application	Level	Abbreviation	Alarm List	History	Fault Reset needed	LBO Horn activation (inc. Flashing)	LBO Alarm activation (inc. Flashing)	Action: CB open	Action: Source 2 stop	Common LBO
Warning	Both	1	Wrn	✓	✓	✓	✗	✓	✗	✗	**AL COMMON WRN (PAGE 363)**
History Record Only	Both	1	Hst	✗	✓	✗	✗	✗	✗	✗	✗
Alarm List Indication	Both	1	ALI	✓	✗	✗	✗	✗	✗	✗	✗
Mains Protection Source 1	Both	2	MP	✗	✓	✗	✗	✗	✓	✗	**AL COMMON MPR (PAGE 362)**
Mains Protection Source 2	Mains-Mains	2	MP2	✗	✓	✗	✗	✗	✓	✗	**AL COMMON MPR2 (PAGE 363)**
Breaker Open & Stop	Mains-Gen	2	BOS	✓	✓	✓	✓	✓	✓	✓	**AL COMMON BOS (PAGE 362)**

Protection blocking

Source 1 protections are always active. Source 2 fixed protections in Mains-Gen application are blocked when engine is starting, stopping or stopped.

Exceptions are:

> E-Stop, Total Stop and Emergency Stop

Several protections in Mains-Gen application can be disabled (**see Mains-Gen Source 2 level 2 protections on page 114**) by dedicated setpoint.

Each setpoint offers following options.

Setpoint options

Options	Description
Enable	Protection is enabled
Disable	Protection is blocked
ExtDisable	Disabling of the protection can be activated by LBI PROTECTION FORCE DISABLE (PAGE 350)

Mains-Gen, Mains-Mains Source 1 protections

	Alarms / Protection name
Frequency	**MP Source 1 Overfrequency (page 424)**
	MP Source 1 Underfrequency (page 424)
Voltage	**MP Source 1 L1 Overvoltage (page 419)**
	MP Source 1 L1 Undervoltage (page 420)
	MP Source 1 L2 Overvoltage (page 421)
	MP Source 1 L2 Undervoltage (page 421)
	MP Source 1 L3 Overvoltage (page 422)
	MP Source 1 L3 Undervoltage (page 422)
	MP Source 1 L1L2 Overvoltage (page 420)
	MP Source 1 L1L2 Undervoltage (page 420)
	MP Source 1 L2L3 Overvoltage (page 421)
	MP Source 1 L2L3 Undervoltage (page 422)
	MP Source 1 L3L1 Overvoltage (page 422)
	MP Source 1 L3L1 Undervoltage (page 423)
	MP Source 1 Voltage Unbalance ph-n (page 423)
	MP Source 1 Voltage Unbalance ph-ph (page 423)
Others	**ALI Source 1 Ph Rotation Opposite (page 413)**

Mains-Gen Source 2 level 2 protections

	Setpoint for protection ON / OFF	Alarms / Protection name
Current	*Always active*	BOS Short Circuit (page 418)
	IDMT Overcurrent Protection (page 224)	BOS Overcurrent IDMT (page 418)
	Current Unbalance Protection (page 225)	BOS Current Unbalance (page 417)
Frequency	Source 2 Frequency Protection (page 223)	BOS Source 2 Overfrequency (page 433)
	Source 2 Frequency Protection (page 223)	BOS Source 2 Underfrequency (page 433)
Power	Overload Protection (page 224)	BOS Overload (page 418)
Voltage	Source 2 < > Voltage Delay (page 211)	BOS Source 2 L1 Overvoltage (page 429)
		BOS Source 2 L2 Overvoltage (page 430)
		BOS Source 2 L3 Overvoltage (page 431)
		BOS Source 2 L1L2 Overvoltage (page 429)
		BOS Source 2 L2L3 Overvoltage (page 430)
		BOS Source 2 L3L1 Overvoltage (page 432)
		BOS Source 2 L1 Undervoltage (page 429)
		BOS Source 2 L2 Undervoltage (page 430)
		BOS Source 2 L3 Overvoltage (page 431)
		BOS Source 2 L1L2 Undervoltage (page 430)
		BOS Source 2 L2L3 Undervoltage (page 431)
		BOS Source 2 L3L1 Undervoltage (page 432)
	Source 2 Voltage Unbalance (page 212)	BOS Source 2 Voltage Unbalance ph-n (page 433)
		BOS Source 2 Voltage Unbalance ph-ph (page 432)
Others	*Always active*	ALI Source 2 Ph Rotation Opposite (page 413)

Mains-Mains Source 2 protections

	Alarms / Protection name
Frequency	MP2 Source 2 Overfrequency (page 427)
	MP2 Source 2 Underfrequency (page 428)
Voltage	MP2 Source 2 L1 Overvoltage (page 424)
	MP2 Source 2 L1 Undervoltage (page 424)
	MP2 Source 2 L1L2 Overvoltage (page 425)
	MP2 Source 2 L1L2 Undervoltage (page 425)
	MP2 Source 2 L2 Overvoltage (page 425)
	MP2 Source 2 L2 Undervoltage (page 426)
	MP2 Source 2 L2L3 Overvoltage (page 426)
	MP2 Source 2 L2L3 Undervoltage (page 426)
	MP2 Source 2 L3 Overvoltage (page 426)
	MP2 Source 2 L3 Overvoltage (page 427)
	MP2 Source 2 L3L1 Overvoltage (page 427)
	MP2 Source 2 L3L1 Undervoltage (page 427)
	MP2 Source 2 Voltage Unbalance ph-n (page 428)
	MP2 Source 2 Voltage Unbalance ph-ph (page 428)
Others	ALI Source 2 Ph Rotation Opposite (page 413)

User Protections

InteliATS2 70 allows users to configure their own protections to any analog value or binary input/output. Only one protection of 1st level and/or one protection of 2nd level can be configured on logical binary input/output. More than one protection can be configured on analog value. Max simultaneous number of configured user protections is 32.

Source upon which the protection is configured can be selected. It can be any analog value or binary state.

Source

Analog values	Binary states
› Values 　» Source 1, Source 2, others › Statistics	› Binary inputs 　» Controller › Binary outputs 　» Controller, PLC › Protection states › LBOs

Protection activation

Type	Name of activation	Description
Analog	Over Limit	Protection is activated if value is over limit.
	Over Limit + Fls	Protection is activated if value is over limit or in a fault state.
	Under Limit	Protection is activated if value is under limit.
	Under Limit + Fls	Protection is activated if value is under limit or in a fault state.
	Fls only	Protection is activated if value is in a fault state.
Binary	True	Protection is activated if value is Logical 1.
	TrueOrFls	Protection is activated if value is Logical 1 or in a fault state.
	False	Protection is activated if value is Logical 0.
	FalseOrFls	Protection is activated if value is Logical 0 or in a fault state.

User Protection types

Name	Application	Level	Abbreviation	Alarm List	History	Fault Reset needed	LBO Horn activation (inc. Flashing)	LBO Alarm activation (inc. Flashing)	Action: CB open	Action: Source 2 stop	Common LBO
Warning	Mains-Mains, Mains-Gen	1	Wrn	✓	✓	✓	✗	✓	✗	✗	**AL COMMON WRN (PAGE 363)**
History Record Only	Mains-Mains, Mains-Gen	1	Hst	✗	✓	✗	✗	✗	✗	✗	✗
AlarmList indication	Mains-Mains, Mains-Gen	1	ALI	✓	✗	✗	✗	✗	✗	✗	✗
Mains Protection Source 1	Mains-Mains, Mains-Gen	2	MP	✗	✓	✗	✗	✗	✓	✗	**AL COMMON MP (PAGE 362)**
Mains Protection Source 1 + Fault Reset	Mains-Mains, Mains-Gen	2	MPR1	✓	✓	✓	✓	✓	✓	✗	**AL COMMON MPR (PAGE 362)**
Mains Protection Source 2	Mains-Mains	2	MP2	✗	✓	✗	✗	✗	✓	✗	**AL COMMON MP2 (PAGE 362)**
Mains Protection Source 2 + Fault Reset	Mains-Mains	2	MPR2	✓	✓	✓	✓	✓	✓	✗	**AL COMMON MPR2 (PAGE 363)**
Breaker Open & Stop	Mains-Gen	2	BOS	✓	✓	✓	✓	✓	✓	✓	**AL COMMON BOS (PAGE 362)**

Protection blocking

It is possible to configure one Protection Blocking to any **User Protections (page 115)**. This function is used to block certain protections when their function is unwanted or meaningless. Each user protection has an option to set the blocking condition.

Protection blocking

Block Type	Description
All the time	The protection is not blocked.
Run Only Block Delay	The protection is blocked depending on engine state
Force Block	The protection is blocked by LBI PROTECTION FORCE DISABLE (PAGE 350).
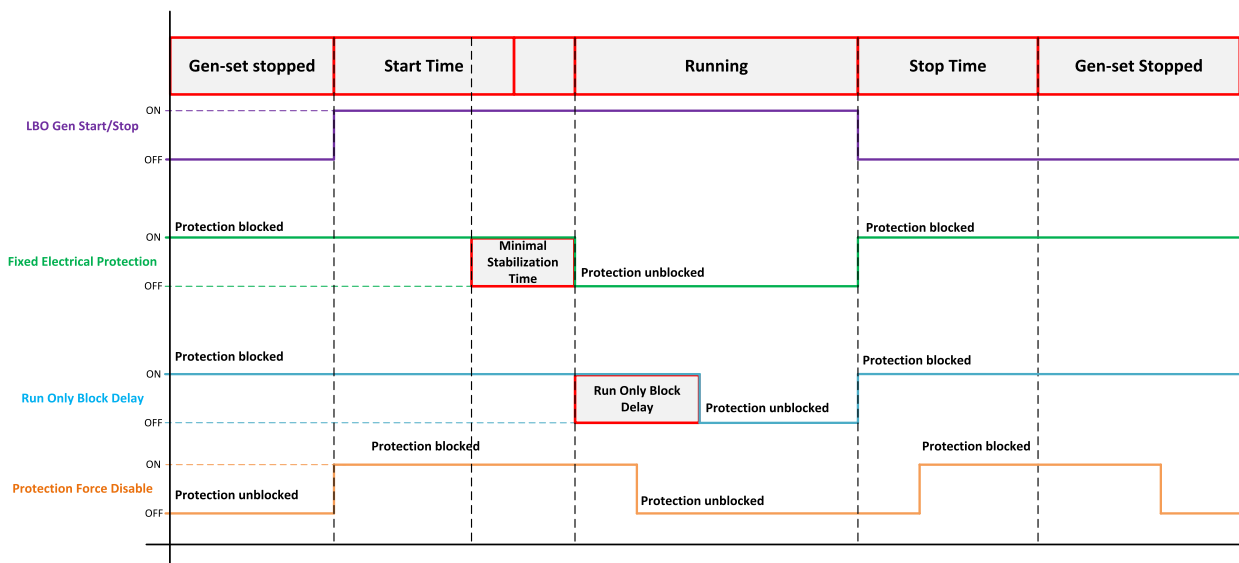
Image 12.36 Types of protection blocking

History record

> Always – History is recorded all the time.

> Once – History is recorded only once after fault reset.

Note: Every User protection is evaluated with period 0.1 s.

Adding analog protection

①		Selecting the input source **see User Protections on page 115**.
②		Selecting the protection type **see Fixed Protection types on page 112**.
③		Selecting the protection activation **see Protection activation on page 116**.
④		Selecting the block type **see Protection blocking on page 118**.
⑤		Selecting if the occurrence of a protection is recorded every time or only once after a Fault Reset.
⑥		Selecting the input for limit. Setpoints must have the correct resolution and dimension as protection source value. › Existing setpoint › New user setpoint › Existing user setpoint Prefix is added to the name based on protection type / level
⑦		Selecting the input for delay. Setpoints must have the correct resolution **0.1** and dimension **[s]** › Existing setpoint › New user setpoint › Existing user setpoint Prefix is added to the name based on protection type / level.
⑧		Text input for Alarm / History message.
⑨		Enables User Protection States.

Adding binary protection

1		Selecting the input source **see User Protections on page 115**.
2		Selecting the protection type **see Fixed Protection types on page 112**.
3		Selecting the protection activation **see Protection activation on page 116**.
4		Selecting the block type **see Protection blocking on page 118**.
5		Selecting if the occurrence of a protection is recorded every time or only once after a Fault Reset.
6		Selecting the input for delay. Setpoints must have the correct resolution **0.1** and dimension **[s]** > Existing setpoint > New user setpoint > Existing user setpoint
7		Text input for Alarm / History message
8		Enables User Protection States.

Protection states

Protection states are states of fixed and user protections. These states can be configured as binary output or used in PLC logic.

Fixed protection states

Important **Fixed Protections (page 111)** have a protection state. The protection state is (usually) named the same as the alarm. Fixed protection states are in a group of 32 values.

Protection states groups:

> **FIXED PROTECTIONS STATES 1 (PAGE 328)**

> **FIXED PROTECTIONS STATES 2 (PAGE 328)**

> **FIXED PROTECTIONS STATES 3 (PAGE 328)**

User protections states

During the configuration of protections in InteliConfig, you can decide whether you want to add user protection state for the protection. The name is the same as the alarm's message.

User protection states are in a group of 32 values.

Note: Group of User protection states is showed only when there is at least 1 protection state in it.

Alarm management

The controller evaluates two levels of alarms. Level 1 – yellow alarm – is a pre-critical alarm that is only informative and does not take any action. Level 2 – red alarm – represents a critical situation, where an action must be taken to prevent damage.

> One alarm of level 1 and one alarm of level 2 can be assigned to each binary input at once.
> Multiple protections can be assigned on each analog value.
> Each alarm is written to the **Alarm list (page 123)**.
> Each alarm causes a record to be written into the history log.
> Each alarm activates the Alarm and Horn output.
> Each alarm can cause an SMS message or an email to be sent.

Alarm handling

There are four different alarm categories regarding the period when the alarms are evaluated. The category is selectable for alarms assigned to binary inputs and fixed for built-in alarms. The categories are the following:

> The alarm is evaluated all the time the controller is switched on.
> The alarm is evaluated only when the engine is running.
> The alarm is evaluated only when the generator is running. These alarms begin to be evaluated after the engine has been started and **Minimal Stabilization Time (page 202)** has elapsed. They are blocked once generator is stopping or stopped.
> The alarm is evaluated only when LBI PROTECTION FORCE DISABLE (PAGE 350) is not active.

If an alarm is being evaluated and the appropriate alarm condition is fulfilled, the delay of evaluation will start to run. The delay is adjustable by a setpoint If the conditions persist, the alarm will activate. The alarm will not activate if the condition is dismissed while the delay is still running.

After pressing the Fault reset button or activating the binary input FAULT RESET BUTTON (PAGE 349), all active alarms change to confirmed state. Confirmed alarms will disappear from the Alarm list as soon as the respective condition dismisses. If the condition is dismissed before acknowledging the alarm, the alarm will remain in the Alarm list as Inactive.

Alarm states

An alarm can have the following states:

> Active alarm: the alarm condition persists, alarm delay has elapsed.
> Inactive alarm: the alarm condition has disappeared, but the alarm has not been confirmed.
> Confirmed alarm: the alarm condition persists, but the alarm has already been confirmed.
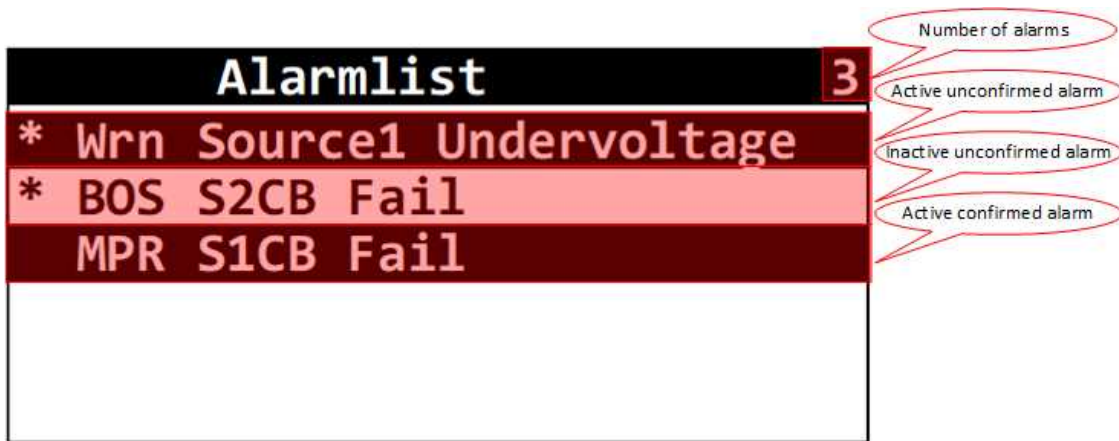
Image 12.37 Alarm List

Alarm types – Level 1

The level 1 alarm indicates that a value or parameter is out of normal limits, but has still not reached critical level. This alarm does not cause any actions regarding the control.

Warning (Wrn)

The alarm appears in the Alarm list and is recorded into the history log. Activates the output **AL COMMON WRN (PAGE 363)** as well as the standard alarm outputs (**HORN (PAGE 368)** and **ALARM (PAGE 365)**).

Alarm indication only (AL Indic)

The alarm is only an indication alarm does not perform any actions. Alarm is only displayed in Alarm list.

History record only (HistRecOnl)

The event is recorded into the history. Standard alarm outputs (**HORN (PAGE 368)** and **ALARM (PAGE 365)**) are not activated.

Alarm types – Level 2

The level 2 alarm indicates that a critical level of the respective value or parameter has been reached.

Note: It is not possible to start the engine if any red level protection is active or not confirmed.

> **IMPORTANT: The engine can start by itself after acknowledging the alarms if there is no longer an active red alarm and the controller is in AUTO!**

Breaker open and stop

The event appears in the Alarm list and is recorded into the history log. It causes immediate opening of the S2CB and deactivation of the LBO **GEN START/STOP (PAGE 368)**. The Source 2 cannot be started again while there is a BOS alarm in the Alarm list. Activates the output **AL COMMON BOS (PAGE 362)** as well as the standard alarm outputs (**HORN (PAGE 368)** and **ALARM (PAGE 365)**).

Mains Protection Source 1 + Fault Reset (MPR1)

The alarm appears in the Alarm list and is recorded into the history log. It causes immediate opening of the S1CB. Source 1 is in the failure until there is active alarm or inactive but not confirmed alarm in the Alarm list. It activates the output **AL COMMON MPR (PAGE 362)** as well as the standard alarm outputs (**HORN (PAGE 368)** and **ALARM (PAGE 365)**).

Mains Protection Source 2 + Fault Reset (MPR2)

The alarm appears in the Alarm list and is recorded into the history log. It causes immediate opening of the S2CB. Source 2 is in the failure until there is active alarm or inactive but not confirmed alarm in the Alarm list. It activates the output **AL COMMON MPR2 (PAGE 363)** as well as the standard alarm outputs (**HORN (PAGE 368)** and **ALARM (PAGE 365)**).

Remote alarm messaging

If the communication plug-in module is connected to the controller, the controller can send SMS messages (CM2-4G-GPS module) and emails (CM2-4G-GPS or CM3-Ethernet modules) at the moment when a new alarm appears in the **Alarm list (page 123)** or new event is written in the **History log (page 91)**. The message will contain a copy of the **Alarm list (page 123)** or reasons from the **History log (page 91)**. To enable this function first to check the controller internet connection (**Subgroup: TCP/IP Settings (page 290)** for CM3-Ethernet or **Subgroup: TCP/IP Settings (page 274)**/**Subgroup: Cellular Interface (page 270)** for CM2-4G-GPS). Then adjust setpoints **Event Message (page 306)**, **Wrn Message (page 306)**, **BOS Message (page 304)** to ON. Also enter a valid GSM phone number or email address to the setpoints **Telephone Number 1 (page 286)**, **Telephone Number 2 (page 286)**, **Telephone Number 3 (page 287)**, **Telephone Number 4 (page 287)**, **Email Address 1 (page 302)**, **Email Address 2 (page 303)**, **Email Address 3 (page 303)**, and **Email Address 4 (page 304)**.

Alarm list

Alarm list is a container of active and inactive alarms. It will appear automatically on the controller display, if a new alarm occurs, or can be displayed manually from the display menu.

Active alarms are shown as inverted, not yet confirmed alarms are marked with asterisk before them.

Alarm list contains two types of alarms:

> Controller built-in alarms
> User configured alarms

Controller built-in alarms

An alarm message in the Alarm list begins with a prefix, which represents the alarm type (e.g. Wrn, BOS, MPR1, MPR2). Then the alarm name follows. In some cases the prefix can be omitted.

User configured alarms

An alarm message in the Alarm list begins with a prefix, which represents the alarm type (e.g. Wrn, BOS, MPR1, MPR2). Alarm type is selected by user during the configuration of binary or analog user protection. Then the alarm name follows, which can be adjusted by user during the configuration.

5.4.15 Source Failure detection

Source 1 Failure detection

The automatic start can be enabled or disabled by binary input **S1 FAIL BLOCK (PAGE 354)** or by switching the controller mode to MAN or OFF mode.

The Source 1 is considered as faulty when one or more of the following conditions are valid:

> The Source 1 voltage is out of the limits given by the setpoints **Source 1 Undervoltage (page 192)** and **Source 1 Overvoltage (page 190)** for a time period longer than **Source 1 Overvoltage Delay (page 190)**.

> The Source 1 voltage balance is out of the limit given by the setpoint **Source 1 Voltage Unbalance (page 194)** for a time period longer than **Source 1 Voltage Unbalance Delay (page 194)**.

> The Source 1 frequency is out of the limits given by the setpoints **Source 1 Underfrequency (page 196)** and **Source 1 Overfrequency (page 194)** for a time period longer than **Source 1 < > Frequency Delay (page 198)**.

> Inactive unconfirmed alarm **Wrn S1CB Fail (page 408)** / **Wrn S1CB Fail To Open (page 408)** / **Wrn S1CB Fail To Close (page 408)** present in the alarmlist

> Phase rotation is incorrect (**ALI Source 1 Ph Rotation Opposite (page 413)**).

> Any Source 1 user protection of level 2 is occurred (**see Mains-Gen, Mains-Mains Source 1 protections on page 113**).

> LBI **SOURCE 1 READY TO LOAD (PAGE 355)** is not active - if configured

Source 2 Failure detection

The Source 2 is considered as faulty when one or more of the following conditions are valid:

> The Source 2 voltage is out of the limits given by the setpoints **Source 2 Undervoltage (page 208)** and **Source 2 Overvoltage (page 205)** for a time period longer than **Source 2 < > Voltage Delay (page 211)**.

> The Source 2 voltage balance is out of the limit given by the setpoint **Source 2 Voltage Unbalance (page 212)** for a time period longer than **Source 2 Voltage Unbalance Delay (page 212)**.

> The Source 2 frequency is out of the limits given by the setpoints **Source 2 Underfrequency (page 215)** and **Source 2 Overfrequency (page 213)** for a time period longer than **Source 2 <> Frequency Delay (page 218)**.

> Inactive unconfirmed alarm **Wrn S2CB Fail (page 408)** / **Wrn S2CB Fail To Close (page 409)** / **Wrn S2CB Fail To Open (page 409)** present in the alarmlist

> Phase rotation is incorrect (**ALI Source 2 Ph Rotation Opposite (page 413)**).

> Any Source 2 user protection of level 2 is occurred (**see Mains-Gen Source 2 level 2 protections on page 114**).

> LBI **SOURCE 2 READY TO LOAD (PAGE 356)** is not active - if configured

5.4.16 Test of the Gen-set

For test of the Gen-set in Mains-Gen application it is possible to configure LBIs TRANSFER TO S2 (PAGE 358) and REMOTE START/STOP (PAGE 353).

> Activation of the LBI REMOTE START/STOP (PAGE 353) in AUTO mode causes the Gen-set to start and run as long as the LBI is active.

> Activation of the LBI TRANSFER TO S2 (PAGE 358) in AUTO mode causes to start the Gen-set and transfers the load from Source 1 to the Gen-set.

> The test of the Gen-set running can be also scheduled via the scheduler option REMOTE START/STOP (PAGE 353) (fore more information **see Exercise timers on page 83**).

5.4.17 User Buttons

The User button is a binary signal. Its value can be set by its setpoint or by remote connection (WebSupervisor or by third party device such as Modbus).

States of user buttons signals are visible in the Values group User Buttons. There are 16 user buttons available.

Each setpoint has these options

Option	Description
COMMAND	The LBO User Button X is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button X is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button X is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

Commands

Commands can be sent from third party device via Modbus or remote connection (WebSupervisor). Following types are available:

Command	Description
ON/OFF	When a command ON is received, User Button is activated. Subsequent commands ON when User Button is active have no effect. If a command OFF is received, User Button is deactivated. Subsequent commands OFF when User Button is inactive have no effect.
TOGGLE	When a command TOGGLE is received, User Button is activated. Next command TOGGLE when User Button is active deactivates User Button and so on.
PULSE	When a command PULSE is received, User Button is activated for the set duration. Pulse length is 200 ms (user can use this pulse in PLC to prolong it using e.g. block Delay) Consequent commands PULSE sent during duration of the pulse prolong the duration accordingly.

Command	Description
	When the setting of pulse duration is changed while the pulse is active, the current pulse will have the original duration and the new setting is applied for the next pulse. If the User Button is active (as a result of COMMAND ON or COMMAND TOGGLE) and COMMAND PULSE comes, User Button remains active for the duration of the pulse and then it deactivates. While a pulse is active (duration of the pulse) and COMMAND ON, COMMAND OFF or COMMAND TOGGLE comes, the pulse is canceled. Next state depends on the canceling command

Note:

> *COMMAND ON – User Button remains active until COMMAND OFF or COMMAND TOGGLE comes*

> *COMMAND OFF or COMMAND TOGGLE – User Button deactivates until COMMAND ON, COMMAND TOGGLE or COMMAND PULSE come*

User button MODBUS commands

	User Button 1	User Button 2	User Button 3	User Button 4	User Button 5	User Button 6	User Button 7	User Button 8
PULSE	00 0A 00 00 00 47	00 14 00 00 00 47	00 1E 00 00 00 47	00 28 00 00 00 47	00 32 00 00 00 47	00 3C 00 00 00 47	00 46 00 00 00 47	00 50 00 00 00 47
TOGGLE	00 0B 00 00 00 47	00 15 00 00 00 47	00 1F 00 00 00 47	00 29 00 00 00 47	00 33 00 00 00 47	00 3D 00 00 00 47	00 47 00 00 00 47	00 51 00 00 00 47
ON	00 0C 00 00 00 47	00 16 00 00 00 47	00 20 00 00 00 47	00 2A 00 00 00 47	00 34 00 00 00 47	00 3E 00 00 00 47	00 48 00 00 00 47	00 52 00 00 00 47
OFF	00 0D 00 00 00 47	00 17 00 00 00 47	00 21 00 00 00 47	00 2B 00 00 00 47	00 35 00 00 00 47	00 3F 00 00 00 47	00 49 00 00 00 47	00 53 00 00 00 47
	User Button 9	User Button 10	User Button 11	User Button 12	User Button 13	User Button 14	User Button 15	User Button 16
PULSE	00 5A 00 00 00 48	00 64 00 00 00 48	00 6E 00 00 00 48	00 78 00 00 00 48	00 82 00 00 00 48	00 8C 00 00 00 48	00 96 00 00 00 48	00 A0 00 00 00 48
TOGGLE	00 5B 00 00 00 48	00 65 00 00 00 48	00 6F 00 00 00 48	00 79 00 00 00 48	00 83 00 00 00 48	00 8D 00 00 00 48	00 97 00 00 00 48	00 A1 00 00 00 48
ON	00 5C 00 00 00 48	00 66 00 00 00 48	00 70 00 00 00 48	00 7A 00 00 00 48	00 84 00 00 00 48	00 8E 00 00 00 48	00 98 00 00 00 48	00 A2 00 00 00 48
OFF	00 5D 00 00 00 48	00 67 00 00 00 48	00 71 00 00 00 48	00 7B 00 00 00 48	00 85 00 00 00 48	00 8F 00 00 00 48	00 99 00 00 00 48	00 A3 00 00 00 48

Note: Table provides data which has to be written into MODBUS registers 4207-4209 (count 3) using function 16 for specific user button and command type.

MODBUS Register: 44208(4207), Function 16, Count 3

5.4.18 User setpoints

Controller allows user to create their own setpoints, as well as edit and delete created setpoints. The number of setpoints created by the user is limited to 64. All setpoints created by user are located in **Group: User Setpoints**. The Comm. object number (**CO**) can be found via InteliConfig (Tools tab → Generate Cfg image (COM)). User setpoints can be used to manage User protections and PLC.

Configuration						Modules	Controller I/O	Sensors	Setpoints	User Setpoints	Protections	LBI/LAI	PLC Editor	Others	
Name	Dimension	Resolution	Low Limit	High Limit	Default Value	Group		Subgroup		Origin					
Oil Pressure Delay	s	0,1	0	3600	0	User Setpoints		User Setpoints		UserGenerated					
Oil Pressure Wrn	Bar	0,1	0	10	0	User Setpoints		User Setpoints		UserGenerated					
Oil Pressure Sd	Bar	0,1	0	10	0	User Setpoints		User Setpoints		UserGenerated					
Coolant Temp Delay	s	0,1	0	3600	0	User Setpoints		User Setpoints		UserGenerated					
Coolant Temp Wrn	°C	1	-16	120	0	User Setpoints		User Setpoints		UserGenerated					
Coolant Temp BOC	°C	1	-16	120	0	User Setpoints		User Setpoints		UserGenerated					
Coolant Temp Low Delay	s	0,1	0	3600	0	User Setpoints		User Setpoints		UserGenerated					
Coolant Temp Low Wrn	°C	1	-16	120	0	User Setpoints		User Setpoints		UserGenerated					
Fuel Level Delay	s	0,1	0	3600	0	User Setpoints		User Setpoints		UserGenerated					
Fuel Level Wrn	%	1	0	100	0	User Setpoints		User Setpoints		UserGenerated					
Fuel Level BOC	%	1	0	100	0	User Setpoints		User Setpoints		UserGenerated					

Operations

① + − ✎

Save as... Controller restart is necessary for configuration change to take effect.   Consistency check   ✔ OK and Restart   ✖ Cancel

①	**Add** User setpoint	+
	Delete selected User setpoint	✕
	Edit selected User setpoint	✎

Image 12.38 Setting parameters of a user setpoint

Contents of the user setpoint

Name	Max. 32 characters *Note: Does not consider duplicities (It is possible to have setpoints with the same name, but it is not recommended.)*
Dimension	Can be chosen from a list or User can create their own with a limit of 32 characters.
Resolution	Max. 4 decimal place
Low Limit	Range of the data type INT32 (restricted by resolution). Value is set as a constant (can not be set as setpoint). Max. value cannot exceed High Limit.
High Limit	Range of the data type INT32 (restricted by resolution). Value is set as a constant (can not be set as setpoint). Min. value cannot be lower than Low Limit.
Default value	Must be in range between Low and High Limit (restricted by resolution).
Group	Group in which setpoint will be shown. Position of a setpoint in a list.
Subgroup	Subgroup in which setpoint will be shown.

5.4.19 Voltage phase sequence detection

The controller detects phase sequence voltage terminals. This protection is important after controller installation to avoid wrong voltage phase connection. When the phases are connected in different order the following alarms are detected:

> **ALI Source 2 Ph Rotation Opposite (page 413)**

> **ALI Source 1 Ph Rotation Opposite (page 413)**

🔺 **back to Functions**

5.5 User management and data access control

> Accessing, monitoring or controlling the device via any communication interface requires a user to be logged-in.

> When a task (read data, write data , control) is to be performed the access level of the user who is currently logged-in must be higher or equal to the access level required for the particular task.

> User must have their user account defined by the administrator of the controller before the user can log-in into the controller and perform monitoring, control or configuration tasks.

*Note: For trusted interfaces there is an "implicit user"(**see Implicit account on page 129**) automatically logged in always while no other explicit user is logged in.*

5.5.1 Types of interfaces

The controller communication interfaces are split into two categories according to what kind of environment the interface is exposed to.

> **Trusted**

>> Trusted interfaces are operated locally inside a closed environment/ infrastructure where additional measures against misuse or attack take place (e.g. physical access limitation). Due to the nature of this interface less strict cybersecurity rules may be applied.

>> Trusted interfaces provide **Implicit account (page 129)** function which allows the performance of certain operations without requiring an explicit user to log in.

>> Trusted interfaces are USB, RS232, RS485.

> **Untrusted**

>> General-purpose interfaces, which may be exposed to public networks, such as the Internet, are untrusted. The communication is running through networks which are not under control of the entity who operates the controller. Thus, strict cybersecurity rules must apply for this type of interface.

>> Untrusted interface are Ethernet and cellular module.

5.5.2 User accounts

User account must be created in the controller by an administrator before the particular user can login to the controller.

Note: User accounts must be created for each controller separately and manually. It is not possible to transfer the accounts from one controller to another.

User account must have the following properties

Username	Consists of 6-15 alphanumeric characters, must contain at least 1 letter. This is the main identifier of the particular user account.
Password	Consists of 6-15 alphanumeric characters, must contain at least 1 letter and 1 digit. This is the password that is used together with user name to authenticate (log-in).
User identifier (UID)	Optional 4-digit identification string which can be used for simplified login at trusted interfaces (e.g. from InteliVision display when connected via Ethernet.
PIN	4-digit "password" to be used together with UID.
Access level	Determines **Access to controller data (page 133)**

Implicit account

At trusted interfaces there is an *implicit user* automatically logged-in at any time if no other explicit user is logged-in at the respective interface. This allows terminal devices (e.g. internal display) to show controller values even without the need for a specific person to be logged-in.

> The implicit account is fixedly defined in the firmware.

> The implicit account has fixed access level 0, unless production mode is activated (**see Production mode on page 130**).

> Implicit user is logged in any time no other user is logged in at the respective interface.

User login

To login to the controller the **username and password must be provided into the login form** of the application (**InteliConfig (page 11)** and **WebSupervisor (page 11)**).

Alternatively, at **trusted interfaces**, it is possible to **login using UID and PIN** instead of username and password. This method of login is designed to simplify the login procedure at devices without alphanumeric keyboard (e.g. InteliVision).

*Note: The controller is featured with a protection against brute force attack to user account credentials. For details **see Account break protection on page 133***.

Changing password and PIN

The password and/or PIN for currently logged user can be changed. The user must be logged with username and password even if PIN has to be changed.

Production mode

Production mode is used to simplify working with the controller while manufacturing, putting into operation or service works.

In production mode the **Implicit account (page 129)** has access level adjusted to **administrator level**. Thus, in production mode at trusted interfaces (like USB) the operator is allowed to perform any operation which normally requires administrator to log in without the need of logging in.

> IMPORTANT: Production mode is intended only for the manufacturing and/or service purposes while the controller is in the respective facility and must be turned off before the controller is put into regular operation.

There is active alarm **WRN Production Mode (page 406)** in the alarm list any time production mode is active. To turn off the Production mode go to User management and uncheck the checkbox Production mode or go to Production Mode display screen and select disable.

Factory default accounts

Each controller comes from the production with one factory default administrator account having following credentials:

Username: "administrator"

Password: <serial number of the controller>

> **Example:** 12345678

UID: 0001

PIN: 0000

When the controller is being configured for operation the desired user accounts including the administrator account should be created and then the factory default account can be deleted.

> IMPORTANT: Adjust the backup e-mail address before you delete the default administrator account. This address is used as second authentication factor in password reset request and the password reset action code will be sent to this and only this e-mail address.

Note: There must always remain at least one administrator account in the system. The controller will not allow deleting last administrator account.

Wrn Default Password appears in Alarm list when the default administrator password is set and communication module is plugged in the controller. The purpose of alarm is to inform that the controller might be or is connected to an untrusted interface and cybersecurity rules are not fulfilled because there is default administrator password.

Reset accounts to factory default

If credentials (username and/or password) for administrator account are lost, it is possible to reset all user accounts to the factory default state. For more information **see Resetting the administrator password on page 134**.

After reset procedure user accounts are in factory default state.

Wrn Default Password appears in Alarm list when the default administrator password is set and communication module is plugged in the controller. The purpose of the alarm is to inform that the controller might be or is connected to an untrusted interface and cybersecurity rules are not fulfilled because there is default administrator password.

5.5.3 Managing accounts

User accounts can be managed from InteliConfig while an online connection to the controller is established. A user with administrator level must be logged with username/password and is prompted to re-enter accounts password before the user management dialog is opened.

> **IMPORTANT: The total available number of accounts in the controller is 5.**
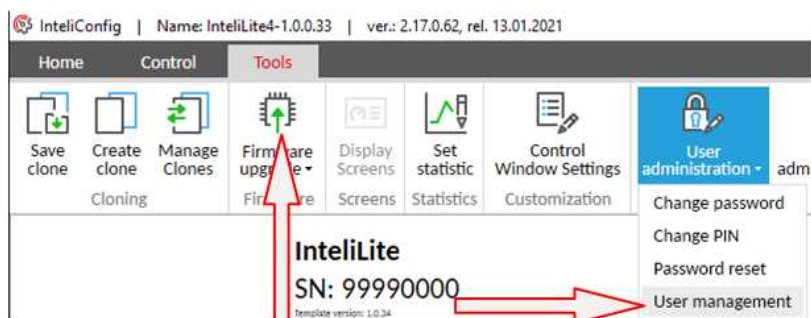
Adding an account

Click on the "**+**" button in the lower left corner of the user management window, then provide the account properties as described in **User accounts (page 129)**.

Note: Rules for the User accounts (page 129) credentials apply and some items are optional
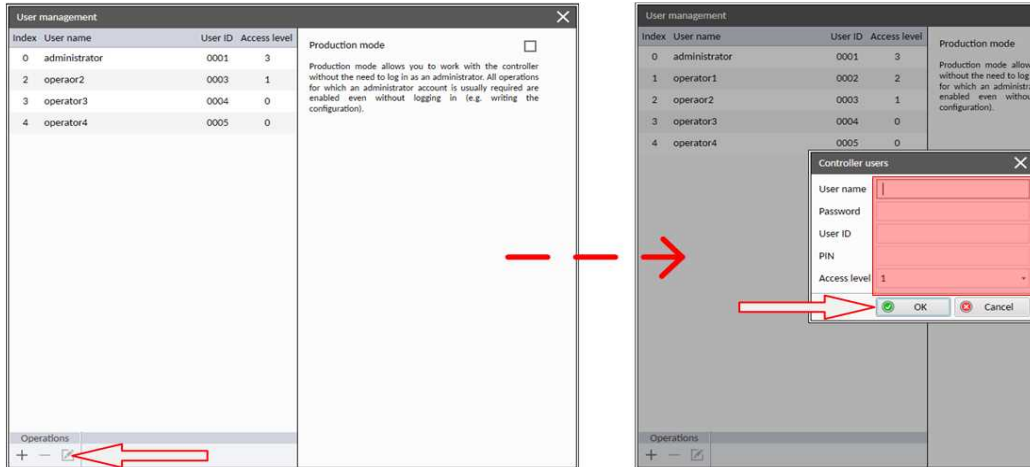
Deleting an account

Select the account that has to be deleted and click on the "**-**" button in the lower left part of the user management window.

Note: You can not delete your own administrator account unless there is another administrator account present in the controller.

Deleting account properties

Select the account that needs to be deleted and click on the "**-**" button in the lower left part of the user management window. Then modify the desired property or properties. You can modify one or more properties at once.
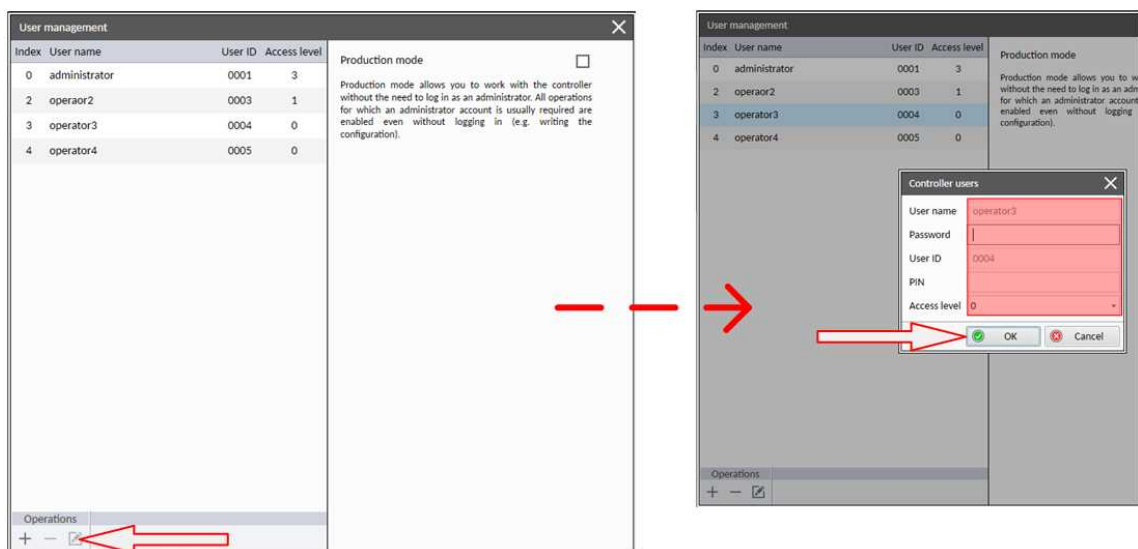
Note: It is not possible to change user name or UID. Instead of this create a new account with the required changes and delete the original one.

5.5.4 Account break protection

The controller protectis the user accounts against a brute-force attack, i.e against breaking into the controller by fast repeating attempts to login with credentials generated from the range of all possible combinations.

If the account break protection detects a possible attack and blocks an account or interface the alarm **WRN Brute Force Protection Active (page 406)** is activated. The alarm can be used to send an active message (e.g. e-mail) to inform about that situation The exact behavior of the controller depends on the situation.

Password protection

1. If a user performs five consecutive attempts to login using username/password, providing correct username but incorrect password, the respective user account is blocked for a time period of 1 minute. The attempts count regardless of the interface from which it is performed.

2. During the blocking period it is not possible to login with the respective account (username) from any interface even if the correct password is provided.

3. After the blocking period elapses, another attempt to login with the respective account (username) is possible. If this attempt fails again the account is blocked again, now for period of 2 minutes.

4. The points repeats 1-3 times further, the duration of the blocking period is multiplied by 2 in each consequential cycle. However, the maximal blocking time is 20 minutes, the blocking time is never higher.

PIN protection

If a user performs **ten consecutive attempts** to login using UID/PIN, providing **correct UID** but **incorrect PIN**, the user account is permanently blocked for login using this UID/PIN. The user must login with username/password and change the PIN to unblock this login method again.

Interface protection

If anyone performs **twenty consecutive attempts** to login via one particular interface and does not provide either a valid username nor a valid uid the respective interface is blocked for 2 minutes.

During this period it is not possible to use that interface for any login. The blocking period is not progressive in this case.

5.5.5 Access to controller data

Every request for reading data from the controller or writing data into it requires a user to be logged. **This user must have an access level higher or equal to the access level defined for the particular object and operation.**

There are 4 access levels available (level 0 to level 3). **Level 3 is administrator level** and users who have this level have full control over the controller.

Reading data

The access level required for reading data from controller is fixedly adjusted to 0. That means **reading of data** (except some system objects) **is available for any user**.

Writing data

The access level required to **write** (modify) **application setpoints or invoke application commands is configurable** via InteliConfig.

Special situations

There are several operations that require administrator level:

> Programming firmware
> Programming configuration
> Managing user accounts

5.5.6 Cybernetic security

The cybernetic security is formed by:

> Protection against a brute-force attack to the password
> Secure method to reset the password
> A new technology of encryption of the remote communication
> Web interface can be disabled

Note: Cybernetic security was designed according to ISA 62443, level 2.

Protection against the brute force attack

Protection against a brute force attack will take place when an invalid password is entered repeatedly.

> If the invalid password is entered 5 times, the controller gets blocked from entering the password for a predetermined amount of time.
> Each further entering of the invalid password cause the consequent blocking time is to be increased.
> If the invalid password is entered repeatedly the controller gets blocked for entering the password permanently and the password must be reset to a default value as described below.

Note: Blocking of the controller for entering the password has no influence on controller / Source 2 operation

Note: Permanent blocking cannot occur accidentally, just by user mistake. It can be practically triggered only by a focused activity.

Resetting the administrator password

If **the administrator password is lost or controller is permanently locked** due to brute-force attack protection, proceed according to a procedure described below:

> **IMPORTANT: There is a backup e-mail address defined in the controller to which and only which ComAp will send the "password reset action code". Please be sure, that you have adjusted this e-mail address correctly. Use InteliConfig to adjust the backup e-mail address**

Reset password procedure

1. Connect InteliConfig.
2. Get the password reset request code and send it via e-mail to support@comap-control.com
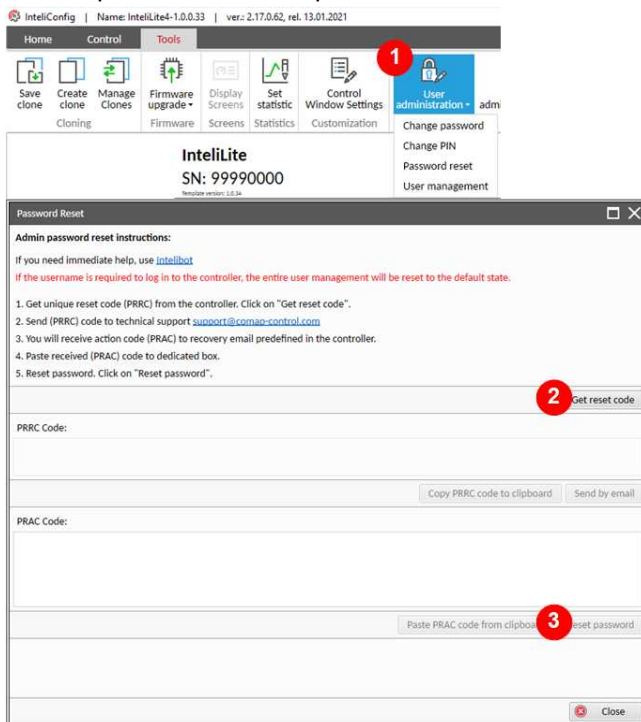
3. Once you receive the reply from ComAp, copy the code from the e-mail (all characters inside the box as indicated below)

Dear customer,

ComAp has received your request for resetting the password in the controller **N/A**, serial number **99990000**. Please perform following steps to finish the action.

1) Connect your PC application to the controller
2) Copy the action code stated below to the clipboard
3) Paste the clipboard content into the appropriate field in the PC application and press the "Reset" button. Password will be reset to the default value.
4) Adjust and remember new password

Code:

```
AHIU/LNxy6sHWxdq/ofpxDCdQCMkgSdHcFp2mny8B9MoK4bV48VepeasJZSJoZf90rwA
Kmi4V4QYcDOvJunVwm64U94q5ddq2EaJi8zsoPDjBFBqiK0LViw+7m0a81n3QWkAIw9Q
hdxalOkWOll7Hz/+Ljd+mV717QT95ITCKocL98soEwQzvzWjkCjJYSboHJO6cbCd05WE
2faWVh9Ab7rWMcaTW3fkvqL/VTkUn8FiDh6BlX5AC0cZiFFFMLOJuaMewdjVwew/7bHJ
NtLy+tmcc8s2OkuNjZZ+XLe/SQ64CHQK2LYwSVHAwWVrlm/9GVtPGGemqjhzXpaEKCzc
XZQ=
```

4. Paste the code into the password reset window
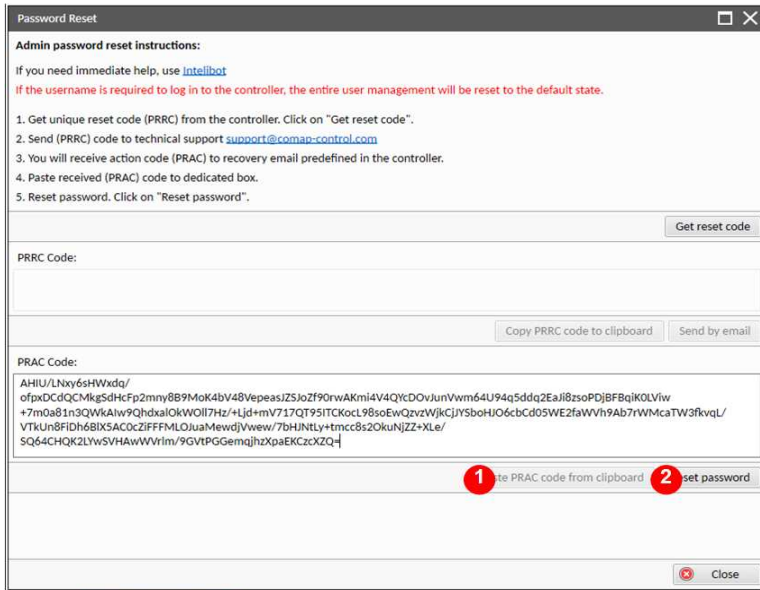
Encryption of the communication

New technology "CCS v.1" is used for an authentication and an encryption of the ComAp protocol via Internet/ethernet/AirGate. This technology is based on strong and proven cryptographic algorithms and has successfully passed penetration tests and cybersecurity audit.

🔺 **back to Controller setup**

6 Communication

⬢ **back to Table of contents**

6.1 PC

6.1.1 Direct communication

A RS232, USB, RS485 or ethernet interface can be used for direct cable connection to a PC.

Connection via RS232

A plug-in communication module CM-RS232-485 is necessary for communication via RS232 connection.

The module is plugged into the slot located on the rear side of the controller. To find more information about installation of the modules **see Plug-in module installation on page 42**.

RS232 interface uses **COM1 Mode (page 266)** port of the controller. Use a cross-wired serial communication cable with DB9 female connectors and signals Rx, Tx, GND.

Note: Also USB-RS232 convertor can be used.
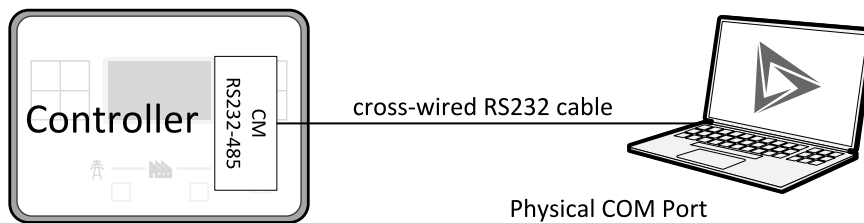
Image 13.1 Cross-wired RS232 cable is used
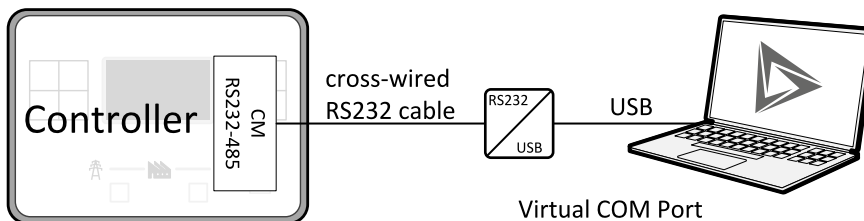
Image 13.2 Cross-wired RS232 cable and USB is used

Connection via RS485

Plug-in module CM-RS232-485 or on board RS485 connector can be used for communication via RS485 connection.

A plug-in communication module CM-RS232-485 is necessary for communication via RS485 connection.

The module is plugged into the slot located on the rear side of the controller. To find more information about installation of the modules **see Plug-in module installation on page 42**.

RS485 interface uses **COM2 Mode (page 268)** port of the controller.
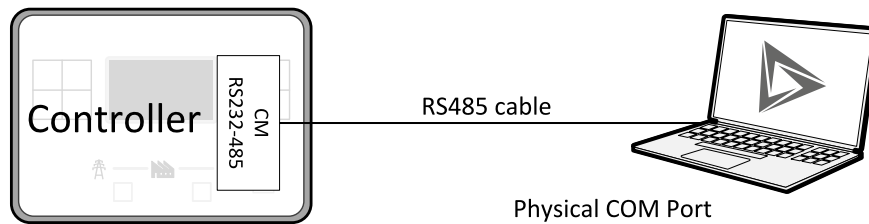
Image 13.3 Plug-in module CM RS232-485 is used

Connection via Ethernet

A plug-in communication module CM3-Ethernet is necessary for Ethernet connection.

The module is plugged into the slot located on the rear side of the controller. To find more information about installation of the modules **see Plug-in module installation on page 42**.

This connection type is used for communication with the controller from InteliConfig or any other PC tool. This connection can be used regardless of whenever the AirGate is switched on or off. Only three remote clients can be connected at the same time (via AirGate only two remote clients at the same time). Eight remote clients can be connected at the same time (six direct IP clients and two AirGate clients).

To connect your PC tool to the controller use the INTERNET connection type and just put the CM3-Ethernet IP address into the Source 2 address box in the PC tool.
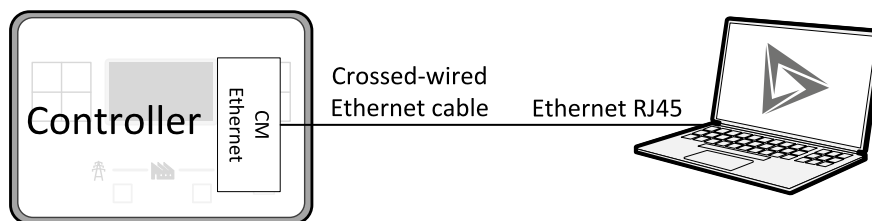
Image 13.4 Ethernet cable is used

Connection via USB

USB interface uses HID profile.
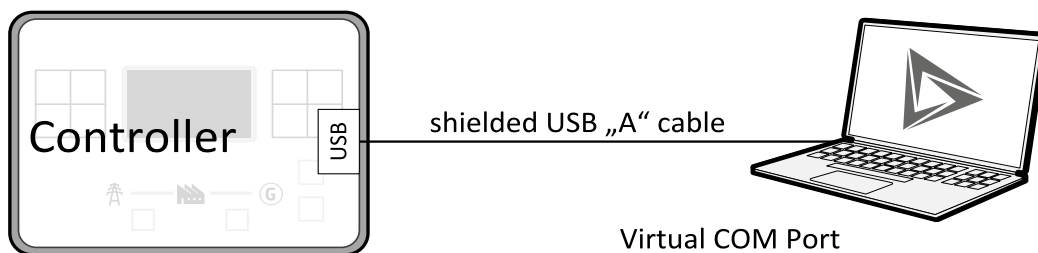
Image 13.5 Shielded USB type A cable is used

6.1.2 Remote communication

Ethernet LAN connection

Direct IP LAN connection is intended to be used if the CM3-Ethernet module is reachable from the client computer by specifying the IP address at which the module can be contacted.

> If direct IP connection is to be used within a local network the CM3-Ethernet must have static IP address in the respective local network.

Note: If you have troubles with setting up static and public IP address for direct connection from Internet try using AirGate connection instead.

192.168.1.10
Dynamic or fixed IP

192.168.1.254
Fixed IP

Controller

LAN
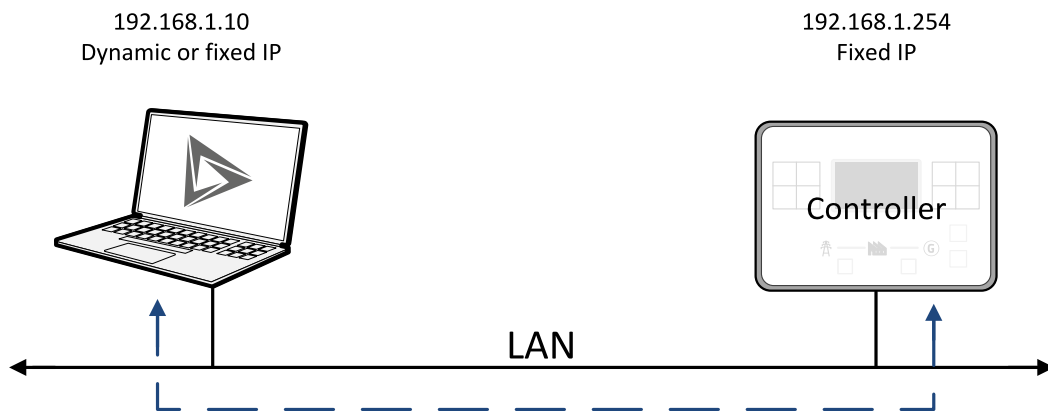
Image 13.6 Ethernet LAN connection

Setting-up static IP address

There are two basic ways to get the static IP address.

First way is to switch the CM3-Ethernet to manual IP address mode. Adjust the setpoint **IP Address Mode (page 290)** to FIXED. In that case all setpoints of IP settings (**IP Address (page 291)**, **Subnet Mask (page 291)**, **Gateway IP (page 292)**, **DNS IP Address 1 (page 293)**) must be adjusted manually. If this method is used several basic rules should be kept avoiding conflicts with the remaining network infrastructure:

> The static IP used in the controller must be selected in accordance with the local network in which CM-Ethernet is connected.

> The static IP used in the controller must be excluded from the pool of addresses which is assigned by DHCP server, which is in charge of the respective local network.

> The local infrastructure must generally allow using devices with manually assigned IP addresses.

> There must not be any other device using the same static IP address. This can be tested from a computer connected to the same network using "ping <required_ip_address>" command issued from the command line. The IP address is not occupied if there is not any response to the ping command.

Note: The list above contains only basic rules. Other specific restrictions/rules may take place depending on the local network security policy, technology used, topology etc.

The second way to get the static IP address is to switch the CM3-Ethernet to automatic IP address mode. Adjust the setpoint **IP Address Mode (page 290)** to AUTOMATIC. In that case all IP settings are assigned by DHCP server. Then configure the DHCP server to assign always the same IP address (i.e. static IP address) to the particular CM3-Ethernet according to its MAC address.

Internet connection

Public static IP

If public static IP connection is to be used from the Internet, the IP address, which is entered into the client computer, must be static and public in scope of the Internet.

> If CM3-Ethernet is connected to the Internet via a local Ethernet network then in the most cases port forwarding must be created from the public IP address of the network gateway to the local IP address of CM3-Ethernet at the port specified for ComAp protocol. Different port numbers can be used to create multiple port forwarding rules in the same local network.

192.168.1.10:23
Dynamic or fixed IP

Internet

192.168.1.254:23
Fixed and public IP

Controller

LAN
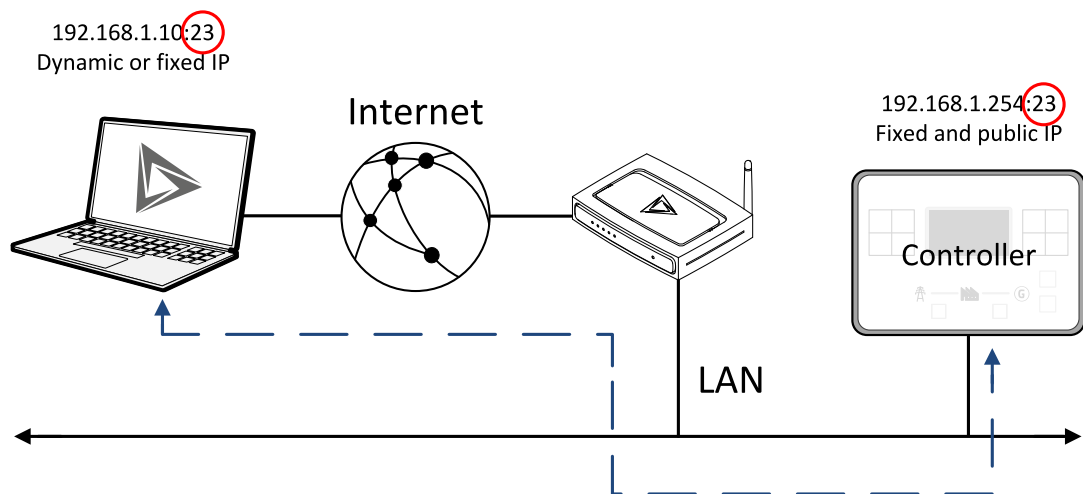
AirGate

This connection type is intended for remote connection from InteliConfig, or any other ComAp PC tool over the Internet in situations, where obtaining fixed public IP address is not possible. Only two remote clients can be connected at the same time.

This connection type is active if AirGate connection is enabled. Setpoint **AirGate Address (page 295)** must contain AirGate server address. It can be entered in text form as well as numeric form. There is a public AirGate server available at the address "global.airgate.link".

Once the controller is connected to the Internet and the AirGate server address is properly adjusted then the controller registers automatically to the server and an identification string AirGate ID is given to a controller, which is visible at the controller screen.

In order to connect to InteliConfig following information have to be filled out:

> AirGate ID
> AirGate server
> Controller address
> User name and Password
> AirGate Key

> IMPORTANT: AirGate Key has to be configured. User with administrator rights has a possibility to set up or change AirGate Key via InteliConfig using Tools -> Access Administration -> Change AirGate Key.

SMS

Event SMS

The InteliATS2 70 controller equipped with the CM2-4G-GPS communication module is able to send Event SMS according to the setting of setpoint:

> **Event Message (page 306)**

*Note: First, the setpoint **Telephone Number 1 (page 286)** must be adjusted to enable this function.*

The following events can be received by mobile phone:

- Engine Start/Stop
    - » Manual Start/Stop
    - » Remote Start/Stop
    - » AMF Start/Stop
    - » Transfer to S2 Start/Stop
- Source 1 Fail
- Source 1 Returned
- Load on Source 1
- Load on Source 2

Message structure:

- Controller Name (hh:mm:ss dd.mm.yyyy)
- hh:mm:ss Source 1 Fail
- hh:mm:ss AMF Start
- hh:mm:ss Load on Source 2
- hh:mm:ss Source 1 Returned
- hh:mm:ss Load on Source 1
- hh:mm:ss AMF Stop

Alarm SMS

The InteliATS2 70 controller equipped with the CM2-4G-GPS communication module is able to send Alarm SMS according to the setting of setpoints:

- **Wrn Message (page 306)**
- **BOS Message (page 304)**

Note: First, the setpoint Telephone Number 1 (page 286) must be adjusted to enable this function.

Message structure:

- Controller Name
- AL=(Alarm 1, Alarm 2, Alarm x)

Note: An asterisk means that alarm is unconfirmed and an exclamation mark means that alarm is active.

Emails

Event Email

The InteliATS2 70 controller equipped with the CM3-Ethernet communication module is able to send an Event Email according to the setting of setpoint:

- **Event Message (page 306)**

Note: Setpoints Email Address 1 (page 302) and SMTP Sender Address (page 300) or SMTP Server Address (page 300) must be adjusted to enable this function.

Note: Time Mode (page 244) and Time Zone (page 308) must be adjusted for correct time in emails.

Message structure:

Controller

Name: XXX

Serial number: XXX

SW branch: XXX

SW version: XXX

Application: XXX

Appl. version: XXX

Date: dd/mm/yyyy

Time: hh:mm:ss

Alarm list

Alarm 1

Alarm 2

Alarm 3

Events

----

hh:mm:ss Event 1

hh:mm:ss Event 2

hh:mm:ss Event 3

Alarm Email

The InteliATS2 70 controller equipped with the CM3-Ethernet communication module is able to send Alarm Emails according to the setting of setpoints:

> **Wrn Message (page 306)**

> **BOS Message (page 304)**

*Note: Setpoints **Email Address 1 (page 302)** and **SMTP Sender Address (page 300)** or **SMTP Server Address (page 300)** must be adjusted to enable this function.*

*Note: **Time Mode (page 244)** and **Time Zone (page 308)** must be adjusted for correct time in emails.*

Message structure:

Controller

Name: XXX

Serial number: XXX

SW branch: XXX

SW version: XXX

Application: XXX

Appl. version: XXX

Date: dd/mm/yyyy

Time: hh:mm:ss

Alarm list

Alarm 1

Alarm 2

Alarm 3

History events

----

0 dd/mm/yyyy hh:mm:ss.0 Event 1

-1 dd/mm/yyyy hh:mm:ss.0 Event 2

-2 dd/mm/yyyy hh:mm:ss.0 Event 3

Note: An asterisk means that alarm is unconfirmed and an exclamation mark means that alarm is active.

6.2 Connection to 3rd party systems

🔺 **back to Communication**

6.2.1 SNMP

SNMP is an UDP-based client-server protocol used for providing data and events into a supervisory system (building management system). The controller plays the role of a "SNMP Agent" while the supervisory system plays the role of a "SNMP Manager".

> CM3-Ethernet module is required for SNMP function

> Supported versions – SNMP v1 and SNMP v2

The SNMP Agent function is to be enabled by the setpoint **SNMP Agent (page 298)** in the CM-Ethernet setpoint group. The setpoints **SNMP RD Community String (page 299)** and **SNMP WR Community String (page 299)** in the same group can be used to customize the "community strings" for the read and write operations which function like "passwords". All requests sent from the SNMP Manager must contain a

community string which matches with the community string adjusted in the controller otherwise the controller will refuse the operation.

MIB table

The "MIB table" (Management Information Base) is a table which gives to the Manager a description of all objects provided by the Agent.

> The MIB table is specific for each controller type and configuration

> The MIB table is to be exported from the controller configuration using InteliConfig

> Controllers with identical firmware and configuration also share identical MIB table, however if the configuration and/or firmware is not identical the MIB table is different and must be exported separately for each controller.

The root OID of the InteliATS2 70 controller is 1.3.6.1.4.1.28634.35. Under this node can be found following sub-nodes :

> Notifications group (SMI v2 only) contains definitions of all notification-type objects that the Agent may send to the Manager.

> GroupRdFix contains read-only objects that exist in all controllers regardless of the firmware version/type and configuration.

> GroupRdCfg contains read-only objects that depend on the firmware version/type and configuration.

> GroupWrFix contains read-write objects that exist in all controllers regardless of the firmware version/type and configuration.

> GroupWrCfg contains read-write objects that depend on the firmware version/type and configuration.

> GroupW contains write-only objects.

> NotificationData group contains objects that are accessible only as bindings of the notification messages.

SMI version

In InteliConfig the MIB table may be exported in two different formats – SMI v1 and SMI v2. The format which shall be used for export depends on the SNMP Manager and the SMI version that it supports.

Typically, SMI v1 is used for SNMP v1 and vice versa, but it is not a rule. SMI v2 may also be used for SNMP v1.

SNMP notifications

Except for the request-response communication model, in which the communication is controlled by the Manager, there are also messages that the Agent sends without any requests. These messages are called "Notifications" and inform the Manager about significant events which occurred in the Agent.

The controller can send notifications to two different SNMP Managers (two different IP addresses). The addresses are to be adjusted in the CM-Ethernet setpoint group by the setpoints **SNMP Traps IP Address 1 (page 298)** and **SNMP Traps IP Address 2 (page 299)**. If the Manager address is not adjusted the particular notification channel is off. The controller will send the notifications in the format adjusted by the setpoint SNMP Trap Format.

> Each notification (kind of event) is identified by a unique identifier (Trap ID in SNMPv1 or Notification OID in SNMPv2). This unique identifier gives the specific meaning to the notification message, e.g. Protection 1st level – Fuel Level – alarm activated.

> All possible notifications and their identifiers are listed in the MIB table.

> The notification message also contains controller name, serial number and textual description of the event.

SMI version

In InteliConfig the MIB table may be exported in two different formats – SMI v1 and SMI v2. The format which shall be used for export depends on the SNMP Manager and the SMI version that it supports. Typically, SMI v1 is used for SNMP v1 and vice versa, but it is not a rule and SMI v2 may also be used for SNMP v1.

SNMP reserved objects

Name	OID	Access	Data type	Meaning
pfActionArgument	groupWrFix.24550	read,write	Gauge32	Writing: command argument Reading: command return value
pfActionCommand	groupW.24551	write	Integer32	Command code *)
pfPassword	groupW.24524	write	Integer32	Password

Note: *)
For list of commands, arguments and description of the procedure of invoking commands see the description of the Modbus protocol.

6.2.2 MODBUS-RTU, MODBUS/TCP

MODBUS protocol is used for integration of the controller into a building management system or for remote monitoring via 3rd party monitoring tools.

> MODBUS-RTU can be used on serial interfaces (via on board RS485 connector or via CM-RS232-485 communication module). The MODBUS-RTU server must be activated by switching the setpoint **COM1 Mode (page 266)** or **COM2 Mode (page 268)** into the Modbus position. The serial speed for MODBUS-RTU communication is adjusted by the setpoint **COM1 MODBUS Communication Speed (page 267)** or **COM2 MODBUS Communication Speed (page 269)**.

> MODBUS/TCP can be used on the Ethernet interface (CM3-Ethernet module is required). Up to 2 clients can be connected simultaneously. The MODBUS/TCP server must be activated by the setpoint **MODBUS Server (page 297)**.

MODBUS, MODBUS/TCP protocol can be used simultaneously with Web connection and direct Ethernet / AirGate connection.

> **IMPORTANT: Do not write setpoint repeatedly (e.g. power control form a PLC repeated writing of baseload setpoint via Modbus). The setpoints are stored in EEPROM memory. which can be overwritten up to 10^5 times without risk of damage or data loss, but may become damaged, when the allowed number of writing cycles is exceeded!**

Note: Modbus-RTU serial communication mode is 8-N-1 – startbit 1, 8 data bits, no parity and 1 stopbit.

Address space

The object address space is separated into several areas as described in the table below. The actual mapping of specific controller data objects to specific Modbus addresses, which depends on configuration,

can be exported into a text file from the appropriate controller archive using InteliConfig. There are several special registers with fixed meaning (reserved registers) which are listed in a separate table in this chapter.

MODBUS address	Meaning	Access	MODICON object type	MODBUS function
0000 .. 0999	Binary objects	Read only	Discrete Inputs	Read: 01, 02
1000 .. 2999	Values	Read only	Input Registers	Read: 03, 04
3000 .. 3999	Setpoints	Read/Write	Holding Registers	Read: 03, 04 Write: 06, 16
4200 .. 7167	Reserved registers	Read/Write, depends on each specific register	Input Registers Holding Registers	Read: 03, 04 Write: 06, 16

Mapping data types to registers

As there are multiple data types in the controller but only one data type in MODBUS (the register, which is 2 byte long), a mapping table is necessary to compose and decompose the MODBUS messages correctly.

Data type	Meaning	Number of registers	Data maping
Integer8	1-byte signed integer	1	MSB = sign extension LSB = value
Unsigned8	1-byte unsigned integer	1	MSB = 0 LSB = value
Integer16	2-byte signed integer	1	MSB = value, MSB LSB = value, LSB
Unsigned16	2-byte unsigned integer	1	MSB = value, MSB LSB = value, LSB
Integer32	4-byte signed integer	2	MSB1 = value, byte 3 (MSB) LSB1 = value, byte 2 MSB2 = value, byte 1 LSB2 = value, byte 0 (LSB)
Unsigned32	4-byte unsigned integer	2	MSB1 = value, byte 3 (MSB) LSB1 = value, byte 2 MSB2 = value, byte 1 LSB2 = value, byte 0 (LSB)
Binary8	8-bit binary value	1	MSB = 0 LSB = value, bits 0-7
Binary16	16-bit binary value	1	MSB = value, bits 8-15 LSB = value, bits 0-7
Binary32	32-bit binary value	2	MSB1 = value, bits 24-31

Data type	Meaning	Number of registers	Data maping
			LSB1 = value, bits 16-23
			MSB2 = value, bits 8-15
			LSB2 = value, bits 0-7
Char	1-byte ASCII character	1	MSB = 0 LSB = ASCII value of the character
StrList	Index into a list of strings	1	MSB = 0 LSB = index into the list
ShortStr	Zero-terminated string of max 15 ASCII characters.	8	MSB1 = ASCII value of the 1. character LSB1 = ASCII value of the 2. character MSB2 = ASCII value of the 3. character LSB2 = ASCII value of the 4. character …
LongStr	Zero-terminated string of max 31 ASCII characters.	16	MSB1 = ASCII value of the 1. character LSB1 = ASCII value of the 2. character MSB2 = ASCII value of the 3. character LSB2 = ASCII value of the 4. character …
Date	Date (dd-mm-yy)	2	MSB1 = BCD (dd) LSB1 = BCD (mm) MSB2 = BCD (yy) LSB2 = 0
Time	Time (hh-mm-ss)	2	MSB1 = BCD (hh) LSB1 = BCD (mm) MSB2 = BCD (ss) LSB2 = 0
Alarm	An item of the Alarmlist	27	MSB1 = reserved for future use LSB1 = reserved for future use MSB2 = Alarm level *) LSB2 = Alarm status **) MSB3 = alarm string ***) LSB3 = alarm string MSB4 = alarm string LSB5 = alarm string …

Note:

*) 1 .. level 1 (yellow), 2 .. level 2 (red), 3 .. sensor fail

**) Bit0 – alarm is active, Bit1 – alarm is confirmed

***) String encoding is UTF-8

Error codes (exception codes)

An exception code is returned by the controller (server) if the query sent from the client could not be completed successfully.

The controller responds with the error codes in as follows:

> 01 – Illegal function is returned if an incompatible type of operation is applied for a specific object, e.g. if function 03 is applied to a binary object.

> 02 – illegal address is returned if the client tries to perform an operation with an object address that is not related to any existing object or that is located inside an object which is composed by multiple addresses (registers).

> 04 – device error is returned in all other erroneous situations. More detailed specification of the problem can be obtained by reading the registers 4205 – 4206.

Reserved registers

There are several registers with specific meanings. These registers are available in all controllers regardless of the configuration.

Register addresses	Number of registers	Access	Data type	Meaning
4200 - 4201	2	read/write	Time	RTC Time in BCD code
4202 - 4203	2	read/write	Date	RTC Date in BCD code
4204	1	read/write	Unsigned8	Index of the language that is used for text data provided by MODBUS (e.g. alarmlist messages).
4205 - 4206	2	read	Unsigned32	Last application error. To be read after the device returns the exception code 04. It contains specific information about the error.
4207 - 4208	2	read/write	Unsigned32	Writing:command argument Reading: command return value
4209	1	write	Unsigned16	Command code
4010	1	-	-	Not implemented
4211	1	write	Unsigned16	Password
4212 - 4213	2	read	Unsigned32	Communication status
4214	1	read	Unsigned8	Number of items in the Alarmlist
4215 - 4241	27	read	Alarm	1. record in alarm list
4242 - 4268	27	read	Alarm	2. record in alarm list
4269 - 4295	27	read	Alarm	3. record in alarm list
4296 - 4322	27	read	Alarm	4. record in alarm list
4323 - 4349	27	read	Alarm	5. record in alarm list
4350 - 4376	27	read	Alarm	6. record in alarm list
4377 - 4403	27	read	Alarm	7. record in alarm list

Register addresses	Number of registers	Access	Data type	Meaning
4404 - 4430	27	read	Alarm	8. record in alarm list
4431 - 4457	27	read	Alarm	9. record in alarm list
4458 - 4484	27	read	Alarm	10. record in alarm list
4485 - 4511	27	read	Alarm	11. record in alarm list
4512 - 4538	27	read	Alarm	12. record in alarm list
4539 - 4565	27	read	Alarm	13. record in alarm list
4566 - 4592	27	read	Alarm	14. record in alarm list
4593 - 4619	27	read	Alarm	15. record in alarm list
4620 - 4646	27	read	Alarm	16. record in alarm list
5000	1	read/writeq	Int16	RemoteControl2B 1
5000	1	read/writeq	Int16	RemoteControl2B 2
5000	1	read/writeq	Int16	RemoteControl2B 3
5000	1	read/writeq	Int16	RemoteControl2B 4
5200	1	read/write	Binary16	Remote ControlBin

List of commands and arguments

"Commands" are used to invoke a specific action in the controller via the communication channel. The list of available actions is in the table below. The general procedure of writing a command via Modbus is as follows:

1. Write the command argument into the registers 44208-44209 (register addresses 4207-4208). Use function 16.

2. Write the command code into the register 44210 (register address 4209). Use function 6.

3. (Optional) Read the command return value from the registers 44208-44209 (register addresses 4207-4208). Use function 3.

4. If the command was executed the return value is as listed in the table. If the command was accepted but there was an error during execution the return value indicates the reason:

    a. 0x00000001 – invalid argument

    b. 0x00000002 – command refused (e.g. controller not in MAN, breaker cannot be closed in the specific situation etc.)

Action	Command code	Argument	Return value
Engine start *)	0x01	0x01FE0000	0x000001FF
Engine stop *)	0x01	0x02FD0000	0x000002FE
Fault reset *)	0x01	0x08F70000	0x000008F8
Horn reset *)	0x01	0x04FB0000	0x000004FC
GCB toggle *)	0x02	0x11EE0000	0x000011EF
GCB on	0x02	0x11EF0000	0x000011F0
GCB off	0x02	0x11F00000	0x000011F1

MCB toggle *)	0x02	0x12ED0000	0x000012EE
MCB on	0x02	0x12EE0000	0x000012EF
MCB off	0x02	0x12EF0000	0x000012F0

***Note:** *)*
This action is an equivalent of pressing the front panel button

MODBUS examples

Modbus RTU examples

> Reading of Battery voltage

>> Export table of values from InteliConfig

Table: Values									
Allowed Modbus functions: 03, 04									
Register (s)	Com.Obj.	Name	Dimension	Type	Len	Dec	Min	Max	Group
01053	8213	**BatteryVoltage**	**V**	Integer	2	**1**	0	400	Controller I/O

Request: (Numbers in Hex)							
01	03	04	1D	00	01	15	3C
Controller address	Modbus function	Register address $041D_{hex}$ = **1053**$_{dec}$		Number of registers		CRC	

Response: (Numbers in Hex)						
01	03	02	00	F0	B8	00
Controller address	Modbus function	Length of data 02_{hex} = 2 bytes read	Data $00F0_{hex}$ = **240**$_{dec}$		CRC	

We read a value 240 from register 01053. From the table of Modbus registers we get the dimension of read value and "Dec". Dec=1 means shift one decimal place to the right. So the battery voltage is **24.0 V**.

> Reading Nominal power

>> Export table of values from InteliConfig

Table: Values									
Allowed MODBUS functions: 03, 04									
Register (s)	Com.Obj.	Name	Dimension	Type	Len	Dec	Min	Max	Group
01227	9018	**Nominal Power**	**kW**	Integer	2	**0**	0	32767	Generator

Request: (Numbers in Hex)							
01	03	04	CC	00	01	45	05
Controller address	Modbus function	Register address $04CC_{hex}$ = **1228_{dec}**		Number of registers		CRC	

Response: (Numbers in Hex)							
01	03	02		00	C8	B9	D2
Controller address	Modbus function	Length of data 02_{hex} = 2 bytes read		Data $00C8_{hex}$ = **200_{dec}**		CRC	

Read nominal power is 200 kW.

> Reading all binary inputs as Modbus register

Table: Values									
Allowed Modbus functions: 03, 04									
Register (s)	Com.Obj.	Name	Dimension	Type	Len	Dec	Min	Max	Group
01089	8235	**Binary Inputs**		Binary#2	2	**0**	-	-	Controller I/O

Request: (Numbers in Hex)							
01	03	04	2C	00	01	44	F3
Controller address	Modbus function	Register address $042C_{hex}$ = **1068_{dec}**		Number of registers		CRC	

Response: (Numbers in Hex)						
01	03	02	00	12	38	49
Controller address	Modbus function	Length of data 02_{hex} = 2 bytes read	Data 0012_{hex} = **00010010_{bin}**		CRC	

Binary inputs is 00010010. This means Binary input 2 and binary input 5 are active.

Note: You can use Modbus function 4 instead of 3, the rest of the data remains the same (CRC differs).

> Reading binary inputs as coil status.

Table: Binaries						
Allowed Modbus functions: 01, 02						
Addresses Modbus Addr. Prot. Addr.	Source = Value = State	C.O.# State #	Name of Value Name of State	Bit #	Bit Name Activated by protection (s):	Group
00000	Value	8235	Binary Inputs	1	GCB Feedback	Controller I/O
00001	Value	8235	Binary Inputs	2	MCB Feedback	Controller I/O
00002	Value	8235	Binary Inputs	3	Emergency Stop	Controller I/O

We will read state of MCB Feedback binary input.

Request: (Numbers in Hex)							
01	01	00	01	00	01	AC	0A
Controller address	Modbus function	Register address 0001_{hex} = 0001_{dec}		Number of registers		CRC	

Response: (Numbers in Hex)					
01	01	01	01	90	48
Controller address	Modbus function	Length of data 01_{hex} = 1 byte read	Data 01_{hex} = active	CRC	

The read data is 01. This means this binary input is active.

Note: You can use Modbus function 2 instead of 1, the rest of the data remains the same (CRC differs).

> Starting the engine

Before starting engine you may need to write password depending on the settings in controller.

Table **Reserved registers (page 149)**

Register addresses	Number of registers	Access	Data type	Meaning
4207 - 4208	2	read/write	Unsigned32	Writing:command argument Reading: command return value
4209	1	write	Unsigned16	Command code

Table **List of commands and arguments (page 150)**

Action	Command code	Argument	Return value
Engine start	0x01	0x01FE0000	0x000001FF
Engine stop	0x01	0x02FD0000	0x000002FE

Request 1/2: (Numbers in Hex)						
01	10	10	6F	00	03	06
Controller address	Modbus function $10_{hex} = 16_{dec}$	Register address $106F_{hex} = \mathbf{4207}_{dec}$		Number of registers		Data length in bytes

Request 2/2: (Numbers in Hex)							
01	FE	00	00	00	01	68	0B
Argument				Command code		CRC	

Note: Command and argument may be written as one "packet" (function 16) or you can split it and write argument (function 16) and then the command code (function 6).

> Nominal Power – writing

Table: Setpoints									
Allowed Modbus functions: 03, 04, 06, 16									
Register (s)	Com.Obj.	Name	Dimension	Type	Len	Dec	Min	Max	Group
03008	8276	**Nominal Power**	**kW**	Unsigned	2	**0**	1	5000	Basic Settings

Request: (Numbers in Hex)							
01	06	0B	C0	00	64	8A	39
Controller address	Modbus function	Register address $0BC0_{hex} = \mathbf{3008_{dec}}$		Data $0064_{hex} = \mathbf{100_{dec}}$		CRC	

Response: (Numbers in Hex)							
01	06	0B	C0	00	00	8B	D2
Controller address	Modbus function	Register address $0BC0_{hex} = \mathbf{3008_{dec}}$		Allways zero		CRC	

Written setpoint nominal power is 100 kW.

> CRC calculation

The check field allows the receiver to check the validity of the message. The check field value is the Cyclical Redundancy Check (CRC) based on the polynomial $x^{16}+x^{15}+x^2+1$. CRC is counted from all message bytes preceding the check field.

Online CRC calculator: http://www.lammertbies.nl/comm/info/crc-calculation.html Use CRC-16 (Modbus) Write LSB first.

For writing nominal power 100 kW the CRC is calculated from this data: $01060BC00064_{hex}$

Modbus TCP examples

> Reading of Battery voltage

>> Export table of values from InteliConfig

Table: Values									
Allowed Modbus functions: 03, 04									
Register (s)	Com.Obj.	Name	Dimension	Type	Len	Dec	Min	Max	Group
01053	8213	**BatteryVoltage**	**V**	Integer	2	**1**	0	400	Controller I/O

Request: (Numbers in Hex)											
00	00	00	00	00	06	01	03	04	1D	00	01
transaction identifier (usually 0)		protocol identifier (usually 0)		Length of data bytes following		Controller address	Modbus function	Register address $041D_{hex} =$ **1053_{dec}**		Number of registers	

Response: (Numbers in Hex)										
00	00	00	00	00	05	01	03	02	00	F0
transaction identifier (usually 0)		protocol identifier (usually 0)		Length of data bytes following		Controller address	Modbus function	Length of data $02_{hex} = 2$ bytes read	Data $00F0_{hex} =$ **240_{dec}**	

We read a value of 240 from register 01053. From the table of Modbus registers we get the dimension of read value and "Dec". Dec=1 means shift one decimal place to the right. So the battery voltage is **24.0 V**.

⬥ **back to Communication**

7 Technical data

Power supply

Power supply range	8-36 VDC
Power consumption (without modules)	2.0 W
RTC battery	Replaceable (3 V)
Fusing power	4 A w/o BOUT consumption
E-Stop fusing	10 A
Max. Power Dissipation	7 W

Operating conditions

Protection degree (front panel)	IP 65
Operating temperature	-20 ˚C to +70 ˚C
Storage temperature	-30 ˚C to +80 ˚C
Operating humidity	95 % non-condensing (EN 60068-2-30)
Vibration	5-25 Hz, ± 1.6 mm 25-100 Hz, a = 4 g
Shocks	a = 500 m/s^2
Surrounding air temperature rating 70 °C Suitable for pollution degree 2	

Voltage measurement

Measurement inputs	3ph-n S1 voltage, S2 voltage
Measurement range	10-277 V AC / 10-480 V AC (EU) 10-346 V AC / 10-600 V AC (US/Canada)
Linear measurement and protection range	350 V AC Ph-N 660 V AC Ph-Ph
Accuracy	1 %
Frequency range	30-70 Hz (accuracy 0.1 Hz)
Input impedance	0.72 MΩ ph-ph , 0.36 MΩ ph-n

Display

Type	Build-in monochromatic 3.2"
Resolution	132 × 64 px

Communications

USB Device	Non-isolated type B connector
RS485	Isolated

Current measurement

Measurement inputs	3ph Load current
Measurement range	5 A
Max. allowed current	10 A
Accuracy	±20 mA for 0-2 A; 1 % of value for 2-5 A
Input impedance	<0.1 Ω

E-Stop

Dedicated terminal for safe E-Stop input.

Physical supply for binary outputs 1 & 2.

Binary inputs

Number	8
Close/Open indication	0-2 VDC close contact 6-36 VDC open contact

Binary outputs

Number	8
Max. current	BO1,2 = 5 A; BO3-8 = 0.5 A
Switching to	positive supply terminal

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8 Appendix

⬛ **back to Table of contents**

8.1 Controller objects

8.1.1 List of controller objects types

8.1.2 Setpoints

What setpoints are:

Setpoints are analog, binary or special data objects which are used for adjusting the controller to the specific environment. Setpoints are organized into groups according to their meaning. Setpoints can be adjusted from the controller front panel, PC, MODBUS, etc.

All setpoints can be protected by a password against unauthorized changes. Password protection can be assigned to the setpoints during the configuration procedure.

> **IMPORTANT: Do not write setpoints repeatedly (e.g. power control from a PLC by repeated writing of baseload setpoint via Modbus). The setpoints are stored in EEPROM memory, which can be overwritten up to 10^5 times without risk of damage or data loss, but it may become damaged, when the allowed number of writing cycles is exceeded.**

For full list of setpoints go to the chapter **List of setpoints (page 160)**.

List of setpoints

🔺 **back to Controller objects**

Group: Basic settings

Controller Name

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0 .. 15 characters [-]		
Default value	InteliATS2	Alternative config	NO
Step	[-]		
Comm object	8637	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User defined name, used for the controller identification at remote phone or mobile connection.

The Controller Name is maximally 15 characters long and can be entered using InteliConfig or from controller's configuration menu.

Note: If the Controller Name is "TurboRunHours", the running hours will be counted faster – 1 minute in real will represent 1 hour.

⬆ **back to List of setpoints**

Nominal Power

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	1 .. 5 000 [kW]		
Default value	200 kW	Alternative config	YES
Step	1 kW		
Comm object	20413	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Nominal power of the Source 2. Generator **Overload BOS (page 218)** protection is based on this setpoint.

⬆ **back to List of setpoints**

Subgroup: Current settings

Nominal Current

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	1 .. 10 000 [A]		
Default value	350 A	Alternative config	YES
Step	1 A		
Comm object	20418	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
It is current limit for current protections and means maximal continuous current. Nominal Current can be different from rated current value.			

🔺 **back to List of setpoints**

Gen CT Ratio Prim

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	1 .. 10000 [A/5A]		
Default value	2000 A/5A	Alternative config	NO
Step	1 A/5A		
Comm object	8274	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Current transformers ratio. *Note: Generator currents and power measurement is suppressed if current level is below 1% of CT range.*			

🔺 **back to List of setpoints**

Gen CT Ratio Sec

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	- [/1A / /5A]		
Default value	/5A	Alternative config	NO
Step	-		
Comm object	10556	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Current transformers ratio of engine.			

🔺 **back to List of setpoints**

Subgroup: Voltage settings

Connection type

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Mono Phase / SplPhL1L2 / SplPhL1L3 / 3Ph3Wire / 3Ph4Wire / High Leg D [-]		
Default value	3Ph4Wire	Alternative config	YES
Step	[-]		
Comm object	11628	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Connection type:

Mono Phase	Single phase voltage measurement L1-N
	1x CT (Current Transformer)
SplPhL1L2	Double Delta connection
	Split Phase
	Two phase voltage measurement L1,L2 with 180° phase shift
	2x CT (Current Transformer)
SplPhL1L3	Double Delta connection
	Split Phase
	Two phase voltage measurement L1,L3 with 180° phase shift
	2x CT (Current Transformer)
3Ph3Wire	Ungrounded Delta connection
	Open Delta
	Ungrounded Wye
	Corner-Grounded Delta
	Split Phase Delta
	Three phase voltage measurement L1,L2,L3 with 120° phase shift
	No neutral is available 3x CT (Current Transformer)
3Ph4Wire	Grounded Star (Grounded Wye) connection – 3PY
	Three phase voltage measurement L1,L2,L3 with 120° phase shift
	3x CT (Current Transformer)
High Leg D	High Leg Delta connection
	Three phase voltage measurement L1,L2,L3
	3x CT (Current Transformer)

⬤ back to List of setpoints

Nominal Voltage Ph-N

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	80 .. 20 000 [V]		
Default value	231 V	Alternative config	YES
Step	1 V		
Comm object	20481	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal voltage (phase to neutral).			

⬆ **back to List of setpoints**

Nominal Voltage Ph-Ph

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	80 .. 40 000 [V]		
Default value	400 V	Alternative config	YES
Step	1 V		
Comm object	20456	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal voltage (phase to phase).			

⬆ **back to List of setpoints**

Source 1 VT Ratio

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0.1 .. 500.0 [V/V]		
Default value	1.0 V/V	Alternative config	NO
Step	0.1 V/V		
Comm object	9580	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Source 1 voltage potential transformers ratio. If no VTs are used, adjust the setpoint to 1.			

⬆ **back to List of setpoints**

Source 2 VT Ratio

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0.1 .. 500.0 [V/V]		
Default value	1.0 V/V	Alternative config	NO
Step	0.1 V/V		
Comm object	9579	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Source 2 voltage potential transformers ratio. If no VTs are used, adjust this setpoint to 1.			

 ⬤ back to List of setpoints

Subgroup: Frequency settings

Nominal Frequency

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	30 .. 65 [Hz]		
Default value	50 Hz	Alternative config	YES
Step	1 Hz		
Comm object	20453	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal frequency (usually 50 or 60 Hz).			

 ⬤ back to List of setpoints

Subgroup: Transition settings

Transition Type

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Open / InPhase / Closed / InPhase-Open / Closed-Open [-]		
Default value	Open	Alternative config	NO
Step	[-]		
Comm object	14688	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

The setpoint defines what type of changeover between Source 1 and Source 2 is set.

Open	Standard type of transition. The load transfer between two power sources is done with the break. The break is defined by the setpoint **Open Transfer Min Break (page 186)**.
InPhase	Special open transition where the break is reduced to the minimum. The controller during Synchronization Timeout calculates the moment when the phase shift between two sources during the transfer is 0.
Closed	The transition without the break where both breakers are closed for 100 ms (max 200 ms). The controller during Synchronization Timeout calculates the moment when the phase shift between the two sources during the transfer is 0.
InPhase-Open	The primary transition is InPhase. When InPhase transition doesn't happen due to the reason that Synchonization Timeout has elapsed, the controller performs Open type of transition.
Closed-Open	The primary transition is Closed. When Closed transition doesn't happen due to the reason that Synchonization Timeout has elapsed, the controller performs Open type of transition.

⬢ **back to List of setpoints**

S1CB Close Latency

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0.01 .. 60.00 [s]		
Default value	2.50 s	Alternative config	NO
Step	0,01 s		
Comm object	20177	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Switching time from close to open position of the Source 1 breaker/contactor. - Switching time from open to close position of the source 1 breaker/contactor. The time is used for time prediction of the closing command in passive synchronization. - S1CB ON Coil pulse length = 2x setpoint S1CB Close Latency. - Max waiting time between close command and feedback that breaker/contactor is closed = 2x setpoint S1CB Close Latency.			

⬣ **back to List of setpoints**

S1CB Open Latency

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0.01 .. 60.00 [s]		
Default value	2.50 s	Alternative config	NO
Step	0.01 s		
Comm object	20176	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Switching time from close to open position of the Source 1 breaker/contactor. - Switching time from close to open position of the source 1 breaker/contactor. The time is used for time prediction of the opening command in passive synchronization. - S1CB OFF Coil pulse length = 2x setpoint S1CB Open Latency. - Max waiting time between open command and feedback that breaker/contactor is opened = 2x setpoint S1CB Open Latency.			

⬣ **back to List of setpoints**

S2CB Close Latency

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0,01 .. 60,00 [s]		
Default value	2,50 s	Alternative config	NO
Step	0,01 s		
Comm object	20179	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Switching time from open to close position of the Source 2 breaker/contactor.

> Switching time from open to close position of the source 2 breaker/contactor. The time is used for time prediction of the closing command in passive synchronization.

> S2CB ON Coil pulse length = 2x setpoint S2CB Close Latency.

> Max waiting time between close command and feedback that breaker/contactor is closed = 2x setpoint S2CB Close Latency.

🔺 **back to List of setpoints**

S2CB Open Latency

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0,01 .. 60,00 [s]		
Default value	2,50 s	Alternative config	NO
Step	0,01 s		
Comm object	20178	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Switching time from close to open position of the Source 2 breaker/contactor.

> Switching time from close to open position of the source 2 breaker/contactor. The time is used for time prediction of the opening command in passive synchronization.

> S2CB OFF Coil pulse length = 2x setpoint S2CB Open Latency.

> Max waiting time between open command and feedback that breaker/contactor is opened = 2x setpoint S2CB Open Latency.

🔺 **back to List of setpoints**

Voltage Window

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0.0 .. 10.0 [%]		
Default value	5.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	8650	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Setpoint **Transition Type (page 170)** ≠ Open		
Description			
The setpoint adjusts the maximum difference between Source 1 and Source 2 voltage in respective phases for passive synchronization.			

🔺 **back to List of setpoints**

Frequency Window

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0.00 .. 0.50 [Hz]		
Default value	0.15 Hz	**Alternative config**	NO
Step	0.01 Hz		
Comm object	14799	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Setpoint **Transition Type (page 170)** ≠ Open		
Description			
The setpoint adjusts the maximum difference between Source 1 and Source 2 frequency in respective phases for passive synchronization.			

🔺 **back to List of setpoints**

Phase Window

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	0.0 .. 2.0 [°]		
Default value	0.0 °	Alternative config	NO
Step	0.1 °		
Comm object	8652	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Setpoint **Transition Type (page 170)** ≠ Open		
Description			

The setpoint adjusts phase window for passive synchronization.

When 0,0° is adjusted, ATS is trying to do passive synchronization when angle between Source 1 and Source 2 is zero.

When this setpoint is adjusted to different value then 0,0°, ATS is trying to do passive synchronization when angle between sources is in window adjusted by this setpoint.

> **Example:** When sources are stable - no change of frequency - no change of angle between sources (external synchronizer is used) and angle between sources is in window - transition is possible (other transition condition have to be met). Also when sources are rotating (angle between sources is changing) transition will be done on the edge of the window - for example around 1° (or -1° - depends on direction of rotation) - other conditions for transition have to be met.

⬖ **back to List of setpoints**

Synchronization Timeout

Setpoint group	Synchronization	Related FW	1.2.0
Range [units]	No Timeout / 1 .. 1800 [s]		
Default value	60 s	Alternative config	NO
Step	1 s		
Comm object	8657	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Setpoint **Transition Type (page 170)** ≠ Open		
Description			

This setpoint adjusts maximum time when the system waits for both sources to get synchronized. When the time has elapsed synchronization timeout alarm is activated and the passive synchronization is interrupted or continues as open delayed transition depends which option is selected for the setpoint Transition Type.

> *Note: If No Timeout is selected the controller waits undefined time till the conditions of passive synchronization are fulfilled.*

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Subgroup: Battery protections

Battery Undervoltage

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	8.0 V .. **Battery Overvoltage (page 175)** [V]		
Default value	18.0 V	Alternative config	NO
Step	0.1 [V]		
Comm object	8387	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning threshold for low battery voltage.			

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Battery Overvoltage

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	**Battery Undervoltage (page 175)** .. 40.0 [V]		
Default value	36.0 V	Alternative config	NO
Step	0.1 V		
Comm object	9587	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Warning threshold for high battery voltage.			

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Battery <> Voltage Delay

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	5 s	Alternative config	NO
Step	1 s		
Comm object	8383	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Battery Undervoltage (page 175)** and **Battery Overvoltage (page 175)** protections.			

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Subgroup: Elevator Switch Settings

Elevator Switch

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Enabled / Disabled [-]		
Default value	Disabled [-]	Alternative config	NO
Step	[-]		
Comm object	20327	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint enables or disables elevator switch functionality (for more information **see Elevator Switch on page 80**). Every time before predicted transfer of the load happens, LBO ELEVATOR SWITCH (PAGE 366) is activated to stop the elevator on the closest floor and open the door.			

⬆ **back to List of setpoints**

Pre Elevator Delay

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	10 s	Alternative config	NO
Step	0 s		
Comm object	20326	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
The delay which determines how long before the predicted transfer of the load the LBO ELEVATOR SWITCH (PAGE 366) is activated. This time is needed for an elevator to stop on the closest floor and open the door before the power is cut off due to the transfer of the load.			

⬆ **back to List of setpoints**

Post Elevator Delay

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	10 s	Alternative config	NO
Step	0 s		
Comm object	20325	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
The delay defines how long after predicted transfer of the load the LBO ELEVATOR SWITCH (PAGE 366) is deactivated.			

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Conversion Coefficient Pulse 1

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0 ... 65 000 [-]		
Default value	1	Alternative config	NO
Step	1		
Comm object	10994	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Only if LBI PULSE COUNTER 1 (PAGE 351) is configured		
Description			
This setpoint adjusts the rate of increasing of the Pulse Counter 1 function. The module counts pulses at the input PULSE COUNTER 1 (PAGE 351) and if the input pulses counter reaches value given by this setpoint, the counter value **Pulse Counter 1 (page 322)** is increased by 1 and input pulses counter is reset to 0. Both counter value and input pulses counter are stored in the nonvolatile memory.			

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Conversion Coefficient Pulse 2

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	0 ... 65 000 [-]		
Default value	1	Alternative config	NO
Step	1		
Comm object	10995	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Only if LBI PULSE COUNTER 2 (PAGE 351) is configured		
Description			
This setpoint adjusts the rate of increasing of the Pulse Counter 2 function. The module counts pulses at the input PULSE COUNTER 2 (PAGE 351) and if the input pulses counter reaches value given by this setpoint, the counter value **Pulse Counter 2 (page 322)** is increased by 1 and input pulses counter is reset to 0. Both counter value and input pulses counter are stored in the nonvolatile memory.			

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Subgroup: Controller settings

Controller Mode

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	OFF / MAN / AUTO [-]		
Default value	OFF	Alternative config	NO
Step	[-]		
Comm object	8315	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint can be used for changing the Controller mode remotely, e.g. via Modbus. Use the mode selector on the main screen for changing the mode from the front panel. Use mode selector in the control window for changing the mode from InteliConfig.			

⬆ **back to List of setpoints**

Power On Mode

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Previous / OFF [-]		
Default value	Previous	Alternative config	NO
Step	[-]		
Comm object	13000	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

This setpoint adjusts controller mode after power on of controller.

Previous	When controller is power on, controller is switched to last mode before power off.
OFF	When controller is power on, controller is switched to OFF Mode.

Note: Remote modes – In case that some LBI remote mode is activated during power on of controller than this LBI has higher priority than this setpoint – controller mode is forced into mode selected via LBI. After deactivation of LBI, controller is switched into value selected via setpoint Power On Mode

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Reset To Manual

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Disabled / Enabled [-]		
Default value	Disabled	Alternative config	NO
Step	[-]		
Comm object	9983	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

If this function is enabled, the controller will switch automatically to MAN mode when there is a red alarm in the alarm list and fault reset button is pressed. This is a safety function that prevents the Source 2 starting again automatically in specific cases when fault reset button is pressed.

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Backlight Timeout

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Disabled / 1 .. 255 [min]		
Default value	Disabled	Alternative config	NO
Step	1 min		
Comm object	10121	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
The display backlight is switched off when this timer exceed. When setpoint is adjusted to disabled then the display will be backlighted all the time.			

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Horn Timeout

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Disabled / 1 .. 600 s / Horn Reset [-]		
Default value	10 s	Alternative config	NO
Step	1 s		
Comm object	8264	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

Setting of horn behavior.

Disabled	Disabling the Horn sounding function
1 .. 600 [s]	Timeout for **HORN (PAGE 368)** binary output. The **HORN (PAGE 368)** output is active when this timeout elapsed.
Horn reset	LBO **HORN (PAGE 368)** is deactivated by Fault reset button or by Horn reset button.

Note: Horn timeout starts again from the beginning if a new alarm appears before previous Horn timeout has elapsed.

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User Logging Record

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Enabled / Disabled		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	23885	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint enables recording of user logings.			

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Subgroup: HMI Settings

Main Screen Line 1

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	S1 L1N / S1 L1L2 / S1 f / PF [-]		
Default value	PF	Alternative config	NO
Step	[-]		
Comm object	13346	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint adjusts line 1 on Main screen.			

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Main Screen Line 2

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	S1 L1N / S1 L1L2 / S1 f / PF [-]		
Default value	RPM	Alternative config	NO
Step	[-]		
Comm object	14628	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint adjusts line 2 on Main screen.			

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Screen Filter

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Enable / Disabled [-]		
Default value	Disabled	Alternative config	NO
Step	[-]		
Comm object	15889	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Every analog value showed on CU screen is filtered when setpoint is enabled.			

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Group: Communication Settings

Subgroup: Controller Address

Controller Address

Setpoint group	Communication Settings	Related FW	1.2.0
Range [units]	1 .. 32 [-]		
Default value	1	Alternative config	NO
Step	1		
Comm object	24537	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Controller identification number. It is possible to set controller address different from the default value (1) so that more controllers can be interconnected (via RS485) and accessed e.g. from Modbus terminal. *Note: When opening connection to the controller it's address has to correspond with the setting in PC tool.*			

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Subgroup: RS485 Settings

RS485 Mode

Setpoint group	Communication Settings	**Related FW**	1.2.0
Range [units]	Direct / MODBUS [-]		
Default value	Direct	**Alternative config**	NO
Step	[-]		
Comm object	24134	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Communication protocol switch for on-board RS485.			

Direct	InteliConfig communication protocol via serial cable.
MODBUS	MODBUS protocol.

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RS485 Communication Speed

Setpoint group	Communication Settings	**Related FW**	1.2.0
Range [units]	9600 / 19200 / 38400 / 57600 / 115200 [bps]		
Default value	57600 bps	**Alternative config**	NO
Step	[-]		
Comm object	24135	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
If the direct mode is selected on on-board RS485, the direct communication speed of controller part of line can be adjusted here. Speed of second part of line has to be adjusted to the same value.			

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RS485 Modbus Mode

Setpoint group	Communication Settings	Related FW	1.2.0
Range [units]	8N1 / 8N2 / 8E1 [-]		
Default value	8N1	Alternative config	NO
Step	[-]		
Comm object	24020	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

This setpoint adjusts communication mode of Modbus-RTU.

Possible options

8N1	8 data bits, 1 stop bit, no parity
8N2	8 data bits, 2 stop bits, no parity
8E1	8 data bits, 1 stop bit, even parity

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RS485 Modbus Speed
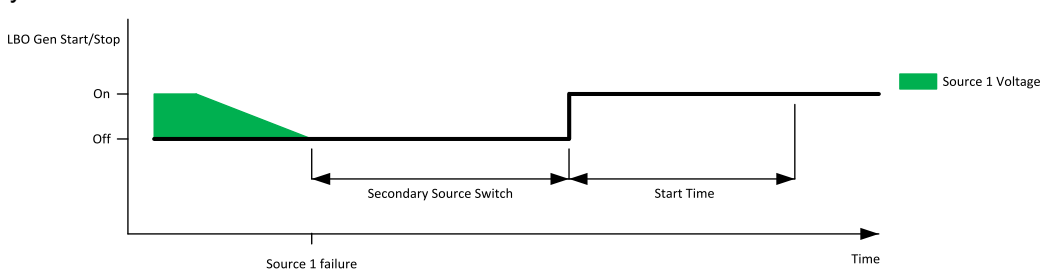
Setpoint group	Communication Settings	Related FW	1.2.0
Range [units]	9600 / 19200 / 38400 / 57600 / 115200 [bps]		
Default value	9600 bps	Alternative config	NO
Step	[-]		
Comm object	24141	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM1 Mode (page 266)**		
Description			

If the MODBUS mode is selected on COM1 channel, the MODBUS communication speed can be adjusted here.

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Group: Source 1

Secondary Source Switch

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0 .. 6 000 [s]		
Default value	5 s	Alternative config	NO
Step	1 s		
Comm object	8301	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for Switch of Secondary Source. The delay after the Source 1 failure to the start command of the Source 2. Image 15.1 Secondary Source Switch			

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Primary Source Return Delay

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	1 .. 3 600 [s]		
Default value	20 s	Alternative config	NO
Step	1 s		
Comm object	8302	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
The delay which defines how long is postponed the return of the load on Source 1.			

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S1CB Close Delay

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0.0 .. 60.0 [s]		
Default value	5.0 s	Alternative config	NO
Step	0.1 s		
Comm object	8389	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Delay after Source 1 returns to S1CB closing when transfer to Source 2 is not finished.

When the controller restarts and Source 1 is healthy the closing of S1CB is done after S1CB Close Delay. This can happen in OFF or AUTO mode.

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Open Transfer Min Break

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	1.0 s	Alternative config	NO
Step	0.1 s		
Comm object	8303	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Transition delay between S1CB opening and S2CB closing and vice versa.

The time charts bellow show recommended setting of Open Transfer Min Break setpoint.

If the Transfer Delay setpoint is set shorter than the time required for opening of the circuit breaker, the controller closes **S2CB CLOSE/OPEN (PAGE 377)** output straight away (100 ms) after the **S1CB FEEDBACK (PAGE 354)** input deactivates.
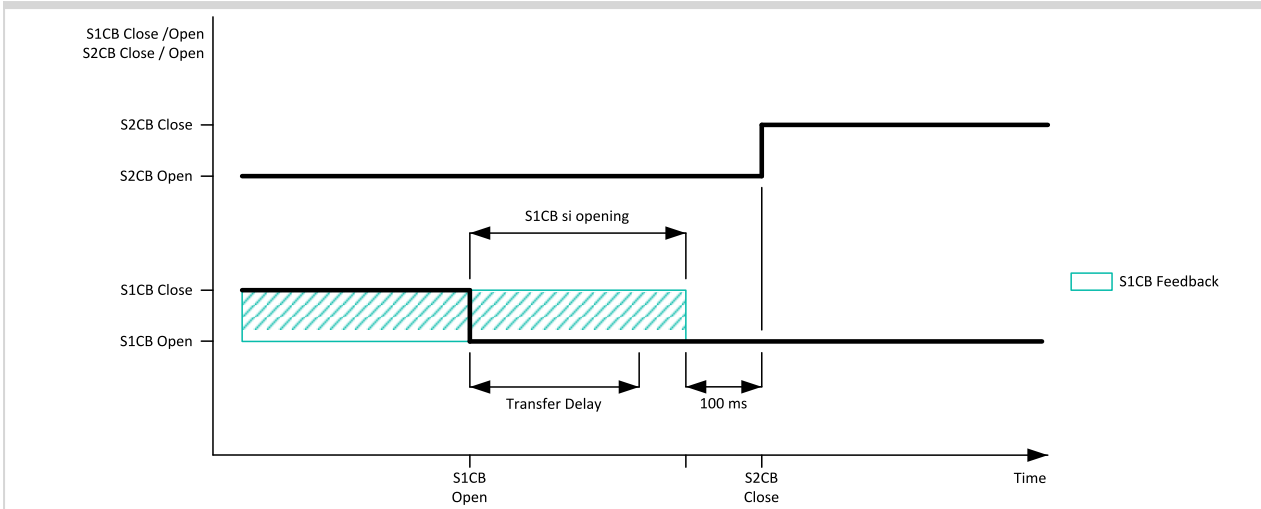
Image 15.2 Open Transfer Min Break

If some delay between **S1CB FEEDBACK (PAGE 354)** deactivation and closing of **S2CB CLOSE/OPEN (PAGE 377)** output is required, then the Open Transfer Min Break must be set to sum of "S1CB opening" + "Delay" time.
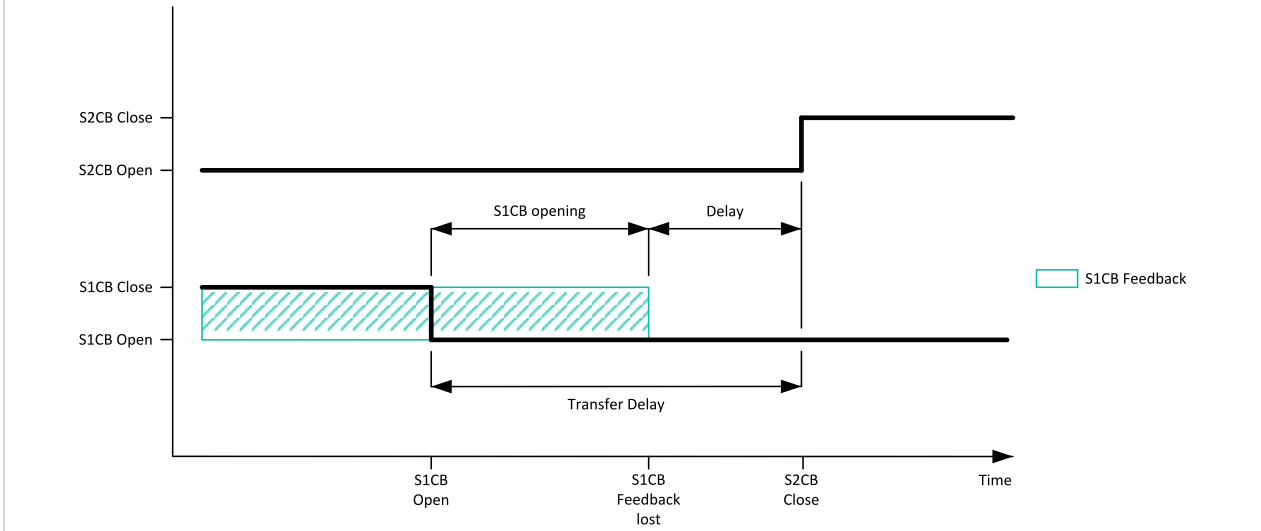
Image 15.3 Transfer Delay 2

⬥ **back to List of setpoints**

Return From Secondary Source

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	Manual / Auto [-]		
DefaultFixed value	Auto	Alternative config	NO
Step	[-]		
Comm object	9590	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

Setpoint adjusts the behavior of S2CB opening and S1CB closing when Source 1 returns.

Manual	The controller waits during the timer Primary Source Return Delay for pushing the S1CB button to open S2CB breaker in order to initiate the transfer. When this is not done Manual Restore message is displayed in alarmlist to notify the operator that S1CB button has to be pushed to initiate the transfer. *Note: Select MANUAL in case you need to manually control the moment when the load is transferred back to the Source 1.*
Auto	S2CB opens automatically after Primary Source Return delay has elapsed. S1CB is closed after Open Transfer Min Break has elapsed.

⬆ **back to List of setpoints**

S1CB Opens On

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	S1 Fail / S2 OK [-]		
Default value	S2 OK	Alternative config	NO
Step	[-]		
Comm object	9850	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

Setpoint adjust the behavior of opening S1CB in AUTO mode when there is Source 1 fail.

S1 Fail	The command to open S1CB is given immediately after Source 1 fail condition is evaluated. If the Source 1 will return into parameter after S1CB was opened and before S2CB is closed, the timer S1CB Close Delay is applied before S1CB closing.
S2 OK	S1CB will be opened when Source 2 is operational (voltage and frequency is OK). *Note: This option should be used if the of the breaker is using 230V control and is not equipped with the undervoltage coil.*

⬆ **back to List of setpoints**

Source 1 Measurement

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED [-]	Alternative config	NO
Step	[-]		
Comm object	19575	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

Enables / Disables Source 1 Measurement.

ENABLED	Source 1 evaluation (S2 is OK or S2 is NOK) is based on frequency and voltages and on user protections and on the LBI SOURCE 1 READY TO LOAD (PAGE 355) – if it is configured .
DISABLED	Source 1 evaluation (S2 is OK or S2 is NOK) is based only on the LBI SOURCE 1 READY TO LOAD (PAGE 355) which has to be configured.

🔺 back to List of setpoints

Activity At OFF

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	11620	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Conditioned by the setpoint **Controller Mode (page 178)**		
Description			

Setpoint adjusts the behavior of S1CB in OFF mode.

Enabled	S1CB closes automatically when Source 1 is operational (voltage and frequency is OK) S1CB opens automatically when Source 1 is not operational and the setpoint **S1CB Opens On (page 188)** = S1 Fail. If the setpoint **S1CB Opens On (page 188)** = S2 OK then S1CB opens when Source 1 is not operational and Source 2 is operational.
Disabled	S1CB is permanently opened. S1CB doesn't close or open automatically. In the situation when controller is switched from MAN to OFF mode and S1CB is closed open command is issued in case the setpoint **S1CB Opens On (page 188)**=S1 Fail. If the the setpoint **S1CB Opens On (page 188)** = S2 OK S1CB close command is issued in case Source 2 is operational (voltage and frequency is OK).

🔺 back to List of setpoints

Subgroup: Voltage protections

Source 1 Overvoltage

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	100 .. 150 [%]		
Default value	110 %	**Alternative config**	NO
Step	1 % of **Nominal Voltage Ph-Ph (page 168)**		
Comm object	20478	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold for Source 1 overvoltage. All three phases are checked. Maximum out of three is used.			

⬆ **back to List of setpoints**

Source 1 Overvoltage Delay

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	**Alternative config**	YES
Step	0.1 s		
Comm object		**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Overvoltage (page 190)** protection.			

⬆ **back to List of setpoints**

Source 1 Overvoltage Hys

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	100 .. **Source 1 Overvoltage (page 190)** [%]		
Default value	105 %	Alternative config	NO
Step	1 %		
Comm object	20476	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold defines the level of turning off Source 1 overvoltage protection. Image 15.4 Source 1 Overvoltage Hys			
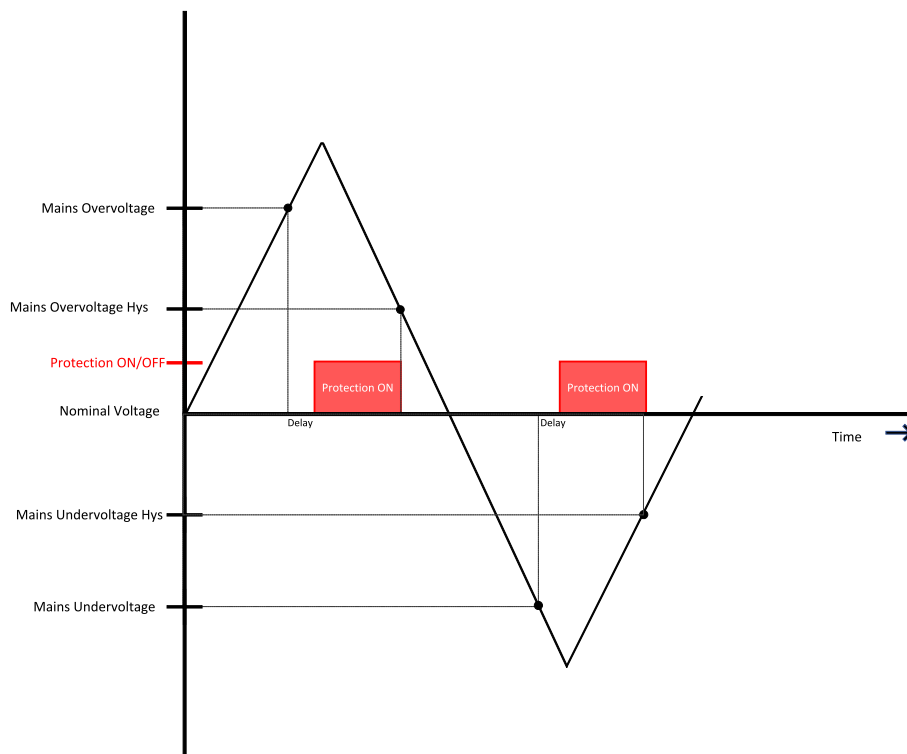
⏏ **back to List of setpoints**

Source 1 Undervoltage

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	50 .. 100 [%]		
Default value	60 %	Alternative config	YES
Step	1 % of **Nominal Voltage Ph-Ph (page 168)**		
Comm object	20477	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold for Source 1 undervoltage. All three phases are checked. Minimum voltage out of three phases is used.			

🔺 **back to List of setpoints**

Source 1 Undervoltage Delay

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	Alternative config	YES
Step	0.1 s		
Comm object		Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Undervoltage (page 192)** protection.			

🔺 **back to List of setpoints**

Source 1 Undervoltage Hys

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	**Source 1 Undervoltage (page 192)** .. 100 [%]		
Default value	65 %	**Alternative config**	NO
Step	1 %		
Comm object	20475	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Threshold defines the level of turning off Source 1 undervoltage protection.
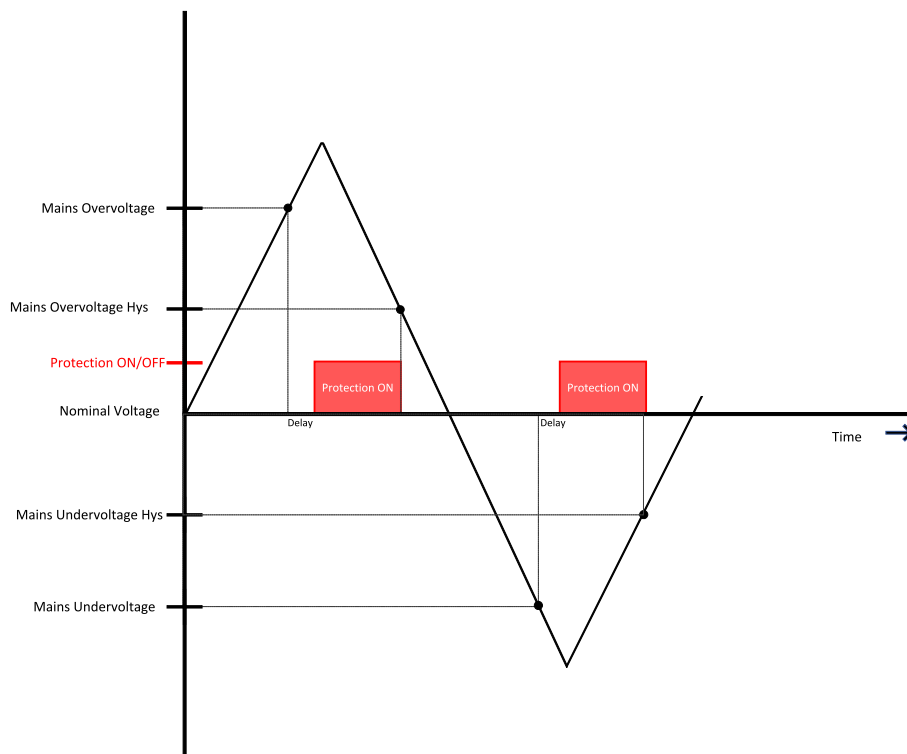
Image 15.5 Source 1 Undervoltage Hys

⏶ **back to List of setpoints**

Source 1 Voltage Unbalance

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	1 .. 150 [%] of **Nominal Voltage Ph-Ph (page 168)** or **Nominal Voltage Ph-N (page 168)**		
Default value	10 %	Alternative config	NO
Step	1 %		
Comm object	20455	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Threshold for Source 1 voltage unbalance.			

⬤ **back to List of setpoints**

Source 1 Voltage Unbalance Delay

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	Alternative config	NO
Step	0.1 s		
Comm object	20454	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Voltage Unbalance (page 194)** protection.			

⬤ **back to List of setpoints**

Subgroup: Frequency protections

Source 1 Overfrequency

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	100 .. 150 [%]		
Default value	102.0 %	Alternative config	NO
Step	1.0 % of **Nominal Frequency (page 169)**		
Comm object	20452	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold for Source 1 overfrequency.			

⬤ **back to List of setpoints**

Source 1 Overfrequency Hys

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	100 .. **Source 1 Overfrequency (page 194)** [%]		
Default value	102.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20450	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold defines the level of turning off Source 1 overfrequency protection. Image 15.6 Source 1 Overfrequency Hys			
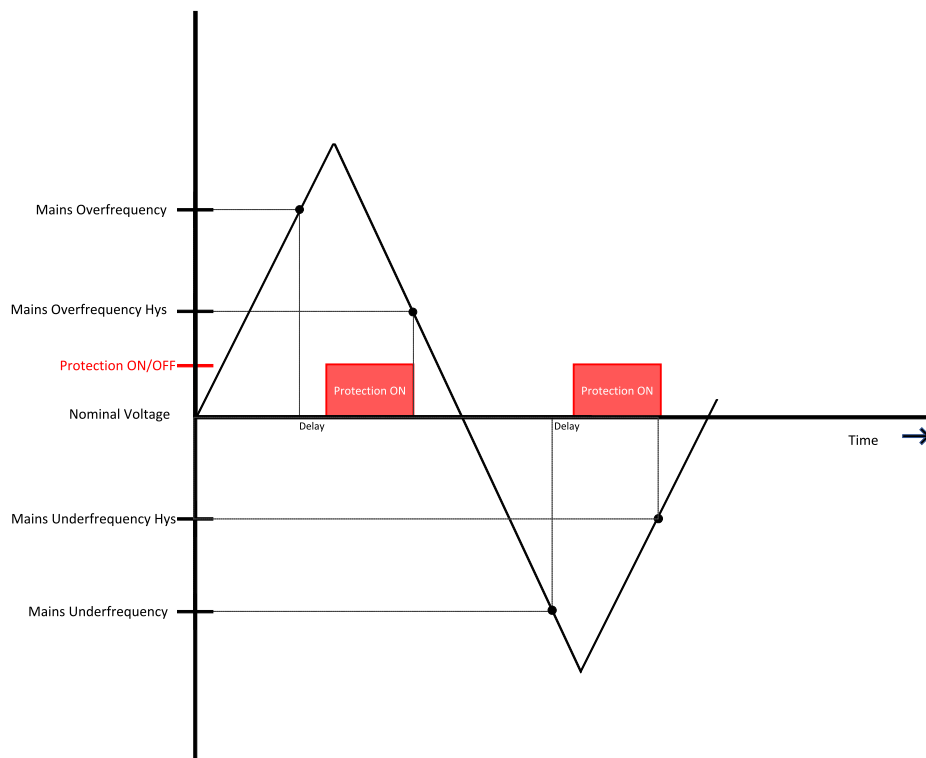
🔺 **back to List of setpoints**

Source 1 Underfrequency

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	50 .. 100 [%]		
Default value	98.0 %	Alternative config	NO
Step	1.0 % of **Nominal Frequency (page 169)**		
Comm object	20451	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold for Source 1 underfrequency.			

🔺 **back to List of setpoints**

Source 1 Underfrequency Hys

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	**Source 1 Underfrequency (page 196)** .. 100 [%]		
Default value	98.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20449	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Threshold defines the level of turning off Source 1 underfrequency protection.
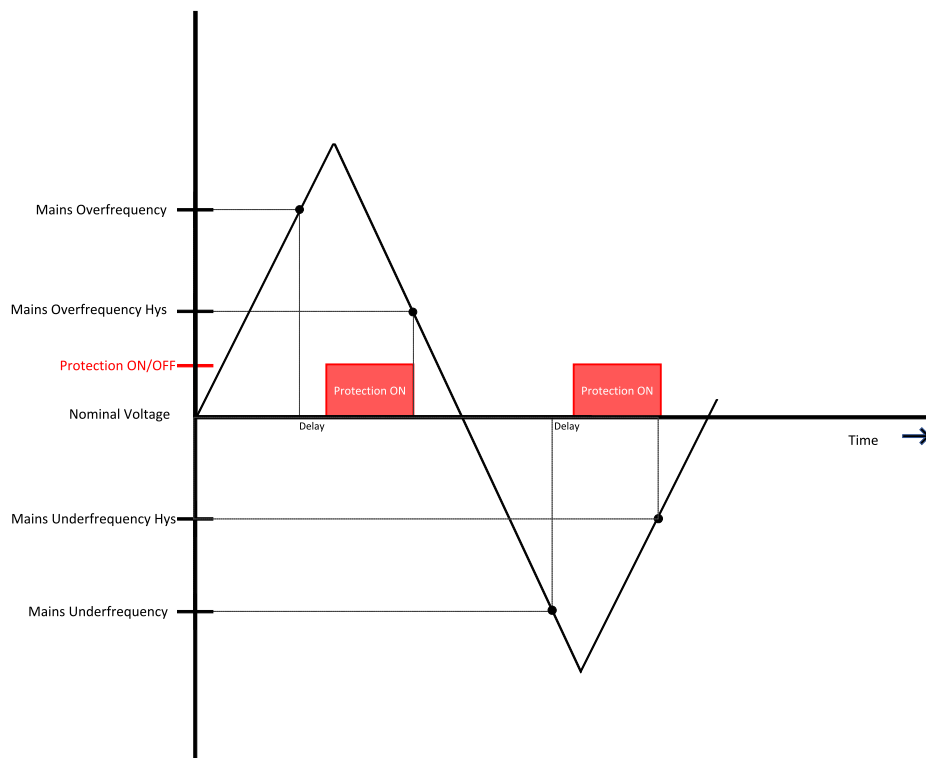
Image 15.7 Source 1 Underfrequency Hys

🔺 **back to List of setpoints**

Source 1 < > Frequency Delay

Setpoint group	Source 1	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	0.5 s	Alternative config	NO
Step	0.1 s		
Comm object	20448	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Underfrequency (page 196)** and **Source 1 Overfrequency (page 194)** protection.			

⬤ **back to List of setpoints**

Subgroup: Phase Rotation

Phase Rotation

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Clockwise / CounterCCW [-]		
Default value	Clockwise	Alternative config	NO
Step	[-]		
Comm object	15122	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint adjust the phase sequence of voltage terminals.			

⬤ **back to List of setpoints**

Phase Rotation Protection

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	19709	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

This setpoint enables or disables Phase Rotation Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoint **Phase Rotation (page 221)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI PROTECTION FORCE DISABLE (PAGE 350).

⬢ **back to List of setpoints**

Group: Source 2

Subgroup: Source 2 settings

S2CB Close Delay

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	0.0 .. 60.0 [s]		
Default value	5.0 s	Alternative config	NO
Step	0.1 s		
Comm object	20352	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Delay after Source 2 returns to S2CB closing when return to Source 1 is not finished.

When the controller restarts and conditions for closing of S2CB are fulfilled (S1 not healthy, S2 healthy), the closing is done after *S2CB Close Delay*.

⬢ **back to List of setpoints**

Start Time

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	**Minimal Stabilization Time (page 202) .. 600 [s]**		
Default value	20 s	Alternative config	NO
Step	1		
Comm object	20329	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
The timer starts when LBO GEN START/STOP (PAGE 368) is active. When engine doesn't reach defined limits for Frequency and Voltage and LBI SOURCE 2 READY TO LOAD (PAGE 356) =0 (if configured), **BOS Start Fail (page 416)** alarm is issued and LBO GEN START/STOP (PAGE 368) is deactivated.			

🔺 **back to List of setpoints**

Stop Time

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	0 .. 3600 [s]		
Default value	60 s	Alternative config	NO
Step	1 s		
Comm object	9815	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
The timer is triggered when LBO GEN START/STOP (PAGE 368) is deactivated. If the engine is still running (generator voltage V(L1,2,3-N) is > 10 V or voltage V(L1,2,3-L1,2,3) is > 17 V or LBI SOURCE 2 READY TO LOAD (PAGE 356) =1 (if configured) after the stop time expires the **Wrn Stop Fail (page 407)** alarm is issued			

🔺 **back to List of setpoints**

Cooling Time

Setpoint group	Engine settings	Related FW	1.2.0
Range [units]	0 .. 300 [s]		
Default value	0 s	Alternative config	NO
Step	1 s		
Comm object	8258	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Cooling Time defines the period when LBO GEN START/STOP (PAGE 368) is still active before stop of the engine is required.

Reasons of the engine to stop:

> AUTO mode situations (S1Fail->S1OK...), MAN mode Stop Button

> When Cooling Time has elapsed Stop Time starts.

In MAN mode

> pressing Stop Button second time the timer Cooling Time is abandoned and starts Stop Time.

> pressing Start Button during Cooling Time the timer Cooling Time is abandoned and engine continues to run.

⏶ **back to List of setpoints**

Minimal Stabilization Time

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	1 .. 300 [s]		
Default value	5 s	Alternative config	NO
Step	1 s		
Comm object	8259	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

Minimal time triggered in starting period during which the conditions for closing S2CB breaker have to be continuously fulfilled. (For more information about conditions **see Evaluation of sources on page 82**.)

Note: In a case that the counting is terminated but the Start Time (page 200) is not finished, the counting starts again.
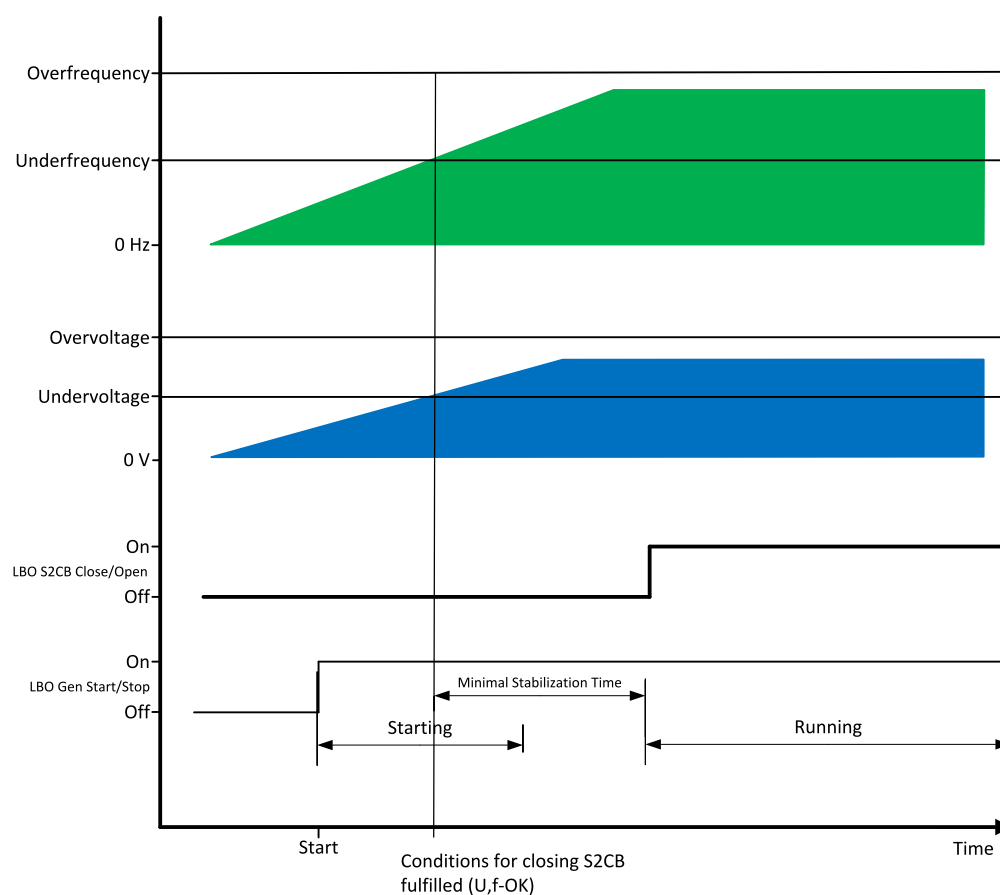
Image 15.8 Minimal Stabilization Time

⬥ **back to List of setpoints**

Run Only Block Delay

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	5.0 s	Alternative config	NO
Step	0.1 s		
Comm object	10023	Related applications	Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

If any protection is configured with blocking condition "Run Only Block" this setpoint influences the blocking condition. The protection blocking is based on the operating state of the engine automat. Once the engine automat reaches the state "Running" the protection with this blocking condition gets unblocked after delay Run Only Block Delay.

🔺 **back to List of setpoints**

S2CB Opens On

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	S2 Fail / S1 OK [-]		
Default value	S1 OK	Alternative config	NO
Step	-		
Comm object	20351	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Always		
Description			

Setpoint adjusts the behavior of opening S2CB in AUTO mode when there is source 2 fail.

S2 Fail	The command to open the S2CB is given immediately after Source 2 fail condition is evaluated. If the 2 will return into parameters after S2CB was opened and before S1CB is closed, timer S2 Close Delay is applied before S2CB closing.
S1 OK	S2CB will be opened when Source 1 is operational (voltage and frequency is OK).

🔺 **back to List of setpoints**

Source 2 Measurement

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED [-]	Alternative config	NO
Step	[-]		
Comm object	17011	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

Enables / Disables Source 2 Measurement.

ENABLED	Source 2 evaluation (S2 is OK or S2 is NOK) is based on frequency and voltages and on user protections and on the LBI SOURCE 2 READY TO LOAD (PAGE 356) – if it is configured .
DISABLED	Source 2 evaluation (S2 is OK or S2 is NOK) is based only on the LBI SOURCE 2 READY TO LOAD (PAGE 356) which has to be configured.

🔺 **back to List of setpoints**

Genset Stop Fail

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	Enabled / Disabled [-]		
Default value	Disabled [-]	Alternative config	NO
Step	[-]		
Comm object	12377	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

Enables / Disables the evaluation of the alarm **Wrn Stop Fail (page 407)**.

Enabled	The alarm **Wrn Stop Fail (page 407)** is evaluated
Disabled	The alarm **Wrn Stop Fail (page 407)** is not evaluated. When this option is selected the Auto Mode accepts the external start of the Gen-set.

🔺 **back to List of setpoints**

Subgroup: Voltage Protection

Source 2 Overvoltage

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100 .. 150 [%]		
Default value	110 %	**Alternative config**	NO
Step	1 %		
Comm object	20469	**Related applications**	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold for Source 2 overvoltage. All three phases are checked. Maximum out of three is used.			

🔺 **back to List of setpoints**

Source 2 Overvoltage BOS

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100 .. 150 [%]		
Default value	100 %	**Alternative config**	NO
Step	1 %		
Comm object	20469	**Related applications**	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 overvoltage protection. All three phases are checked. Maximum out of three is used. *Note: Phase to phase and phase to neutral voltages are used for this protection.*			

🔺 **back to List of setpoints**

Source 2 Overvoltage Wrn

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100 .. 150 [%]		
Default value	110 %	Alternative config	NO
Step	1 %		
Comm object	20467	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 overvoltage protection. All three phases are checked. Maximum out of three is used.			
Note: Phase to phase and phase to neutral voltages are used for this protection.			

⬤ **back to List of setpoints**

Source 2 Overvoltage Hys

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100 .. **Source 2 Overvoltage (page 205)** [%]		
Default value	100 %	Alternative config	NO
Step	1 %		
Comm object	20465	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold defines the level of turning off Source 2 overvoltage protection. Image 15.9 Source 2 Overvoltage Hys			
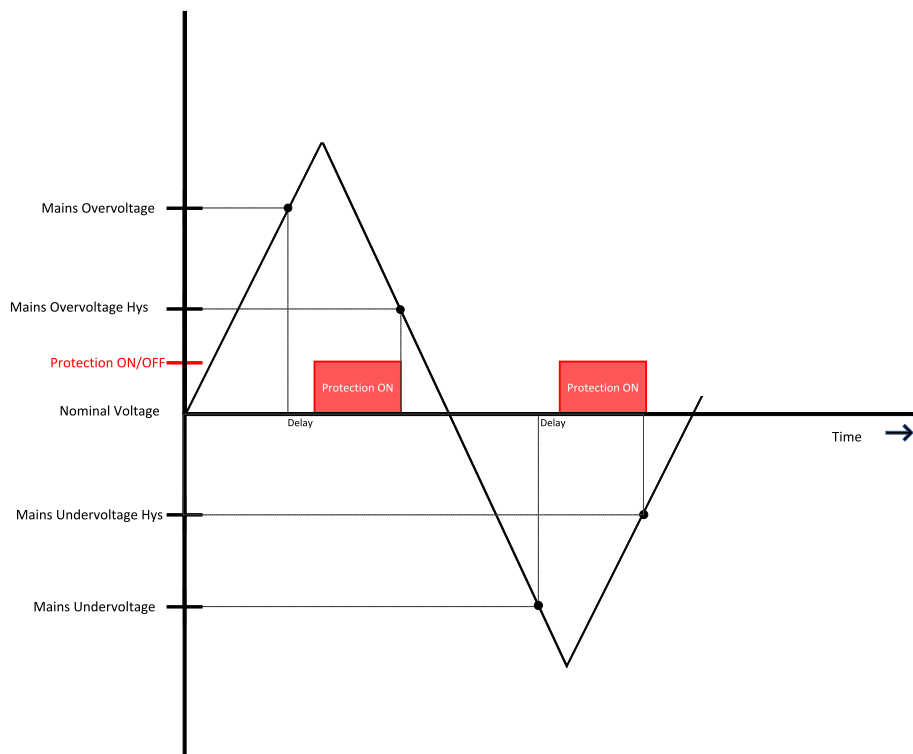
⏶ **back to List of setpoints**

Source 2 Undervoltage

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	50 .. 100 [%]		
Default value	60 %	Alternative config	NO
Step	1 %		
Comm object	20468	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold for Source 2 undervoltage. All three phases are checked. Minimum voltage out of three phases is used.			

🔺 **back to List of setpoints**

Source 2 Undervoltage BOS

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100 .. 150 [%]		
Default value	100 %	Alternative config	NO
Step	1 %		
Comm object	20468	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 undervoltage protection. All three phases are checked. Minimum out of three is used. *Note: Phase to phase and phase to neutral voltages are used for this protection.*			

🔺 **back to List of setpoints**

Source 2 Undervoltage Wrn

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	50 .. 100 [%]		
Default value	60 %	Alternative config	NO
Step	1 %		
Comm object	20466	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 undervoltage protection. All three phases are checked. Minimum out of three is used.			
Note: Phase to phase and phase to neutral voltages are used for this protection.			

⏶ **back to List of setpoints**

Source 2 Undervoltage Hys

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	**Source 2 Undervoltage (page 208)** .. 100 [%]		
Default value	100 %	Alternative config	NO
Step	1 %		
Comm object	20464	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold defines the level of turning off Source 2 undervoltage protection.			
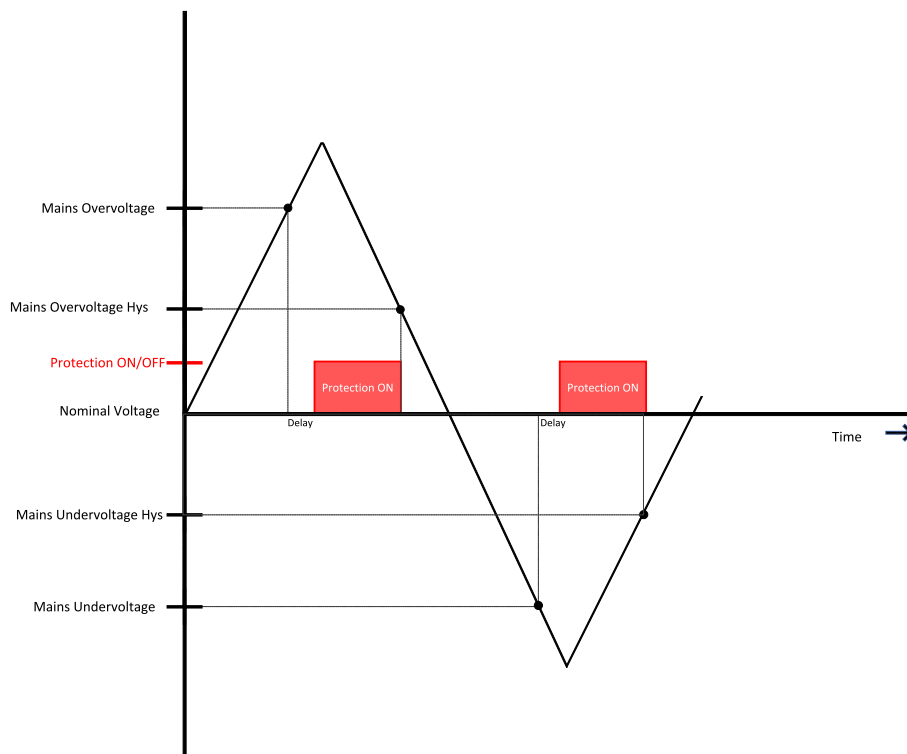
Image 15.10 Source 2 Undervoltage Hys

🔺 **back to List of setpoints**

Source 2 < > Voltage Delay

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	Alternative config	NO
Step	0.1 s		
Comm object	20463	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for voltage protections.			

Mains-Mains application	Mains-Gen application	
MP2 Source 2 L1 Overvoltage (page 424)	Wrn Source 2 L1 Overvoltage (page 409)	BOS Source 2 L1 Overvoltage (page 429)
MP2 Source 2 L1 Undervoltage (page 424)	Wrn Source 2 L1 Undervoltage (page 411)	BOS Source 2 L1 Undervoltage (page 429)
MP2 Source 2 L1L2 Overvoltage (page 425)	Wrn Source 2 L1L2 Overvoltage (page 410)	BOS Source 2 L1L2 Overvoltage (page 429)
MP2 Source 2 L1L2 Undervoltage (page 425)	Wrn Source 2 L1L2 Undervoltage (page 411)	BOS Source 2 L1L2 Undervoltage (page 430)
MP2 Source 2 L2 Overvoltage (page 425)	Wrn Source 2 L2 Overvoltage (page 409)	BOS Source 2 L2 Overvoltage (page 430)
MP2 Source 2 L2 Undervoltage (page 426)	Wrn Source 2 L2 Undervoltage (page 411)	BOS Source 2 L2 Undervoltage (page 430)
MP2 Source 2 L2L3 Overvoltage (page 426)	Wrn Source 2 L2L3 Overvoltage (page 410)	BOS Source 2 L2L3 Overvoltage (page 430)
MP2 Source 2 L2L3 Undervoltage (page 426)	Wrn Source 2 L2L3 Undervoltage (page 412)	BOS Source 2 L2L3 Undervoltage (page 431)
MP2 Source 2 L3 Overvoltage (page 426)	Wrn Source 2 L3 Overvoltage (page 410)	BOS Source 2 L3 Overvoltage (page 431)
MP2 Source 2 L3 Overvoltage (page 427)	Wrn Source 2 L3 Undervoltage (page 411)	BOS Source 2 L3 Overvoltage (page 431)
MP2 Source 2 L3L1 Overvoltage (page 427)	Wrn Source 2 L3L1 Overvoltage (page 410)	BOS Source 2 L3L1 Overvoltage (page 432)
MP2 Source 2 L3L1 Undervoltage (page 427)	Wrn Source 2 L3L1 Undervoltage (page 412)	BOS Source 2 L3L1 Undervoltage (page 432)

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Source 2 Voltage Unbalance

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	1 .. 150 [%] of **Nominal Voltage Ph-Ph (page 168)** or **Nominal Voltage Ph-N (page 168)**		
Default value	10 %	Alternative config	NO
Step	1 %		
Comm object	20432	Related applications	Mains-Mains
Config level	Advanced		
Setpoint visibility	Always		
Description			
Threshold for Source 2 voltage unbalance.			

⬣ **back to List of setpoints**

Source 2 Voltage Unbalance BOS

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	1 .. 150 [%] of **Nominal Voltage Ph-Ph (page 168)** or **Nominal Voltage Ph-N (page 168)**		
Default value	10 %	Alternative config	NO
Step	1 %		
Comm object	20432	Related applications	Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Threshold for Source 2 voltage unbalance BOS.			

⬣ **back to List of setpoints**

Source 2 Voltage Unbalance Delay

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	Alternative config	NO
Step	0.1 s		
Comm object	20431	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Delay for **Source 2 Voltage Unbalance (page 212)** protection.			

⬣ **back to List of setpoints**

Subgroup: Frequency Protection

Source 2 Overfrequency

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20437	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold for Source 2 overfrequency.			

⏶ **back to List of setpoints**

Source 2 Overfrequency BOS

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20437	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 overfrequency.			

⏶ **back to List of setpoints**

Source 2 Overfrequency Hys

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100.0 .. **Source 2 Overfrequency (page 213)** [%]		
Default value	102.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20435	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold defines the level of turning off Source 2 overfrequency protection. Image 15.11 Source 2 Overfrequency Hys			
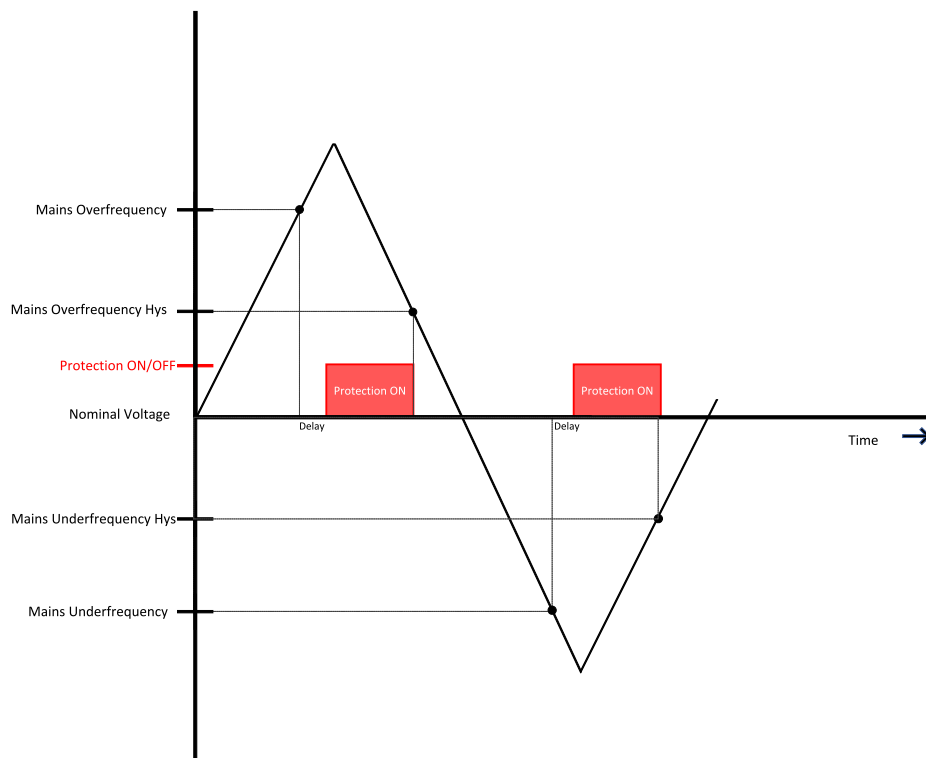
Source 2 Underfrequency

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20436	Related applications	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold for Source 2 underfrequency.			

⬤ **back to List of setpoints**

Source 2 Underfrequency BOS

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20436	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 underfrequency.			

⬤ **back to List of setpoints**

Source 2 Underfrequency Hys

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	**Source 2 Underfrequency (page 215) .. 100.0 [%]**		
Default value	100.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20434	**Related applications**	Mains-Mains
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold defines the level of turning off Source 2 underfrequency protection. Image 15.12 Source 2 Underfrequency Hys			
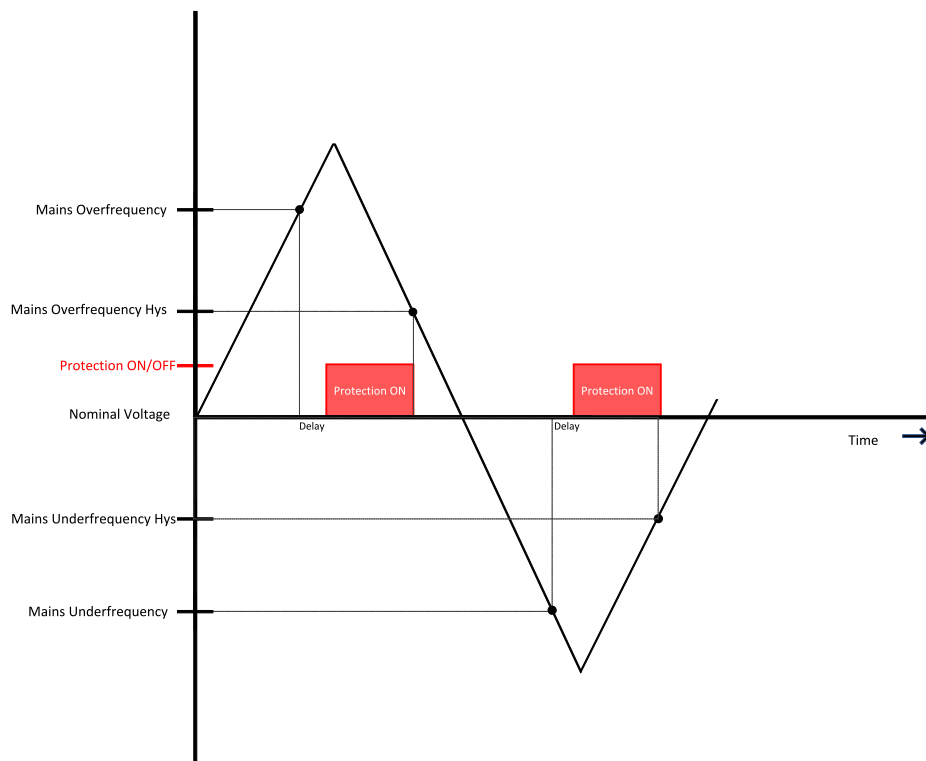
⬢ **back to List of setpoints**

Source 2 Overfrequency Wrn

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20439	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 overfrequency.			

⏶ **back to List of setpoints**

Source 2 Underfrequency Wrn

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	Alternative config	NO
Step	0.1 %		
Comm object	20438	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 underfrequency.			

⏶ **back to List of setpoints**

Source 2 <> Frequency Delay

Setpoint group	Source 2	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	0.5 s	Alternative config	NO
Step	0.1 s		
Comm object	20433	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for frequency protections.			

Mains-Mains application	Mains-Gen application	
MP2 Source 2 Overfrequency (page 427)	**Wrn Source 2 Overfrequency (page 412)**	**BOS Source 2 Overfrequency (page 433)**
MP2 Source 2 Underfrequency (page 428)	**Wrn Source 2 Uderfrequency (page 413)**	**BOS Source 2 Underfrequency (page 433)**

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Subgroup: Overload Protection

Overload BOS

Setpoint group	Load	Related FW	1.2.0
Range [units]	**Overload Wrn (page 219)** .. 200 [%]		
Default value	120 %	Alternative config	NO
Step	1 % of **Nominal Power (page 165)**		
Comm object	20412	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold level for overload of Source 2 (in % of Nominal power) protection.			

🔺 **back to List of setpoints**

Overload Wrn

Setpoint group	Load	Related FW	1.2.0
Range [units]	0 .. **Overload BOS (page 218)** [%]		
Default value	120 %	Alternative config	NO
Step	1 % of **Nominal Power (page 165)**		
Comm object	20411	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold level for overload of Source 2 (in % of **Nominal Power (page 165)**) protection. This is only warning.			

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Overload Delay

Setpoint group	Load	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	5.0 s	Alternative config	NO
Step	0.1 s		
Comm object	20410	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Delay for protections **Overload BOS (page 218)** and **Overload Wrn (page 219)**.			

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Subgroup: Current protection

Short Circuit BOS

Setpoint group	Load	Related FW	1.2.0
Range [units]	100 .. 500 [%]		
Default value	250 %	Alternative config	NO
Step	1 %		
Comm object	20416	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Protection occurs when generator current reaches this preset threshold. Type of the protection is BOS.			

🔺 **back to List of setpoints**

Short Circuit Delay

Setpoint group	Load	Related FW	1.2.0
Range [units]	0.00 .. 10.00 [s]		
Default value	0.04 s	Alternative config	NO
Step	0.01		
Comm object	9991	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Delay for **Short Circuit BOS (page 219)** protection.			

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IDMT Overcurrent Delay

Setpoint group	Load	Related FW	1.2.0
Range [units]	1.0 .. 600.0 [s]		
Default value	4.0 s	Alternative config	NO
Step	0.1		
Comm object	20417	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
IDMT curve shape selection. IDMT is "very inverse" over current protection. Reaction time is not constant but depends on over current level. *Note: Reaction time is limited to 3600 s = 60 minutes. IDMT protection is not active for Reaction time values longer than 60 minutes.* I_{gen} is maximal value of all measured phases of generator current.			

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Current Unbalance BOS

Setpoint group	Load	Related FW	1.2.0
Range [units]	1 .. 200 [%]		
Default value	50 %	Alternative config	NO
Step	1 %		
Comm object	20415	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for generator current asymmetry (unbalance). Protection is BOS.			

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Current Unbalance Delay

Setpoint group	Load	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	5.0 s	Alternative config	NO
Step	0.1 s		
Comm object	20414	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Delay for **Current Unbalance BOS (page 221)** protection.			

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Subgroup: Phase Rotation

Phase Rotation

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Clockwise / CounterCCW [-]		
Default value	Clockwise	Alternative config	NO
Step	[-]		
Comm object	15122	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint adjust the phase sequence of voltage terminals.			

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Phase Rotation Protection

Setpoint group	Basic settings	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	19709	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

This setpoint enables or disables Phase Rotation Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoint **Phase Rotation (page 221)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI Protection Force Disable (page 350).

Group: Source 2 Protections

Subgroup: Voltage protection

Source 2 < > Voltage Protection

Setpoint group	Source 2 Protections	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	-		
Comm object	15668	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

This setpoint enables or disables Source 2 < > Voltage Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Source 2 < > Voltage Delay (page 211)**, **Source 2 Overvoltage (page 205)**, **Source 2 Undervoltage (page 208)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI Protection Force Disable (page 350).

Voltage Unbalance Protection

Setpoint group	Source 2 Protections	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	-		
Comm object	15669	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

This setpoint enables or disables Voltage Unbalance Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Source 2 Voltage Unbalance (page 212)**, **Source 2 Voltage Unbalance Delay (page 212)**, **Source 2 Undervoltage (page 208)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI PROTECTION FORCE DISABLE (PAGE 350).

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Subgroup: Frequency protection

Source 2 Frequency Protection

Setpoint group	Source 2 Protections	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	-		
Comm object	15670	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

This setpoint enables or disables Source 2 Frequency Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Source 2 Overfrequency (page 213)**, **Source 2 Underfrequency (page 215)**, **Source 2 <> Frequency Delay (page 218)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI PROTECTION FORCE DISABLE (PAGE 350).

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Subgroup: Overload protection

Overload Protection

Setpoint group	Source 2 Protections	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	-		
Comm object	15664	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

This setpoint enables or disables Overload Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Overload BOS (page 218)**, **Overload Wrn (page 219)**, **Overload Delay (page 219)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI PROTECTION FORCE DISABLE (PAGE 350).

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Subgroup: Current protection

IDMT Overcurrent Protection

Setpoint group	Source 2 Protections	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	-		
Comm object	15666	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

This setpoint enables or disables IDMT Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **IDMT Overcurrent Delay (page 220)**, **Current Unbalance BOS (page 221)**, **Current Unbalance Delay (page 221)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI PROTECTION FORCE DISABLE (PAGE 350).

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Current Unbalance Protection

Setpoint group	Source 2 Protections	Related FW	1.2.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	Alternative config	NO
Step	-		
Comm object	15667	Related applications	Mains-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

This setpoint enables or disables Current Unbalance Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Current Unbalance BOS (page 221)**, **Current Unbalance Delay (page 221)**, **IDMT Overcurrent Delay (page 220)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI PROTECTION FORCE DISABLE (PAGE 350).

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Group: Load Shedding

Load Shedding Active

Setpoint group	Load Shedding	**Related FW**	1.2.0
Range [units]	Disabled / Source 2 / Source 1 / All the time [-]		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	11001	**Related applications**	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			

This setpoint enables or disables the load shedding function. In addition it offers options to select with which power source the function is enabled. Load shedding is controlled disconnection of less important load groups when the load power consumption is close to the **Nominal Power (page 165)**.

Load shedding outputs are activated one by one once the **Load P (page 316)** exceeds the **Load Shedding Level (page 227)** with the delay given by setpoint **Load Shedding Delay (page 227)**.

Load shedding outputs are deactivated one by one if the **Load P (page 316)** is lower than **Load Reconnection Level (page 228)** with the delay given by setpoint **Load Reconnection Delay (page 228)**.

Disabled	The Load shedding function is disabled. All the outputs are open.
Source 2	The function is active when Source 2 supplies the load. Once the S2CB breaker is closed all configured load shedding stages outputs are activated.
	They are deactivated one by one if the Load P is lower than **Load Reconnection Level (page 228)** with the delay given by setpoint **Load Reconnection Delay (page 228)**.
Source 1	The function is active when Source 1 supplies the load.
All the time	The function is active all the time. No matter from which source the load is supplied.

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Load Shedding Level

Setpoint group	Load Shedding	Related FW	1.2.0
Range [units]	Load Reconnection Level .. 200 [%] of **Nominal Power (page 165)**		
Default value	80 %	Alternative config	NO
Step	1 %		
Comm object	8884	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Visible only if **Load Shedding Active (page 226)** is enabled		
Description			
This setpoint is used to activate the next Load shedding stage.When **Load P (page 316)** exceeds this level for more than **Load Shedding Delay (page 227)** time			

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Load Shedding Delay

Setpoint group	Load Shedding	Related FW	1.2.0
Range [units]	0.0 .. 600.0 [s]		
Default value	10 s	Alternative config	NO
Step	0.1 s		
Comm object	8887	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Visible only if **Load Shedding Active (page 226)** is enabled		
Description			
This setpoint is used to proceeds the next Load shedding stage. When **Load P (page 316)** exceeds **Load Shedding Level (page 227)** for more than this delay's time, the controller proceeds to the next Load shedding stage – the next binary output Load Shedding Stage 1-2 is active.			

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Subgroup: Load Reconnection Settings

Load Reconnection Level

Setpoint group	Load Shedding	Related FW	1.2.0
Range [units]	0 .. **Load Shedding Level (page 227)** [%]		
Default value	20 %	Alternative config	NO
Step	1 %		
Comm object	8890	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Visible only if **Load Shedding Active (page 226)** is enabled		
Description			
This setpoint is used to proceed to the lower load shedding stage when the **Load P (page 316)** drops below this level for more than **Load Reconnection Delay (page 228)**.			

⬤ **back to List of setpoints**

Load Reconnection Delay

Setpoint group	Load Shedding	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	10 s	Alternative config	NO
Step	1 s		
Comm object	8893	Related applications	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Visible only if **Load Shedding Active (page 226)** is enabled		
Description			
This setpoint is used to proceeds the lower Load shedding stage. When **Load P (page 316)** drops under **Load Reconnection Level (page 228)** for more than this delay time, the binary output for higher stage is opened. Automatic load reconnection works only when **Auto Load Reconnection (page 229)** = Enabled.			

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Auto Load Reconnection

Setpoint group	Load Shedding	Related FW	1.2.0
Range [units]	Disabled / Enabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	9649	**Related applications**	Mains-Mains, Mains-Gen
Config level	Advanced		
Setpoint visibility	Visible only if **Load Shedding Active (page 226)** is enabled		
Description			

Switch between manual and automatic reconnection of shedded load..

Disabled	Rising edge on binary input MANUAL LOAD RECONNECTION (PAGE 350) resets controller to the lower stage, but only if the load is under the **Load Reconnection Level (page 228)**. **Load Reconnection Delay (page 228)** is not taken into account in this case.
Enabled	Load reconnection is automatic depend on setpoints **Load Reconnection Level (page 228)** and **Load Reconnection Delay (page 228)**. Binary input MANUAL LOAD RECONNECTION (PAGE 350) has no function.

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Group: User Buttons

User Button 1

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20826	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 1 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 1 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 1 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 2

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20827	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 2 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 2 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 2 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 3

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20828	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 3 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 3 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 3 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 4

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20829	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 4 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 4 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 5 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 5

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20830	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 5 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 5 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 5 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 6

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20831	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 6 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 6 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 6 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 7

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20832	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 7 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 7 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 7 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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User Button 8

Setpoint group	User Buttons	Related FW	1.2.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	Alternative config	NO
Step	-		
Comm object	20833	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

User button is a binary signal which value can be set by its setpoint or by remote connection (WebSupervisor or by third party device(Modbus).

Option	Description
COMMAND	The LBO User Button 8 is controlled by command from WebSupervisor or third party device.
MAN OFF	The LBO User Button 8 is controlled manually via the setpoint, value of the user button is still 0.
MAN ON	The LBO User Button 8 is controlled manually via the setpoint, value of the user button is still 1. *Note: You should always switch from MAN ON to MAN OFF before switching to COMMAND, otherwise value of the LBO User Button will be 1 until command is received.*

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Group: Analog Switches

Subgroup: Analog Switches 1

AIN Switch01On

Setpoint group	Analog Switches	Related FW	1.2.0
Range [units]	the range is defined by an analog sensor curve		
Default value	the value is defined by an analog sensor curve	Alternative config	NO
Step	the step is defined by an analog sensor curve		
Comm object	11407	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output AIN SWITCH01 (PAGE 361) is configured		
Description			

Threshold level for switching the binary output **AIN SWITCH01 (PAGE 361)** on. The value is measured from **AIN SWITCH 01 (PAGE 385)** analog input.
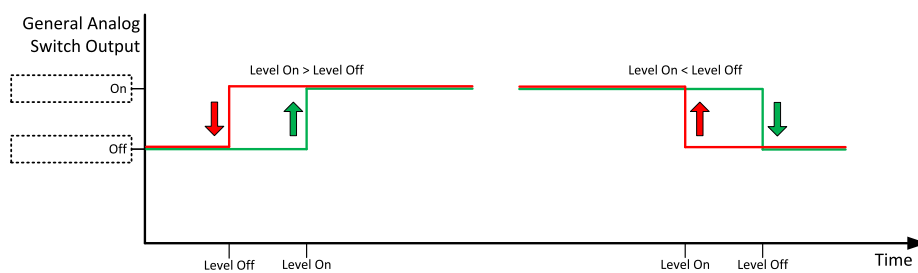
Image 15.13 General analog input 1 switch

🔺 **back to List of setpoints**

AIN Switch01 Off

Setpoint group	Analog Switches	Related FW	1.2.0
Range [units]	the range is defined by an analog sensor curve		
Default value	the value is defined by an analog sensor curve	Alternative config	NO
Step	the step is defined by an analog sensor curve		
Comm object	11410	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN SWITCH01 (PAGE 361)** is configured		
Description			

Threshold level for switching the binary output **AIN SWITCH01 (PAGE 361)** off. The value is measured from **AIN SWITCH 01 (PAGE 385)** analog input.

Image 15.14 General analog input 1 switch

🔺 **back to List of setpoints**

Subgroup: Analog Switches 2

AIN Switch02 On

Setpoint group	Analog Switches	Related FW	1.2.0
Range [units]	the range is defined by an analog sensor curve		
Default value	the value is defined by an analog sensor curve	Alternative config	NO
Step	the step is defined by an analog sensor curve		
Comm object	11408	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN Switch02 (page 361)** is configured		
Description			

Threshold level for switching the binary output **AIN Switch02 (page 361)** on. The value is measured from **AIN Switch 02 (page 385)** analog input.

Image 15.15 General analog input 2 switch

⊙ **back to List of setpoints**

AIN Switch02 Off

Setpoint group	Analog Switches	Related FW	1.2.0
Range [units]	the range is defined by an analog sensor curve		
Default value	the value is defined by an analog sensor curve	Alternative config	NO
Step	the step is defined by an analog sensor curve		
Comm object	11411	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN SWITCH02 (PAGE 361)** is configured		
Description			
Threshold level for switching the binary output **AIN SWITCH02 (PAGE 361)** off. The value is measured from **AIN SWITCH 02 (PAGE 385)** analog input.			

Image 15.16 General analog input 2 switch

🔺 **back to List of setpoints**

Group: Scheduler

Subgroup: Time & Date

Time

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	HH:MM:SS [-]		
Default value	00:00:00	Alternative config	NO
Step	[-]		
Comm object	24554	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Real time clock adjustment.			
Note: RTC has backup battery.			

🔺 **back to List of setpoints**

Date

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	DD/MM/YYYY [-]		
Default value	1.1.2015	Alternative config	NO
Step	[-]		
Comm object	24553	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual date adjustment.			

⬆ **back to List of setpoints**

Time Stamp Period

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	0 .. 240 [min]		
Default value	60 min	Alternative config	NO
Step	1 min		
Comm object	8979	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Time interval for periodic history records.			
Note: History record is made only when engine is running.			

⬆ **back to List of setpoints**

Time Zone

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.2.0
Range [units]	GMT-12:00 .. GMT+13:00 [hours]		
Default value	GMT+1:00 hour	**Alternative config**	NO
Step	[-]		
Comm object	24366	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint is used to select the time zone where the controller is located. See your computer time zone setting (click on the time indicator located in the rightmost position of the Windows task bar) if you are not sure about your time zone.

> *Note: If the time zone is not selected properly the active e-mails may contain incorrect information about sending time, which may result in confusion when the respective problem actually occurred.*

🔺 **back to List of setpoints**

DST Switching Mode

Setpoint group	Scheduler	**Related FW**	1.2.0
Range [units]	Disabled / Auto / Manual		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	20250	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

This setpoints is used to enable or disable daylight saving time.

> **AUTO** – activation / deactivation of the DST, and changing of the RTC Time value accordingly is performed automatically by the controller. The user always sees valid local time without any action from his side.

> **MANUAL** – activation, and deactivation of the DST is performed manually by the user via the setpoint Time mode. Changing of the RTC Time value accordingly is then performed automatically by the controller. So the user does not need to readjust the RTC time, he only needs to select the proper **Time Mode (page 244)**.

> **DISABLED** – Time mode is fixedly set to STD and the function does not perform any changes of RTC time.

🔺 **back to List of setpoints**

Time Mode

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	STD / DST		
Default value	STD	Alternative config	NO
Step	[-]		
Comm object	20249	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
In manual **DST Switching Mode (page 243)** this input is used to adjust the actual time mode. If DST Switching Mode is set to any other option, this input is not taken into account.			

⬆ **back to List of setpoints**

DST Period Rule

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Australia / Chile / Europe / Mexico / New Zealand / Paraguay / US/Canada		
Default value	Europe	Alternative config	NO
Step	[-]		
Comm object	20251	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Selection of the rule that will be applied for the calculation of the DST validity period.			

⬆ **back to List of setpoints**

Subgroup: Timer 1

Timer 1 Function

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Disable / No Func / Mode OFF / Manual On / Rem Start/Stop / S1 FailBlock [-]		
Default value	Disable	Alternative config	NO
Step	[-]		
Comm object	15358	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

It is possible to choose from following timer functions. Binary output EXERCISE TIMER 1 (PAGE 366) is always activated when Timer is active regardless of chosen timer function. Timer functions require controller running in AUTO mode.

Timer 1 has higher priority over Timer 2. So if **Timer 1 Function (page 245)** is configured for OFF mode and **Timer 2 Function (page 253)** is over the same time configured for AUTO mode, controller will work in OFF mode.

Controller activates timer whenever it is powered up even in period, where timer should be already running.

Disable	The Timer is disabled.
Manual On	When this option is selected LBO EXERCISE TIMER 1 (PAGE 366) is activated in all controller modes (OFF,MAN,AUTO)
No Func	There is no any other function, only binary output of timer is activated.
Mode OFF	When this option is chosen then the binary output of timer is internally connected to the Remote OFF binary input.
Rem Start/Stop	When this option is chosen then the binary output of timer is internally connected to REMOTE START/STOP (PAGE 353) binary input.
S1 Fail Block	When this option is chosen then the binary output of timer is internally connected to the S1 FAIL BLOCK (PAGE 354) binary input.
Transfer To S2	When this option is chosen then the binary output of timer is internally connected to TRANSFER TO S2 (PAGE 358) binary input.

⬢ **back to List of setpoints**

Timer 1 Setup

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	10969	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Related setpoints for timer 1 are:			

> **Timer 1 Function (page 245)**

🔺 **back to List of setpoints**

Timer 1 Repetition

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Off / Once / Repeated [-]		
Default value	Off	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			

Defines repetition of **Timer 1 Function (page 245)**.

Off	**Timer 1 Function (page 245)** will not be activated.
Once	**Timer 1 Function (page 245)** will be activated only one time.
Repeated	**Timer 1 Function (page 245)** will be repeatedly activated.

🔺 **back to List of setpoints**

Timer 1 First Occur. Date

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[DD/MM/YYYY]		
Default value	01/01/2000	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			

Date of first occurrence of **Timer 1 Function (page 245)**.

🔺 **back to List of setpoints**

Timer 1 First Occur. Time

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[HH:MM]		
Default value	00:00	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			
Time of first occurrence of **Timer 1 Function (page 245)**.			

⏺ **back to List of setpoints**

Timer 1 Duration

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[HH:MM]		
Default value	00:00	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			
Timer 1 Function (page 245) duration time.			

⏺ **back to List of setpoints**

Timer 1 Repeated

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Daily / Weekly / Monthly / Short Period [-]		
Default value	Daily	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			

Repeated interval of **Timer 1 Function (page 245)**.

Daily	**Timer 1 Function (page 245)** is repeated every day.
Weekly	**Timer 1 Function (page 245)** is repeated every week in chosen days.
Monthly	**Timer 1 Function (page 245)** is repeated in chosen day every month or in chosen days of chosen week of month
Short Period	**Timer 1 Function (page 245)** is repeated in adjusted period.

⏴ **back to List of setpoints**

Timer 1 Repeat Day

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Repeated Day / Repeated Day In Week [-]		
Default value	Repeated Day	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			

Use this setpoint to adjust behavior of monthly repetition of the **Timer 1 Function (page 245)**.

Repeated Day	Chose one day in month when **Timer 1 Function (page 245)** will be activated.
Repeated Day In Week	Chose days in one week when **Timer 1 Function (page 245)** will be activated.

⏴ **back to List of setpoints**

Timer 1 Day

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Monday / Tuesday / Wednesday / Thursday / Friday / Saturday/ Sunday[-]		
Default value	All OFF	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			
Use this setpoint to include or exclude individual days of week. To select the day use Up and Down buttons. To change the value of day use Enter button.			

⬤ **back to List of setpoints**

Timer 1 Repeated Day In Week

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Monday / Tuesday / Wednesday / Thursday / Friday / Saturday/ Sunday[-]		
Default value	All OFF	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			
Use this setpoint to select the day of week when timer will be activated. *Note: More day can be selected. Timer will be activated on the day which happened like the first.*			

⬤ **back to List of setpoints**

Timer 1 Repeat Day In Month

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	1..31 [day]		
Default value	0	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			
Use this setpoint to chose the day in month when the **Timer 1 Function (page 245)** will be activated.			

⬤ **back to List of setpoints**

Timer 1 Repeat Week In Month

Setpoint group	Scheduler	**Related FW**	1.2.0
Range [units]	1 .. 5 [week]		
Default value	1 week	**Alternative config**	NO
Step	1 week		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			
This setpoint adjust the week of month in which the **Timer 1 Function (page 245)** will be activated.			

⬢ **back to List of setpoints**

Timer 1 Refresh Period

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			

Refresh period of **Timer 1 Function (page 245)**. Meaning of this setpoint depends on type of repetition adjusted in **Timer 1 Repeated (page 248)**.

Daily	Range [units]: 1 .. 1000 [day]. This setpoint adjust that every X day the timer will be activated. **Example:** If you have daily repetition and you set this setpoint to 2, then every second day from first occurrence of **Timer 1 Function (page 245)**, the **Timer 1 Function (page 245)** will be activated.
Weekly	Range [units]: 1 .. 60 [week]. This setpoint adjust that every X week the timer will be activated. **Example:** If you have weekly repetition and you set this setpoint to 2, then every second week from first occurrence of **Timer 1 Function (page 245)**, the **Timer 1 Function (page 245)** will be activated in selected days adjusted by **Timer 1 Day (page 249)**.
Monthly	Range [units]: 1 .. 12 [month]. This setpoint adjust that every X month the timer will be activated. **Example:** If you have monthly repetition and you set this setpoint to 2, then every second month from first occurrence of **Timer 1 Function (page 245)**, the **Timer 1 Function (page 245)** will be activated in selected day of month adjusted by **Timer 1 Repeat Day In Month (page 249)** or in selected days of week of month adjusted by **Timer 1 Day (page 249)** and **Timer 1 Repeat Week In Month (page 250)**.
Short Period	Range [units]: [HH:MM]. This setpoint adjust that every X short period the timer will be activated. **Example:** If you have short period repetition and you set this setpoint to 2, then every second minute from first occurrence of **Timer 1 Function (page 245)**, the **Timer 1 Function (page 245)** will be activated.

Timer 1 Weekends

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Including / Skip / Postpone [-]		
Default value	Including	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 245)**		
Description			

Behavior of **Timer 1 Function (page 245)** on weekends.

Including	**Timer 1 Function (page 245)** counter is running on the weekends and **Timer 1 Function (page 245)** can be active.
Skip	**Timer 1 Function (page 245)** counter is running on the weekends but **Timer 1 Function (page 245)** isn't active.
Postpone	**Timer 1 Function (page 245)** counter isn't running on the weekends and **Timer 1 Function (page 245)** isn't active. If the activation of timer is counted on the weekend, than timer will be activated after weekend. Another activation of timer is counted from original date of first occurrence date.

⬢ **back to List of setpoints**

Subgroup: Timer 2

Timer 2 Function

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Disable / No Func / Mode OFF / Manual On / Rem Start/Stop / S1 FailBlock [-]		
Default value	No Func	Alternative config	NO
Step	[-]		
Comm object	15359	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

> *Note: It is possible to choose from following Timer functions. Binary output EXERCISE TIMER 2 (PAGE 367) is always activated when Timer is active regardless of chosen timer function. Timer functions require controller running in AUTO mode.*

Timer 1 has higher priority over Timer 2. So if **Timer 1 Function (page 245)** is configured for OFF mode and **Timer 2 Function (page 253)** is over the same time configured for AUTO mode, controller will work in OFF mode.

Controller activates timer whenever it is powered up even in period, where timer should be already running.

Disable	The Timer is disabled.
Manual On	When this option is selected LBO EXERCISE TIMER 1 (PAGE 366) is activated in all controller modes (OFF,MAN,AUTO)
No Func	There is no any other function, only binary output of timer is activated.
Mode OFF	When this option is chosen then the binary output of timer is internally connected to the Remote OFF binary input.
Rem Start/Stop	When this option is chosen then the binary output of timer is internally connected to REMOTE START/STOP (PAGE 353) binary input.
S1 Fail Block	When this option is chosen then the binary output of timer is internally connected to the S1 FAIL BLOCK (PAGE 354) binary input.
Transfer To S2	When this option is chosen then the binary output of timer is internally connected to TRANSFER TO S2 (PAGE 358) binary input.

⬭ **back to List of setpoints**

Timer 2 Setup

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	10970	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Related setpoints for timer 2 are:			

> **Timer 2 Function (page 253)**

🔺 **back to List of setpoints**

Timer 2 Repetition

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Off / Once / Repeated [-]		
Default value	Off	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			

Defines repetition of **Timer 2 Function (page 253)**.

Off	**Timer 2 Function (page 253)** will not be activated.
Once	**Timer 2 Function (page 253)** will be activated only one time.
Repeated	**Timer 2 Function (page 253)** will be repeatedly activated.

🔺 **back to List of setpoints**

Timer 2 First Occur. Date

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[DD/MM/YYYY]		
Default value	01/01/2000	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			

Date of first occurrence of**Timer 2 Function (page 253)**.

🔺 **back to List of setpoints**

Timer 2 First Occur. Time

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[HH:MM]		
Default value	00:00	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			
Time of first occurrence of **Timer 2 Function (page 253)**.			

⬛ **back to List of setpoints**

Timer 2 Duration

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[HH:MM]		
Default value	00:00	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			
Timer 2 Function (page 253) duration time.			

⬛ **back to List of setpoints**

Timer 2 Repeated

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Daily / Weekly / Monthly / Short Period [-]		
Default value	Daily	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			

Repeated interval of **Timer 2 Function (page 253)**.

Daily	**Timer 2 Function (page 253)** is repeated every day.
Weekly	**Timer 2 Function (page 253)** is repeated every week in chosen days.
Monthly	**Timer 2 Function (page 253)** is repeated in chosen day every month or in chosen days of chosen week of month
Short Period	**Timer 2 Function (page 253)** is repeated in adjusted period.

⬤ **back to List of setpoints**

Timer 2 Repeat Day

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Repeated Day / Repeated Day In Week [-]		
Default value	Repeated Day	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			

Use this setpoint to adjust behavior of monthly repetition of the **Timer 2 Function (page 253)**.

Repeated Day	Chose one day in month when **Timer 2 Function (page 253)** will be activated.
Repeated Day In Week	Chose days in one week when **Timer 2 Function (page 253)** will be activated.

⬤ **back to List of setpoints**

Timer 2 Day

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Monday / Tuesday / Wednesday / Thursday / Friday / Saturday/ Sunday[-]		
Default value	All OFF	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			
Use this setpoint to include or exclude individual days of week. To select the day use Up and Down buttons. To change the value of day use Enter button.			

🔺 **back to List of setpoints**

Timer 2 Repeated Day In Week

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Monday / Tuesday / Wednesday / Thursday / Friday / Saturday/ Sunday[-]		
Default value	All OFF	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			
Use this setpoint to select the day of week when timer will be activated.			
Note: More day can be selected. Timer will be activated on the day which happened like the first.			

🔺 **back to List of setpoints**

Timer 2 Repeat Day In Month

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	1..31 [day]		
Default value	0	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			
Use this setpoint to chose the day in month when the **Timer 2 Function (page 253)** will be activated.			

🔺 **back to List of setpoints**

Timer 2 Repeat Week In Month

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	1 .. 5 [week]		
Default value	1 week	Alternative config	NO
Step	1 week		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			
This setpoint adjust the week of month in which the **Timer 2 Function (page 253)** will be activated.			

⬤ **back to List of setpoints**

Timer 2 Refresh Period

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	[-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			

Refresh period of **Timer 2 Function (page 253)**. Meaning of this setpoint depends on type of repetition adjusted in **Timer 2 Repeated (page 256)**.

Daily	Range [units]: 1 .. 1000 [day]. This setpoint adjust that every X day the timer will be activated. **Example:** If you have daily repetition and you set this setpoint to 2, then every second day from first occurrence of **Timer 2 Function (page 253)**, the **Timer 2 Function (page 253)** will be activated.
Weekly	Range [units]: 1 .. 60 [week]. This setpoint adjust that every X week the timer will be activated. **Example:** If you have weekly repetition and you set this setpoint to 2, then every second week from first occurrence of **Timer 2 Function (page 253)**, the **Timer 2 Function (page 253)** will be activated in selected days adjusted by **Timer 2 Day (page 257)**.
Monthly	Range [units]: 1 .. 12 [month]. This setpoint adjust that every X month the timer will be activated. **Example:** If you have monthly repetition and you set this setpoint to 2, then every second month from first occurrence of **Timer 2 Function (page 253)**, the **Timer 2 Function (page 253)** will be activated in selected day of month adjusted by **Timer 2 Repeat Day In Month (page 257)** or in selected days of week of month adjusted by **Timer 2 Day (page 257)** and **Timer 2 Repeat Week In Month (page 258)**.
Short Period	Range [units]: [HH:MM]. This setpoint adjust that every X short period the timer will be activated. **Example:** If you have short period repetition and you set this setpoint to 2, then every second minute from first occurrence of **Timer 2 Function (page 253)**, the **Timer 2 Function (page 253)** will be activated.

Timer 2 Weekends

Setpoint group	Scheduler	Related FW	1.2.0
Range [units]	Including / Skip / Postpone [-]		
Default value	Including	Alternative config	NO
Step	[-]		
Comm object	0	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 2 Function (page 253)**		
Description			

Behavior of **Timer 2 Function (page 253)** on weekends.

Including	**Timer 2 Function (page 253)** counter is running on the weekends and **Timer 2 Function (page 253)** can be active.
Skip	**Timer 2 Function (page 253)** counter is running on the weekends but **Timer 2 Function (page 253)** isn't active.
Postpone	**Timer 2 Function (page 253)** counter isn't running on the weekends and **Timer 2 Function (page 253)** isn't active. If the activation of timer is counted on the weekend, than timer will be activated after weekend. Another activation of timer is counted from original date of first occurrence date.

⬤ **back to List of setpoints**

Group: Geo-Fencing

Subgroup: Geo Fencing

Geo-Fencing

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	Disabled / Enabled / LBI Enable [-]		
Default value	Disabled	Alternative config	NO
Step	[-]		
Comm object	11681	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint enables or disables geo-fencing function.

Disabled	**Fence 1 Protection (page 263)** and **Fence 2 Protection (page 264)** are disabled.
Enabled	**Fence 1 Protection (page 263)** and **Fence 2 Protection (page 264)** are enabled.
LBI Enable	**Fence 1 Protection (page 263)** and **Fence 2 Protection (page 264)** are enabled only when logical binary input .GEO-FENCING ENABLE (PAGE 349) is active.

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Subgroup: Position

Home Latitude

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	-90,0000..90,0000 [°]		
Default value	0,0000 °	Alternative config	NO
Step	0,0001 °		
Comm object	14606	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint adjust latitude of "home" position. Home is position where gen-set should runs. Positions on north hemisphere have positive value, position on south hemisphere have negative value.

Note: This value with Home Longitude (page 262) are used for counting Fence Radius 1 (page 263) and Fence Radius 2 (page 265).

Note: This value can be also obtained automatically via logical binary input GEO HOME POSITION (PAGE 349). In case of activation of this binary input for at least 2 seconds, setpoint will be adjusted automatically from actual coordinates from GPS signal.

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Home Longitude

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	-180,0000..180,0000 [°]		
Default value	0,0000 °	Alternative config	NO
Step	0,0001 °		
Comm object	14607	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint adjust longitude of "home" position. Home is position where gen-set should runs. Positions on east hemisphere have positive value, position on west hemisphere have negative value.

*Note: This value with **Home Latitude (page 261)** are used for counting **Fence Radius 1 (page 263)** and **Fence Radius 2 (page 265)**.*

Note: This value can be also obtained automatically via logical binary input GEO HOME POSITION (PAGE 349). In case of activation of this binary input for at least 2 seconds, setpoint will be adjusted automatically from actual coordinates from GPS signal.

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Subgroup: Fence 1

Fence 1 Protection

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	HistRecOnl / Wrn / Sd / BOC[-]		
Default value	HistRecOnl	Alternative config	NO
Step	[-]		
Comm object	14610	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Protection type for geo-fencing 1 protection. Fence of circle area is adjusted by setpoint **Fence Radius 1 (page 263)**. Delay for protection is adjusted by setpoint **Fence 1 Delay (page 264)**.

Protection types

HistRecOnl	Position of engine is only measured and displayed on the LCD screen but not used for protection. History record is made if position is out of **Fence Radius 1 (page 263)**.
Wrn	Position of engine is used for warning protection only. Protection is activated when position of the engine is out of **Fence Radius 1 (page 263)**.
BOS	Position of engine is used for BOS (Breaker Open and Stop) protection. Protection is activated when position of the engine is out of **Fence Radius 1 (page 263)**. *Note: Only in Mains-Gen application.*

*Note: Protection is activated also when GPS signal is lost for **Fence 1 Delay (page 264)**.*

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Fence Radius 1

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	0,0..99,9 [km]		
Default value	0,0 km	Alternative config	NO
Step	0,1 km		
Comm object	11677	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Radius for circle area 1. When the Source 2 leaves this area, **Fence 1 Protection (page 263)** is activated after **Fence 1 Delay (page 264)**.

*Note: The center of this circle area is defined by "Home" position – setpoints **Home Longitude (page 262)** and **Home Latitude (page 261)**.*

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Fence 1 Delay

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	0..3600 [s]		
Default value	0 s	Alternative config	NO
Step	1 s		
Comm object	11682	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Delay for **Fence 1 Protection (page 263)**.			

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Subgroup: Fence 2

Fence 2 Protection

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	HistRecOnl / Wrn / Sd / BOC[-]		
Default value	HistRecOnl	Alternative config	NO
Step	[-]		
Comm object	14611	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Protection type for geo-fencing 2 protection. Fence of circle area is adjusted by setpoint **Fence Radius 2 (page 265)**. Delay for protection is adjusted by setpoint **Fence 2 Delay (page 265)**.

Protection types

HistRecOnl	Position of engine is only measured and displayed on the LCD screen but not used for protection. History record is made if position is out of **Fence Radius 2 (page 265)**.
Wrn	Position of engine is used for warning protection only. Protection is activated when position of the engine is out of **Fence Radius 2 (page 265)**.
BOS	Position of engine is used for BOS (Breaker Open and Stop) protection. Protection is activated when position of the engine is out of **Fence Radius 2 (page 265)**. *Note: Only in Mains-Gen application.*

*Note: Protection is activated also when GPS signal is lost for **Fence 2 Delay (page 265)**.*

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Fence Radius 2

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	0,0..99,9 [km]		
Default value	0,0 km	Alternative config	NO
Step	0,1 km		
Comm object	14608	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Radius for circle area 2. When the gen-set leaves this area, **Fence 2 Protection (page 264)** is activated after **Fence 2 Delay (page 265)**. *Note:* The center of this circle area is defined by "Home" position - setpoints *Home Longitude (page 262)* and *Home Latitude (page 261)*.			

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Fence 2 Delay

Setpoint group	Geo-Fencing	Related FW	1.2.0
Range [units]	0..3600 [s]		
Default value	0 s	Alternative config	NO
Step	1 s		
Comm object	14609	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Delay for **Fence 2 Protection (page 264)**.			

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Group: Plug-In Modules

Subgroup: Slot A

Slot A

Setpoint group	Plug-In Modules	Related FW	1.2.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED	Alternative config	NO
Step	[-]		
Comm object	24280	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Always		

Description			
This setpoint enable or disable module in slot A.			

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Group: CM-RS232-485

Subgroup: COM1 Setting

COM1 Mode

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	Direct / MODBUS [-]		
Default value	Direct	**Alternative config**	NO
Step	[-]		
Comm object	24522	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Communication protocol switch for the COM1 channel.			

Direct	InteliConfig communication protocol via serial cable.
MODBUS	MODBUS protocol.

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COM1 Communication Speed

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	9600 / 19200 / 38400 / 57600 / 115200 [bps]		
Default value	57600 bps	**Alternative config**	NO
Step	[-]		
Comm object	24341	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM1 Mode (page 266)**		
Description			
If the direct mode is selected on COM1 channel, the direct communication speed of controller part of line can be adjusted here. Speed of second part of line has to be adjusted to the same value.			

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COM1 Modbus Mode

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	8N1 / 8N2 / 8E1 [-]		
Default value	8N1	Alternative config	NO
Step	[-]		
Comm object	23867	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint adjusts communication mode of Modbus-RTU.

Possible options

8N1	8 data bits, 1 stop bit, no parity
8N2	8 data bits, 2 stop bits, no parity
8E1	8 data bits, 1 stop bit, even parity

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COM1 MODBUS Communication Speed

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	9600 / 19200 / 38400 / 57600 / 115200 [bps]		
Default value	9600 bps	Alternative config	NO
Step	[-]		
Comm object	24477	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM1 Mode (page 266)**		
Description			

If the MODBUS mode is selected on COM1 channel, the MODBUS communication speed can be adjusted here.

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Subgroup: COM2 Setting

COM2 Mode

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	Direct / MODBUS [-]		
Default value	Direct	Alternative config	NO
Step	[-]		
Comm object	24451	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Communication protocol switch for the COM2 channel.			

Direct	InteliConfig communication protocol via serial cable.
MODBUS	MODBUS protocol.

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COM2 Communication Speed

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	9600 / 19200 / 38400 / 57600 / 115200 [bps]		
Default value	57600 bps	Alternative config	NO
Step	[-]		
Comm object	24340	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM2 Mode (page 268)**		
Description			
If the direct mode is selected on COM2 channel, the direct communication speed of controller part of line can be adjusted here. Speed of second part of line has to be adjusted to the same value.			

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COM2 Modbus Mode

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	8N1 / 8N2 / 8E1 [-]		
Default value	8N1	Alternative config	NO
Step	[-]		
Comm object	23866	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint adjusts communication mode of Modbus-RTU.

Possible options

8N1	8 data bits, 1 stop bit, no parity
8N2	8 data bits, 2 stop bits, no parity
8E1	8 data bits, 1 stop bit, even parity

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COM2 MODBUS Communication Speed

Setpoint group	CM-RS232-485	Related FW	1.2.0
Range [units]	9600 / 19200 / 38400 / 57600 / 115200 [bps]		
Default value	9600 bps	Alternative config	NO
Step	[-]		
Comm object	24420	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM2 Mode (page 268)**		
Description			

If the MODBUS mode is selected on COM2 channel, the MODBUS communication speed can be adjusted here.

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Group: CM-4G-GPS

Internet Connection

Setpoint group	CM-4G-GPS	**Related FW**	1.2.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	24315	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint adjust the communication mode of module.			

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Network Mode

Setpoint group	CM-4G-GPS	**Related FW**	1.2.0
Range [units]	2G / 3G / 4G / Automatic [-]		
Default value	Automatic	**Alternative config**	NO
Step	[-]		
Comm object	24132	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint adjusts preferred connection type of CM2-4G-GPS module.			

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Access Point Name

Setpoint group	CM-4G-GPS	**Related FW**	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	internet	**Alternative config**	NO
Step	[-]		
Comm object	24363	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
APN (Access Point Name) of the network, provided by GSM operator.			

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Connection Check IP1

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	[-]		
Default value	"empty"	Alternative config	NO
Step	[-]		
Comm object	23978	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			

IP address of reliable server in the internet.

To provide maximal reliability of wireless cellular connection the module is equipped with function that periodically checks the data connection over the cellular network is working.

This function is based on periodical sending of ICMP messages (known as "ping") to reliable servers in the internet and checking of their responses. If there is not any response received from any of the servers (at least one setpoint Connection Check IP1, IP2, IP3 is filled with IP address) for certain time period, the cellular connection is considered as non-working and the module will close and reestablish the connection.

If all three servers are not defined (setpoints Connection Check IP1, IP2, IP3 have empty addresses) then the cellular connection check is disabled

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Connection Check IP2

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	[-]		
Default value	"empty"	Alternative config	NO
Step	[-]		
Comm object	23977	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
IP address of reliable server in the internet. To provide maximal reliability of wireless cellular connection the module is equipped with function that periodically checks the data connection over the cellular network is working. This function is based on periodical sending of ICMP messages (known as "ping") to reliable servers in the internet and checking of their responses. If there is not any response received from any of the servers (at least one setpoint Connection Check IP1, IP2, IP3 is filled with IP address) for certain time period, the cellular connection is considered as non-working and the module will close and reestablish the connection. If all three servers are not defined (setpoints Connection Check IP1, IP2, IP3 have empty addresses) then the cellular connection check is disabled			

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Connection Check IP3

Setpoint group	CM-4G-GPS	**Related FW**	1.2.0
Range [units]	[-]		
Default value	"empty"	**Alternative config**	NO
Step	[-]		
Comm object	23976	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		

Description

IP address of reliable server in the internet.

To provide maximal reliability of wireless cellular connection the module is equipped with function that periodically checks the data connection over the cellular network is working.

This function is based on periodical sending of ICMP messages (known as "ping") to reliable servers in the internet and checking of their responses. If there is not any response received from any of the servers (at least one setpoint Connection Check IP1, IP2, IP3 is filled with IP address) for certain time period, the cellular connection is considered as non-working and the module will close and reestablish the connection.

If all three servers are not defined (setpoints Connection Check IP1, IP2, IP3 have empty addresses) then the cellular connection check is disabled

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Subgroup: TCP/IP Settings

DNS Mode

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	Automatic / Manual [-]		
Default value	Automatic	Alternative config	NO
Step	[-]		
Comm object	23988	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint enables to enter DNS server addresses manually, even with the **Internet Connection (page 270)** set to Automatic.

Automatic	DNS server addresses automatically obtained from a DHCP server are used
Manual	**DNS IP Address 1 (page 274)** and **DNS IP Address 2 (page 275)** can be adjusted manually. Use this option to resolve e.g. internet access policy related issue, if local DNS server addresses automatically obtained from a DHCP server do not work

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DNS IP Address 1

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	Alternative config	NO
Step	[-]		
Comm object	24314	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

The setpoint is used to select the method how the DNS Address 1 is adjusted.

If **DNS Mode (page 274)** is MANUAL this setpoint is used to adjust the domain name server (DNS), which is needed to translate domain names in email addresses and server names into correct IP addresses.

If **DNS Mode (page 274)** is AUTOMATIC this setpoint is inactive. The DNS server IP address is assigned by the DHCP server.

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DNS IP Address 2

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	Alternative config	NO
Step	[-]		
Comm object	23986	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

The setpoint is used to select the method how the DNS Address 2 is adjusted.

If **DNS Mode (page 274)** is FIXED this setpoint is used to adjust the domain name server (DNS), which is needed to translate domain names in email addresses and server names into correct IP addresses.

If **DNS Mode (page 274)** is AUTOMATIC this setpoint is inactive. The DNS server IP address is assigned by the DHCP server.

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IP Firewall

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	ENABLED / DISABLED [-]		
Default value	DISABLED	Alternative config	NO
Step	[-]		
Comm object	23959	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoints enables to switch on the built-in Firewall functionality.

DISABLED	The firewall function is switched off
ENABLED	The firewall function is switched on, use InteliConfig to setup the firewall rules (configuration card Others – Firewall)

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Subgroup: AirGate Settings

AirGate Connection

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	Disabled/ Enabled [-]		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	23968	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
This setpoint enable or disable AirGate connection via CM2-4G-GPS.			

DISABLED:	Only SMS are sent. Internet-enabled SIM card is not required. AirGate is not used.
ENABLED	This mode uses the "AirGate" service. Internet-enabled SIM card must be used. The AirGate server address is adjusted by the setpoint **AirGate Address (page 295)**.

> **IMPORTANT: When this setpoint is changed the controller has to be restarted to apply changes.**

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AirGate Address

Setpoint group	CM-4G-GPS; CM-Ethernet	Related FW	1.2.0
Range [units]	[-]		
Default value	global.airgate.link	Alternative config	NO
Step	[-]		
Comm object	24364	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
This setpoint is used for entering the domain name or IP address of the AirGate server. Use the free AirGate server provided by ComAp at global.airgate.link.			

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Airgate Port

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	1 .. 65535 [-]		
Default value	54440	Alternative config	NO
Step	1		
Comm object	24091	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
This port is used for TCP communication with the AirGate server. *Note: Use port 54440 for standard ComAp AirGate service.*			

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Subgroup: ComAp Client Settings

Direct Connection

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	Disabled / Enabled [-]		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	23961	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this to enable/disable direct connection of a ComAp client (e.g. InteliConfig) to the IP address of the controller. *Note: For Direct connection the controller IP address must be reachable from the client IP address.*			

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Direct Connection Port

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	1 .. 65535 [-]		
Default value	23	Alternative config	NO
Step	[-]		
Comm object	23960	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This port is used to listen for an incoming TCP connection if Direct Connection is ENABLED.			

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ComAp Client Inactivity Timeout

Setpoint group	CM-Ethernet CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	60 s	Alternative config	NO
Step	1 s		
Comm object	24098	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Connection (TCP socket) is closed by controller, if a client (e.g. InteliConfig) does not communicate for this time. This timeout applies to both direct and AirGate connection.			

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Subgroup: E-mail Settings

SMTP Server Address

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	global.airgate.link:9925	Alternative config	NO
Step	[-]		
Comm object	23962	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint is used for entering the domain name (e.g. smtp.yourprovider.com) or IP address (e.g. 74.125.39.109) or number of port (with colon like a first mark) of the SMTP server. Ask your internet provider or IT manager for this information.

> *Note: You may use also any public SMTP server which does not require connection over SSL/TLS channels. If the device is connected to AirGate the AirGate SMTP server at "global.airgate.link" may be used. Ports 25 and 9925 are supported. After controller connects to AirGate for the first time (or with new public IP address), it may not be able to send emails for first 5-10 minutes.*

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SMTP Sender Address

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24310	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter an existing email address into this setpoint. This address will be used as sender address in active e-mails that will be sent from the controller.

> *Note: It is not needed to enter an existing email address, nevertheless valid email format needs to be followed.*

> **IMPORTANT: This item is obligatory when emails are configured.**

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SMTP User Name

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24313	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this setpoint to enter the username for the SMTP server. Leave the setpoint blank if the SMTP server does not require authentication.			

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SMTP User Password

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 15 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24312	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this setpoint to enter the password for the SMTP server. Leave the setpoint blank if the SMTP server does not require authentication.			

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SMTP Encryption

Setpoint group	CM-4G-GPS	**Related FW**	1.2.0
Range [units]	None / SSL-TLS / STARTTLS [-]		
Default value	None	**Alternative config**	NO
Step	[-]		
Comm object	23965	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			

Encryption settings of SMTP communication.

NONE	E-SMTP protocol without encryption is used.
STARTTLS	Communication is started without encryption and then is switched to TLS encryption.
TLS	Communication runs in TLS encryption.

Email Address 1

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24298	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.

Email Address 2

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24297	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

⬖ **back to List of setpoints**

Email Address 3

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24145	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

⬖ **back to List of setpoints**

Email Address 4

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24144	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

⬆ **back to List of setpoints**

Subgroup: Message Settings

E-mail/SMS Language

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	Depends on CU languages [-]		
Default value	English	Alternative config	NO
Step	[-]		
Comm object	24299	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this setpoint to set the language of SMS and e-mail.			

> *Note: See the chapter Language selection (page 73) for more information.*

This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.

⬆ **back to List of setpoints**

Event Message

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	Alternative config	NO
Step	[-]		
Comm object	10926	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Event Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

🔺 **back to List of setpoints**

Wrn Message

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	Alternative config	NO
Step	[-]		
Comm object	8482	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Wrn Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

🔺 **back to List of setpoints**

MPR1 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	Alternative config	NO
Step	[-]		
Comm object	8484	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MPR1 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

BOS Message

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	Alternative config	NO
Step	[-]		
Comm object	10566	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables BOS Messages.			

Telephone Number 1

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24296	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter in this setpoint a valid GSM phone number where the alarm messages shall be sent. For GSM numbers use either the national format (i.e. the number you would dial if you wanted to make a local call) or the full international format beginning with a "+" character followed by the country prefix.

> IMPORTANT: Telephone number has to be entered without spaces.

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Telephone Number 2

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24295	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter in this setpoint a valid GSM phone number where the alarm messages shall be sent. For GSM numbers use either the national format (i.e. the number you would dial if you wanted to make a local call) or the full international format beginning with a "+" character followed by the country prefix.

> IMPORTANT: Telephone number has to be entered without spaces.

⏶ back to List of setpoints

Telephone Number 3

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24143	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter in this setpoint a valid GSM phone number where the alarm messages shall be sent. For GSM numbers use either the national format (i.e. the number you would dial if you wanted to make a local call) or the full international format beginning with a "+" character followed by the country prefix.

> IMPORTANT: Telephone number has to be entered without spaces.

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Telephone Number 4

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24142	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter in this setpoint a valid GSM phone number where the alarm messages shall be sent. For GSM numbers use either the national format (i.e. the number you would dial if you wanted to make a local call) or the full international format beginning with a "+" character followed by the country prefix.

> IMPORTANT: Telephone number has to be entered without spaces.

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GPS Tracking

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	Alternative config	NO
Step	[-]		
Comm object	23975	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
If GPS tracking is enabled the module sends position/speed data to the controller with period 10 s.			

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Subgroup: RTC Synchronization

NTP Clock Sync

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	DISABLED / ENABLED [-]		
Default value	DISABLED	Alternative config	NO
Step	[-]		
Comm object	23964	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint is used to enable/disable controller time synchronization with exact time from an NTP server.			

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NTP Server

Setpoint group	CM-4G-GPS	Related FW	1.2.0
Range [units]	[-]		
Default value	pool.ntp.org	Alternative config	NO
Step	[-]		
Comm object	23963	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
NTP server address.			

⬤ **back to List of setpoints**

GPS Clock Sync

Setpoint group	CM-4G-GPS	**Related FW**	1.2.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23974	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
This setpoint is used to enable/disable synchronization of the controller's time with the exact time from GPS. The module sends UTC timestamp to the controller after reset/power on and then in period of 60 minutes.			

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Time Zone

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.2.0
Range [units]	GMT-12:00 .. GMT+13:00 [hours]		
Default value	GMT+1:00 hour	**Alternative config**	NO
Step	[-]		
Comm object	24366	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint is used to select the time zone where the controller is located. See your computer time zone setting (click on the time indicator located in the rightmost position of the Windows task bar) if you are not sure about your time zone. *Note: If the time zone is not selected properly the active e-mails may contain incorrect information about sending time, which may result in confusion when the respective problem actually occurred.*			

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Group: CM-Ethernet

Subgroup: TCP/IP Settings

IP Address Mode

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	MANUAL / AUTOMATIC / DISABLED [-]		
Default value	AUTOMATIC	**Alternative config**	NO
Step	[-]		
Comm object	23939	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

The setpoint is used to select the method how the ethernet connection is adjusted.

MANUAL	The Ethernet connection is fixed by means of the setpoints IP Addr, NetMask, GateIP, DNS IP Address.
	This method should be used for a classic Ethernet or internet connection. When this type of connection opens, the controller is specified by its IP address. This means that it would be inconvenient if the IP address were not fixed (static).
AUTOMATIC	The Ethernet connection setting is obtained **automatically from the DHCP server**. The obtained settings are then copied to the related setpoints. If the process of obtaining the settings from the DHCP server is not successful, the value *000.000.000.000* is copied to the setpoint IP address and the module continues to try to obtain the settings.
DISABLED	The Ethernet terminal is disabled.

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IP Address

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 15 characters [-]		
Default value	192.168.1.254	Alternative config	NO
Step	[-]		
Comm object	23950	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **IP Address Mode (page 290)**		
Description			
The setpoint is used to set the address when you are in static mode.			

The setpoint is used to set the address when you are in static mode.

If **IP Address Mode (page 290)** is MANUAL this setpoint is used to adjust the IP address of the ethernet interface of the controller. Ask your IT specialist for help with this setting.

If **IP Address Mode (page 290)** is AUTOMATIC this setpoint is inactive. The IP address is assigned by the DHCP server.

If **IP Address Mode (page 290)** is DISABLED Ethernet terminal is disabled.

Note: Only valid IP address can be inserted.

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Subnet Mask

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	255.255.255.0	Alternative config	NO
Step	[-]		
Comm object	23949	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **IP Address Mode (page 290)**		
Description			

The setpoint is used to select the method how the Subnet Mask is adjusted.

If **IP Address Mode (page 290)** is MANUAL this setpoint is used to adjust the Subnet Mask. Ask your IT specialist for help with this setting.

If **IP Address Mode (page 290)** is AUTOMATIC this setpoint is inactive. The Subnet Mask is assigned by the DHCP server.

If **IP Address Mode (page 290)** is DISABLED Ethernet terminal is disabled.

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Gateway IP

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	192.168.1.1	Alternative config	NO
Step	[-]		
Comm object	23948	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **IP Address Mode (page 290)**		
Description			

The setpoint is used to select the method how the Gateway IP is adjusted.

If **IP Address Mode (page 290)** is MANUAL this setpoint is used to adjust the Subnet Mask. Ask your IT specialist for help with this setting.

If **IP Address Mode (page 290)** is AUTOMATIC this setpoint is inactive. The Subnet Mask is assigned by the DHCP server.

If **IP Address Mode (page 290)** is DISABLED Ethernet terminal is disabled.

A gateway is a device which connects the respective segment with the other segments and/or Internet.

DNS Mode

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Automatic / Manual [-]		
Default value	Automatic	Alternative config	NO
Step	[-]		
Comm object	23921	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint enables to enter DNS server addresses manually, even with the **IP Address Mode (page 290)** set to Automatic.

Automatic	DNS server addresses automatically obtained from a DHCP server are used
Manual	**DNS IP Address 1 (page 293)** and **DNS IP Address 2 (page 293)** can be adjusted manually. Use this option to resolve e.g. internet access policy related issue, if local DNS server addresses automatically obtained from a DHCP server do not work

DNS IP Address 1

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	Alternative config	NO
Step	[-]		
Comm object	23947	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

The setpoint is used to select the method how the DNS Address 1 is adjusted.

If **IP Address Mode (page 290)** is MANUAL this setpoint is used to adjust the domain name server (DNS), which is needed to translate domain names in email addresses and server names into correct IP addresses.

If **IP Address Mode (page 290)** is AUTOMATIC this setpoint is inactive. The DNS server IP address is assigned by the DHCP server.

If **IP Address Mode (page 290)** is DISABLED Ethernet terminal is disabled.

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DNS IP Address 2

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	Alternative config	NO
Step	[-]		
Comm object	23946	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

The setpoint is used to select the method how the DNS Address 2 is adjusted.

If **IP Address Mode (page 290)** is MANUAL this setpoint is used to adjust the domain name server (DNS), which is needed to translate domain names in email addresses and server names into correct IP addresses.

If **IP Address Mode (page 290)** is AUTOMATIC this setpoint is inactive. The DNS server IP address is assigned by the DHCP server.

If **IP Address Mode (page 290)** is DISABLED Ethernet terminal is disabled.

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IP Firewall

Setpoint group	CM-Ethernet	**Related FW**	1.2.0
Range [units]	ENABLED / DISABLED [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	23920	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoints enables to switch on the built-in Firewall functionality.			

DISABLED	The firewall function is switched off
ENABLED	The firewall function is switched on, use InteliConfig to setup the firewall rules (configuration card Others – Firewall)

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Subgroup: AirGate Settings

AirGate Connection

Setpoint group	CM-Ethernet	**Related FW**	1.2.0
Range [units]	DISABLED / ENABLED [-]		
Default value	ENABLED	**Alternative config**	NO
Step	[-]		
Comm object	23935	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint selects the AirGate connection mode.			

DISABLED:	This is a standard mode in which the controller listens to the incoming traffic and answers the TCP/IP queries addressed to it. This mode requires the controller to be accessible from the remote device (PC), i.e. it must be accessible at a public and static IP address if you want to connect to it from the internet.
ENABLED	This mode enables the AirGate service. The AirGate server address is adjusted by the setpoint **AirGate Address (page 295)**. Also the standard TCP/IP is enabled.

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AirGate Address

Setpoint group	CM-4G-GPS; CM-Ethernet	Related FW	1.2.0
Range [units]	[-]		
Default value	global.airgate.link	Alternative config	NO
Step	[-]		
Comm object	24364	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
This setpoint is used for entering the domain name or IP address of the AirGate server. Use the free AirGate server provided by ComAp at global.airgate.link.			

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AirGate Port

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	1 .. 65535 [-]		
Default value	23	Alternative config	NO
Step	1		
Comm object	23919	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This port is used for TCP data communication with the AirGate server.			
Note: Use port 21, 23 or 6127 for standard ComAp AirGate service.			

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Subgroup: ComAp Client Settings

Direct Connection

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Disabled / Enabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23917	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this to enable/disable direct connection of a ComAp client (e.g. InteliConfig) to the IP address of the controller. *Note: For Direct connection the controller IP address must be reachable from the client IP address.*			

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Direct Connection Port

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	1 .. 65535 [-]		
Default value	23	**Alternative config**	NO
Step	[-]		
Comm object	23918	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This port is used to listen for an incoming TCP connection if Direct Connection is ENABLED.			

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ComAp Client Inactivity Timeout

Setpoint group	CM-Ethernet CM-4G-GPS	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	60 s	Alternative config	NO
Step	1 s		
Comm object	24098	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Connection (TCP socket) is closed by controller, if a client (e.g. InteliConfig) does not communicate for this time. This timeout applies to both direct and AirGate connection.			

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Subgroup: MODBUS Settings

MODBUS Server

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	DISABLED / ENABLED [-]		
Default value	Disabled	Alternative config	NO
Step	[-]		
Comm object	23937	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enable or disable Modbus communication via ethernet interface.			

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MODBUS Client Inactivity Timeout

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 600 [s]		
Default value	60 s	Alternative config	NO
Step	1 s		
Comm object	24097	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Modbus connection (TCP socket) is closed by controller, if a Modbus client does not communicate for this time.			

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Subgroup: SNMP Settings

SNMP Agent

Setpoint group	CM-Ethernet	**Related FW**	1.2.0
Range [units]	DISABLED / ENABLED [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	23936	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enable or disable SNMP Agent.			

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SNMP Trap Format

Setpoint group	CM-Ethernet	**Related FW**	1.2.0
Range [units]	v1Trap / v2Notif / v2Inform [-]		
Default value	v1Trap	**Alternative config**	NO
Step	[-]		
Comm object	23922	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint adjusts type of SNMP traps.			

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SNMP Traps IP Address 1

Setpoint group	CM-Ethernet	**Related FW**	1.2.0
Range [units]	Valid IP address [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	24095	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
IP address 1 for receiving SNMP Traps. Leave this setpoint blank if SNMP traps should not be send.			

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SNMP Traps IP Address 2

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	Valid IP address [-]		
Default value	DISABLED	Alternative config	NO
Step	[-]		
Comm object	24094	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
IP address 2 for receiving SNMP Traps. Leave this setpoint blank if SNMP traps should not be send.			

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SNMP RD Community String

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	public	Alternative config	NO
Step	[-]		
Comm object	23941	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **SNMP Agent (page 298)**		
Description			
SNMP Community String only for reading.			

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SNMP WR Community String

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0..31 characters [-]		
Default value	private	Alternative config	NO
Step	[-]		
Comm object	23940	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **SNMP Agent (page 298)**		
Description			
SNMP Community String for writing and reading.			

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Subgroup: E-mail Settings

SMTP Server Address

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	global.airgate.link:9925	Alternative config	NO
Step	[-]		
Comm object	23942	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint is used for entering the domain name (e.g. smtp.yourprovider.com) or IP address (e.g. 74.125.39.109) or number of port (with colon like a first mark) of the SMTP server. Ask your internet provider or IT manager for this information.

Note: You may use also any public SMTP server which does not require connection over SSL/TLS channels. If the device is connected to AirGate the AirGate SMTP server at "global.airgate.link" may be used. Ports 25 and 9925 are supported. After controller connects to AirGate for the first time (or with new public IP address), it may not be able to send emails for first 5-10 minutes.

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SMTP Sender Address

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	23944	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

Enter an existing email address into this setpoint. This address will be used as sender address in active e-mails that will be sent from the controller.

Note: It is not needed to enter an existing email address, nevertheless valid email format needs to be followed.

IMPORTANT: This item is obligatory when emails are configured.

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SMTP UserName

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	23943	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this setpoint to enter the username for the SMTP server. Leave the setpoint blank if the SMTP server does not require authentication.			

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SMTP User Password

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	0 .. 15 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	23945	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this setpoint to enter the password for the SMTP server. Leave the setpoint blank if the SMTP server does not require authentication.			

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SMTP Encryption

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	None / SSL-TLS / STARTTLS [-]		
Default value	None	Alternative config	NO
Step	[-]		
Comm object	23938	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 270)**		
Description			
Encryption settings of SMTP communication.			

NONE	E-SMTP protocol without encryption is used.
STARTTLS	Communication is started without encryption and then is switched to TLS encryption.
TLS	Communication runs in TLS encryption.

Email Address 1

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24298	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

Email Address 2

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24297	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

⬆ **back to List of setpoints**

Email Address 3

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	Alternative config	NO
Step	[-]		
Comm object	24145	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

⬆ **back to List of setpoints**

Email Address 4

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.2.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24144	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Enter in this setpoint a valid e-mail address where the alarm and event e-mails shall be sent. Leave this setpoint blank if alarm and event email should not be send.			

⬤ **back to List of setpoints**

Subgroup: Messages Settings

BOS Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10566	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables BOS Messages.			

⬤ **back to List of setpoints**

E-mail/SMS Language

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	Depends on CU languages [-]		
Default value	English	**Alternative config**	NO
Step	[-]		
Comm object	24299	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Use this setpoint to set the language of SMS and e-mail.			

> *Note: See the chapter **Language selection (page 73)** for more information.*

This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.

🔺 **back to List of setpoints**

MPR1 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	8484	**Related applications**	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MPR1 Messages.			
This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

🔺 **back to List of setpoints**

Event Message

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	Alternative config	NO
Step	[-]		
Comm object	10926	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Event Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

⬤ **back to List of setpoints**

Wrn Message

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	ON / OFF [-]		
Default value	ON	Alternative config	NO
Step	[-]		
Comm object	8482	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Wrn Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

⬤ **back to List of setpoints**

Subgroup: NTP Settings

NTP Clock Synchronization

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	DISABLED / ENABLED [-]		
Default value	DISABLED	Alternative config	NO
Step	[-]		
Comm object	23934	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint is used to enable/disable controller time synchronization with exact time from an NTP server.			

⏶ **back to List of setpoints**

NTP Server

Setpoint group	CM-Ethernet	Related FW	1.2.0
Range [units]	[-]		
Default value	pool.ntp.org	Alternative config	NO
Step	[-]		
Comm object	23933	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
NTP server address.			

⏶ **back to List of setpoints**

Time Zone

Setpoint group	CM-4G-GPS CM-Ethernet	Related FW	1.2.0
Range [units]	GMT-12:00 .. GMT+13:00 [hours]		
Default value	GMT+1:00 hour	Alternative config	NO
Step	[-]		
Comm object	24366	Related applications	Mains-Mains, Mains-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			

This setpoint is used to select the time zone where the controller is located. See your computer time zone setting (click on the time indicator located in the rightmost position of the Windows task bar) if you are not sure about your time zone.

> *Note: If the time zone is not selected properly the active e-mails may contain incorrect information about sending time, which may result in confusion when the respective problem actually occurred.*

⏹ **back to List of setpoints**

Group: Remote Control

RemoteControl2B 1

Value group	Remote Control	Related FW	1.2.0
Units	-		
Comm object	16671	Related applications	Mains-Mains, Mains-Gen
Description			

This value contains user data written over MODBUS-RTU, MODBUS/TCP. Data type of this value is Int16.

⏹ **back to List of values**

RemoteControl2B 2

Value group	Remote Control	Related FW	1.2.0
Units	-		
Comm object	16672	Related applications	Mains-Mains, Mains-Gen
Description			

This value contains user data written over MODBUS-RTU, MODBUS/TCP. Data type of this value is Int16.

⏹ **back to List of values**

RemoteControl2B 3

Value group	Remote Control	Related FW	1.2.0
Units	-		
Comm object	16673	Related applications	Mains-Mains, Mains-Gen
Description			
This value contains user data written over MODBUS-RTU, MODBUS/TCP. Data type of this value is Int16.			

 back to List of values

RemoteControl2B 4

Value group	Remote Control	Related FW	1.2.0
Units	-		
Comm object	16674	Related applications	Mains-Mains, Mains-Gen
Description			
This value contains user data written over MODBUS-RTU, MODBUS/TCP. Data type of this value is Int16.			

 back to List of values

RemoteControlBin

Value group	Remote Control	Related FW	1.2.0
Units	-		
Comm object	16683	Related applications	Mains-Mains, Mains-Gen
Description			
This value contains user data written over MODBUS-RTU, MODBUS/TCP. Data type of this value is Binary16.			

 back to List of values

8.1.3 Values

What values are:

Values (or quantities) are analog or binary data objects, measured or computed by the controller, that are intended for reading from the controller screen, PC, MODBUS, etc. Values are organized into groups according to their meaning.

For a full list of values go to the chapter **List of values (page 310)**.

Invalid flag

If valid data is not available for a particular value, the invalid flag is set to it. This situation may be due to the following:

> The value is not being evaluated in the scope of the current application and configuration.

A value containing the invalid flag is displayed as "####" in InteliConfig and on the controller screen. If such a value is read out via Modbus, it will contain the data 32768 in the case of signed values and 65535 in the case of unsigned values.

List of values

⬤ back to Controller objects

Group: Source 1

Source 1 Frequency

Value group	Source 1	Related FW	1.2.0
Units	Hz		
Comm object	20519	Related applications	Mains-Mains, Mains-Gen
Description			
Frequency of Source 1.			

⏶ **back to List of values**

Source 1 Voltage L1-N

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	20530	Related applications	Mains-Mains, Mains-Gen
Description			
Source 1 voltage on phase 1.			

⏶ **back to List of values**

Source 1 Voltage L2-N

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	20529	Related applications	Mains-Mains, Mains-Gen
Description			
Source 1 voltage on phase 2.			

⏶ **back to List of values**

Source 1 Voltage L3-N

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	20528	Related applications	Mains-Mains, Mains-Gen
Description			
Source 1 voltage on phase 3.			

⏶ **back to List of values**

Source 1 Voltage L1-L2

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	20527	Related applications	Mains-Mains, Mains-Gen
Description			
Source 1 phase to phase voltage between L1 and L2 phases.			

⏶ **back to List of values**

Source 1 Voltage L2-L3

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	20526	Related applications	Mains-Mains, Mains-Gen
Description			
Source 1 phase to phase voltage between L2 and L3 phases.			

🔺 **back to List of values**

Source 1 Voltage L3-L1

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	20525	Related applications	Mains-Mains, Mains-Gen
Description			
Source 1 phase to phase voltage between L3 and L1 phases.			

🔺 **back to List of values**

Source 1 Voltage Unbalance Ph-N

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	19594	Related applications	Mains-Mains, Mains-Gen
Description			
Actual value of Source 1 voltage unbalance Ph-N.			

🔺 **back to List of values**

Source 1 Voltage Unbalance Ph-Ph

Value group	Source 1	Related FW	1.2.0
Units	V		
Comm object	19595	Related applications	Mains-Mains, Mains-Gen
Description			
Actual value of Source 1 voltage unbalance Ph-Ph.			

🔺 **back to List of values**

Group: Source 2

Source 2 Frequency

Value group	Source 2	Related FW	1.2.0
Units	Hz		
Comm object	20506	Related applications	Mains-Mains, Mains-Gen
Description			
Frequency of Source 2.			

🔺 **back to List of values**

Source 2 Voltage L1-N

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	20517	Related applications	Mains-Mains, Mains-Gen
Description			
Source 2 voltage on phase 1.			

⏶ **back to List of values**

Source 2 Voltage L2-N

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	20516	Related applications	Mains-Mains, Mains-Gen
Description			
Source 2 voltage on phase 2.			

⏶ **back to List of values**

Source 2 Voltage L3-N

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	20515	Related applications	Mains-Mains, Mains-Gen
Description			
Source 2 voltage on phase 3.			

⏶ **back to List of values**

Source 2 Voltage L1-L2

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	20514	Related applications	Mains-Mains, Mains-Gen
Description			
Source 2 phase to phase voltage between L1 and L2 phases.			

⏶ **back to List of values**

Source 2 Voltage L2-L3

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	20513	Related applications	Mains-Mains, Mains-Gen
Description			
Source 2 phase to phase voltage between L2 and L3 phases.			

⏶ **back to List of values**

Source 2 Voltage L3-L1

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	20512	Related applications	Mains-Mains, Mains-Gen
Description			
Source 2 phase to phase voltage between L3 and L1 phases.			

⏏ **back to List of values**

Source 2 Voltage Unbalance Ph-N

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	19596	Related applications	Mains-Mains, Mains-Gen
Description			
Actual value of Source 2 voltage unbalance Ph-N.			

⏏ **back to List of values**

Source 2 Voltage Unbalance Ph-Ph

Value group	Source 2	Related FW	1.2.0
Units	V		
Comm object	19597	Related applications	Mains-Mains, Mains-Gen
Description			
Actual value of Source 2 voltage unbalance Ph-Ph.			

⏏ **back to List of values**

Group: Synchronization

Slip Angle

Value group	Synchronization	Related FW	1.2.0
Units			
Comm object	19888	Related applications	Mains-Mains, Mains-Gen
Description			
Phase shift between Source 1 and Source 2 voltages.			

⏏ **back to List of values**

Slip Frequency

Value group	Synchronization	Related FW	1.2.0
Units			
Comm object	19887	Related applications	Mains-Mains, Mains-Gen
Description			
Max difference between respective phases of Source 1 and Source 2 voltage frequencies.			

⏏ **back to List of values**

Group: Load

Load P

Value group	Load	Related FW	1.2.0
Units	kW		
Comm object	8202	Related applications	Mains-Mains, Mains-Gen
Description			
Load active power.			

🔺 **back to List of values**

Load P L1

Value group	Load	Related FW	1.2.0
Units	kW		
Comm object	8524	Related applications	Mains-Mains, Mains-Gen
Description			
Load active power in phase L1.			

🔺 **back to List of values**

Load P L2

Value group	Load	Related FW	1.2.0
Units	kW		
Comm object	8525	Related applications	Mains-Mains, Mains-Gen
Description			
Load active power in phase L2.			

🔺 **back to List of values**

Load P L3

Value group	Load	Related FW	1.2.0
Units	kW		
Comm object	8526	Related applications	Mains-Mains, Mains-Gen
Description			
Load active power in phase L3.			

🔺 **back to List of values**

Load S

Value group	Generator	Related FW	1.2.0
Units	kVA		
Comm object	8565	Related applications	Mains-Mains, Mains-Gen
Description			
Apparent power of load.			

🔺 **back to List of values**

Load S L1

Value group	Load	Related FW	1.2.0
Units	kVA		
Comm object	8530	Related applications	Mains-Mains, Mains-Gen
Description			
Load apparent power L1.			

⏶ **back to List of values**

Load S L2

Value group	Load	Related FW	1.2.0
Units	kVA		
Comm object	8531	Related applications	Mains-Mains, Mains-Gen
Description			
Load apparent power L2.			

⏶ **back to List of values**

Load S L3

Value group	Load	Related FW	1.2.0
Units	kVA		
Comm object	8532	Related applications	Mains-Mains, Mains-Gen
Description			
Load apparent power L3.			

⏶ **back to List of values**

Load Q

Value group	Load	Related FW	1.2.0
Units	kVAr		
Comm object	8203	Related applications	Mains-Mains, Mains-Gen
Description			
Load reactive power.			

⏶ **back to List of values**

Load Q L1

Value group	Load	Related FW	1.2.0
Units	kVAr		
Comm object	8527	Related applications	Mains-Mains, Mains-Gen
Description			
Load reactive power in phase L1.			

⏶ **back to List of values**

Load Q L2

Value group	Load	Related FW	1.2.0
Units	kVAr		
Comm object	8528	Related applications	Mains-Mains, Mains-Gen
Description			
Load reactive power in phase L2.			

⬆ **back to List of values**

Load Q L3

Value group	Load	Related FW	1.2.0
Units	kVAr		
Comm object	8529	Related applications	Mains-Mains, Mains-Gen
Description			
Load reactive power in phase L3.			

⬆ **back to List of values**

Load Power Factor

Load	Load	Related FW	1.2.0
Units	[-]		
Comm object	8204	Related applications	Mains-Mains, Mains-Gen
Description			
Load power factor.			

⬆ **back to List of values**

Load Power Factor L1

Value group	Load	Related FW	1.2.0
Units	[-]		
Comm object	8533	Related applications	Mains-Mains, Mains-Gen
Description			
Load power factor in phase L1.			

⬆ **back to List of values**

Load Power Factor L2

Value group	Load	Related FW	1.2.0
Units	[-]		
Comm object	8534	Related applications	Mains-Mains, Mains-Gen
Description			
Load power factor in phase L2.			

⬆ **back to List of values**

Load Power Factor L3

Value group	Load	Related FW	1.2.0
Units	[-]		
Comm object	8535	Related applications	Mains-Mains, Mains-Gen
Description			
Load power factor in phase L3.			

🔺 **back to List of values**

Load Character

Value group	Generator	Related FW	1.2.0
Units	[-]		
Comm object	8395	Related applications	Mains-Mains, Mains-Gen
Description			
Character of the generator load. "L" means inductive load, "C" is capacitive and "R" is resistive load (power factor = 1).			

🔺 **back to List of values**

Load Character L1

Value group	Load	Related FW	1.2.0
Units	[-]		
Comm object	8626	Related applications	Mains-Mains, Mains-Gen
Description			
Character of the generator load in the L1 phase. "L" means inductive load, "C" is capacitive and "R" is resistive load (power factor = 1).			

🔺 **back to List of values**

Load Character L2

Value group	Load	Related FW	1.2.0
Units	[-]		
Comm object	8627	Related applications	Mains-Mains, Mains-Gen
Description			
Character of the generator load in the L2 phase. "L" means inductive load, "C" is capacitive and "R" is resistive load (power factor = 1).			

🔺 **back to List of values**

Load Character L3

Value group	Load	Related FW	1.2.0
Units	[-]		
Comm object	8628	Related applications	Mains-Mains, Mains-Gen
Description			
Character of the generator load in the L3 phase. "L" means inductive load, "C" is capacitive and "R" is resistive load (power factor = 1).			

🔺 **back to List of values**

Load Current L1

Value group	Generator	Related FW	1.2.0
Units	A		
Comm object	8198	Related applications	Mains-Mains, Mains-Gen
Description			
Current phase L1 of Load.			

🔺 **back to List of values**

Load Current L2

Value group	Generator	Related FW	1.2.0
Units	A		
Comm object	8199	Related applications	Mains-Mains, Mains-Gen
Description			
Current phase L2 of Load.			

🔺 **back to List of values**

Load Current L3

Value group	Generator	Related FW	1.2.0
Units	A		
Comm object	8200	Related applications	Mains-Mains, Mains-Gen
Description			
Current phase L3 of Load.			

🔺 **back to List of values**

Current Unbalance

Value group	Load	Related FW	1.2.0
Units	A		
Comm object	19598	Related applications	Mains-Mains, Mains-Gen
Description			
Actual value of current unbalance.			

🔺 **back to List of values**

Group: Controller I/O

Battery Volts

Value group	Controller I/O	Related FW	1.2.0
Units	V		
Comm object	8213	Related applications	Mains-Mains, Mains-Gen
Description			
Controller supply voltage.			

🔺 **back to List of values**

Binary Inputs

Value group	Controller I/O	Related FW	1.2.0
Units	[-]		
Comm object	8235	Related applications	Mains-Mains, Mains-Gen
Description			
State of the binary inputs of the controller.			

🔺 **back to List of values**

E-Stop

Value group	Controller I/O	Related FW	1.2.0
Units	%		
Comm object	15780	Related applications	Mains-Mains, Mains-Gen
Description			

Shows state of E-STOP input – the same principle of visualization like binary inputs.

Principle of value (principle of normally close binary input):

> 1 – E-STOP has voltage – state is OK

> 0 – E-STOP has no voltage – protection is active

Note: It is necessary to connect E-Stop input to + terminal also in Mains-Mains application. E-Stop is used as power supply for binary outputs 1 and 2.

🔺 **back to List of values**

Binary Outputs

Value group	Controller I/O	Related FW	1.2.0
Units	[-]		
Comm object	8239	Related applications	Mains-Mains, Mains-Gen
Description			
State of the binary outputs of the controller.			

🔺 **back to List of values**

Group: Statistics

Pulse Counter 1

Value group	Statistics	Related FW	1.2.0
Units	-		
Comm object	10986	Related applications	Mains-Mains, Mains-Gen
Description			

This is the value of PULSE COUNTER 1 (PAGE 351) function.

Note: Maximum value is 1000000.

🔺 **back to List of values**

Pulse Counter 2

Value group	Statistics	Related FW	1.2.0
Units	-		
Comm object	10987	Related applications	Mains-Mains, Mains-Gen
Description			

This is the value of PULSE COUNTER 2 (PAGE 351) function.

Note: Maximum value is 1000000.

🔺 **back to List of values**

Source 1 kWh

Value group	Statistics	Related FW	1.2.0
Units	kWh		
Comm object	11025	Related applications	Mains-Mains, Mains-Gen
Description			

Counter of Source 1 active power.

🔺 **back to List of values**

Source 1 kVArh

Value group	Statistics	Related FW	1.2.0
Units	kVArh		
Comm object	11026	Related applications	Mains-Mains, Mains-Gen
Description			

Counter of Source 1 reactive power.

🔺 **back to List of values**

Source 2 kWh

Value group	Statistics	Related FW	1.2.0
Units	kWh		
Comm object	8205	Related applications	Mains-Mains, Mains-Gen
Description			
Counter of Source 2 active power.			

🔺 **back to List of values**

Source 2 kVArh

Value group	Statistics	Related FW	1.2.0
Units	kVArh		
Comm object	8539	Related applications	Mains-Mains, Mains-Gen
Description			
Counter of Source 2 reactive power.			

🔺 **back to List of values**

Conditioned Hours Counter 1

Value group	Statistics	Related FW	1.2.0
Units	hours		
Comm object	20292	Related applications	Mains-Mains, Mains-Gen
Description			
Engine operation conditioned hours counter. The Engine hours are incremented in the controller while the is running and the customer condition is met (when the LBI CONDITIONED HOURS COUNTER 1 (PAGE 348) is closed).			

🔺 **back to List of values**

Conditioned Hours Counter 2

Value group	Statistics	Related FW	1.2.0
Units	hours		
Comm object	20293	Related applications	Mains-Mains, Mains-Gen
Description			
Engine operation conditioned hours counter. The Engine hours are incremented in the controller while the Engine is running and the customer condition is met (when the LBI CONDITIONED HOURS COUNTER 2 (PAGE 348) is closed).			

🔺 **back to List of values**

Group: Info

Active Application

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	14446	Related applications	Mains-Mains, Mains-Gen
Description			
This Value mirrors the active application in the controller.			

> **Example:** Mains-Mains or Mains-Gen.

🔺 **back to List of values**

Load Shedding Status

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	9591	Related applications	Mains-Mains, Mains-Gen
Description			
The value contains actual "load shedding stage". The value can get the values of the range 0 to 2, where 0 means no load shedding stage is active and 1, 2 means that the corresponding load shedding stage is active.			

🔺 **back to List of values**

Breaker State

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	9245	Related applications	Mains-Mains, Mains-Gen
Description			
The value contains actual "breaker state" message which is shown on the main screen of the controller.			

Text	Description
S1Oper	The load is supplied by Source 1.
S1Fail	Source 1 failure detected.
S2Oper	The load is supplied by Source 2.
S2Fail	Source 2 failure detected.
BrksOff	S1CB, S2CB opened.

🔺 **back to List of values**

Timer Text

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	10040	Related applications	Mains-Mains, Mains-Gen
Description			
The value contains the "Current process timer" text which is shown on the main screen of the controller.			

🔺 **back to List of values**

Connection Type

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	12944	Related applications	Mains-Mains, Mains-Gen
Description			
The text of this value represents the connection type which is adjusted in setpoint **Connection type (page 167)**.			

🔺 **back to List of values**

SPI Module A

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	14447	Related applications	Mains-Mains, Mains-Gen
Description			
The name of plug-in module which is inserted in slot A.			

🔺 **back to List of values**

Timer Value

Value group	Info	Related FW	1.2.0
Units	[HH:MM:SS]		
Comm object	14147	Related applications	Mains-Mains, Mains-Gen
Description			
The value contains the "Current process timer" value which is shown on the main screen of the controller.			

🔺 **back to List of values**

ID String

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	24501	Related applications	Mains-Mains, Mains-Gen
Description			
Name of controller which is used in InteliConfig in command bar.			

🔺 **back to List of values**

FW Version

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	24339	Related applications	Mains-Mains, Mains-Gen
Description			
Major and minor firmware version number.			

🔺 **back to List of values**

Application

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	8480	Related applications	Mains-Mains, Mains-Gen
Description			
The value contains actual application in controller.			

🔺 **back to List of values**

FW Branch

Value group	Info	Related FW	1.2.0
Units	[-]		
Comm object	8707	Related applications	Mains-Mains, Mains-Gen
Description			
The value contains actual branch of firmware in controller.			

🔺 **back to List of values**

Group: Log Bout

Log Bout 1

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9143	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Log Bout 2

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9144	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Log Bout 3

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9145	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Log Bout 4

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9146	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Log Bout 5

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9147	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Log Bout 6

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9148	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Log Bout 7

Value group	Log Bout	Related FW	1.2.0
Units	[-]		
Comm object	9149	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs.			

🔺 **back to List of values**

Group: Fixed Protection States

Fixed Protections States 1

Value group	Fixed Protection States	Related FW	1.2.0
Units	[-]		
Comm object	20744	Related applications	Mains-Mains, Mains-Gen
Description			
Values of LBO Fixed Protections State.			

🔺 **back to List of values**

Fixed Protections States 2

Value group	Fixed Protection States	Related FW	1.2.0
Units	[-]		
Comm object	20745	Related applications	Mains-Mains, Mains-Gen
Description			
Values of LBO Fixed Protections State.			

🔺 **back to List of values**

Fixed Protections States 3

Value group	Fixed Protection States	Related FW	1.2.0
Units	[-]		
Comm object	20746	Related applications	Mains-Mains, Mains-Gen
Description			
Values of LBO Fixed Protections State.			

🔺 **back to List of values**

Group: Date/Time

Time

Value group	Date/Time	Related FW	1.2.0
Units	HH:MM:SS		
Comm object	24554	Related applications	Mains-Mains, Mains-Gen
Description			
Shows setup time.			

🔺 **back to List of values**

Date

Value group	Date/Time	Related FW	1.2.0
Units	DD.MM.YYYY		
Comm object	24553	Related applications	Mains-Mains, Mains-Gen
Description			
Shows setup date.			

 back to List of values

Time Mode

Value group	Date/Time	Related FW	1.2.0
Units	HH:MM:SS		
Comm object	20252	Related applications	Mains-Mains, Mains-Gen
Description			
Indicates actual time mode. STD – Standard zone time (e.g GMT+1 for Prague). DST – Daylight Saving Time = STD+1 (e.g. GMT+2 for Prague).			

 back to List of values

Exercise Timer 1

Value group	Date/Time	Related FW	1.2.0
Units	HH:MM:SS		
Comm object	19664	Related applications	Mains-Mains, Mains-Gen
Description			
Remaining time of Exercise Timer 1.			

 back to List of values

Exercise Timer 2

Value group	Date/Time	Related FW	1.2.0
Units	HH:MM:SS		
Comm object	19665	Related applications	Mains-Mains, Mains-Gen
Description			
Remaining time of Exercise Timer 2.			

 back to List of values

Group: CM-4G-GPS

Signal Strength

Value group	CM-4G-GPS	Related FW	1.2.0
Units	%		
Comm object	24302	**Related applications**	Mains-Mains, Mains-Gen
Description			
This value contains information about relative strength of the cellular signal received by the CM2-4G-GPS module. It is a relative value helping to find the best signal and for troubleshooting cases.			

🔺 **back to List of values**

Network Status

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24290	**Related applications**	Mains-Mains, Mains-Gen
Description			
The text of this value represents the status of the GSM modem.			

Code	Description
Not availab	Not available
Available	Available
Attached	Attached

🔺 **back to List of values**

Last Email Result

Value group	CM-4G-GPS	**Related FW**	1.2.0
Units	[-]		
Comm object	24307	**Related applications**	Mains-Mains, Mains-Gen

Description

Result of last email, which was sent by controller.

Code	Description
0	Email was successfully sent.
2	It is not possible to establish connection with SMTP server.
3	SMTP server is not ready for communication.
4	Maximum length of data can't be read.
5	No appeal to send command.
6	Command can't be send.
7	Command can't be send.
8	HELO command was refused.
11	AUTH LOGIN command was refused.
12	Wrong user name.
13	Wrong password.
14	MAIL FROM command was refused.
15	RCPT TO command was refused.
16	DATA command was refused.
17	Sending of email failed.
18	SMTP server refused the data of email.
19	SMTP server refused the data of email.
20	QUIT command was refused.
21	Lost of connection.
23	Error during closing the connection.
24	No answer from server.
25	It is impossible to create data for command DATA.
26	It is impossible to read data for command DATA.
28	Error of encoding.
29	There was no attempt to send email.

🔺 **back to List of values**

Network Name

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24147	Related applications	Mains-Mains, Mains-Gen
Description			

The name of operator which to SIM card is connected.

> *Note: If roaming service is used then prefix "R" is added before the name of operator.*

 back to List of values

Network Mode

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24146	Related applications	Mains-Mains, Mains-Gen
Description			

The type of data connection.

 back to List of values

GPS Status

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	23973	Related applications	Mains-Mains, Mains-Gen
Description			

Value describing the GPS signal.

Code	Description
Undefined	GPS signal is not available. Check antenna connection.
Searching	Looking up for signal from available satellites.
Fixed	GPS signal available.

 back to List of values

Latitude

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24268	Related applications	Mains-Mains, Mains-Gen
Description			

Actual GPS latitude. Positions on north hemisphere have positive value, position on south hemisphere have negative value.

 back to List of values

Longitude

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24267	Related applications	Mains-Mains, Mains-Gen
Description			
Actual GPS longitude. Positions on east hemisphere have positive value, position on west hemisphere have negative value.			

🔺 **back to List of values**

Active Satellites

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24265	Related applications	Mains-Mains, Mains-Gen
Description			
Number of available satellites for GPS location.			

🔺 **back to List of values**

Speed

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24227	Related applications	Mains-Mains, Mains-Gen
Description			
Actual speed of the controller calculated from the GPS coordinates.			

🔺 **back to List of values**

HomePosDist

Value group	CM-4G-GPS	Related FW	1.2.0
Units	km		
Comm object	11680	Related applications	Mains-Mains, Mains-Gen
Description			
Actual distance from home position. Home position is adjusted via setpoints **Home Latitude (page 261)** and **Home Longitude (page 262)** or by binary input GEO HOME POSITION (PAGE 349).			

🔺 **back to List of values**

AirGate Status

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24308	Related applications	Mains-Mains, Mains-Gen
Description			

Diagnostic code for AirGate connection. Helps in troubleshooting.

AirGate Status

Code	Description
Not defined	Setpoint AirGate Connection is Disabled
Wait to connect	Waiting to connect
Resolving	Resolving
Connecting	Connecting
Creat sec chan	Creating secure channel
Registering	Registering
Conn inoperable	Connected, inoperable
Conn operable	Connected, operable
Susp AGkeyEmpty	AirGate is not set in the controller

🔺 back to List of values

AirGate ID

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24309	Related applications	Mains-Mains, Mains-Gen
Description			

Identification string generated by AirGate server for the purpose of establishing communication via InteliConfig or any other supported PC tool.

🔺 back to List of values

AirGate Servicing Node

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24087	Related applications	Mains-Mains, Mains-Gen
Description			

IP address of AirGate 2 node to which the module is currently attached.

🔺 back to List of values

Current IP Address

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24184	Related applications	Mains-Mains, Mains-Gen
Description			
Current IP address of the controller.			

🔺 **back to List of values**

Primary DNS

Value group	CM-Ethernet CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24181	Related applications	Mains-Mains, Mains-Gen
Description			
Current domain name server.			

🔺 **back to List of values**

Secondary DNS

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24100	Related applications	Mains-Mains, Mains-Gen
Description			
Backup domain name server.			

🔺 **back to List of values**

Modem Status

Value group	CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24288	Related applications	Mains-Mains, Mains-Gen
Description			
The text of this value represents the status of the modem.			

Modem Status

Code	Description
OK	Module successfully initialized and connected to the cellular network
E01	Unsuccessful restore to the factory settings
E02	Modem configuration error
E SIM	SIM not inserted or locked by PIN. ❯ Use another device (e.g. mobile phone) to disable the option for SIM to be locked by PIN

E04	It is not possible to set manually chosen network mode 2G/3G/4G/Automatic
E registration	It is not possible to register into cellular network. Possible reasons: ❯ No signal (no coverage, broken or unconnected antenna) ❯ Manually chosen network mode 2G/3G/4G is not available
E context	It is not possible to set PDP (Packet Data Protocol) context for defined APN (Access Point Name). Possible reasons: ❯ Setpoint Access Point Name is not correctly set (format) ❯ Wrong PDP context number
E connect	It is not possible to connect to cellular network (ATD*99***context) Possible reasons: ❯ Setpoint Access Point Name is not correctly set (wrong text)
E08	Modem configuration error
E09	It is not possible to get signal strength
E10	It is not possible to get operator name
E11	Loss of registration into cellular network was detected
E12	Data error
E13	Data error
E14	Modem was restarted
E SMS send	It is not possible to send SMS. Possible reasons: ❯ Wrong number ❯ SIM doesn't support SMS
E18	Modem hardware configuration error
E conn lost	Loss of connection with cellular network
E19	Modem configuration error
Restart-config	Modem was restarted due to the change of controller setpoint
Restart-app	Modem was restarted due to the performed cellular connection check

⬢ **back to List of values**

Group: CM-Ethernet

ETH Interface Status

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24180	Related applications	Mains-Mains, Mains-Gen
Description			
Current status of ethernet communication.			

⬢ **back to List of values**

Current IP Address

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24184	Related applications	Mains-Mains, Mains-Gen
Description			
Current IP address of the controller.			

🔺 back to List of values

Current Subnet Mask

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24183	Related applications	Mains-Mains, Mains-Gen
Description			
Current subnet mask.			

🔺 back to List of values

Current Gateway

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24182	Related applications	Mains-Mains, Mains-Gen
Description			
Current gateway address.			

🔺 back to List of values

Primary DNS

Value group	CM-Ethernet CM-4G-GPS	Related FW	1.2.0
Units	[-]		
Comm object	24181	Related applications	Mains-Mains, Mains-Gen
Description			
Current domain name server.			

🔺 back to List of values

Secondary DNS

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24100	Related applications	Mains-Mains, Mains-Gen
Description			
Backup domain name server.			

🔺 back to List of values

AirGate ID

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24345	Related applications	Mains-Mains, Mains-Gen
Description			
Identification string generated by AirGate server for the purpose of establishing communication via InteliConfig or any other supported PC tool.			

 back to List of values

AirGate Servicing Node

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24087	Related applications	Mains-Mains, Mains-Gen
Description			
IP address of AirGate 2 node to which the module is currently attached.			

 back to List of values

AirGate Status

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24344	Related applications	Mains-Mains, Mains-Gen
Description			

Diagnostic code for AirGate connection. Helps in troubleshooting.

Code	Description
Not defined	Setpoint AirGate Connection is Disabled
Wait to connect	Waiting to connect
Resolving	Resolving
Connecting	Connecting
Creat sec chan	Creating secure channel
Registering	Registering
Conn inoperable	Connected, inoperable
Conn operable	Connected, operable

 back to List of values

Last Email Results

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24332	Related applications	Mains-Mains, Mains-Gen
Description			

Result of last email, which was sent by controller.

Code	Description
0	Email was successfully sent.
2	It is not possible to establish connection with SMTP server.
3	SMTP server is not ready for communication.
8	HELO command was refused.
9	EHLO command was refused.
11	AUTH LOGIN command was refused.
12	Wrong user name.
13	Wrong password.
14	MAIL FROM command was refused.
15	RCPT TO command was refused.
16	DATA command was refused.
17	Sending of email failed.
20	QUIT command was refused.
25	It is impossible to create data for command DATA.
26	It is impossible to read data for command DATA.
27	Email address can't be read.
30	SMTP server address translation error (from DNS server).
31	Error reading email content data (24327).

⬤ **back to List of values**

MAC Address

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24333	Related applications	Mains-Mains, Mains-Gen
Description			

Current MAC address of the controller ethernet interface.

⬤ **back to List of values**

Ethernet PHY Mode

Value group	CM-Ethernet	Related FW	1.2.0
Units	[-]		
Comm object	24088	Related applications	Mains-Mains, Mains-Gen
Description			
Ethernet interface mode:			

	10- HD	10 Mbit Half-Duplex
	10- FD	10 Mbit Full-Duplex
	100- HD	100 Mbit Half-Duplex
	10- FD	100 Mbit Full-Duplex

🔺 **back to List of values**

Group: Plug-In I/O

EM BIO A

Value group	Plug-In I/O	Related FW	1.2.0
Units	[-]		
Comm object	14291	Related applications	Mains-Mains, Mains-Gen
Description			
Binary inputs from extension module in slot A.			

🔺 **back to List of values**

Group: User Buttons

User Button 1

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20743	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 1.			
Note: For more information see User Buttons on page 125.			

🔺 **back to List of values**

User Button 2

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20827	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 2.			
*Note: For more information **see User Buttons on page 125***.			

⏏ **back to List of values**

User Button 3

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20828	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 3.			
*Note: For more information **see User Buttons on page 125***.			

⏏ **back to List of values**

User Button 4

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20829	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 4.			
*Note: For more information **see User Buttons on page 125***.			

⏏ **back to List of values**

User Button 5

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20830	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 5.			
*Note: For more information **see User Buttons on page 125***.			

⏏ **back to List of values**

User Button 6

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20831	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 6.			
*Note: For more information **see User Buttons on page 125**.*			

🔺 **back to List of values**

User Button 7

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20832	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 7.			
*Note: For more information **see User Buttons on page 125**.*			

🔺 **back to List of values**

User Button 8

Value group	User Buttons	Related FW	1.2.0
Units	[-]		
Comm object	20833	Related applications	Mains-Mains, Mains-Gen
Description			
State of User Button 8.			
*Note: For more information **see User Buttons on page 125**.*			

🔺 **back to List of values**

Group: PLC

PLC-BOUT 1

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10424	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC-BOUT 2

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10425	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC-BOUT 3

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10426	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC-BOUT 4

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10427	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC-BOUT 5

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10428	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC-BOUT 6

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10429	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC-BOUT 7

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10430	Related applications	Mains-Mains, Mains-Gen
Description			
State of binary outputs of PLC.			

🔺 **back to List of values**

PLC Resource 1

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10504	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 2

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10505	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 3

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10506	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 4

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10507	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 5

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10508	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 6

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10509	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 7

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10510	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

PLC Resource 8

Value group	PLC	Related FW	1.2.0
Units	[-]		
Comm object	10511	Related applications	Mains-Mains, Mains-Gen
Description			
Internal state of PLC countdowns (e.g. state of block Timer etc.).			

🔺 **back to List of values**

8.1.4 Logical binary inputs

What Logical binary inputs are:

Logical binary inputs are inputs for binary values and functions.

Alphabetical groups of Logical binary inputs

For a full list of Logical binary inputs go to the chapter **Logical binary inputs alphabetically (page 347)**.

Logical binary inputs alphabetically

⏶ **back to Controller objects**

LBI: A

Access Lock

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1		
Description			
When this input is active, no setpoints can be adjusted from controller's front panel and controller mode (OFF / MAN / AUTO) cannot be changed. The front panel buttons can not be used as well.			

> *Note: Access Lock does not protect setpoints and mode changing from InteliConfig. To avoid unqualified changes the selected setpoints have to be password protected.*
>
> *Also the buttons Fault Reset* ⬛ *and Horn Reset* ⬛ *are not blocked at all and buttons Start* 🟩 *and Stop* 🟥 *in MAN mode are not blocked.*

🔺 **back to Logical binary inputs alphabetically**

LBI: C

Conditioned Hours Counter 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1094		
Description			
This LBI enables incrementation of statistic value CONDITIONED HOURS COUNTER 1 (PAGE 323).			

🔺 **back to Logical binary inputs alphabetically**

Conditioned Hours Counter 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1095		
Description			
This LBI enables incrementation of statistic value CONDITIONED HOURS COUNTER 2 (PAGE 323).			

🔺 **back to Logical binary inputs alphabetically**

LBI: E

Emergency Stop

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	40		
Description			
The shutdown procedure will start immediately when this input is activated.			

🔺 **back to Logical binary inputs alphabetically**

LBI: F

Fault Reset Button

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	191		
Description			
Binary input has the same function as Fault Reset button ⬛ on the InteliATS2 70 front panel.			

🔺 **back to Logical binary inputs alphabetically**

LBI: G

Geo Home Position

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	219		
Description			
This binary input can be used to adjust home position of gen-set. In case that binary input is active, setpoints **Home Latitude (page 261)** and **Home Longitude (page 262)** are adjusted automatically from actual coordinates from GPS signal. *Note: Input has to be activated for at least 2 seconds.*			

🔺 **back to Logical binary inputs alphabetically**

Geo-Fencing Enable

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	218		
Description			
This binary input enables or disables **Fence 1 Protection (page 263)** and **Fence 2 Protection (page 264)** if **Group: Geo-Fencing (page 261)** is adjusted to value "LBI Enable".			

🔺 **back to Logical binary inputs alphabetically**

LBI: H

Horn Reset Button

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	192		
Description			
Binary input has the same function as Horn reset ⬛ button on the InteliATS2 70 front panel.			

🔺 **back to Logical binary inputs alphabetically**

LBI: M

Manual Load Reconnection

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	60		
Description			
This input is used for manual reconnection of the last disconnected part of the load, if the load has dropped below the setpoint **Load Reconnection Level (page 228)**. This works only if automatic reconnection is disabled, i.e. the setpoint **Auto Load Reconnection (page 229)** = Disabled.			

⬦ **back to Logical binary inputs alphabetically**

LBI: N

Neutral Position

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1090		
Description			
In MAN mode this input switches a three position ATS switch to its neutral position – it activates the binary outputs NEUTRAL CLOSE/OPEN (PAGE 371) and NEUTRAL ON COIL (PAGE 371). S1CB and S2CB are switched to off.			

⬦ **back to Logical binary inputs alphabetically**

LBI: P

Protection Force Disable

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	16		
Description			
Activation of this LBI disables selected protections. Proper history record is written to the history log. › Protection Force Disable active › Protection Force Disable inactive *Note: Some of the fixed protections has possibility to turn off. These protections has dedicated setpoints located in setpoint group Protections. Setpoints have options: Enabled, Disabled (protection is turned off), ExtDisabled (protection is turned off by LBI).*			

⬦ **back to Logical binary inputs alphabetically**

Pulse Counter 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	87		
Description			

This is the input of the Pulse Counter 1 function. The module counts pulses at the input and if the input pulses counter reaches value given by the setpoint **Conversion Coefficient Pulse 1 (page 177)** the counter value **Pulse Counter 1 (page 322)** is increased by 1 and input pulses counter is reset to 0. Both counter value and input pulses counter are stored in the nonvolatile memory.

Note: Recommended length of the pulse is 500 ms.

🔺 **back to Logical binary inputs alphabetically**

Pulse Counter 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	88		
Description			

This is the input of the Pulse Counter 2 function. The module counts pulses at the input and if the input pulses counter reaches value given by the setpoint **Conversion Coefficient Pulse 2 (page 178)** the counter value **Pulse Counter 2 (page 322)** is increased by 1 and input pulses counter is reset to 0. Both counter value and input pulses counter are stored in the nonvolatile memory.

Note: Recommended length of the pulse is 500 ms.

🔺 **back to Logical binary inputs alphabetically**

LBI: R

Remote AUTO

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	620		
Description			

The controller is switched to the AUTO mode (there are four modes OFF / MAN / AUTO) when this binary input is active. When opens controller is switched back to previous mode.

This binary input has the lowest priority from Remote OFF / MAN / AUTO binary inputs

Remote control priority:

> Remote OFF (Highest priority)

> Remote MAN

> Remote AUTO (Lowest Priority)

🔺 **back to Logical binary inputs alphabetically**

Remote Ctrl Lock

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	4		
Description			

If the input is active, the controller will not accept any actions regarding the system control – e.g. writing of commands and setpoint changes via remote communication interfaces.

⏴ **back to Logical binary inputs alphabetically**

Remote MAN

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	618		
Description			

The controller is switched to the MAN mode (there are four modes OFF / MAN / AUTO) when this binary input is active. When opens controller is switched back to previous mode.

Remote control priority:

> Remote OFF (Highest priority)
> Remote MAN
> Remote AUTO (Lowest Priority)

⏴ **back to Logical binary inputs alphabetically**

Remote OFF

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	617		
Description			

The controller is switched to the OFF mode (there are four modes OFF / MAN / AUTO) when this binary input is active. When opens controller is switched back to previous mode.

Remote control priority:

> Remote OFF (Highest priority)
> Remote MAN
> Remote AUTO (Lowest Priority)

⏴ **back to Logical binary inputs alphabetically**

Remote Start/Stop

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	38		
Description			

Use this input to start and stop the engine in AUTO mode.

*Note: If the binary input Remote Start/Stop is active and engine is running and Source 1 failure occurs, the S1CB breaker opens, after **Open Transfer Min Break (page 186)** the S2CB breaker is closed. Once the mains is OK, the **Primary Source Return Delay (page 185)** elapses and the S2CB breaker is opened. Then after **Open Transfer Min Break (page 186)** S1CB breaker is closed. The engine remains running as long as binary input Rem Start/Stop is active. For more details see timing diagram below.*
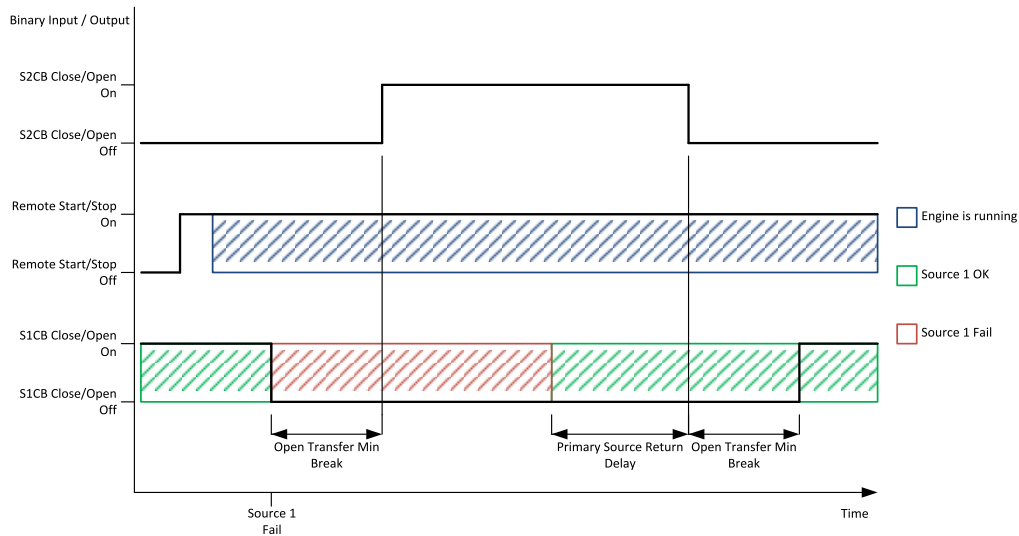
Image 15.17 Remote Start/Stop

Active	➤ Start the engine and stay running with opened S2CB if Source 1 OK. ➤ If Source 1 fails when this binary is active, the load is transfered to Source 2. ➤ If Source 1 is not OK the AMF function transfers the load to Source 2.
Inactive	➤ Stop the engine if Source 1 is OK ➤ If Source 1 not OK the engine stays running due to AMF function anyway.

🔺 **back to Logical binary inputs alphabetically**

LBI: S

S1 Fail Block

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	622		
Description			
If the input is active, the automatic transfer to Source 2 at Source 1 failure is blocked. In case the load is already transferred to Source 2 in AUTO mode, timer **Primary Source Return Delay (page 185)** is started and when it elapses S2CB is opened. When S2CB is opened after **Open Transfer Min Break (page 186)** the S1CB is closed.			

> *Note: This input simulates healthy Source 1.*

⏏ **back to Logical binary inputs alphabetically**

S1CB Button

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	194		
Description			
This binary input has the same function as S1CB button ⌷I/O⌷ on the InteliATS2 70 front panel. It is evaluated in MAN mode only.			

⏏ **back to Logical binary inputs alphabetically**

S1CB Feedback

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	65		
Description			
Use this input for indication whether the Source 1 circuit breaker is open or closed.			

Image 15.18 S1CB Feedback

> *Note: InteliATS2 70 controller can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.*

⏏ **back to Logical binary inputs alphabetically**

S2 Block

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	211		
Description			
This binary input can allow or block the transfer to Source 2 in Auto mode. In case this binary input is activated when the load is already transferred to Source 2, the S2CB breaker opens immediately. If Source 2 is engine, it is stopped.			
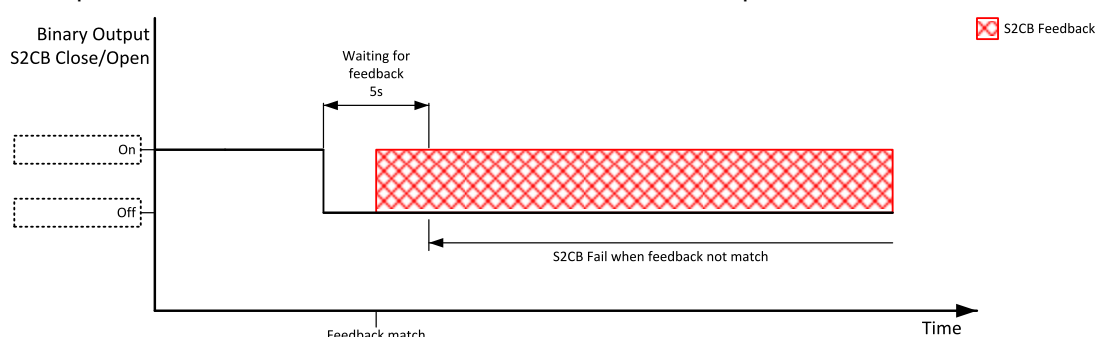
⬙ **back to Logical binary inputs alphabetically**

S2CB Button

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	193		
Description			
Binary input has the same function as the S2CB button ⬚I/O on the InteliATS2 70 front panel. It is evaluated in MAN mode only.			

⬙ **back to Logical binary inputs alphabetically**

S2CB Feedback

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	63		
Description			
Use this input for indication whether the Source 2 circuit breaker is open or closed.			

Image 15.19 S2CB Feedback 1

Note: InteliATS2 70 controller can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.

⬙ **back to Logical binary inputs alphabetically**

Source 1 Ready To Load

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	1189		
Description			
This binary input indicates that the Source 1 is ready to take the load.			

⬙ **back to Logical binary inputs alphabetically**

Source 2 Ready To Load

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	1087		
Description			
This binary input indicates that the Source 2 is ready to take the load.			

⬧ **back to Logical binary inputs alphabetically**

Start Button

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	189		
Description			
Binary input has the same function as Start Button ▣ on the InteliATS2 70 front panel. It is evaluated in MAN mode only.			

⬧ **back to Logical binary inputs alphabetically**

Stop Button

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	190		
Description			
Binary input has the same function as Stop Button ▣ on the InteliATS2 70 front panel. It is evaluated in MAN Mode only.			

⬧ **back to Logical binary inputs alphabetically**

Switch To AUT

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1112		
Description			

When the first rising edge appears on the binary input, the MODE is changed to AUTO. Falling edge has no effect and controller stays in AUTO MODE.

There is no blocking between these "Switch To" LBIs.

> **Example:** CU is in OFF mode. LBI Switch To AUTO is activated – CU goes to AUTO Mode (LBI stays active). Then LBI SWITCH TO MAN (PAGE 357) is activated – CU goes to MAN Mode (at this moment, LBIs Switch To OFF and Switch To AUTO are active – CU reacts only on rising edges).

When more rising edges from "Switch To" LBIs are detected at the same time, mode is selected according to priorities in the table below.

"GO to" control priority	
Highest	OFF
	MAN
Lowest	AUTO

⬧ **back to Logical binary inputs alphabetically**

Switch To MAN

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1111		
Description			

When the first rising edge appears on the binary input, the MODE is changed to MAN. Falling edge has no effect and controller stays in MAN MODE.

There is no blocking between these "Switch To" LBIs.

> **Example:** CU is in OFF mode. LBI Switch To MAN is activated – CU goes to MAN Mode (LBI stays active). Then LBI SWITCH TO AUT (PAGE 356) is activated – CU goes to AUTO Mode (at this moment, LBIs Switch To MAN and Switch To AUTO are active – CU reacts only on rising edges).

When more rising edges from "Switch To" LBIs are detected at the same time, mode is selected according to priorities in the table below.

"GO to" control priority	
Highest	OFF
	MAN
Lowest	AUTO

⬤ **back to Logical binary inputs alphabetically**

Switch To OFF

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1110		
Description			

When the first rising edge appears on the binary input, the MODE is changed to OFF. Falling edge has no effect and controller stays in OFF MODE.

There is no blocking between these "Switch To" LBIs.

> **Example:** CU is in MAN mode. LBI Switch To OFF is activated – CU goes to OFF Mode (LBI stays active). Then LBI SWITCH TO AUT (PAGE 356) is activated – CU goes to AUTO Mode (at this moment, LBIs Switch To OFF and Switch To AUTO are active – CU reacts only on rising edges).

When more rising edges from "Switch To" LBIs are detected at the same time, mode is selected according to priorities in the table below.

"GO to" control priority	
Highest	OFF
	MAN
Lowest	AUTO

⬤ **back to Logical binary inputs alphabetically**

LBI: T

Total Emergency Stop

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	995		
Description			
This binary input opens S1CB or S2CB breaker depends which one is at the moment of input activation closed. In addition when Source 2 is the engine it deactivates LBO GEN START/STOP (PAGE 368).			

⬤ **back to Logical binary inputs alphabetically**

Transfer to S2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1089		
Description			
When this binary input is activated in AUTO mode the transfer of the load to Source 2 is initiated. The timer Secondary Source Switch is not counted.			

When the load is supplied by Source 2 and this binary input is deactivated the return transfer of the load to Source 1 is initiated. The timer Primary Source Return Delay is not counted.

⬤ **back to Logical binary inputs alphabetically**

8.1.5 Logical binary outputs

What Logical binary outputs are:

Logical binary outputs are outputs for binary values and functions.

Alphabetical groups of Logical binary outputs

For a full list of Logical binary inputs go to the chapter **Logical binary outputs alphabetically (page 360)**.

Logical binary outputs alphabetically

⏏ **back to Controller objects**

LBO: A

AIN Switch01

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1400		
Description			
This is an output from the General Analog Input 1 switch function. The behavior of the switch depends on the adjustment of the setpoints **AIN Switch01On (page 238)** and **AIN Switch01 Off (page 239)**. The value is measured from **AIN SWITCH 01 (PAGE 385)** analog input.			

Image 15.20 General analog input 1 switch
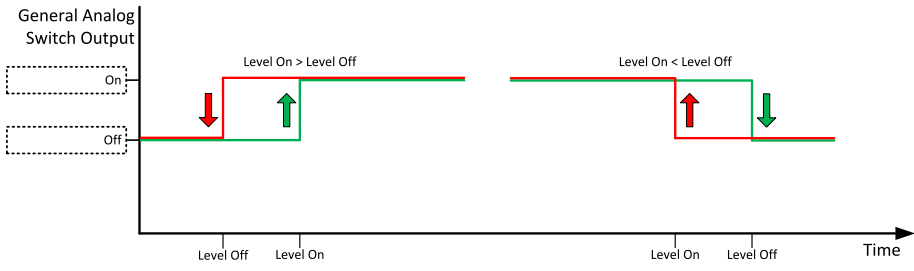
⏶ **back to Logical binary outputs alphabetically**

AIN Switch02

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1401		
Description			
This is an output from the General Analog Input 2 switch function. The behavior of the switch depends on the adjustment of the setpoints **AIN Switch02 On (page 240)** and **AIN Switch02 Off (page 241)**. The value is measured from **AIN SWITCH 02 (PAGE 385)** analog input.			

Image 15.21 General analog input 2 switch

⏶ **back to Logical binary outputs alphabetically**

AL Common BOS

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	9		
Description			
Output is activated when any BOS alarm appears. The output opens, if:			

> No BOS alarm is active and

> Fault reset ⚠ button is pressed

⬤ **back to Logical binary outputs alphabetically**

AL Common MP

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	10		
Description			
The output is active when any MP protection is active.			

⬤ **back to Logical binary outputs alphabetically**

AL Common MP2

Related FW	1.2.0	Related applications	Mains-Mains
Comm object	2625		
Description			
The output is active when any MP2 protection is active.			

⬤ **back to Logical binary outputs alphabetically**

AL Common MPR

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2626		
Description			
Output is activated when MPR alarm appears. The output opens, if:			

> No MPR alarm is active and

> Fault reset button is pressed

⬤ **back to Logical binary outputs alphabetically**

AL Common MPR2

Related FW	1.2.0	Related applications	Mains-Mains
Comm object	4		
Description			

Output is activated when MPR2 alarm appears.

The output opens, if:
> No MPR2 alarm is active and
> Fault reset button is pressed

⏏ **back to Logical binary outputs alphabetically**

AL Common Wrn

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	3		
Description			

Output is activated when any warning alarm appears.

The output opens, if:
> No warning alarm is active and
> Fault reset ⚠ button is pressed

⏏ **back to Logical binary outputs alphabetically**

AL Overcurrent

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	109		
Description			

This output is active when the **BOS Overcurrent IDMT (page 418)** or **BOS Short Circuit (page 418)** alarm is present in alarmlist or isn't confirm.

⏏ **back to Logical binary outputs alphabetically**

AL S1 Fail

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2555		
Description			

This output is active when there is active any Source 1 level 2 protection (fixed or user protection).

⏏ **back to Logical binary outputs alphabetically**

AL S1 Frequency

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2556		
Description			

This output is active when any Source 1 Underfrequency or Overfrequency fixed protection is active.

⏏ **back to Logical binary outputs alphabetically**

AL S1 Voltage

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2557		
Description			
This output is active when any Source 1 Overvoltage or Undervoltage fixed protection is active.			

 back to **Logical binary outputs alphabetically**

AL S2 Fail

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2561		
Description			
This output is active when there is active any Source 2 level 2 protection (fixed or user protection).			

 back to **Logical binary outputs alphabetically**

AL S2 Freq Wrn

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2553		
Description			
This output is active when any Source 2 fixed protection of type Wrn is active or inactive but not confirmed in the alarmlist.			

 back to **Logical binary outputs alphabetically**

AL S2 Frequency

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2554		
Description			
This output is active when any Source 2 fixed frequency protection of type BOS (Mains-Gen) MP2 (Mains-Mains) is active or inactive but not confirmed in the alarmlist.			

 back to **Logical binary outputs alphabetically**

AL S2 Voltage Wrn

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1289		
Description			
This output is active when any Source 2 fixed voltage protection of type Wrn is active or inactive but not confirmed in the alarmlist.			

 back to **Logical binary outputs alphabetically**

AL S2 Voltage

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2549		
Description			
This output is active when any Source 2 fixed voltage protection of type BOS (Mains-Gen) or MP2 (Mains-Mains) is active or inactive but not confirmed in the alarmlist.			

⬆ **back to Logical binary outputs alphabetically**

Alarm

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2		
Description			
The output is designed to be used as external alarm indication such as a red bulb in the control room etc. The output is active when there is active alarm or inactive unconfirmed alarm present in the alarmlist and remains active until confirmation of alarm.			

⬆ **back to Logical binary outputs alphabetically**

LBO: C

Common Alarm Active Level 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	13		
Description			
This LBO is active when there is an alarm level 1 unconfirmed or confirmed in the alarmlist.			

⬆ **back to Logical binary outputs alphabetically**

Common Alarm Active Level 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	15		
Description			
This LBO is active when there is an alarm level 2 unconfirmed or confirmed in the alarmlist.			

⬆ **back to Logical binary outputs alphabetically**

Common Alarm Level 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	14		
Description			
This LBO is active when there is an alarm level 1 unconfirmed present in the alarmlist.			

⬆ **back to Logical binary outputs alphabetically**

Common Alarm Level 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	16		
Description			
This LBO is active when there is an alarm level 2 unconfirmed present in the alarmlist.			

🔺 **back to Logical binary outputs alphabetically**

LBO: E

Electrical Alarm

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2410		
Description			
LBO Electrical Alarm is active when any fixed protection of level 2 is unconfirmed in the alarmlist (counts both active and inactive alarms).			

🔺 **back to Logical binary outputs alphabetically**

Elevator Switch

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2629		
Description			
LBO Elevator Switch is input for an elevator control in order to stop the elevator and open the door before lost of the power happens due to the predicted transfer of the load. (For more information **see Elevator Switch on page 80**).			

🔺 **back to Logical binary outputs alphabetically**

Exercise Timer 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1250		
Description			
This is an output from the Exercise timer 1. This output makes it easy to make periodic tests of the Source 2 and its activation depends on the setpoints in the **Subgroup: Timer 1 (page 245)** subgroup. This output is active when Timer 1 is active.			

> *Note: In the event that both Timers are active at the same time, Subgroup: Timer 1 (page 245) has a higher priority than Subgroup: Timer 2 (page 253).*

🔺 **back to Logical binary outputs alphabetically**

Exercise Timer 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1251		
Description			
This is an output from the Exercise timer 2. This output makes it easy to make periodic tests of the gen-set and its activation depends on the setpoints in the **Subgroup: Timer 2 (page 253)** subgroup. This output is active when Timer 2 is active. *Note: In the event that both Timers are active at the same time, Subgroup: Timer 1 (page 245) has a higher priority than Subgroup: Timer 2 (page 253).*			

⬤ **back to Logical binary outputs alphabetically**

LBO: F

FltRes Button Echo

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	592		
Description			

This output provides 1s pulse when:

- ❯ Fault Reset button is pressed on the controller front facia or
- ❯ Fault Reset button is pressed on any of external local/remote terminals or
- ❯ Fault Reset command is received via communication line or
- ❯ The input FAULT RESET BUTTON (PAGE 349) is activated.

⬤ **back to Logical binary outputs alphabetically**

FltRes Button State

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2695		
Description			
LBO is active as long as it's button is pressed or it's LBI is active.			

⬤ **back to Logical binary outputs alphabetically**

Forward Synchronization

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	68		
Description			
The LBO is active when Synchronization Timeout is running for Closed or In-Phase transition from Source 1 to Source 2.			

⬤ **back to Logical binary outputs alphabetically**

LBO: G

Gen Start/Stop

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	2582		
Description			
This LBO is used to start or stop the engine.			

 back to Logical binary outputs alphabetically

LBO: H

Heartbeat

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	81		
Description			
This output toggles on/off in a period of 500 ms whenever the controller is switched on and functional.			

 back to Logical binary outputs alphabetically

History Record Indication

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2762		
Description			
This LBO triggers 1s pulse when new history record is created in history log.			
Note: When more history records are created at the same time, only one 1s pulse is created.			

 back to Logical binary outputs alphabetically

Horn

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1		
Description			
The output designed to be used for acoustic indication of a newly appeared alarm. The output is activated each time a new alarm has appeared and remains active until one of the following events occurs:			

> Fault reset is pressed

> Horn reset is pressed

> **Horn Timeout (page 180)** has elapsed

 back to Logical binary outputs alphabetically

HornRes Button Echo

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	31		
Description			
This output provides 1s pulse when:			

> Horn Reset button is pressed on the controller front facia or
> Horn Reset button is pressed on any of external local/remote terminals or
> Horn Reset command is received via communication line or
> the input HORN RESET BUTTON is activated.

🔺 **back to Logical binary outputs alphabetically**

HornRes Button State

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2696		
Description			
LBO is active as long as it's button is pressed or it's LBI is active.			

🔺 **back to Logical binary outputs alphabetically**

LBO: I

Initialized

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1222		
Description			
This output is activated when the engine proceeded through initialization phase. (Initialization phase is restart or power up of the controller.)			

🔺 **back to Logical binary outputs alphabetically**

LBO: L

Load Shedding Stage 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	51		
Description			
Particular instances of the load shedding functionality.			

The load shedding outputs are activated (load is being shedd) in the order 1, 2.

The load shedding outputs are deactivated (load is being reconnected) in the order 2, 1.

The load disconnected by the LBO Nr.1 is the less essential load of these two possible loads instances.

🔺 **back to Logical binary outputs alphabetically**

Load Shedding Stage 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	52		
Description			
Particular instances of the load shedding functionality. The load shedding outputs are activated (load is being shedd) in the order 1, 2. The load shedding outputs are deactivated (load is being reconnected) in the order 2, 1. The load disconnected by the LBO Nr.1 is the less essential load of these two possible loads instances.			

 ⬤ **back to Logical binary outputs alphabetically**

LBO: M

Mode AUTO

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	19		
Description			
This output is active whenever the controller is in AUTO mode.			

 ⬤ **back to Logical binary outputs alphabetically**

Mode MAN

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	18		
Description			
This output is active whenever the controller is in MAN mode.			

 ⬤ **back to Logical binary outputs alphabetically**

Mode OFF

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	17		
Description			
This output is active whenever the controller is in OFF mode.			

 ⬤ **back to Logical binary outputs alphabetically**

LBO: N

Neutral Close/Open

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	50		
Description			
The output controls the neutral position of the three positions ATS switch. The ATS switch must react within 5 seconds to a close or open command, otherwise an alarm is issued.			

> *Note: InteliATS2 70 controllers can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.*

 back to Logical binary outputs alphabetically

Neutral ON Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2591		
Description			
The output activates the neutral position coil of the three positions ATS switch. The pulse lasts for 5 seconds.			

 back to Logical binary outputs alphabetically

Not In AUTO

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	1248		
Description			
This output is active when controller isn't in AUTO mode.			

 back to Logical binary outputs alphabetically

Not Used

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	286		
Description			
Output has no function.			

 back to Logical binary outputs alphabetically

LBO: R

Ready To AMF

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	324		
Description			
The output is active if the Source 2 is ready to take the load if the Source 1 fails.			

 back to Logical binary outputs alphabetically

Reverse Synchronization

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	69		
Description			
The LBO is active when Synchronization Timeout is running for Closed or In-Phase transition from Source 2 to Source 1.			

⬥ **back to Logical binary outputs alphabetically**

LBO: S

S1 Healthy

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2552		
Description			

The LBO is active when Source 1 frequency and voltages are within the protection limits.

AL S1 Fail – is active when:

- ❯ active S1 protection (fixed or user) level 2.
- ❯ inactive S1 protection (fixed or user) level 2 not confirmed.
- ❯ inactive unconfirmed **Wrn S1CB Fail (page 408)** / **Wrn S1CB Fail To Open (page 408)** / **Wrn S1CB Fail To Close (page 408)**.
- ❯ active **ALI Source 1 Ph Rotation Opposite (page 413)**.

⬥ **back to Logical binary outputs alphabetically**

S1 Ready To Load

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2547		
Description			
This output is active when there is no Source 1 failure detected and S2CB breaker is opened.			

⬥ **back to Logical binary outputs alphabetically**

S1CB Button Echo

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	34		
Description			

This output provides 1s pulse when:

- ❯ S1CB button is pressed on the controller front facia or
- ❯ S1CB button is pressed on any of external local/remote terminals or
- ❯ S1CB command is received via communication line or
- ❯ the input S1CB BUTTON is activated.

⬥ **back to Logical binary outputs alphabetically**

S1CB Button State

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2698		
Description			
LBO is active as long as it's button is pressed or it's LBI is active.			

🔺 **back to Logical binary outputs alphabetically**

S1CB Close/Open

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	45		
Description			
The output controls the Source 1 circuit breaker. Its state represents the breaker position requested by the controller. The breaker must react within 5 seconds to a close or open command, otherwise an alarm is issued.			

> *Note: InteliATS2 70 controllers can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.*

Image 15.22 S1CB Close command

🔺 **back to Logical binary outputs alphabetically**

S1CB OFF Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	47		

Description

The output is intended for control of open coil of Source 1 circuit breaker. The output gives a pulse in the moment the breaker has to be opened.

Image 15.23 S1CB OFF Coil command

⬡ **back to Logical binary outputs alphabetically**

S1CB ON Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	46		

Description

The output is intended for control of close coil of S1CB circuit breaker.

Image 15.24 S1CB ON Coil close command

⬡ **back to Logical binary outputs alphabetically**

S1CB Status

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	85		
Description			

This output indicates the S1CB position (circuit breaker is closed or opened) as it is internally considered by the controller.
 	
  > In case the S1CB feedback is configured the S1CB Status reflects the **S1CB FEEDBACK (PAGE 354)**.
 	
  > In case the S1CB feedback is not configured the S1CB Status reflects the **S1CB CLOSE/OPEN (PAGE 373)** output.			

⬤ back to Logical binary outputs alphabetically

S1CB UV Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	48		

Description

The output is intended for control of undervoltage coil of S1CB circuit breaker. The output is active the whole time when the controller is switched on. The output is deactivated for 5 seconds in the moment the breaker has to be switched off.
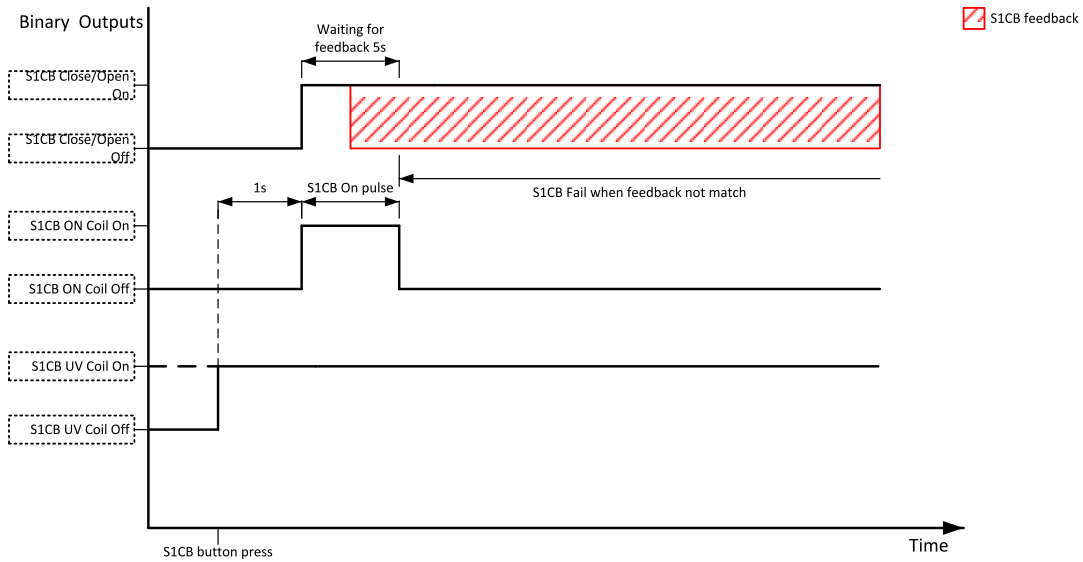
Image 15.25 S1CB UV Coil close command
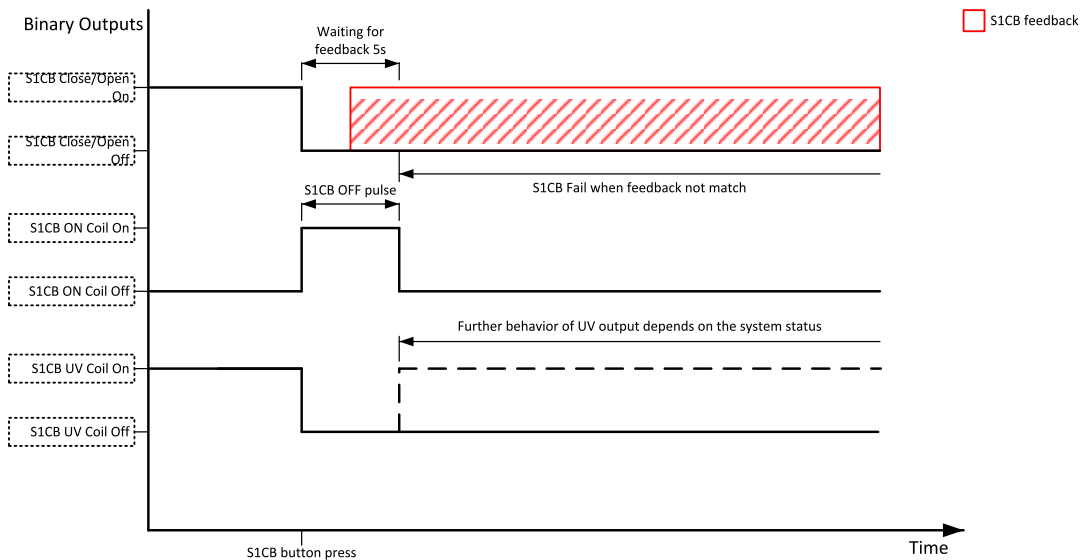
Image 15.26 S1CB UV Coil open command

⬣ **back to Logical binary outputs alphabetically**

S2 Healthy

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2551		
Description			

The LBO is active when Source 2 frequency and voltages are within the protection limits.

AL S1 Fail – is active when:

> active S1 protection (fixed or user) level 2.

> inactive S1 protection (fixed or user) level 2 not confirmed.

> inactive unconfirmed **Wrn S2CB Fail (page 408)** / **Wrn S2CB Fail To Open (page 409)** / **Wrn S2CB Fail To Close (page 409)**.

> active **ALI Source 2 Ph Rotation Opposite (page 413)**.

⏶ back to **Logical binary outputs alphabetically**

S2 Ready To Load

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2548		
Description			

This output is active when there is no Source 2 failure detected and S1CB breaker is opened.

⏶ back to **Logical binary outputs alphabetically**

S2CB Button Echo

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	35		
Description			

This output provides 1s pulse when:

> S2CB button is pressed on the controller front facia or

> S2CB button is pressed on any of external local/remote terminals or

> S2CB command is received via communication line or

> the input S2CB BUTTON is activated.

⏶ back to **Logical binary outputs alphabetically**

S2CB Button State

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	2697		
Description			

LBO is active as long as it's button is pressed or it's LBI is active.

⏶ back to **Logical binary outputs alphabetically**

S2CB Close/Open

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	41		

Description

The output controls the Source 2 circuit breaker. Its state represents the breaker position requested by the controller. The breaker must react within 5 seconds to a close or open command, otherwise an alarm is issued.

Note: InteliATS2 70 controllers can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.
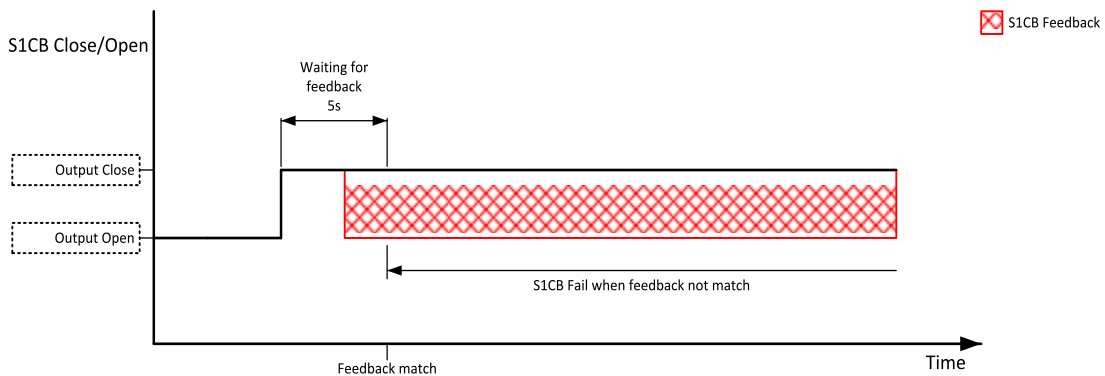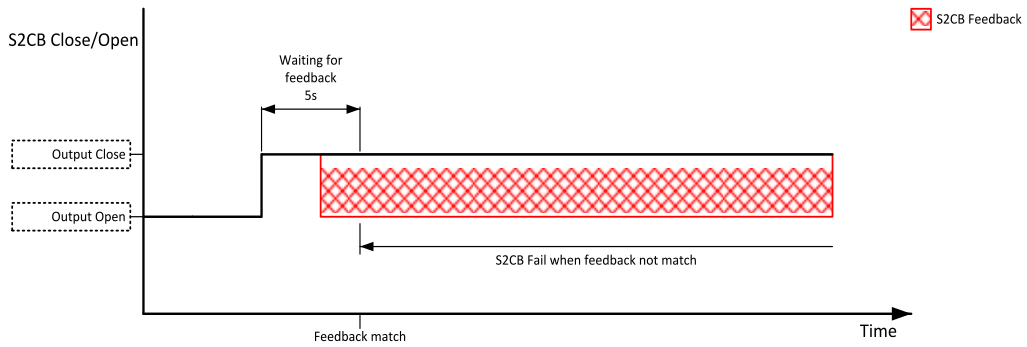

Image 15.27 S2CB Close command
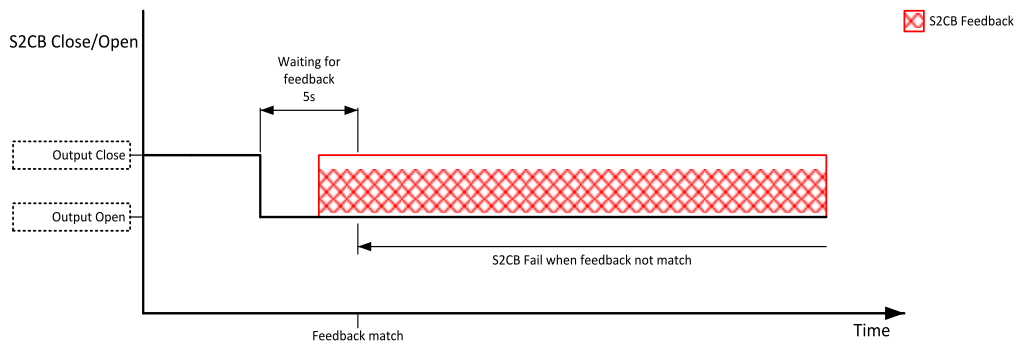
Image 15.28 S2CB Open command

⏶ **back to Logical binary outputs alphabetically**

S2CB OFF Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	43		

Description

The output is intended for control of open coil of generator circuit breaker. The output gives a pulse in the moment the breaker has to be opened.

Image 15.29 S2CB OFF Coil command

⬤ **back to Logical binary outputs alphabetically**

S2CB ON Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	42		

Description

The output is intended for control of close coil of Source 2 circuit breaker. The output gives 5s pulse in the moment the breaker has to be closed.

Image 15.30 S2CB ON Coil close command

⬤ **back to Logical binary outputs alphabetically**

S2CB Status

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	84		
Description			

This output indicates the S2CB position (circuit breaker is closed or opened) as it is internally considered by the controller.

> In case the S2CB feedback is configured the S2CB Status reflects the **S2CB FEEDBACK (PAGE 355)**.

> In case the S2CB feedback is not configured the S2CB Status reflects the **S2CB CLOSE/OPEN (PAGE 377)** output

⬤ back to Logical binary outputs alphabetically

S2CB UV Coil

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	44		
Description			

The output is intended for control of undervoltage coil of Source 2 circuit breaker. The output is active the whole time when the engine is running.

Image 15.31 S2CB UV Coil close command

Image 15.32 S2CB UV Coil open command

⬢ **back to Logical binary outputs alphabetically**

Start Button Echo

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	33		
Description			
This output provides 1s pulse when:			

> ❯ Start button is pressed on the controller front facia or
>
> ❯ Start button is pressed on any of external local/remote terminals or
>
> ❯ Start command is received via communication line or
>
> ❯ the input START BUTTON is activated.

⬢ **back to Logical binary outputs alphabetically**

Start Button State

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	2693		
Description			
LBO is active as long as it's button is pressed or it's LBI is active.			

⬢ **back to Logical binary outputs alphabetically**

Still Log 0

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	26		
Description			
Logical binary output which is still in logical 0.			

⬢ **back to Logical binary outputs alphabetically**

Still Log 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	27		
Description			
Logical binary output which is still in logical 1.			

🔺 **back to Logical binary outputs alphabetically**

Stop Button Echo

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	32		
Description			
This output provides 1s pulse when:			

> Stop button is pressed on the controller front facia or

> Stop button is pressed on any of external local/remote terminals or

> Stop command is received via communication line or

> the input STOP BUTTON is activated.

🔺 **back to Logical binary outputs alphabetically**

Stop Button State

Related FW	1.2.0	Related applications	Mains-Gen
Comm object	2694		
Description			
LBO is active as long as it's button is pressed or it's LBI is active.			

🔺 **back to Logical binary outputs alphabetically**

Synchronizing

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object	325		
Description			
The LBO is active when Synchronization Timeout is running for Closed or In-Phase transition.			

🔺 **back to Logical binary outputs alphabetically**

LBO: U

User button 1

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

🔺 **back to Logical binary outputs alphabetically**

User button 2

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

⬢ back to Logical binary outputs alphabetically

User button 3

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

⬢ back to Logical binary outputs alphabetically

User button 4

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

⬢ back to Logical binary outputs alphabetically

User button 5

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

⬢ back to Logical binary outputs alphabetically

User button 6

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

⬢ back to Logical binary outputs alphabetically

User button 7

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

⬢ back to Logical binary outputs alphabetically

User button 8

Related FW	1.2.0	Related applications	Mains-Mains, Mains-Gen
Comm object			
Description			
.			

🔺 **back to Logical binary outputs alphabetically**

8.1.6 Logical analog inputs

What Logical analog inputs are:

Logical analog inputs are inputs for analog values.

AIN Switch 01

Related FW	1.2.0	**Related applications**	Mains-Mains, Mains-Gen
Comm object	209		
Description			
Logical analog input designed for any analog value available in the controller. This analog input controls logical binary output **AIN SWITCH01 (PAGE 361)**. The behavior of the switch depends on the adjustment of the setpoints **AIN Switch01On (page 238)** and **AIN Switch01 Off (page 239)**.			

AIN Switch 02

Related FW	1.2.0	**Related applications**	Mains-Mains, Mains-Gen
Comm object	210		
Description			
Logical analog input designed for any analog value available in the controller. This analog input controls logical binary output **AIN SWITCH02 (PAGE 361)**. The behavior of the switch depends on the adjustment of the setpoints **AIN Switch02 On (page 240)** and **AIN Switch02 Off (page 241)**.			

8.1.7 PLC

List of PLC groups

For a full list of PLC blocks go to the chapter **List of PLC blocks (page 386)**.

List of PLC blocks

Group: Basic Logical functions

OR/AND

PLC group	Basic logical functions	
Related FW	1.2.0	
Related applications	Mains-Mains, Mains-Gen	
Comm object	1	

Inputs

Input	Type	Negation	Range	Function
Input 1 .. 8	Binary	Yes	0/1	Inputs 1 .. 8

Outputs

Output	Type	Negation	Range	Function
Output	Binary	Yes	0/1	Result of the logical operation

Description

The block performs logical operation OR / AND of 2 – 8 binary operands. The inputs as well as the output can be inverted.

Function OR

Input 1	Input 2	Output
0	0	0
0	1	1
1	0	1
1	1	1

Function AND

Input 1	Input 2	Output
0	0	0
0	1	0
1	0	0
1	1	1

There have to be at least 2 inputs every time. There may be up to 8 inputs configured.
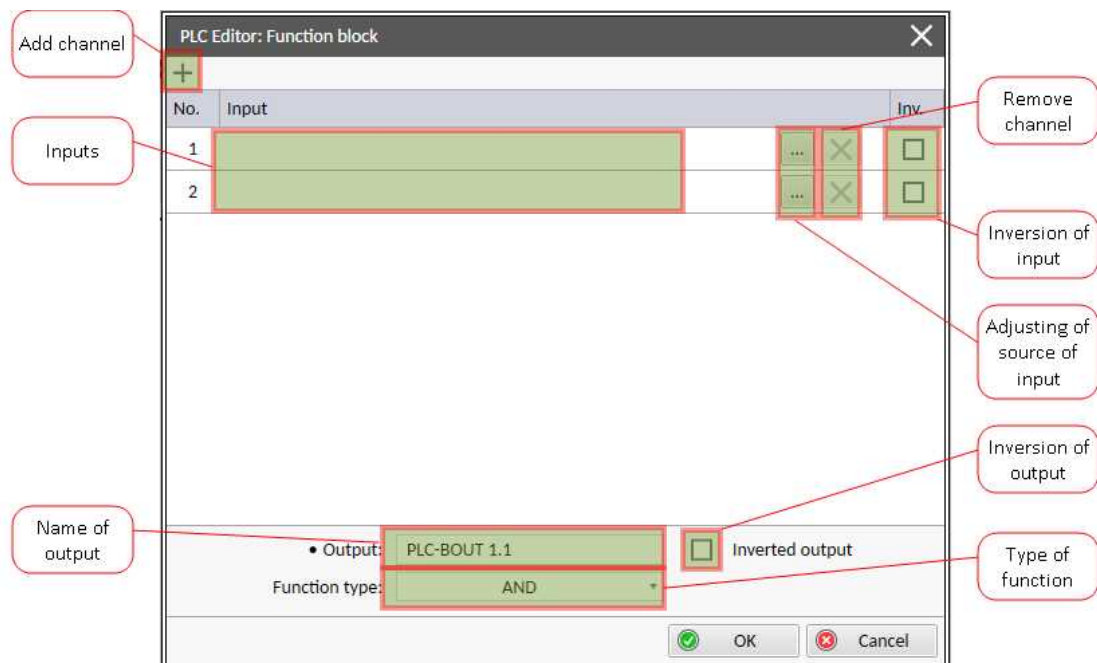
Image 15.33 Configuration of OR/AND block

🔺 **back to List of PLC blocks**

XOR/RS

PLC group	Basic logical functions
Related FW	1.2.0
Related applications	Mains-Mains, Mains-Gen
Comm object	39

Inputs

Input	Type	Negation	Range	Function
Input 1 .. 2	Binary	Yes	0/1	Inputs 1 .. 2

Outputs

Output	Type	Negation	Range	Function
Output	Binary	Yes	0/1	Result of the logical operation

Description

The block provides logical function of two values – XOR or RS flip-flop. Both inputs and output can be inverted.

Function XOR

Input 1	Input 2	Output
0	0	0
0	1	1
1	0	1
1	1	0

The block contains a setting for RS dominance. This setting is available in the block dialog window (i.e. this setting is constantly set by configuration and cannot be changed dynamically in operation).

Function RS

Input 1 (S)	Input 2 (R)	R-latch Q	S-latch Q	E-latch Q	JK-latch Q
0	0	Q^{-1}	Q^{-1}	Q^{-1}	Q^{-1}
0	1	0	0	0	0
1	0	1	1	1	1
1	1	0	1	Q^{-1}	$NOT(Q^{-1})$
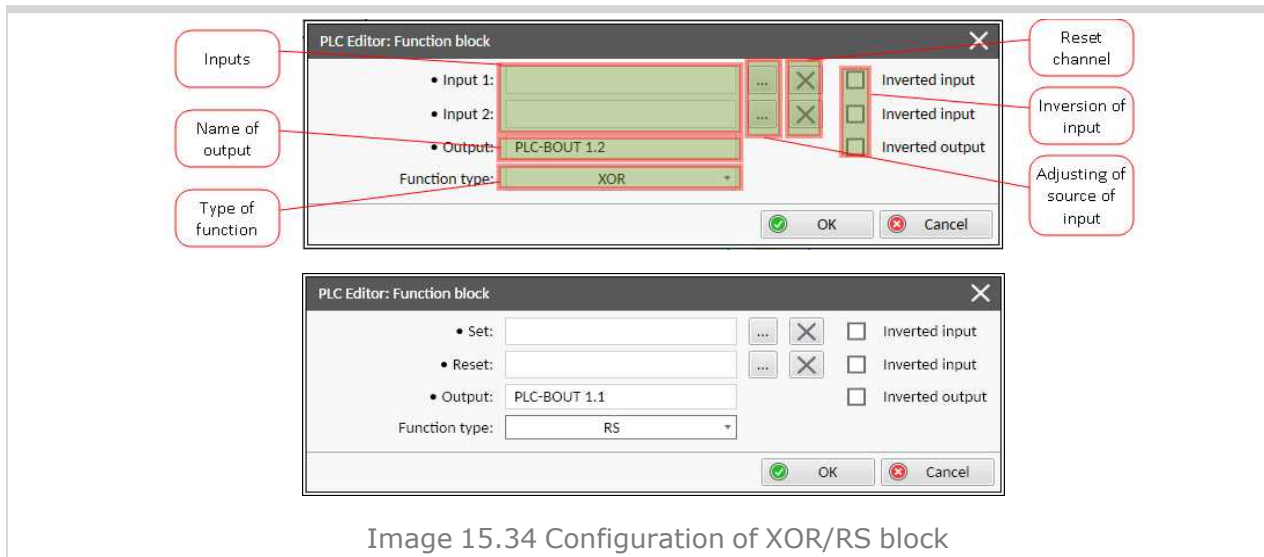
Image 15.34 Configuration of XOR/RS block

⬥ **back to List of PLC blocks**

Group: Comparison of analog inputs

Comparator With Hysteresis

PLC group	Comparison of analog inputs	
Related FW	1.2.0	
Related applications	Mains-Mains, Mains-Gen	
Comm object	3	

Inputs

Input	Type	Negation	Range	Function
Input	Analog	No	Any	Compared value
Input ON	Analog	No	Same as Input	Comparative level for switching on
Input OFF	Analog	No	Same as Input	Comparative level for switching off

Outputs

Output	Type	Negation	Range	Function
Output	Binary	No	0/1	Comparator output

Description

The block compares the input value with the comparative levels. The behavior depends on whether the ON level is higher than OFF level or vice versa.
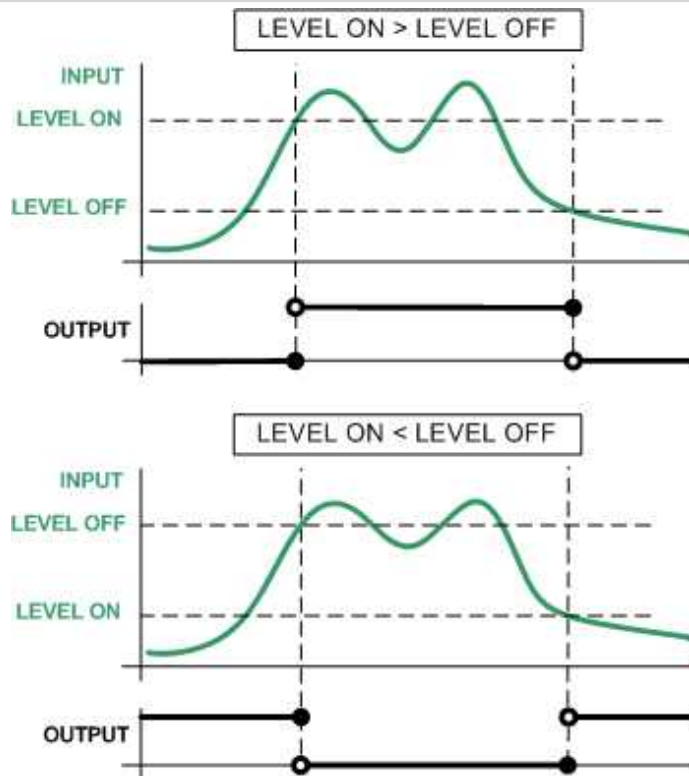
Image 15.35 Different On and Off levels
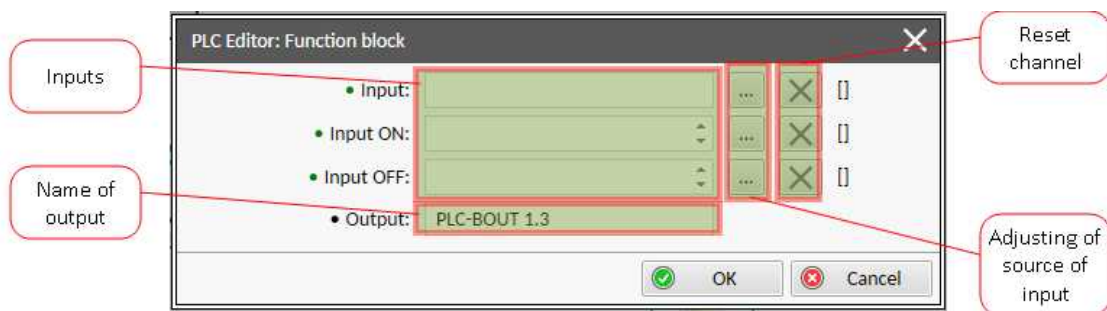
Image 15.36 Configuration of Comp Hyst block

Note: Level On and Level Off can be constants or values from controller.

> **IMPORTANT: In case that the values on inputs have different decimal numbers, then the values are converted and the name of block is red. It is strongly recommended to use values with the same decimal numbers.**

⬆ **back to List of PLC blocks**

Comparator With Delay

PLC group	Comparison of analog inputs	
Related FW	1.2.0	
Related applications	Mains-Mains, Mains-Gen	
Comm object	4	
Inputs		

Input	Type	Negation	Range	Function
Input 1	Analog	No	Any	Compared value
Input 2	Analog	No	Same as Input 1	Comparative level
Delay	Analog	No	0.0..3000,0 [s]	Comparative delay

Outputs

Output	Type	Negation	Range	Function
Output	Binary	No	0/1	Comparator output

Description

The block works as an analog switch. It compares the input value with the comparative level. The output will switch on if the input is equal or higher than the comparative level for time longer than the delay.
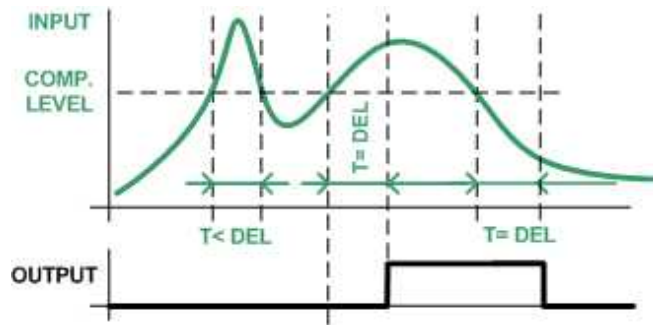
Image 15.37 Principle of delay
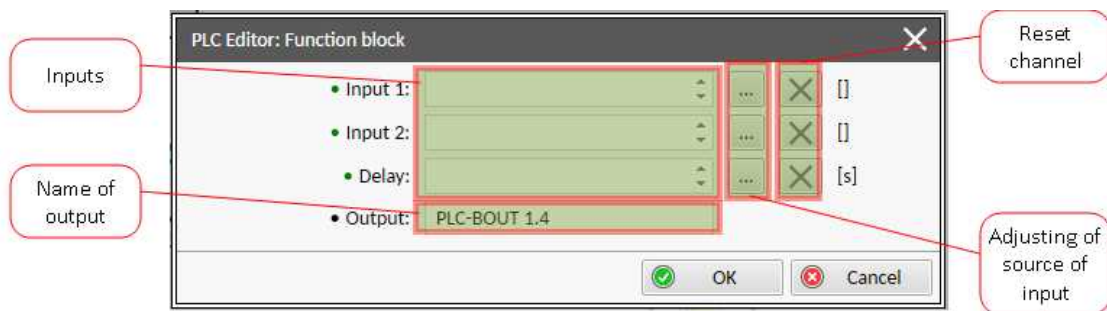
Image 15.38 Configuration of Comp Time block

Note: Input 2 and Delay can be constants or values from controller.

⬢ **back to List of PLC blocks**

Group: Time functions

Timer

PLC group	Time functions	
Related FW	1.2.0	
Related applications	Mains-Mains, Mains-Gen	
Comm object	38	
Inputs		

Input	Type	Negation	Range	Function
Run	Binary	No	0/1	The timer runs only if this input is active or not connected
Reload	Binary	No	0/1	This input reloads the timer to the initial value
Reload value	Analog	No	0.0..3276.7 [s]	Initial value of the timer

Outputs

Output	Type	Negation	Range	Function
Output	Binary	No	0/1	Timer output

Description

The block works as a countdown timer which is decreased by 1 every PLC cycle. The timer initial value is adjustable by the "Reload value" input. The timer is automatically reloaded with the initial value when it reaches zero or it can be reloaded at any other time using the "reload" input. The timer remains at reload value until the reload input is deactivated. The timer output is inverted always when the timer is reloaded.
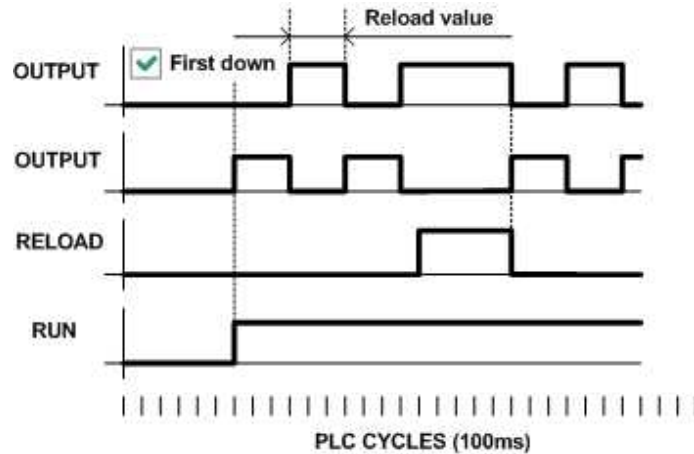
Image 15.39 Principle of timer
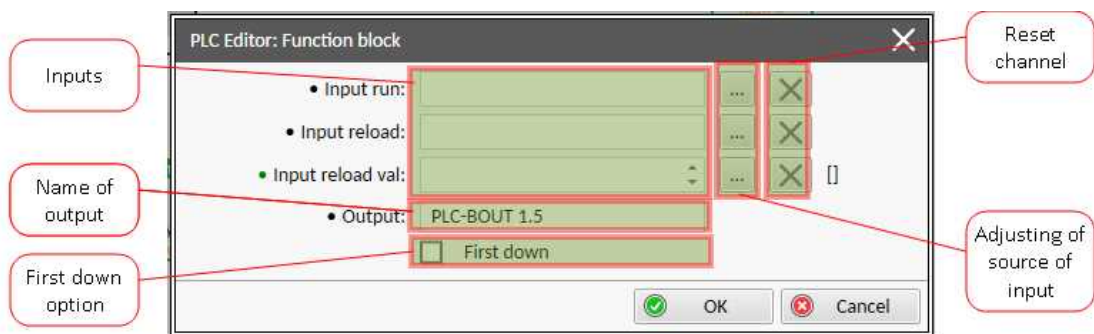
Image 15.40 Configuration of Timer block

Note: Input reload value can be constant or value from controller.

Note: If you want the output to start at logical 0, tick First down option. Otherwise the output will start at logical 1.

> **IMPORTANT: If the inputs are not connected and First down option is not ticked, then the output is active.**

⏶ **back to List of PLC blocks**

Delay

PLC group	Time functions
Related FW	1.2.0
Related applications	Mains-Mains, Mains-Gen
Comm object	33

Inputs

Input	Type	Negation	Range	Function
Input	Binary	No	0/1	Input signal to be delayed
Input time up	Analog	No	-3200.0 .. 3200.0 [s, m, h]	Delay of the rising edge resp. pulse length generated by rising edge of the input
Input time down	Analog	No	-3200.0 .. 3200.0 [s, m, h]	Delay of the falling edge resp. pulse length generated by falling edge of the input
Input reset	Binary	No	0/1	Resets the output to logical 0. The output remains in logical 0 until new rising edge appears on Input (when Input reset is deactivated already)

Outputs

Output	Type	Negation	Range	Function
Output	Binary	No	0/1	Output signal

Description

This block can work in two modes of operation:

> Delay mode – the rising edge at the output is generated with delay of "input time up" when a rising edge at the input is detected. The falling edge at the output is generated with delay of "input time down" when a falling edge at the input is detected. If the delayed falling edge at the output came earlier than the delayed rising edge, then no pulse would be generated at the output.

> Pulse mode – a pulse of "input time up" length is generated at the output when a rising edge is detected, a pulse of "input time down" length is generated at the output when a falling edge is detected.
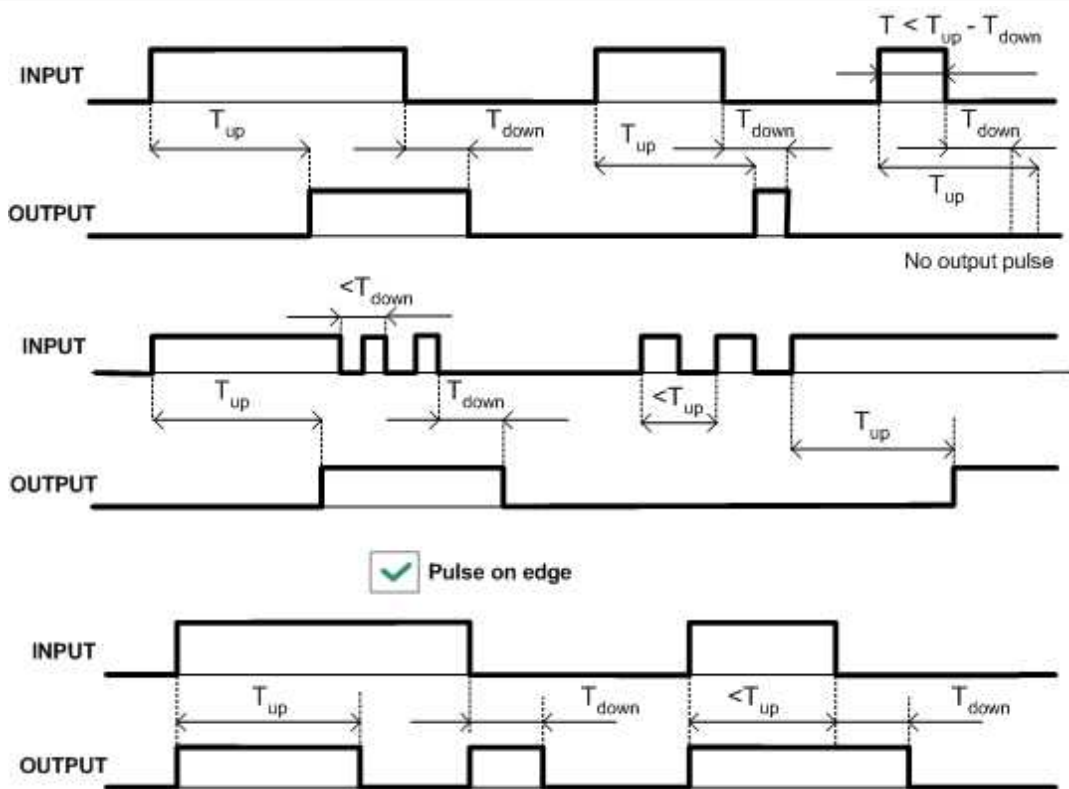
Image 15.41 Delay modes principles
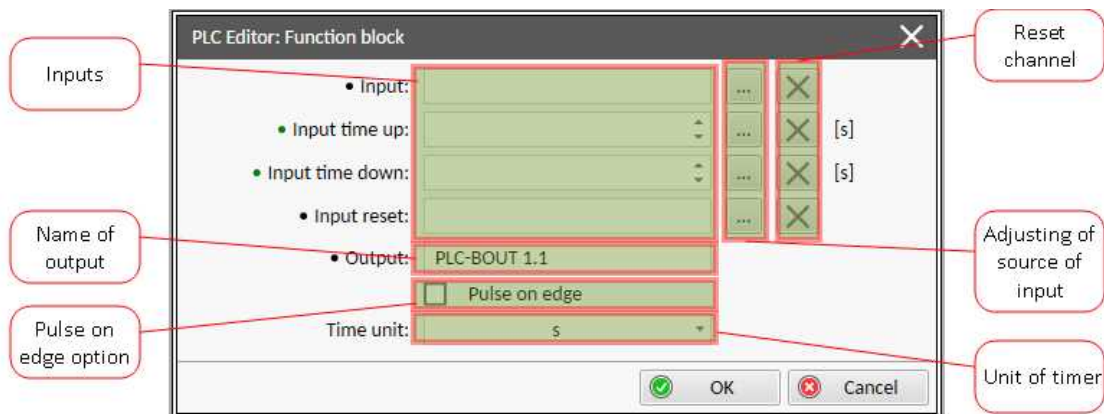
Image 15.42 Configuration of Delay block

Note: If Input time up or Input time down value is <0, this input is internally set to zero.
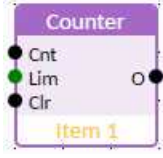
Note: Input time up and Input time down values can be constants or values from controller.

Note: Use Pulse on edge option to choose between delay and pulse mode.

⏶ **back to List of PLC blocks**

Group: Other functions

Counter

PLC group	Other functions
Related FW	1.2.0
Related applications	Mains-Mains, Mains-Gen
Comm object	13

Inputs

Input	Type	Negation	Range	Function
Input Count Up	Binary	No	0/1	Input at which the edges are counted
Input Preset Limit	Analog	No	0 .. 32767 [-]	Counter value limit for activation of the output
Input Clear	Binary	No	0/1	Reset input

Outputs

Output	Type	Negation	Range	Function
Output	Binary	No	0/1	Output is activated when the counter value exceeds the limit

Description

The block works as a counter of edges (selectable rising, falling or both) with reset input and adjustable counting limit. The maximal counter value is 32767. The counter value is lost when the controller is switched off. The output is activated when the counter value is equal or higher than Input Preset Limit and stays active until the block reset is done using Input Clear. Activating of the Input Clear resets the counter value to 0 and deactivates the output. Holding the Input Clear active blocks the counting.
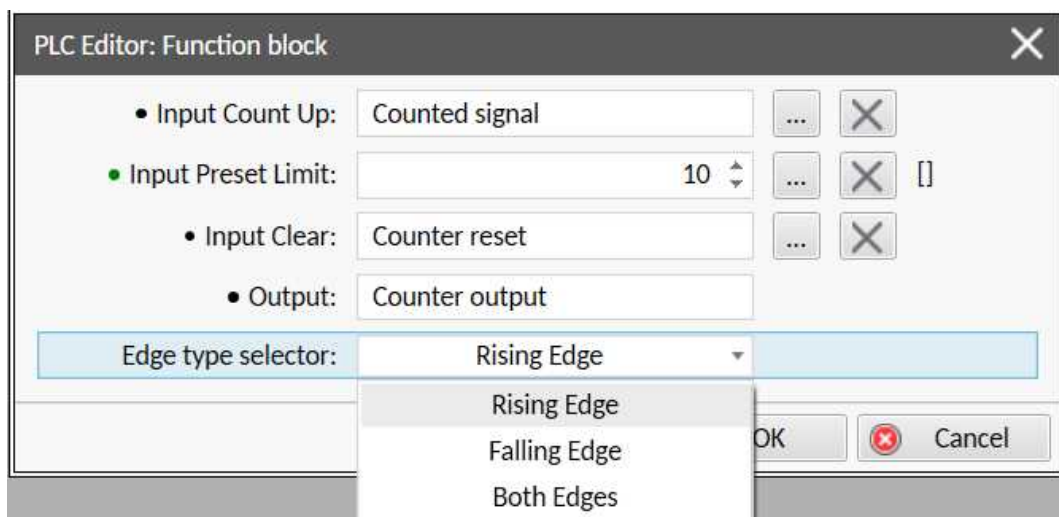
Image 15.43 Configuration of the Counter block

⏏ **back to List of PLC blocks**

Decomposer

PLC group	Other functions
Related FW	1.2.0
Related applications	Mains-Mains, Mains-Gen
Comm object	

Inputs

Input	Type	Negation	Range	Function
Input	Analog	No	-2147483647..2147483647	Value to be "decomposed" to bits

Outputs

Output	Type	Negation	Range	Function
Output 1	Binary	Yes	0/1	Bit 0,4,8,12,16,20,24,28 – according to selected group of bits.
Output 2	Binary	Yes	0/1	Bit 1,5,9,13,17,21,25,29 – according to selected group of bits.
Output 3	Binary	Yes	0/1	Bit 2,6,10,14,18,22,26,30 – according to selected group of bits.
Output 4	Binary	Yes	0/1	Bit 3,7,11,15,19,23,27,31 – according to selected group of bits.

Description

The block converts the input analog value to binary form and provides selected bits as binary outputs.
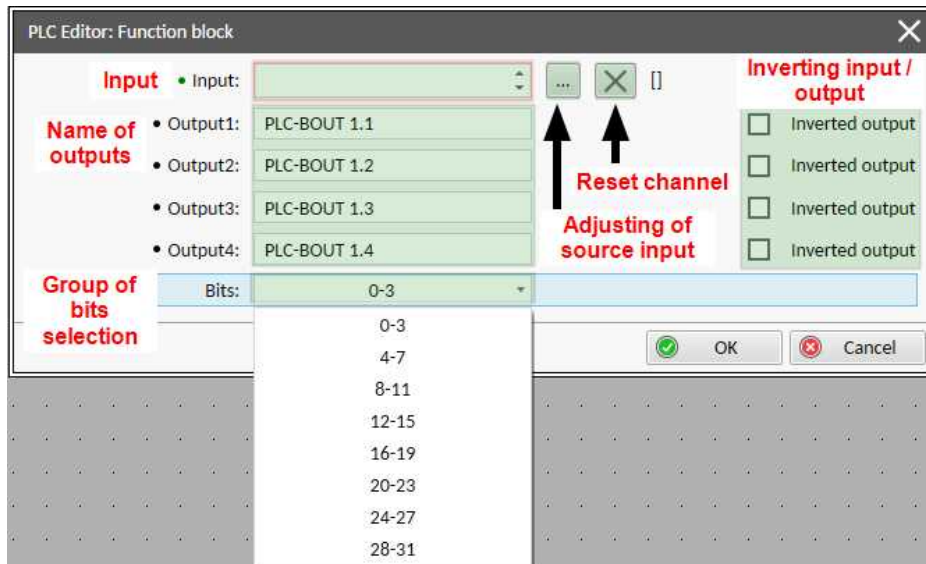
Image 15.44 Configuration of Comp Time block

Note: Input 2 and Delay can be constants or values from the controller.

🔺 **back to List of PLC blocks**

8.2 Alarms

What alarms are:

The controller evaluates two levels of alarms. For more information **see Alarm management on page 121**.

8.2.1 Alarm levels in the controller

8.2.2 Alarms level 1

What alarms level 1 are:

The level 1 alarm indicates that a value or parameter is out of normal limits, but has still not reached critical level.

List of alarms level 1

⏶ **back to Alarms**

Wrn Module(slotA) - false module

Alarm Type	WRN
Alarmlist message	Module(slotA) - fake module
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that false module is inserted in slot.

⬤ **back to List of alarms level 1**

Wrn Module(slotA) - unknown module

Alarm Type	WRN
Alarmlist message	Module(slotA) - unknown module
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that unknown module is inserted in slot.

⬤ **back to List of alarms level 1**

Wrn Module(slotA) - unattended

Alarm Type	WRN
Alarmlist message	Module(slotA) - unattended
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that two same communication modules are inserted in slots and one of them will be inactive.

⬤ **back to List of alarms level 1**

Wrn Module(slotA) - comm. outage

Alarm Type	WRN
Alarmlist message	Module(slotA) - comm. outage
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that there is a problem with communication between controller and module in slot.

⬤ **back to List of alarms level 1**

Wrn Module(slotA) - unexpected

Alarm Type	WRN
Alarmlist message	Module(slotA) - unexpected
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that in slot is inserted different module than which is configured or the module is unconfigured and has to be configured for proper function.

⬤ **back to List of alarms level 1**

Wrn EM(A) - a message lost

Alarm Type	WRN
Alarmlist message	EM(A) - a message lost
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that there is a problem with communication between controller and module in slot.

⬓ **back to List of alarms level 1**

Wrn EM(A) - configuration mistake

Alarm Type	WRN
Alarmlist message	EM(A) - configuration mistake
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that there is a problem with configuration of binary input or output of module in slot.

⬓ **back to List of alarms level 1**

Wrn EM(A) - insufficient

Alarm Type	WRN
Alarmlist message	EM(A) - insufficient
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that module does not support all required features.

⬓ **back to List of alarms level 1**

Wrn EM(A) - missing or damaged

Alarm Type	WRN
Alarmlist message	EM(A) - missing or damaged
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm indicates that there is a problem with communication with module in slot (in first 5 second there was no communication and module is configured in slot).

⬓ **back to List of alarms level 1**

Wrn Event Email 1 Fail

Alarm Type	WRN
Alarmlist message	Event Email 1 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event email to email address which is adjusted in setpoint **Email Address 1 (page 302)** and email

| | wasn't send. |

⬖ **back to List of alarms level 1**

Wrn Event Email 2 Fail

Alarm Type	WRN
Alarmlist message	Event Email 2 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event email to email address which is adjusted in setpoint **Email Address 2 (page 303)** and email wasn't send.

⬖ **back to List of alarms level 1**

Wrn Event Email 3 Fail

Alarm Type	WRN
Alarmlist message	Event Email 3 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event email to email address which is adjusted in setpoint **Email Address 3 (page 303)** and email wasn't send.

⬖ **back to List of alarms level 1**

Wrn Event Email 4 Fail

Alarm Type	WRN
Alarmlist message	Event Email 4 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event email to email address which is adjusted in setpoint **Email Address 4 (page 304)** and email wasn't send.

⬖ **back to List of alarms level 1**

Wrn Event SMS 1 Fail

Alarm Type	WRN
Alarmlist message	Event SMS 1 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event SMS to telephone number which is adjusted in setpoint **Telephone Number 1 (page 286)** and SMS wasn't send.

⬖ **back to List of alarms level 1**

Wrn Event SMS 2 Fail

Alarm Type	WRN
Alarmlist message	Event SMS 2 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event SMS to telephone number which is adjusted in setpoint **Telephone Number 2 (page 286)** and SMS wasn't send.

Wrn Event SMS 3 Fail

Alarm Type	WRN
Alarmlist message	Event SMS 3 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event SMS to telephone number which is adjusted in setpoint **Telephone Number 3 (page 287)** and SMS wasn't send.

Wrn Event SMS 4 Fail

Alarm Type	WRN
Alarmlist message	Event SMS 4 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an event SMS to telephone number which is adjusted in setpoint **Telephone Number 4 (page 287)** and SMS wasn't send.

Wrn Alarm Email 1 Fail

Alarm Type	WRN
Alarmlist message	Alarm Email 1 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm email to email address which is adjusted in setpoint **Email Address 1 (page 302)** and email wasn't send.

Wrn Alarm Email 2 Fail

Alarm Type	WRN
Alarmlist message	Alarm Email 2 Fail

Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm email to email address which is adjusted in setpoint **Email Address 2 (page 303)** and email wasn't send.

🔺 **back to List of alarms level 1**

Wrn Alarm Email 3 Fail

Alarm Type	WRN
Alarmlist message	Alarm Email 3 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm email to email address which is adjusted in setpoint **Email Address 3 (page 303)** and email wasn't send.

🔺 **back to List of alarms level 1**

Wrn Alarm Email 4 Fail

Alarm Type	WRN
Alarmlist message	Alarm Email 4 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm email to email address which is adjusted in setpoint **Email Address 4 (page 304)** and email wasn't send.

🔺 **back to List of alarms level 1**

Wrn Alarm SMS 1 Fail

Alarm Type	WRN
Alarmlist message	Alarm SMS 1 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm SMS to telephone number which is adjusted in setpoint **Telephone Number 1 (page 286)** and SMS wasn't sent.

🔺 **back to List of alarms level 1**

Wrn Alarm SMS 2 Fail

Alarm Type	WRN
Alarmlist message	Alarm SMS 2 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm SMS to telephone number which is adjusted in setpoint **Telephone Number 2 (page 286)** and

	SMS wasn't sent.

Wrn Alarm SMS 3 Fail

Alarm Type	WRN
Alarmlist message	Alarm SMS 3 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm SMS to telephone number which is adjusted in setpoint **Telephone Number 3 (page 287)** and SMS wasn't sent.

Wrn Alarm SMS 4 Fail

Alarm Type	WRN
Alarmlist message	Alarm SMS 4 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm indicates that there was a request to send an alarm SMS to telephone number which is adjusted in setpoint **Telephone Number 4 (page 287)** and SMS wasn't sent.

Wrn SNMP TRAP 1 Fail

Alarm Type	WRN
Alarmlist message	SNMP TRAP 1 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued if TRAP will not be able to reach server.

Wrn SNMP TRAP 2 Fail

Alarm Type	WRN
Alarmlist message	SNMP TRAP 2 Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued if TRAP will not be able to reach server, or in case there is no reply for the server

Wrn PasswEnterBlock

Alarm Type	WRN
Alarmlist message	PasswEnterBlock
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued to indicate that user will not be able to type in password for set amount of time. *Note: This is cause by too many invalid attempts.*

🔺 **back to List of alarms level 1**

Wrn Default Password

Alarm Type	WRN
Alarmlist message	Wrn Default Password
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is activated when the default administrator password is set and communication module is plugged in the controller.

🔺 **back to List of alarms level 1**

WRN Brute Force Protection Active

Alarm Type	WRN
Alarmlist message	Wrn Brute Force Protection Active
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is activated when account break protection detects possible attack and at least one account is blocked according to the **Account break protection (page 133)** rules.

🔺 **back to List of alarms level 1**

WRN Production Mode

Alarm Type	WRN
Alarmlist message	Wrn Production Mode
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	Alarm is active when the controller has turned on Production mode. In turned on Production mode the user has the highest level 3 access without performing log in.

🔺 **back to List of alarms level 1**

WRN Password reset e-mail addr is not set

Alarm Type	WRN
Alarmlist message	Wrn Password reset e-mail addr is not set

Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is active when there is no email address set in the controller and simultaneously controller administrator password is not the default password. *Note: When default password is changed the Wrn Password reset e-mail addr is not set will be active after the restart of the controller.*

 ⏶ **back to List of alarms level 1**

Wrn Synchronization Fail

Alarm Type	WRN
Alarmlist message	Wrn Synchronization Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm is activated when **Synchronization Timeout (page 174)** elapses. The passive synchronization transfer from Source 1 to Source 2 failed due to at least one of three conditions was not fullfilled.

 ⏶ **back to List of alarms level 1**

Wrn Reverse Synchro Fail

Alarm Type	WRN
Alarmlist message	Wrn Reverse Synchro Fail
Alarm evaluated	During synchronization
Related applications	Mains-Mains, Mains-Gen
Description	The alarm is activated when Synchronization Timeout elapses. The passive synchronization transfer from Source 2 to Source 1 failed due to at least one of three conditions was not fulfilled.

 ⏶ **back to List of alarms level 1**

Wrn Stop Fail

Alarm Type	WRN
Alarmlist message	Wrn Stop Fail
Alarm evaluated	While the engine shall be stopped
Related applications	Mains-Gen
Description	This alarm occurs after stop time has elapsed and parameters don't reach required limits for stopped engine. Stopped engine parameters: ❯ LBI SOURCE 2 READY TO LOAD (PAGE 356) deactivated ❯ Voltage < 10 (L-N) and <17 (L-L) *Note: To disable this alarm during stopping, set setpoint Stop Time to Disable To disable this alarm completely set setpoint Genset Stop Fail (page 204) to Disable*

Image 15.45 Stop Fail

Note: Source 2 cannot be started until this alarm is inactive and reset.
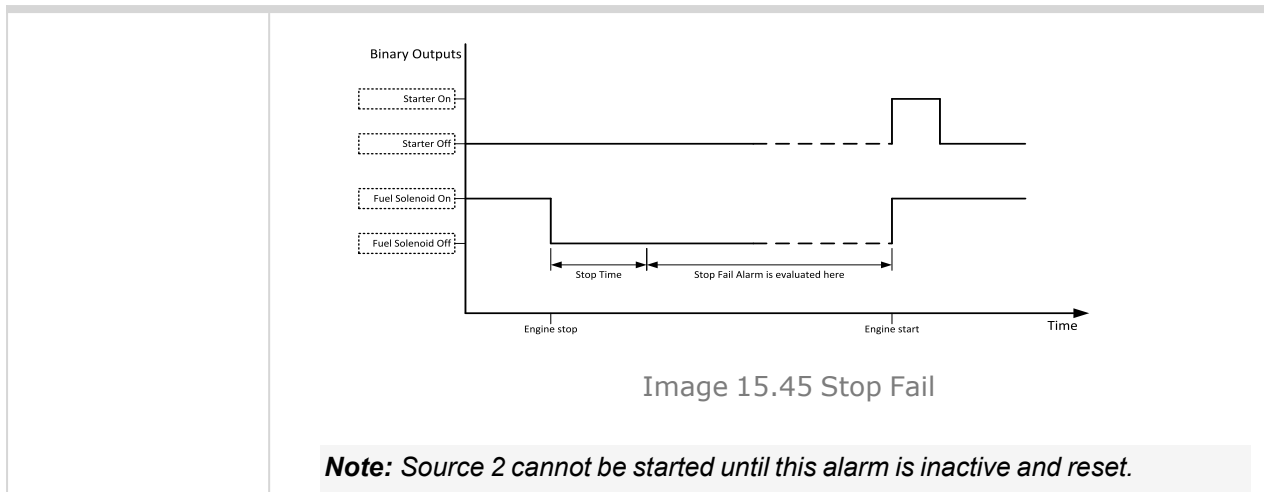
⏏ **back to List of alarms level 1**

Wrn S1CB Fail

Alarm Type	WRN
Alarmlist message	Wrn S1CB Fail
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is active when there is a fail in S1CB breaker.

⏏ **back to List of alarms level 1**

Wrn S1CB Fail To Open

Alarm Type	WRN
Alarmlist message	Wrn S1CB Fail To Open
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm is activated when the breaker (feedback) doesnt react to the open command of the controller.

⏏ **back to List of alarms level 1**

Wrn S1CB Fail To Close

Alarm Type	WRN
Alarmlist message	Wrn S1CB Fail To Close
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	The alarm is activated when the breaker (feedback) doesnt react to the close command of the controller.

⏏ **back to List of alarms level 1**

Wrn S2CB Fail

Alarm Type	WRN
Alarmlist message	Wrn S2CB Fail
Alarm evaluated	All the time

Related applications	Mains-Mains
Description	The alarm is activated when there was not issued command by the controller and the breaker (feedback) changes suddenly the position itself.

⏺ **back to List of alarms level 1**

Wrn S2CB Fail To Open

Alarm Type	WRN
Alarmlist message	Wrn S2CB Fail To Open
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	The alarm is activated when the breaker (feedback) doesnt react to the open command of the controller.

⏺ **back to List of alarms level 1**

Wrn S2CB Fail To Close

Alarm Type	WRN
Alarmlist message	Wrn S2CB Fail To Close
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	The alarm is activated when the breaker (feedback) doesnt react to the close command of the controller.

⏺ **back to List of alarms level 1**

Wrn Source 2 L1 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L1 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phase 1. The following setpoints are related to it: ❯ **Source 2 Overvoltage Wrn (page 206)** ❯ **Source 2 < > Voltage Delay (page 211)**

⏺ **back to List of alarms level 1**

Wrn Source 2 L2 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L2 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phase 2. The following setpoints are related to it: ❯ **Source 2 Overvoltage Wrn (page 206)** ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 L3 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phase 3. The following setpoints are related to it: ❯ **Source 2 Overvoltage Wrn (page 206)** ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 L1L2 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L1L2 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase to phase voltage between phases 1 and 2. The following setpoints are related to it: ❯ **Source 2 Overvoltage Wrn (page 206)** ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 L2L3 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L2L3 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase to phase voltage between phases 2 and 3. The following setpoints are related to it: ❯ **Source 2 Overvoltage Wrn (page 206)** ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 L3L1 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3L1 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase to phase voltage between phases 3 and 1. The following setpoints are related to it: ❯ **Source 2 Overvoltage Wrn (page 206)**

❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 1**

Wrn Source 2 L1 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L1 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phase 1. The following setpoints are related to it: ❯ **Source 2 Undervoltage Wrn (page 209)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 1**

Wrn Source 2 L2 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L2 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phase 2. The following setpoints are related to it: ❯ **Source 2 Undervoltage Wrn (page 209)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 1**

Wrn Source 2 L3 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phase 3. The following setpoints are related to it: ❯ **Source 2 Undervoltage Wrn (page 209)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 1**

Wrn Source 2 L1L2 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L1L2 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase to phase voltage between phases 1 and 2. The following setpoints are related to it:

> ❯ **Source 2 Undervoltage Wrn (page 209)**
>
> ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 L2L3 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L2L3 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase to phase voltage between phases 2 and 3. The following setpoints are related to it: ❯ **Source 2 Undervoltage Wrn (page 209)** ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 L3L1 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3L1 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase to phase voltage between phases 3 and 1. The following setpoints are related to it: ❯ **Source 2 Undervoltage Wrn (page 209)** ❯ **Source 2 < > Voltage Delay (page 211)**

Wrn Source 2 Overfrequency

Alarm Type	WRN
Alarmlist message	Source 2 > Frequency
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 overfrequency in the phase L1. The following setpoints are related to it: ❯ **Source 2 Overfrequency Wrn (page 217)** ❯ **Source 2 <> Frequency Delay (page 218)**

Wrn Source 2 Uderfrequency

Alarm Type	WRN
Alarmlist message	Source 2 < Frequency
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 underfrequency in the phase L1. The following setpoints are related to it: ❯ **Source 2 Underfrequency Wrn (page 217)** ❯ **Source 2 <> Frequency Delay (page 218)**

🔺 **back to List of alarms level 1**

ALI Source 1 Ph Rotation Opposite

Alarm Type	ALI
Alarmlist message	ALI Source 1 Ph Rotation Opposite
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued if Source 1 phases are wired in wrong order.

🔺 **back to List of alarms level 1**

ALI Source 2 Ph Rotation Opposite

Alarm Type	ALI
Alarmlist message	ALI Source 2 Ph Rotation Opposite
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued if Source 2 phases are wired in wrong order.

🔺 **back to List of alarms level 1**

Wrn Battery Overvoltage

Alarm Type	WRN
Alarmlist message	All the time
Alarm evaluated	Wrn Battery > Voltage
Related applications	Mains-Mains, Mains-Gen
Description	This alarm informs the operator that the controller supply voltage is too high. The following setpoints are related to it: ❯ **Battery Overvoltage (page 175)** ❯ **Battery <> Voltage Delay (page 175)**

🔺 **back to List of alarms level 1**

Wrn Battery Undervoltage

Alarm Type	WRN
Alarmlist message	Wrn Battery < Voltage
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm informs the operator that the controller supply voltage is too low. The following setpoints are related to it: ❯ **Battery Undervoltage (page 175)** ❯ **Battery <> Voltage Delay (page 175)**

⏏ **back to List of alarms level 1**

ALI Manual Restore

Alarm Type	ALI
Alarmlist message	Manual Restore
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is activated in Auto mode when the setpoint **Return From Secondary Source (page 188)** is set to manual, load is on Source 2, is returning back to Source 1 and the counter **Primary Source Return Delay (page 185)** has elapsed.

⏏ **back to List of alarms level 1**

8.2.3 Alarms level 2

What alarms level 2 are:

The level 2 level alarm indicates that a critical level of the respective value or parameter has been reached.

List of alarms level 2

⬢ **back to Alarms**

BOS Emergency Stop

Alarm Type	BOS
Alarmlist message	BOS Emergency Stop
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	Alarm is activated when binary input EMERGENCY STOP (PAGE 348) is activated. The Source 2 shuts down in the moment the input is activated and starting is blocked until the input is deactivated and fault reset is pressed. *Note: Use red emergency button placed on the switchboard door and connect it to a binary input of the controller. Then configure the function Emergency Stop to this binary input. It is recommended to use NC contact of the button.*

⬛ back to List of alarms level 2

Total Emergency Stop

Alarm Type	-
Alarmlist message	Total Emergency Stop
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is active when LBI TOTAL EMERGENCY STOP (PAGE 358) is active. S2CB or S1CB breaker is opening depends on which one is closed. *Note: In addition, in Mains-Gen application the LBO GEN START/STOP (PAGE 368) is deactivated.*

⬛ back to List of alarms level 2

BOS Start Fail

Alarm Type	BOS
Alarmlist message	BOS Start Fail
Alarm evaluated	Engine Starting
Related applications	Mains-Gen
Description	This alarm is issued after Start Time has elapsed and parameters: LBI SOURCE 2 READY TO LOAD (PAGE 356) if configured, is not active or frequency or voltages are not within the limits defined by setpoints for frequency and voltage protections.

⬛ back to List of alarms level 2

BOS S2CB Fail To Open

Alarm Type	BOS
Alarmlist message	BOS S2CB Fail To Open
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm will occur when the S2CB FEEDBACK (PAGE 355) input does not match the expected position given by the S2CB CLOSE/OPEN (PAGE 377) output. It

stays active until the mismatch between the output and feedback disappears.

> If there was no command issued by the controller and the breaker (feedback) changes suddenly the position itself, the alarm will be issued immediately.

> Self-opening of the breaker is not considered a fault and if all Source 2 values are within limits, the command to reclose the breaker is issued after 5s delay.

> The alarm will be also issued, if the breaker does not respond to the close command within 5 seconds. After this period has elapsed the output S2CB Close/Open is deactivated again and the next attempt to close the breaker will occur after the alarm is reset.

> The alarm will be also issued if the breaker does not respond to the open command within 5 seconds.

🔺 back to List of alarms level 2

BOS S2CB Fail To Open

Alarm Type	BOS
Alarmlist message	BOS S2CB Fail To Open
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm will occur when the **S2CB FEEDBACK (PAGE 355)** input does not match the expected position given by the **S2CB CLOSE/OPEN (PAGE 377)** output. It stays active until the mismatch between the output and feedback disappears. > If there was no command issued by the controller and the breaker (feedback) changes suddenly the position itself, the alarm will be issued immediately. > Self-opening of the breaker is not considered a fault and if all Source 2 values are within limits, the command to reclose the breaker is issued after 5s delay. > The alarm will be also issued, if the breaker does not respond to the close command within 5 seconds. After this period has elapsed the output S2CB Close/Open is deactivated again and the next attempt to close the breaker will occur after the alarm is reset. > The alarm will be also issued if the breaker does not respond to the open command within 5 seconds.

🔺 back to List of alarms level 2

BOS Current Unbalance

Alarm Type	BOS
Alarmlist message	BOS Current Unbalance
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	This alarm evaluates the unbalance of the phase currents, i.e. the difference between highest and lowest phase current at any given time. The following

setpoints are related to it:

> **Current Unbalance BOS (page 221)** adjusts the maximum allowed difference between the highest and lowest phase current at any given time.
> **Current Unbalance Delay (page 221)** adjusts the alarm delay.

BOS Short Circuit

Alarm Type	BOS
Alarmlist message	BOS Short Circuit
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	This is a fast overcurrent protection. The following setpoints are related to this alarm: > **Short Circuit BOS (page 219)** adjusts the short current limit > **Short Circuit Delay (page 220)** adjusts the delay in fine steps

BOS Overcurrent IDMT

Alarm Type	BOS
Alarmlist message	BOS Overcurrent IDMT
Alarm evaluated	Source 2 excited only
Related applications	Mains-Gen
Description	This alarm is issued if IDMT protection is activated due to over-crossing the IDMT curve set by setpoints **IDMT Overcurrent Delay (page 220)**. The behavior of the overcurrent alarm is adjusted by the following setpoints: > **IDMT Overcurrent Delay (page 220)** defines the reaction time of the protection when the current is twice the amount of nominal value. > **Nominal Current (page 166)** set the nominal current level, where the alarm starts to be evaluated. The reaction time is infinite at this point.

BOS Overload

Alarm Type	BOS
Alarmlist message	BOS Overload
Alarm evaluated	Engine is running
Related applications	Mains-Gen
Description	The alarm is issued when the Source 2 power is over the limit for time period longer than the delay. The following setpoints are related to it: > **Overload Wrn (page 219)** adjusts the overload limit. > **Overload BOS (page 218)** Overload Del adjusts the delay.

BOS Fence 1 Alarm

Alarm Type	BOS
Alarmlist message	BOS Fence 1 Alarm
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	This alarm evaluates the GPS position of Source 2. The following setpoint are related to it: › **Geo-Fencing (page 261)** › **Fence 1 Protection (page 263)** › **Fence Radius 1 (page 263)**

🔺 **back to List of alarms level 2**

BOS Fence 2 Alarm

Alarm Type	BOS
Alarmlist message	BOS Fence 2 Alarm
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	This alarm evaluates the GPS position of Source 2. The following setpoint are related to it: › **Geo-Fencing (page 261)** › **Fence 1 Protection (page 263)** › **Fence Radius 1 (page 263)**

🔺 **back to List of alarms level 2**

BOS E-Stop

Alarm Type	BOS
Alarmlist message	BOS E-Stop
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	Alarm is activated when dedicated E-Stop input is activated. The Source 2 shuts down in the moment the input is activated and starting is blocked until the input is deactivated and fault reset is pressed.

🔺 **back to List of alarms level 2**

MP Source 1 L1 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 L1-N voltage. The following setpoints are related to it: › **Source 1 Overvoltage (page 190)**

	> **Source 1 Overvoltage Delay (page 190)**
	Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph4Wire or MonoPhase.

🔺 **back to List of alarms level 2**

MP Source 1 L1 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 L1-N voltage. The following setpoints are related to it: > **Source 1 Undervoltage (page 192)** > **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph4Wire or MonoPhase.*

🔺 **back to List of alarms level 2**

MP Source 1 L1L2 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 phase voltage in phases L1 and L2. The following setpoints are related to it: > **Source 1 Overvoltage (page 190)** > **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph3Wire or High Leg D.*

🔺 **back to List of alarms level 2**

MP Source 1 L1L2 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 phase voltage in phases L1 and L2. The following setpoints are related to it: > **Source 1 Overvoltage (page 190)** > **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph3Wire or High Leg D.*

MP Source 1 L2 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 L2-N voltage. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

MP Source 1 L2 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 L2-N voltage. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

MP Source 1 L2L3 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 phase voltage in phases L2 and L3. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D.*

MP Source 1 L2L3 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 phase voltage in phases L2 and L3. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D.*

🔺 **back to List of alarms level 2**

MP Source 1 L3 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Gen
Description	This alarm evaluates the Source 1 L3-N voltage. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

🔺 **back to List of alarms level 2**

MP Source 1 L3 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 L3-N voltage. The following setpoints are related to it: ❯ **Source 1 Undervoltage (page 192)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

🔺 **back to List of alarms level 2**

MP Source 1 L3L1 Overvoltage

Alarm Type	MP

Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 phase voltage in phases L3 and L1. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph3Wire or High Leg D or SplitPhase.*

🔺 **back to List of alarms level 2**

MP Source 1 L3L1 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm evaluates the Source 1 phase voltage in phases L3 and L1. The following setpoints are related to it: ❯ **Source 1 Overvoltage (page 190)** ❯ **Source 1 Overvoltage Delay (page 190)** *Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph3Wire or High Leg D or SplitPhase.*

🔺 **back to List of alarms level 2**

MP Source 1 Voltage Unbalance ph-ph

Alarm Type	MP
Alarmlist message	MP Source 1 Voltage Unbalance ph-ph
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued depending on evaluation of the unbalance of the phase voltages, i.e. the difference between highest and lowest phase voltage at any given time. The following setpoints are related to it: ❯ **Source 1 Voltage Unbalance (page 194)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. ❯ **Source 1 Voltage Unbalance Delay (page 194)** adjusts the alarm delay.

🔺 **back to List of alarms level 2**

MP Source 1 Voltage Unbalance ph-n

Alarm Type	MP
Alarmlist message	Source 1 Voltage Unbalance ph-n
Alarm evaluated	All the time

Related applications	Mains-Mains, Mains-Gen
Description	This alarm is issued depending on evaluation of the unbalance of the phase voltages, i.e. the difference between highest and lowest phase voltage at any given time. The following setpoints are related to it: ❯ **Source 1 Voltage Unbalance (page 194)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. ❯ **Source 1 Voltage Unbalance Delay (page 194)** adjusts the alarm delay.

🔺 back to List of alarms level 2

MP Source 1 Overfrequency

Alarm Type	MP
Alarmlist message	Source 1 Overfrequency
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is active when Source 1 frequency is above the setpoint **Source 1 Overfrequency (page 194)** for the period longer than **Source 1 < > Frequency Delay (page 198)**.

🔺 back to List of alarms level 2

MP Source 1 Underfrequency

Alarm Type	MP
Alarmlist message	Source 1 Underfrequency
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen
Description	This alarm is active when Mains frequency is bellow the setpoint **Source 1 Underfrequency (page 196)** for the period longer than **Source 1 < > Frequency Delay (page 198)**.

🔺 back to List of alarms level 2

MP2 Source 2 L1 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 back to List of alarms level 2

MP2 Source 2 L1 Undervoltage

Alarm Type	MP2

Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L1L2 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 phase voltage in phases L1 and L2. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L1L2 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 phase voltage in phases L1 and L2. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L2 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L2 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L2L3 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 phase voltage in phases L2 and L3. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L2L3 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 phase voltage in phases L2 and L3. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)**

🔺 **back to List of alarms level 2**

MP2 Source 2 L3 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)**

MP2 Source 2 L3 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)**

MP2 Source 2 L3L1 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 phase voltage in phases L3 and L1. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)**

MP2 Source 2 L3L1 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm evaluates the Source 2 phase voltage in phases L3 and L1. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)**

MP2 Source 2 Overfrequency

Alarm Type	MP2
Alarmlist message	MP2 Source 2 Overfrequency
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm is active when Mains frequency is above the setpoint **Source 2 Overfrequency (page 213)** for the period longer than **Source 2 <> Frequency Delay (page 218)**.

MP2 Source 2 Underfrequency

Alarm Type	MP2
Alarmlist message	MP2 Source 2 Underfrequency
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm is active when Mains frequency is bellow the setpoint **Source 2 Underfrequency (page 215)** for the period longer than **Source 2 <> Frequency Delay (page 218)**.

MP2 Source 2 Voltage Unbalance ph-n

Alarm Type	MP2
Alarmlist message	MP2 Source 2 Voltage Unbalance ph-n
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm is issued depending on evaluation of the unbalance of the phase voltages, i.e. the difference between highest and lowest phase voltage at any given time. The following setpoints are related to it: ❯ **Source 2 Voltage Unbalance (page 212)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. ❯ **Source 2 Voltage Unbalance Delay (page 212)** adjusts the alarm delay.

MP2 Source 2 Voltage Unbalance ph-ph

Alarm Type	MP2
Alarmlist message	MP2 Source 2 Voltage Unbalance ph-ph
Alarm evaluated	All the time
Related applications	Mains-Mains
Description	This alarm is issued depending on evaluation of the unbalance of the phase to phase voltages, i.e. the difference between highest and lowest phase to phase voltage at any given time. The following setpoints are related to it: ❯ **Source 2 Voltage Unbalance (page 212)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. ❯ **Source 2 Voltage Unbalance Delay (page 212)** adjusts the alarm delay.

Parallel Work

Alarm Type	-
Alarmlist message	Parallel Work
Alarm evaluated	All the time

Related applications	Mains-Mains, Mains-Gen
Description	The alarm is triggered when parallel run exceeds 200 ms.

🔺 **back to List of alarms level 2**

BOS Source 2 L1 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen

Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it:
	
	  ❯ **Source 2 Overvoltage (page 205)**
	  ❯ **Source 2 < > Voltage Delay (page 211)**
	
	Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph4Wire or MonoPhase.

🔺 **back to List of alarms level 2**

BOS Source 2 L1 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen

Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it:
	
	  ❯ **Source 2 Undervoltage (page 208)**
	  ❯ **Source 2 < > Voltage Delay (page 211)**
	
	Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph4Wire or MonoPhase.

🔺 **back to List of alarms level 2**

BOS Source 2 L1L2 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1L2 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen

Description	This alarm evaluates the Source 2 phase voltage in phases L1 and L2. The following setpoints are related to it:
	
	  ❯ **Source 2 Overvoltage (page 205)**
	  ❯ **Source 2 < > Voltage Delay (page 211)**
	
	Note: Alarm is active only in case the setpoint Connection type (page 167) is set to 3Ph3Wire or High Leg D.

🔺 **back to List of alarms level 2**

BOS Source 2 L1L2 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1L2 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phases L1 and L2. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D.*

🔺 **back to List of alarms level 2**

BOS Source 2 L2 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

🔺 **back to List of alarms level 2**

BOS Source 2 L2 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

🔺 **back to List of alarms level 2**

BOS Source 2 L2L3 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2L3 Overvoltage

Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phases L2 and L3. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D.*

🔺 **back to List of alarms level 2**

BOS Source 2 L2L3 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2L3 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phases L2 and L3. The following setpoints are related to it: ❯ **Source 2 Undervoltage (page 208)** ❯ **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D.*

🔺 **back to List of alarms level 2**

BOS Source 2 L3 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L3 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: ❯ **Source 2 Overvoltage (page 205)** ❯ **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

🔺 **back to List of alarms level 2**

BOS Source 2 L3 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L3 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are

related to it:

> **Source 2 Undervoltage (page 208)**

> **Source 2 < > Voltage Delay (page 211)**

*Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph4Wire.*

BOS Source 2 L3L1 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L3L1 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phases L3 and L1. The following setpoints are related to it: > **Source 2 Overvoltage (page 205)** > **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D or SplitPhase.*

BOS Source 2 L3L1 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L3L1 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm evaluates the Source 2 phase voltage in phases L3 and L1. The following setpoints are related to it: > **Source 2 Undervoltage (page 208)** > **Source 2 < > Voltage Delay (page 211)** *Note: Alarm is active only in case the setpoint **Connection type (page 167)** is set to 3Ph3Wire or High Leg D or SplitPhase.*

BOS Source 2 Voltage Unbalance ph-ph

Alarm Type	BOS
Alarmlist message	BOS Source 2 Voltage Unbalance ph-ph
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm is issued depending on evaluation of the unbalance of the phase to phase voltages, i.e. the difference between highest and lowest phase to phase voltage at any given time. The following setpoints are related to it: > **Source 2 Voltage Unbalance (page 212)** adjusts the maximum allowed

	difference between the highest and lowest phase voltage at any given time.
	❯ **Source 2 Voltage Unbalance Delay (page 212)** adjusts the alarm delay.

🔺 **back to List of alarms level 2**

BOS Source 2 Voltage Unbalance ph-n

Alarm Type	BOS
Alarmlist message	BOS Source 2 Voltage Unbalance ph-n
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm is issued depending on evaluation of the unbalance of the phase voltages, i.e. the difference between highest and lowest phase voltage at any given time. The following setpoints are related to it: ❯ **Source 2 Voltage Unbalance (page 212)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. ❯ **Source 2 Voltage Unbalance Delay (page 212)** adjusts the alarm delay.

🔺 **back to List of alarms level 2**

BOS Source 2 Overfrequency

Alarm Type	BOS
Alarmlist message	BOS Source 2 Overfrequency
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm is active when Source 2 frequency is above the setpoint **Source 2 Overfrequency (page 213)** for the period longer than **Source 2 <> Frequency Delay (page 218)**.

🔺 **back to List of alarms level 2**

BOS Source 2 Underfrequency

Alarm Type	BOS
Alarmlist message	BOS Source 2 Underfrequency
Alarm evaluated	Engine running
Related applications	Mains-Gen
Description	This alarm is active when Source 2 frequency is bellow the setpoint **Source 2 Underfrequency (page 215)** for the period longer than **Source 2 <> Frequency Delay (page 218)**.

🔺 **back to List of alarms level 2**

8.3 Modules

8.3.1 Plug-in modules

The available communication plug-in modules are:

> CM-RS232-485 – communication module for connection via RS232 or RS485 line

> CM2-4G-GPS – communication module for connection via 4G

> CM3-Ethernet – communication module for internet connection via Ethernet

The available extension plug-in modules are:

> EM-BIO8-EFCP – extension module with 8 binary inputs/outputs.

Note: Controller has 1 plug-in module slots.

Communication modules

CM-RS232-485

CM-RS232-485 is optional plug-in card to enable InteliATS2 70 the RS232 and RS485 communication. The CM-RS232-485 is a dual port module with RS232 and RS485 interfaces at independent COM channels. The RS232 is connected to COM1 and RS485 to COM2.
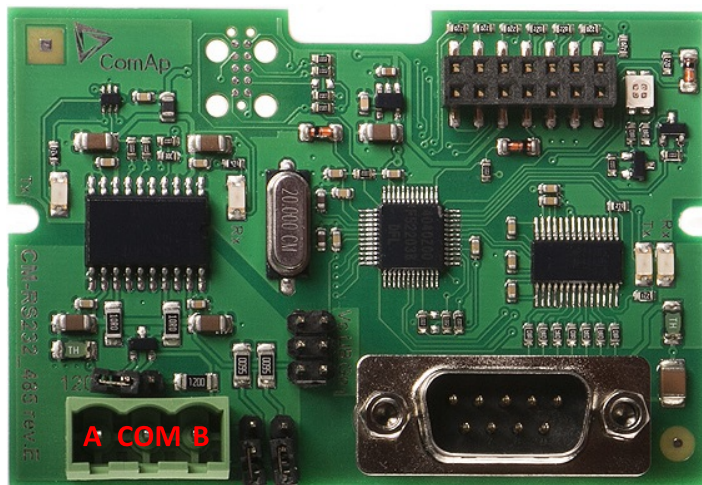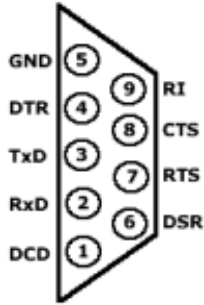

Image 15.46 CM-RS232-485 interface

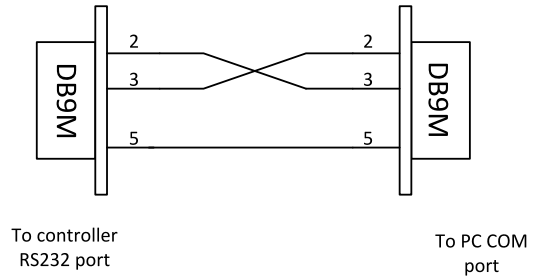**IMPORTANT: Any manipulation with plug-in module shall be done with disconnected power supply to controller.**
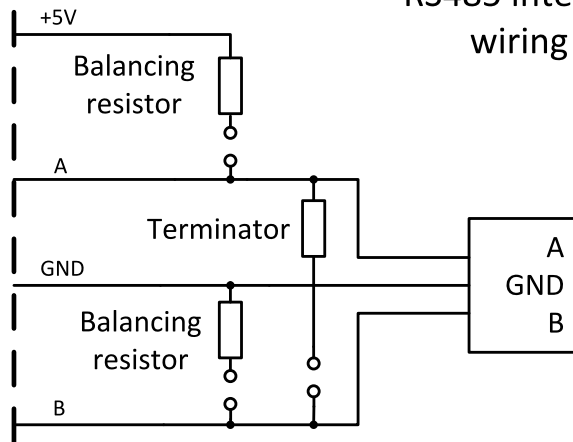
Image 15.47 Pinout of RS232 line

Image 15.48 Pinout of RS485 line

Image 15.49 Jumpers description

Note: *Balancing resistors should both be closed at only one device in the whole RS485 network.*

Maximal distance of line is 10 m for RS232 line and 1200 m for RS485 line.

Terminator 120 Ω

Balancing resistor +5 V

Technical data

Power consumption	40 mA / 8 VDC
	26 mA / 12 VDC
	14 mA / 24 VDC
	10 mA / 36 VDC
Isolation	Galvanic separation

Firmware upgrade

> Download the newest FW of module from ComAp website (in form of PSI file or installation package)

> Install package to computer or open PSI to install it into InteliConfig

> Plug the module into the controller and power the controller on.

> Open a connection with controller via InteliConfig

> Go the menu Tools -> Firmware upgrade, select the Plug-in modules tab and select the appropriate firmware you want to program into the module (in InteliConfig).

> Press the OK button to start upgrade of firmware.

The firmware update process may be performed via any kind of connection including connection via the same module in which the firmware is to be updated. The connection is re-established again automatically when the update process is finished.

CM3-Ethernet

CM3-Ethernet is a plug-in card with Ethernet 10/100 Mbit interface in RJ45 connector. It provides an interface for connecting a PC through ethernet/internet network, for sending active e-mails and for integration of the controller into a building management (MODBUS TCP and SNMP protocols).
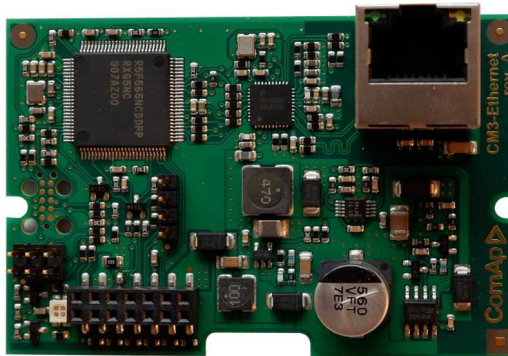

Image 15.50 CM3-Ethernet interface

> **IMPORTANT: Any manipulation with plug-in module shall be done with disconnected power supply to controller.**

Use an Ethernet UTP cable with a RJ45 connector for linking the module with your Ethernet network. The module can also be connected directly to a PC using cross-wired UTP cable.
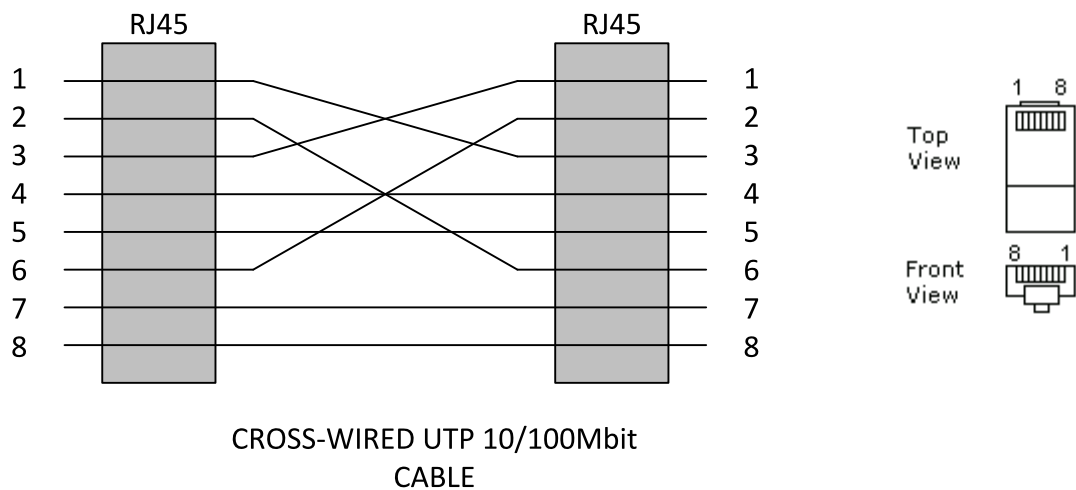
CROSS-WIRED UTP 10/100Mbit
CABLE

Image 15.51 Cross-wired cable

Technical data

General

Width × Height × Depth	73.8 × 50.3 × 21
Weight	~30 g
Power supply	8-36 V DC
Power consumption	1 W
Peak power consumption	2 W
Operating temperature	-40 ˚C to +70 ˚C
Storage temperature	-40 ˚C to +80 ˚C

Ethernet port

100 Mbit/s, full duplex
RJ45 socket

Module setup

All settings related to the module are to be adjusted via the controller setpoints. The respective setpoints are located in the setpoint **Group: CM-Ethernet (page 290)**.

All actual operational values like actual IP address etc. are available in controller values in a specific group as well.

Status LED

Blinking frequency	Color
1 Hz	Green – everything is OK Red – some of following errors occurred: ❯ unplugged Ethernet cable ❯ module cannot connect to AirGate ❯ module can not obtain IP address from DHCP
10 Hz	Green – firmware is currently being programmed Red – no firmware present in the module

Firmware upgrade

> Download the newest FW of module from ComAp website (in form of PSI file or installation package)

> Install package to computer or open PSI to install it into InteliConfig

> Plug the module into the controller and power the controller on.

> Open a connection with controller via InteliConfig

> Go the menu Tools -> Firmware upgrade, select the Plug-in modules tab and select the appropriate firmware you want to program into the module (in InteliConfig).

> Press the OK button to start upgrade of firmware.

The firmware update process may be performed via any kind of connection including connection via the same module in which the firmware is to be updated. The connection is re-established again automatically when the update process is finished.

CM2-4G-GPS

CM2-4G-GPS plug-in module containing a GPS receiver and GSM/WCDMA/LTE modem which can work in two modes of operation based on the settings in the setpoint **Internet Connection (page 270)**.
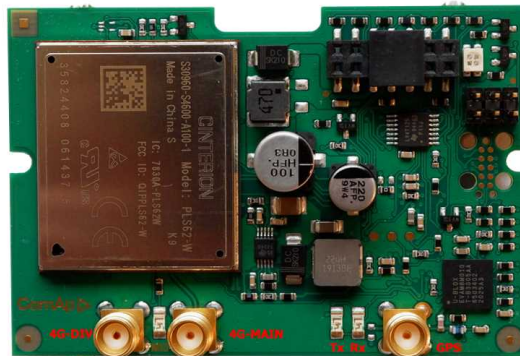

Image 15.52 CM2-4G-GPS module

> **IMPORTANT: Any manipulation with plug-in module shall be done with disconnected power supply to controller.**

> **IMPORTANT: Operating temperature of module is from -30 °C to +75 °C.**

Note: Cellular data service must be enabled in your SIM card by your mobile operator for successful operation.

CM2-4G-GPS module works with:

> WebSupervisor – internet-based remote monitoring solution

> AirGate – powerful connection technology to make internet access as simple as possible

CM2-4G-GPS module also works like GPS locator. Geo-fencing function can be used with this module.

4G module types

> If the anthenna is CELLULAR only and has 1 cable ([OT1A4GXXMCX](#)), it is connected to the 4G-MAIN connector.

> If the anthenna is CELLULAR only and has 2 cables, cables are connected to the 4G-MAIN or 4G-DIV connectors (does not matter which cable to which connector).

> If the anthenna is a combination of CELLULAR/GPS and has 2 cables ([OT1A4GGPSCX](#)), then cable "4G/LTE" needs to be connected to the 4G-MAIN connector and "GPS" cable to the GPS connector.

> If the anthenna is a combination of CELLULAR/GPS and has 3 cables ([OT2A4GGPSCX](#)), then cables "4G/LTE" need to be connected to the 4G-MAIN and 4G-DIV connectors (does not matter which cable to which connector) and "GPS" cable to the GPS connector.

Note: Type of the cable is labeled on its side.

Technical data

General

Width × Height × Depth	73.8 × 50.3 × 15
Weight	~35 g
Power supply	8-36 V DC
Power consumption	1.7 W
Peak power consumption	10 W
Operating temperature	-30 ˚C to +70 ˚C
Storage temperature	-40 ˚C to +80 ˚C

GNSS

Antenna interface	SMA female, 2.8 V / 20 mA
Antenna type	Active

Cellular

Supported networks and frequency bands	> 2G (GSM/GPRS/EDGE) Quad band, 850/900/1800/1900 MHz > 3G (UMTS/HSPA+) Seven band, 800 (BdXIX) / 850 (BdV) / 900 (BdVIII) / AWS (BdIV) / 1800 (BdIX) / 1900 (BdII) / 2100MHz (BdI) > 4G (LTE) Twelve band, 700 (Bd12 <MFBI

	Bd17>, Bd28) 800 (Bd18, Bd19, Bd20) 850 (Bd5) / 900 (Bd8) / AWS (Bd4) / 1800 (Bd3) / 1900 (Bd2) / 2100 (Bd1) / 2600MHz (Bd7)
Antenna interface	2x SMA female (Main and Diversity)

SIM card settings

SIM card must be adjusted as follows:

> SMS service enabled

> Packet data (Internet access) enabled (when required for the selected mode of operation)

> PIN code security disabled

How to start using CM2-4G-GPS module

> You will need a controller, CM2-4G-GPS module, antenna and SIM card with SMS and packet data service.

Note: Make sure that your SIM supports the packet data network type you want to use. – i.e. if you want to use the module in LTE (4G) network you have to confirm with the operator that the particular SIM card supports 4G network.

> Make sure SIM card does not require PIN code. Use any mobile phone to switch the SIM PIN security off.

> Place the SIM card into slot on CM2-4G-GPS card

> Connect the antenna to Cellular module antenna connector.

> If you want to use the built-in GPS receiver, also connect an **active** GPS antenna to the GPS antenna connector.

> Switch off the controller.

> Insert CM2-4G-GPS module into controller

> Power up the controller.

> Activate CM2-4G-GPS module by switching the setpoint **Internet Connection (page 270)** to enabled

> Enter correct **Access Point Name** (this information is provided by Mobile Operator). Setpoint can be set on controller's front panel or by InteliConfig.

> Wait for approx 2 – 4 minutes for first connection of the system to AirGate. AirGate will automatically generate the AirGate ID value. Then navigate to measurement screens where you will find signal strength bar and AirGate ID identifier.

```
CM-4G-GPS        1/2
Signal Strength      93%
Net Status
Net Name
Net Mode              4G
Status
IPAddr 123.123.123.123
```

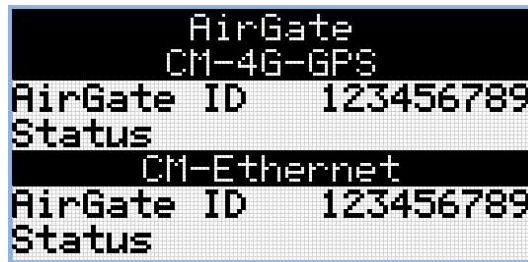Image 15.53 Main screen of CM2-4G-GPS module

Image 15.54 Screen of AirGate

Modem Status

Code	Description
OK	Module successfully initialized and connected to the cellular network
E01	Unsuccessful restore to the factory settings
E02	Modem configuration error
E SIM	SIM not inserted or locked by PIN. ❯ Use another device (e.g. mobile phone) to disable the option for SIM to be locked by PIN
E04	It is not possible to set manually chosen network mode 2G/3G/4G/Automatic
E registration	It is not possible to register into cellular network. Possible reasons: ❯ No signal (no coverage, broken or unconnected antenna) ❯ Manually chosen network mode 2G/3G/4G is not available
E context	It is not possible to set PDP (Packet Data Protocol) context for defined APN (Access Point Name). Possible reasons: ❯ Setpoint Access Point Name is not correctly set (format) ❯ Wrong PDP context number
E connect	It is not possible to connect to cellular network (ATD*99***context) Possible reasons: ❯ Setpoint Access Point Name is not correctly set (wrong text)
E08	Modem configuration error
E09	It is not possible to get signal strength
E10	It is not possible to get operator name
E11	Loss of registration into cellular network was detected
E12	Data error
E13	Data error
E14	Modem was restarted
E SMS send	It is not possible to send SMS. Possible reasons: ❯ Wrong number ❯ SIM doesn't support SMS
E18	Modem hardware configuration error
E conn lost	Loss of connection with cellular network

E19	Modem configuration error
Restart-config	Modem was restarted due to the change of controller setpoint
Restart-app	Modem was restarted due to the performed cellular connection check

AirGate Status

Code	Description
Not defined	Setpoint AirGate Connection is Disabled
Wait to connect	Waiting to connect
Resolving	Resolving
Connecting	Connecting
Creat sec chan	Creating secure channel
Registering	Registering
Conn inoperable	Connected, inoperable
Conn operable	Connected, operable
Susp AGkeyEmpty	AirGate is not set in the controller

Firmware upgrade

> Download the newest FW of module from ComAp website (in form of PSI file or installation package)

> Install package to computer or open PSI to install it into InteliConfig

> Plug the module into the controller and power the controller on.

> Open a connection with controller via InteliConfig

> Go the menu Tools -> Firmware upgrade, select the Plug-in modules tab and select the appropriate firmware you want to program into the module (in InteliConfig).

> Press the OK button to start upgrade of firmware.

The firmware update process may be performed via any kind of connection including connection via the same module in which the firmware is to be updated. The connection is re-established again automatically when the update process is finished.

Extension modules

EM-BIO8-EFCP

EM-BIO8-EFCP is optional plug-in card. Through this card, the controller can accommodate up to 8 binary inputs or outputs. In InteliConfig PC configuration tool it is possible to easily choose whether particular I/O will be binary input or output.

Image 15.55 EM-BIO8-EFCP interface

> **IMPORTANT: Any manipulation with plug-in module shall be done with disconnected power supply to controller.**

Image 15.56 Overview of EM-BIO8-EFCP

EM-BIO8-EFCP technical data

Power supply

Power supply range	8-36 VDC
Power consumption	40 mA / 8 VDC
	27 mA / 12 VDC
	22 mA / 24 VDC
	19 mA / 36 VDC

Binary inputs

Number	Up to 8, non-isolated
Close/Open indication	0-2 VDC close contact >6 VDC open contact

Binary outputs

Number	Up to 8 , non-isolated
Max. current	0.5A
Switching to	positive supply terminal

Firmware upgrade

> Download the newest FW of module from ComAp website (in form of PSI file or installation package)

> Install package to computer or open PSI to install it into InteliConfig

> Plug the module into the controller and power the controller on.

> Open a connection with controller via InteliConfig

> Go the menu Tools -> Firmware upgrade, select the Plug-in modules tab and select the appropriate firmware you want to program into the module (in InteliConfig).

> Press the OK button to start upgrade of firmware.

The firmware update process may be performed via any kind of connection including connection via the same module in which the firmware is to be updated. The connection is re-established again automatically when the update process is finished.

⬤ **back to Appendix**