ComAp
The heart of smart control

InteliATS2 50

Automatic Transfer Switch Controller

SW version 1.3.0

Written by Michal Slavata
Prague, Czech Republic
ComAp a.s., U Uranie 1612/14a,
170 00 Prague 7, Czech Republic
Tel: +420 246 012 111
E-mail: info@comap-control.com, www.comap-control.com

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 50 family controllers which must be followed during installation and maintenance of the controllers.

This manual provides general information how to install and operate InteliATS2 50 controllers.

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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	**Breaker failure**	50BF
Multi-function device	11	**AC circuit breaker**	52
Starting-to-running transition contactor	19	**Overvoltage**	59
Undervoltage	27	**Aux Over Voltage**	59X
Aux Battery Under Voltage	27X	**Reclosing relay**	79
Annunciator	30	**Overfrequency**	81O
Master sequence device	34	**Underfrequency**	81U
Voltage unbalance/Negative sequence voltage	47	**Auto selective control/transfer**	83

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
5	1.3.0	11.6.2025	Michal Slavata
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
- Active current sensor
- AirGate
- Alternating current
- Analog modem
- Battery
- Binary output
- Breaker contact
- Breaker contact
- Breaker
- Breaker
- Breaker
- Capacitor
- Coil
- Connector – female
- Connector – male
- Contact
- Contactor
- Controller simplified
- Module simplified
- Current measuring
- Current measuring
- Diode
- Ethernet male
- Ethernet female
- Fuel solenoid
- Fuse
- Fuse switch
- Generator
- Generator schematic
- Grounding
- GSM
- GSM modem
- Jumper
- Load
- Mains
- Mains
- Mobile provider
- Passive current sensor
- Pick - up
- Relay coil
- Relay coil of slow-operating
- Resistor
- Resistor adjustable
- Resistive sensor RPTC
- RS232 male
- RS232 female
- Source 1
- Source 2
- Starter
- Switch – manually operated
- Transformer
- USB type B male
- USB type B female
- Voltage measuring
- Wi-fi / WAN / LAN

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2 System overview

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2.1 General description

This manual describes the InteliATS2 50 controller which is designed for automatic transfer switch applications and provides general information on how to install and operate the InteliATS2 50 controller.

This manual is dedicated for

- Automatic transfer switch panel builders
- Operators of remote engines (started remotely from InteliATS2 50)
- For everybody who is concerned with installation, operation and maintenance of the engine

2.1.1 The key features of InteliATS2 50

- 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

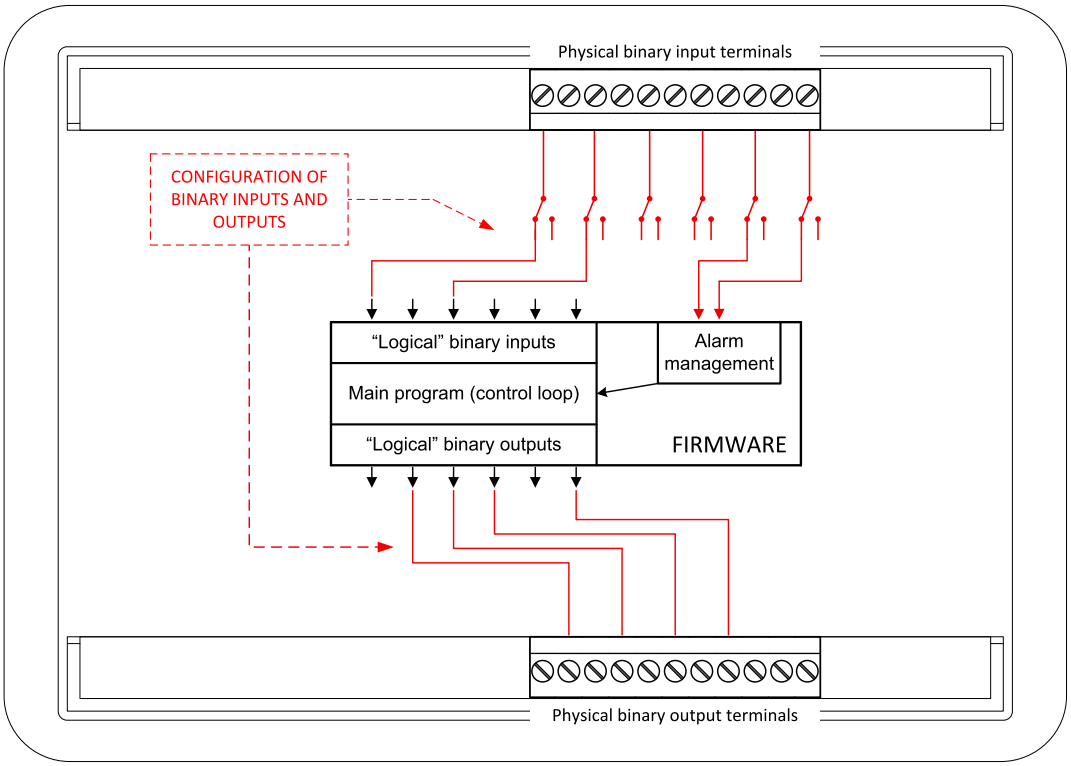


Image 2.1 Principle of binary inputs and outputs configuration

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:

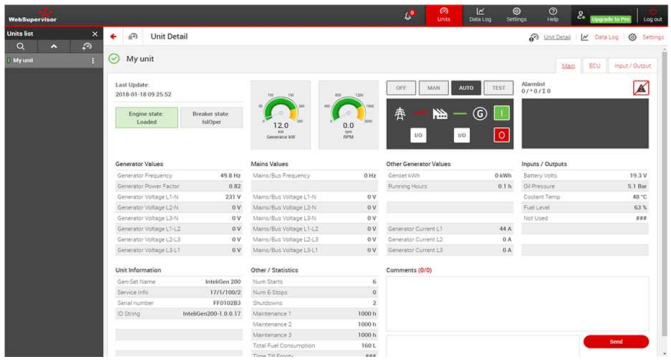
- Direct or internet communication with the controller
- Offline or online controller configuration
- Controller firmware upgrade
- Reading/writing/adjustment of setpoints
- Reading of measured values
- Browsing of controller history records
- Exporting data into an XLS file
- Controller language translation

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:

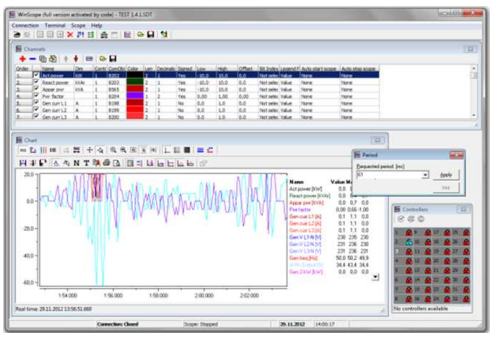
- Login: comaptest
- Password: ComAp123

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

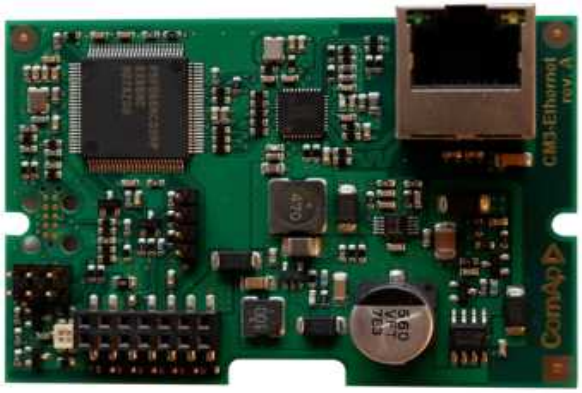


2.5 Plug-in Modules

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

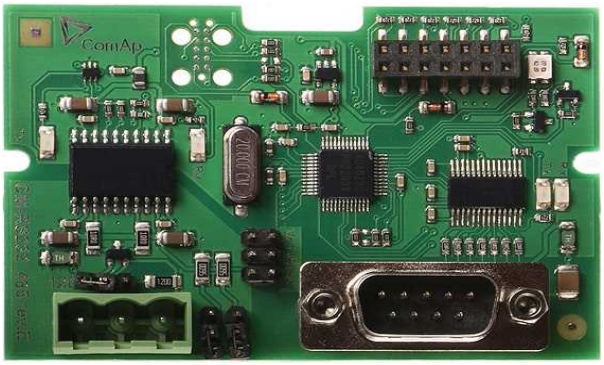
GSM/4G module

- 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.

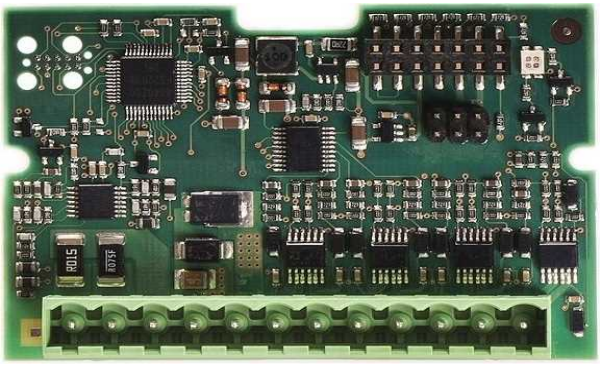
- RS232 and RS485 interface
- Modbus
- Serial connection to InteliConfig



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 Application switching

The InteliATS2 50 firmware comes with 3 archives. One archive is dedicated for Mains-Gen (MG) application. The second one is dedicated for Mains-Mains (MM) application. The third archive is dedicated for Gen-Gen (GG) application.

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

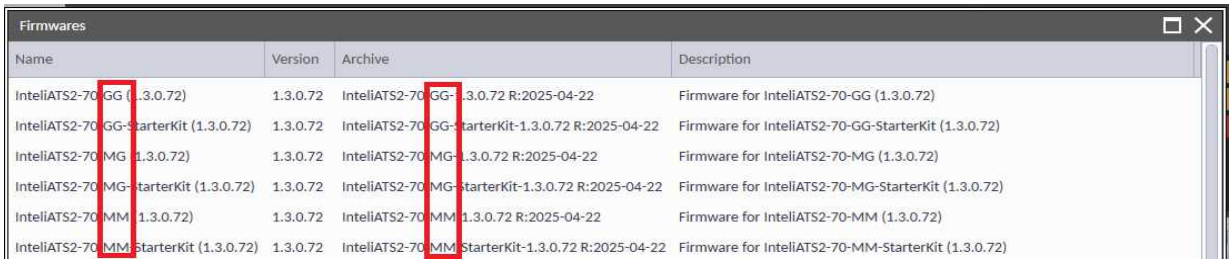

Image 3.1 InteliATS2 50 MG/MM archives

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 50 controllers can also work without breaker feedback.

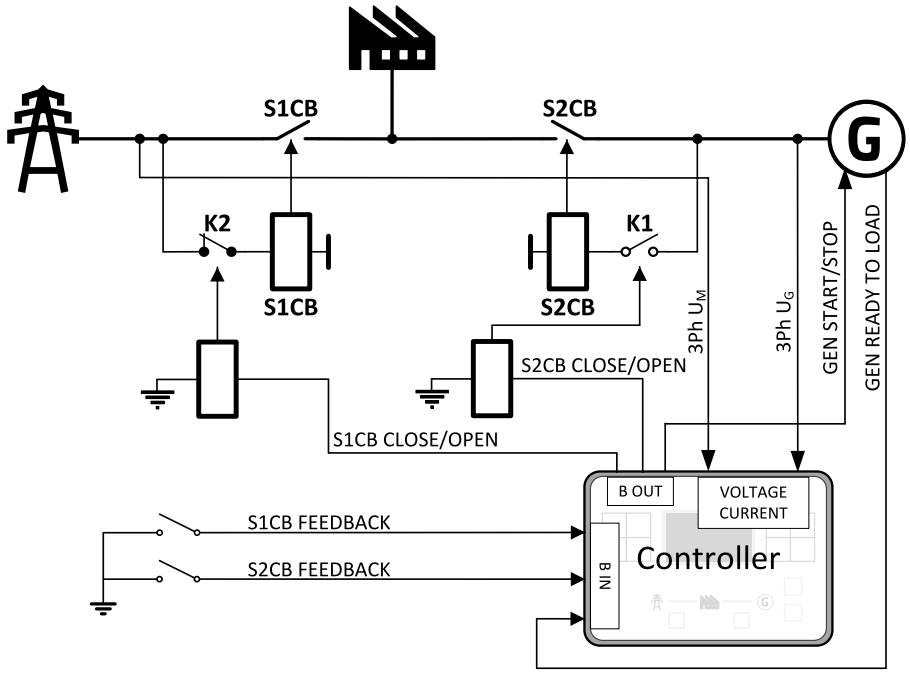

Image 3.2 Mains-Gen application overview

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 50 controllers can also work without breaker feedback.

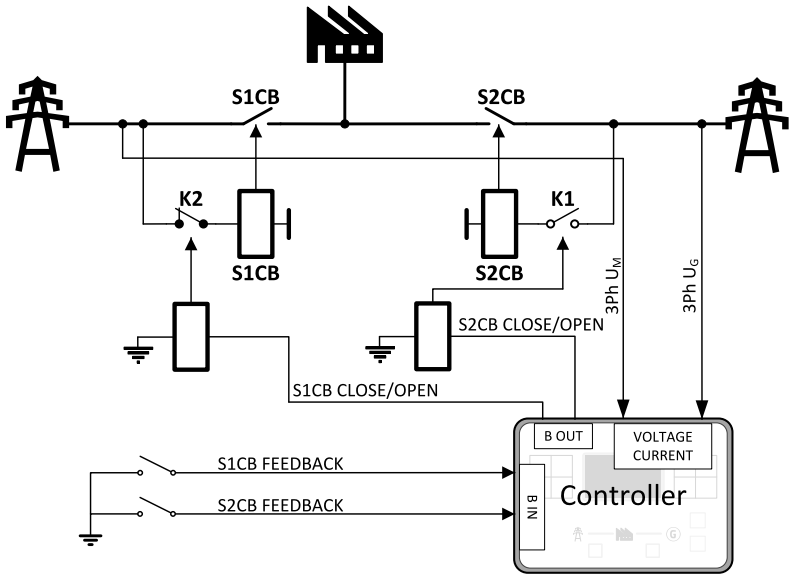

Image 3.3 Mains-Mains application overview

3.4 Gen-Gen

The typical schematic of Gen-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 50 controllers can also work without breaker feedback.

> **IMPORTANT: LBI REMOTE START/STOP (PAGE 321) is trigger for starting of gen-set in AUTO mode. Without this LBI, primary or secondary gen-set is not started!**

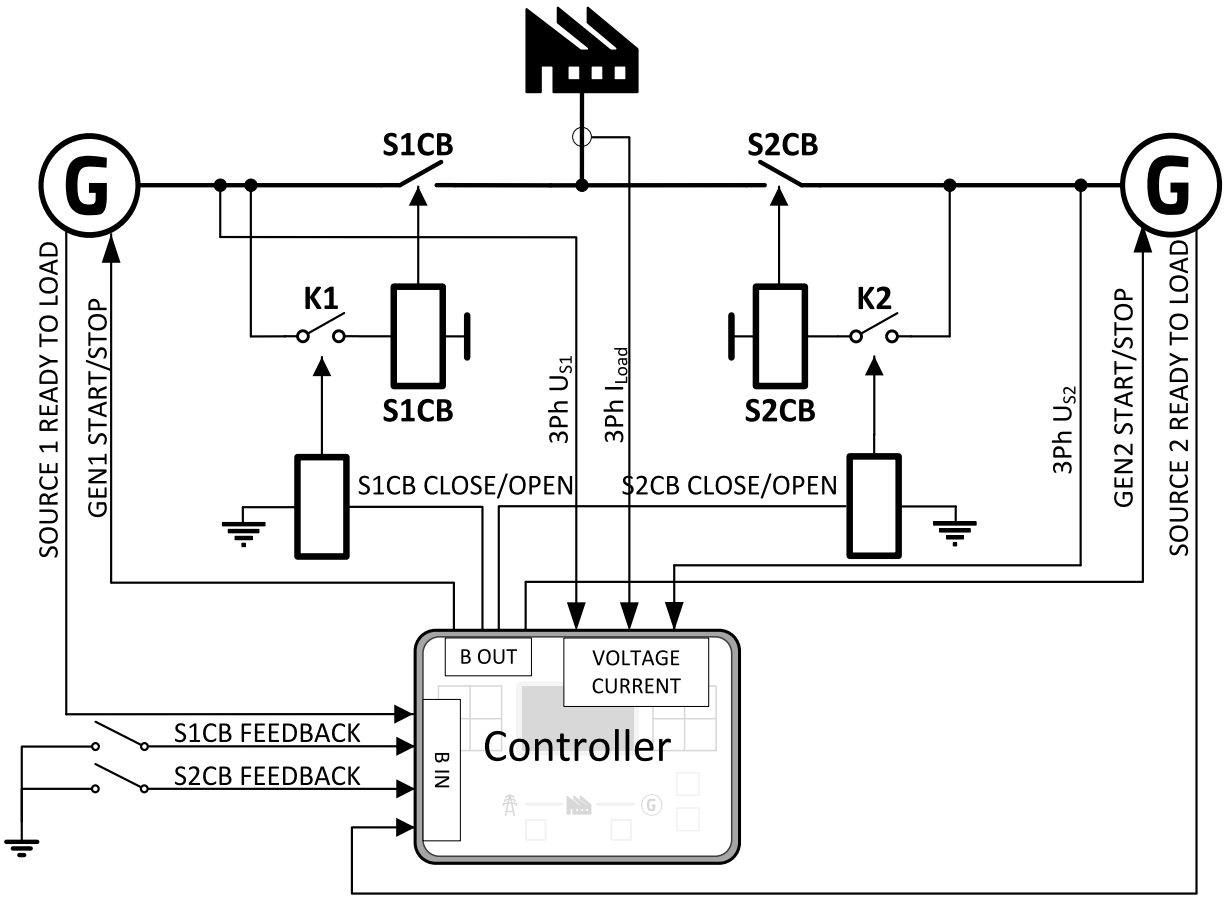

Image 3.4 Gen-Gen application overview

3.5 Applications using Automatic Transfer Switch

3.5.1 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

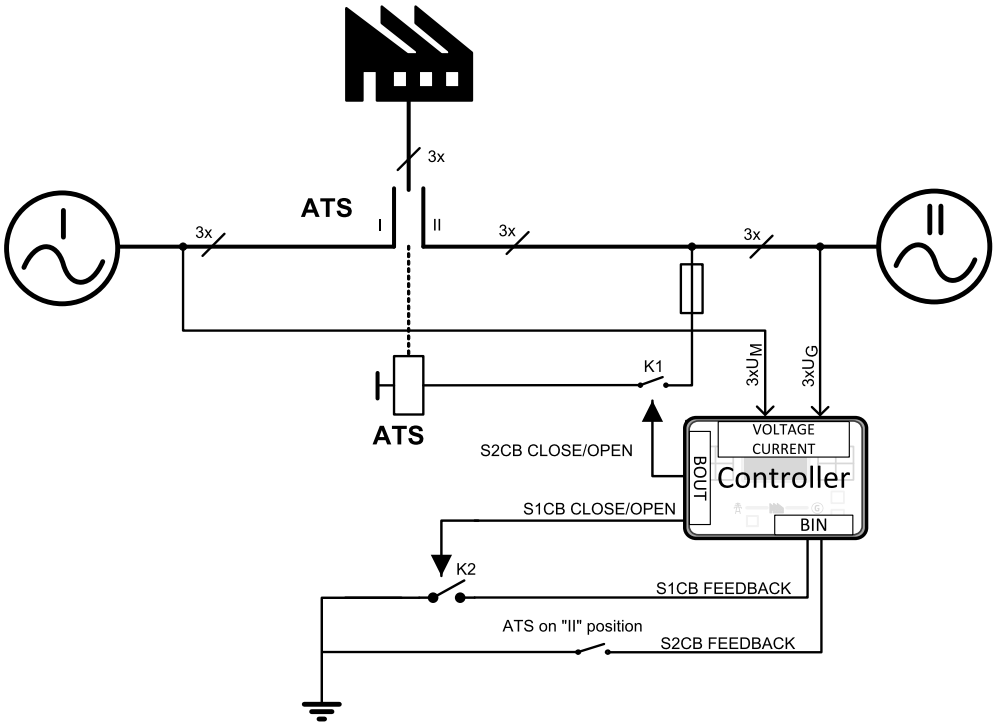

Image 3.5 Two positions ATS with feedback

3.5.2 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

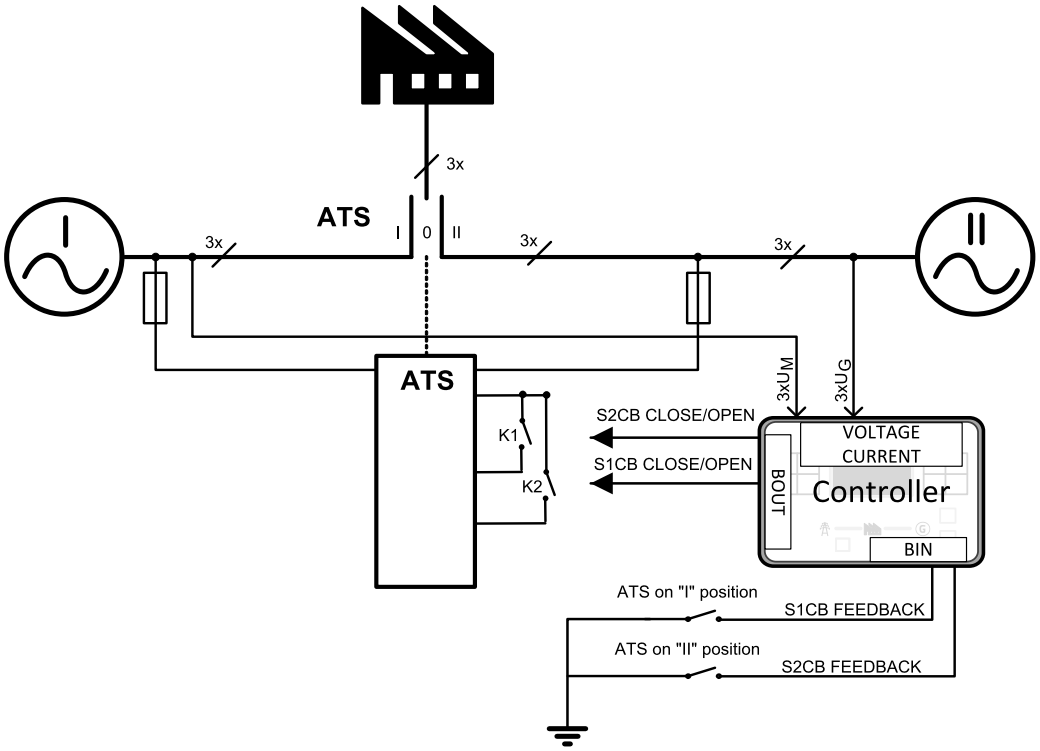

Image 3.6 Three positions ATS with feedback without Neutral control

3.5.3 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

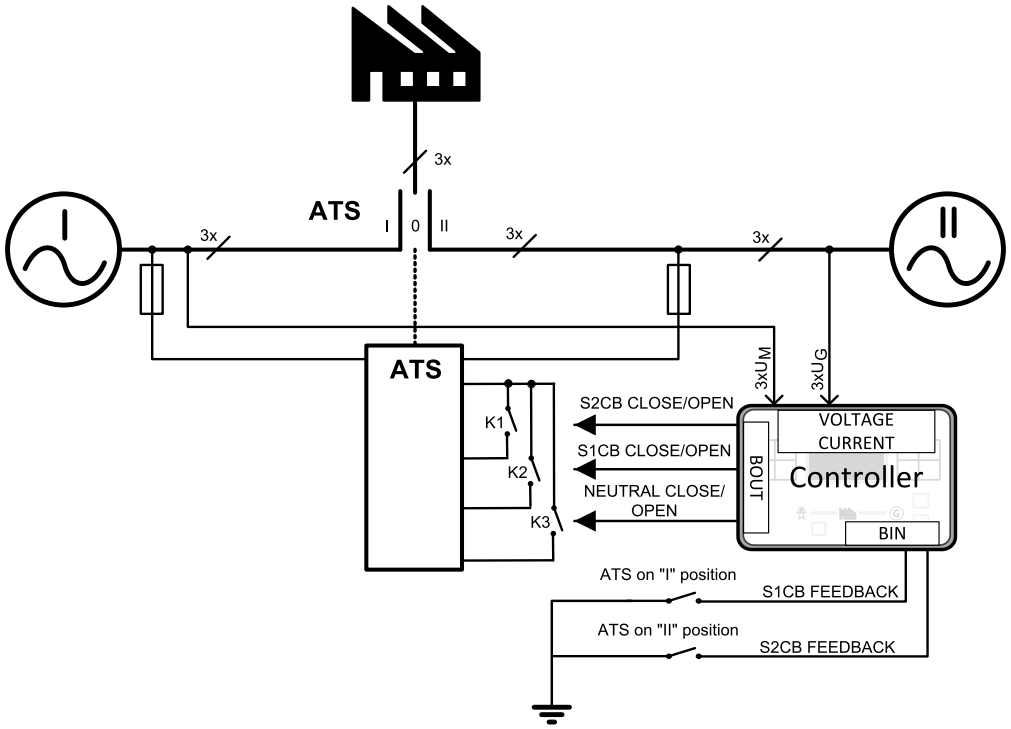

Image 3.7 Three positions ATS with feedback with Neutral control

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4 Installation and wiring

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4.1 Package content

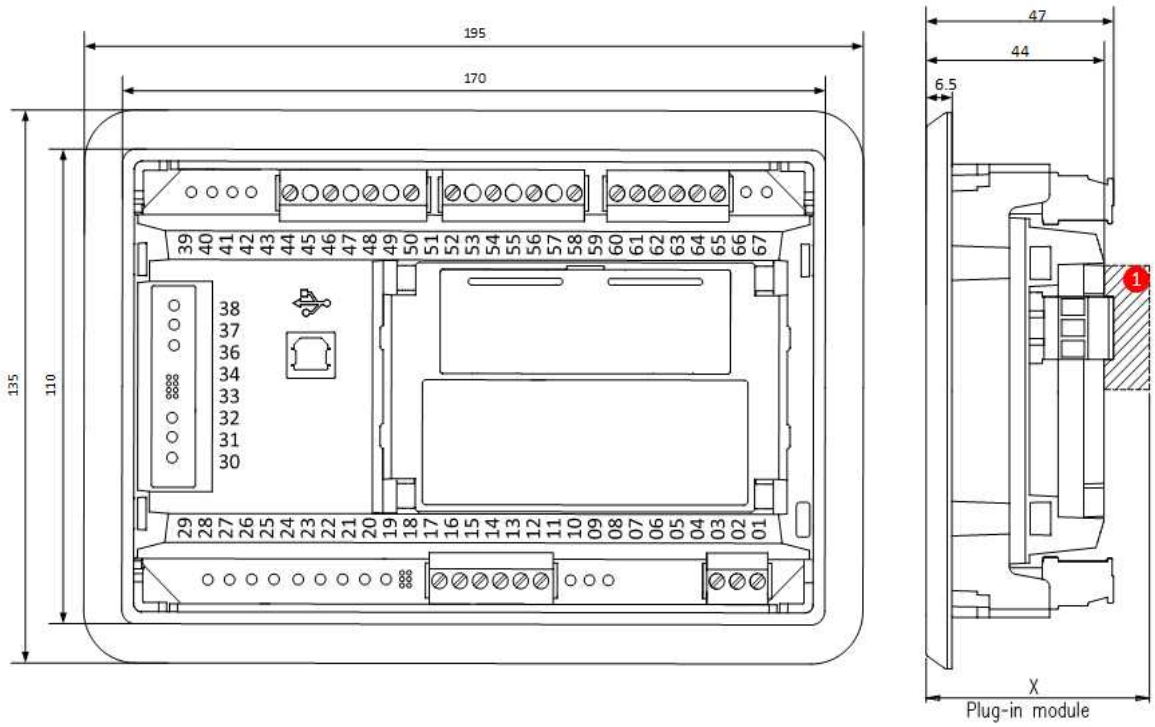
The package contains:

- 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

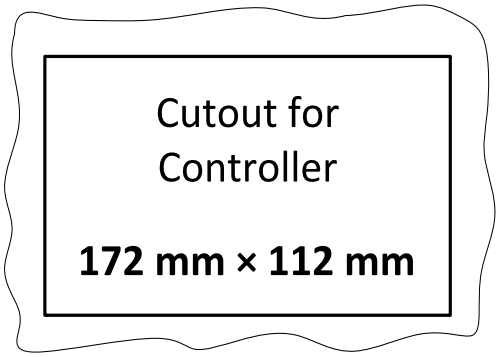
4.2.1 Dimensions



1 Plug-in module

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

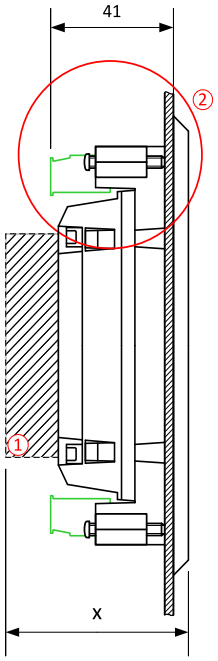
Note: *Dimensions are in millimeters.*



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 SOURCE2 VOLTAGE MEASUREMENT		❷ SOURCE1 VOLTAGE MEASUREMENT		❸ BINARY INPUTS	
T44	N	T52	N	T60	BIN1
T46	L1	T54	L1	T61	BIN2
T48	L2	T56	L2	T62	BIN3
T50	L3	T58	L3	T63	BIN4
				T64	BIN5
				T65	BIN6

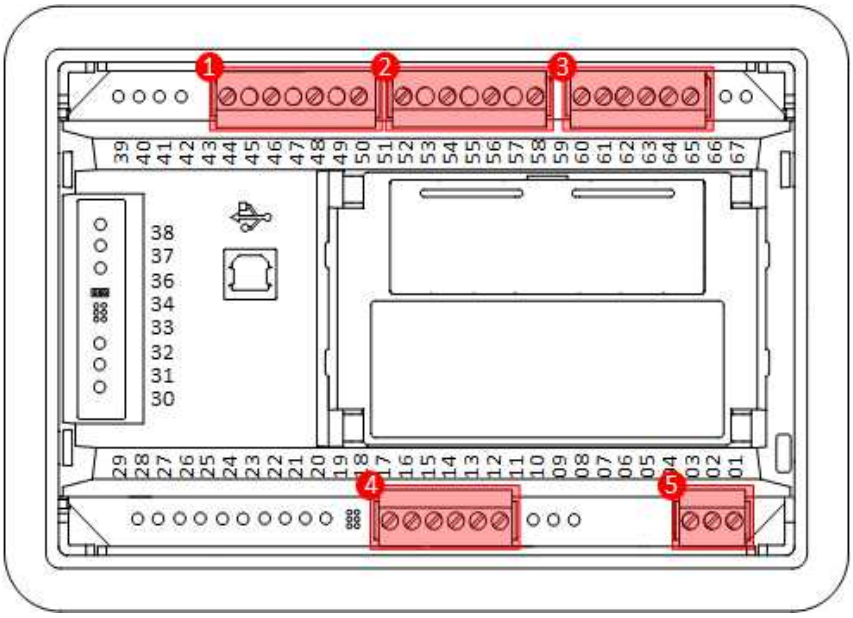
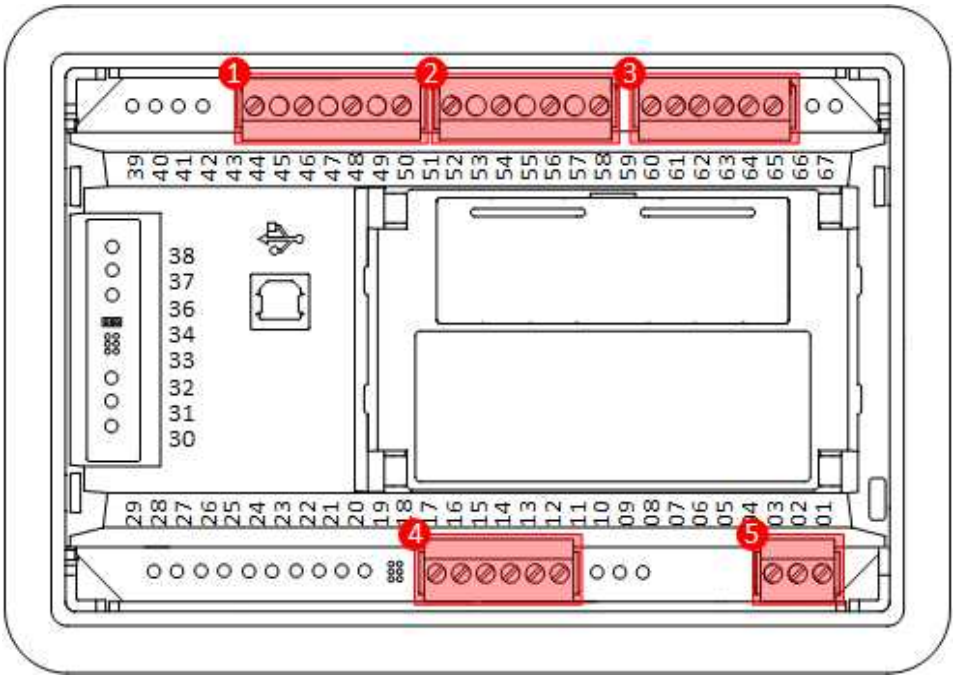


Image 4.1 Terminal diagram for InteliATS2 50

❹ BINARY OUTPUTS		❺ POWER SUPPLY	
T12	BOUT1	T01	BATT -
T13	BOUT2	T03	BATT +
T14	BOUT3		
T15	BOUT4		
T16	BOUT5		
T17	BOUT6		

4.4 Recommended wiring



1	Voltage inputs	44, 46, 48, 50	**Voltage measurement wiring (page 25)**
2	Voltage inputs	52, 54, 56, 58	**Voltage measurement wiring (page 25)**
3	Binary inputs	60-65	**Binary inputs (page 33)**
4	Binary outputs	12-17	**Binary outputs (page 34)**
5	Power supply	"+", "-"	**Power supply (page 24)**

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.

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. Adjust **Connection type (page 128)**, **Nominal Voltage Ph-N (page 129)**, **Nominal Voltage Ph-Ph (page 129)**, **Source 2 VT Ratio (page 130)**, **Source 1 VT Ratio (page 130)** 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.

Voltage measurement wiring

There are 6 voltage measurement Connection Type (setpoint **Connection type (page 128)** [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 128)** 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

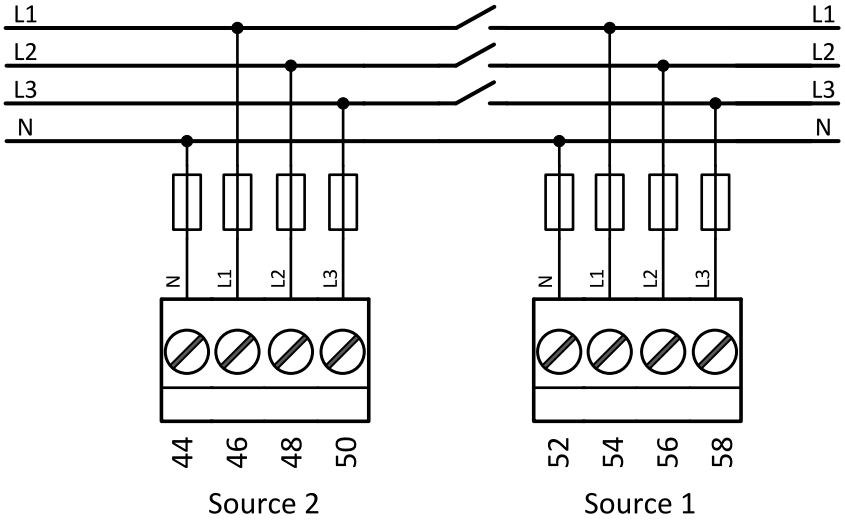


Image 4.2 3 phase application with neutral

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

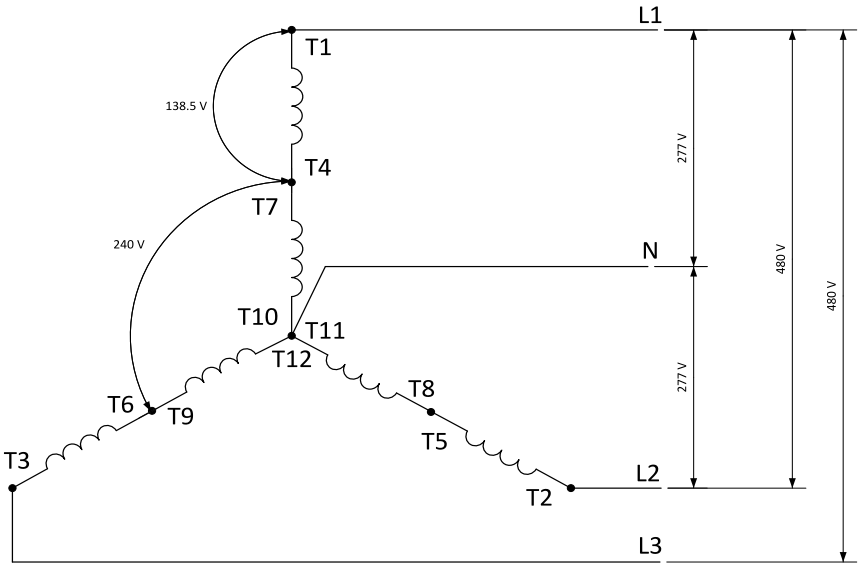


Image 4.3 Typical 3 Phase 4 Wires generator wiring, also known as 3ph High Y

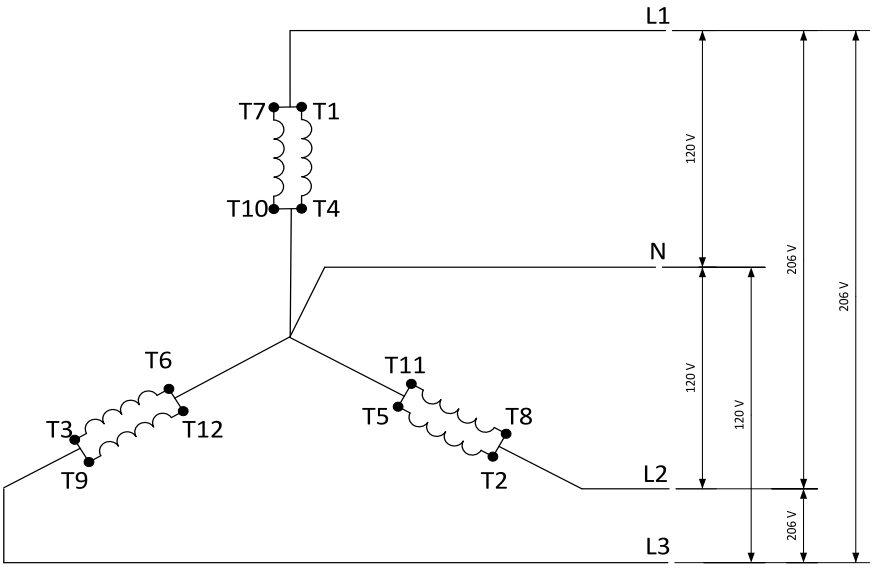


Image 4.4 3 Phase 4 Wires generator wiring, also known as 3ph Low Y

Connection Type: High Leg D

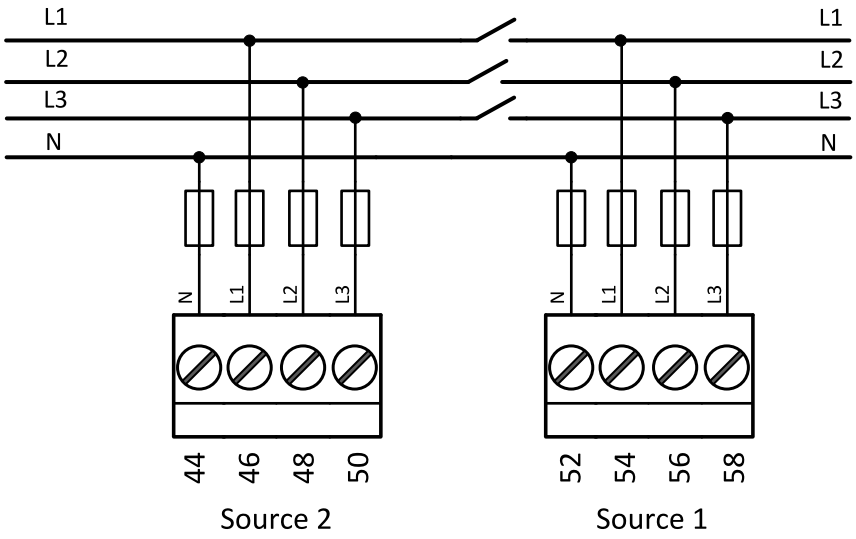


Image 4.5 High Leg Delta application

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

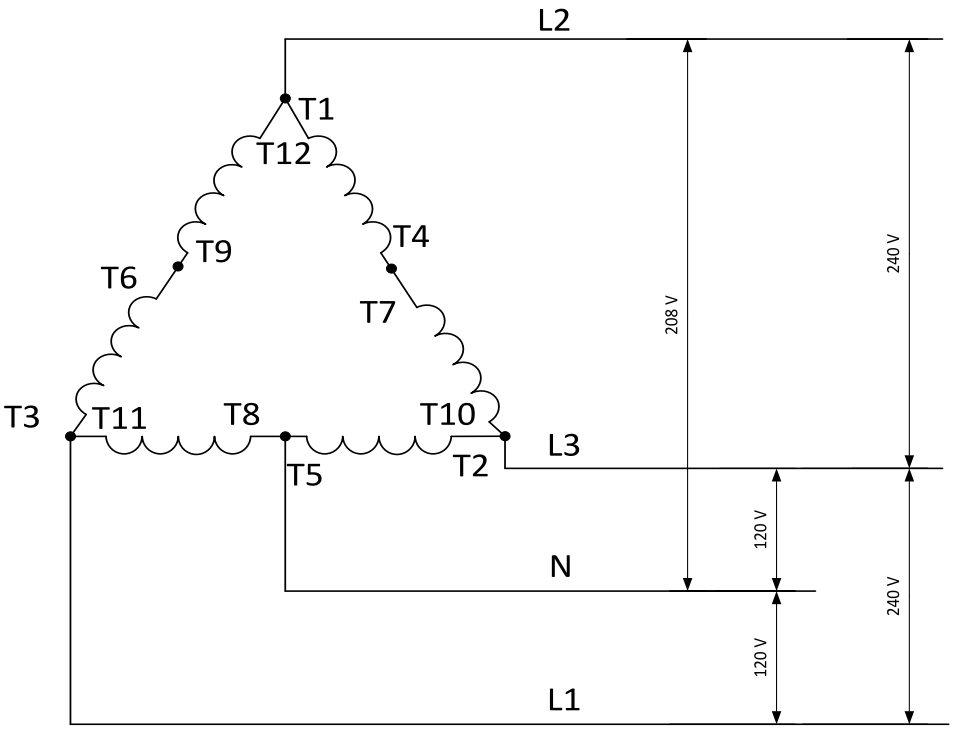


Image 4.6 Typical High Leg D generator wiring

Connection Type: 3 Phase 3 Wires

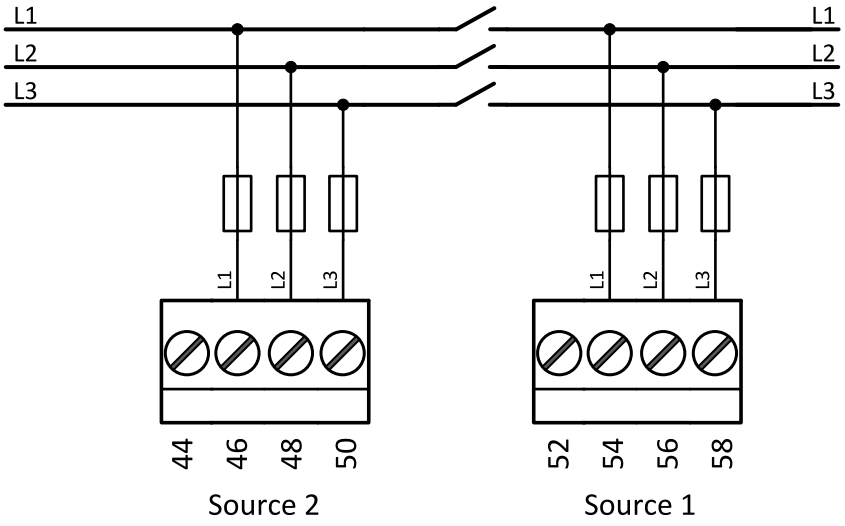


Image 4.7 3 phase application without neutral

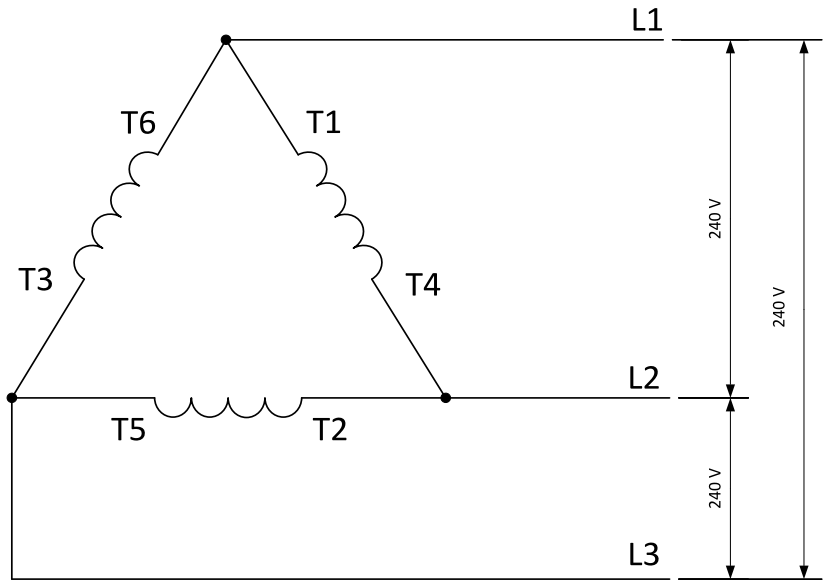


Image 4.8 Typical 3 Phase 3 Wires generator wiring

Connection Type: SplPhL1L2

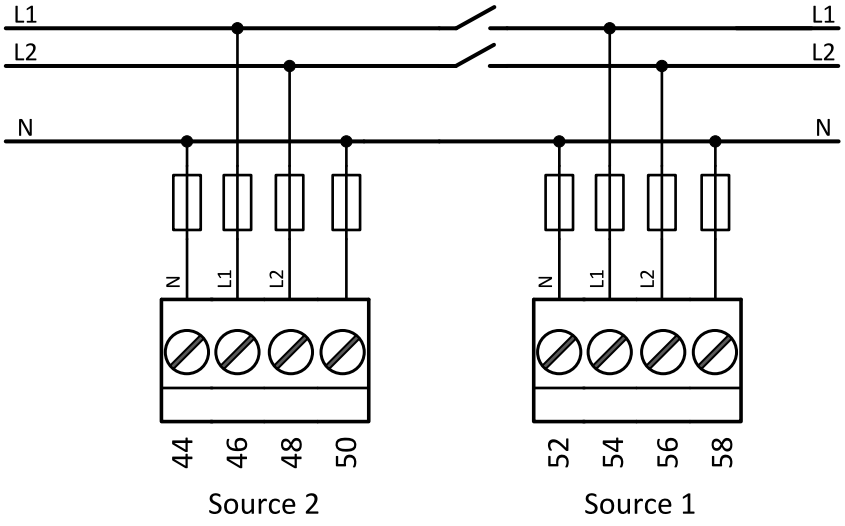


Image 4.9 Split phase L1L2 application

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

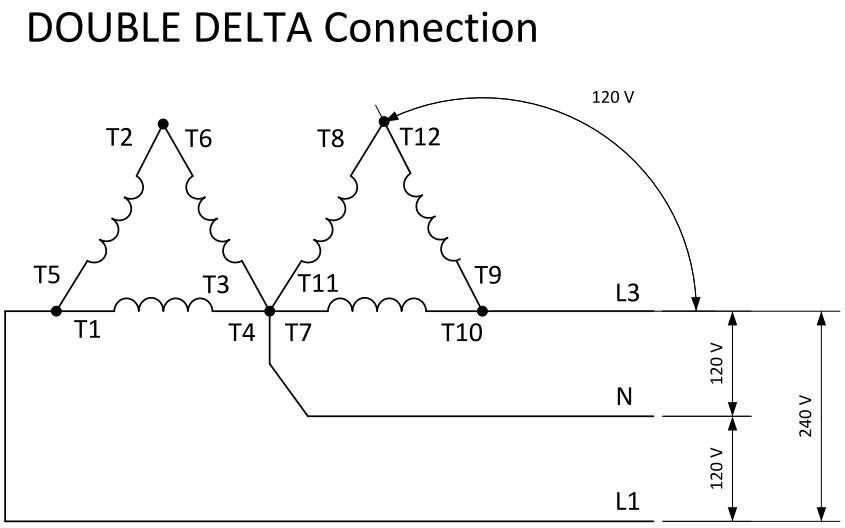


Image 4.10 Typical Split Phase generator wiring

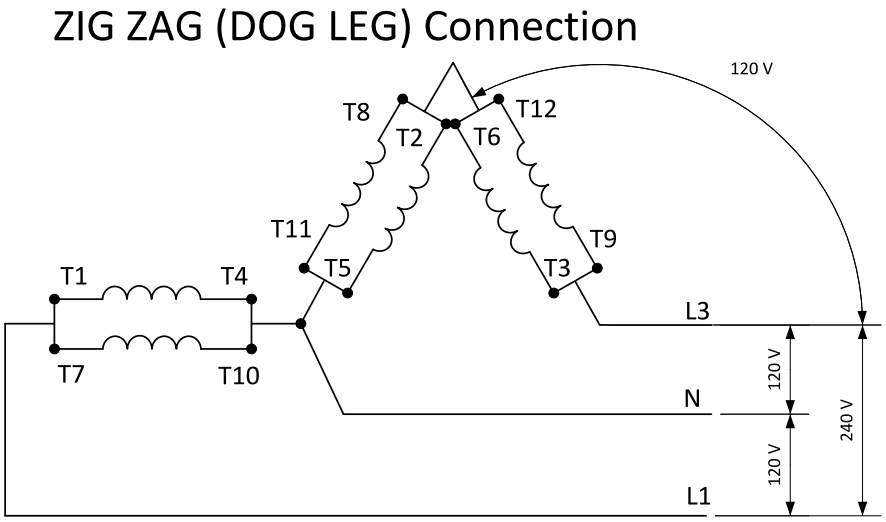


Image 4.11 Typical Split Phase generator wiring

Connection Type: SplPhL1L3

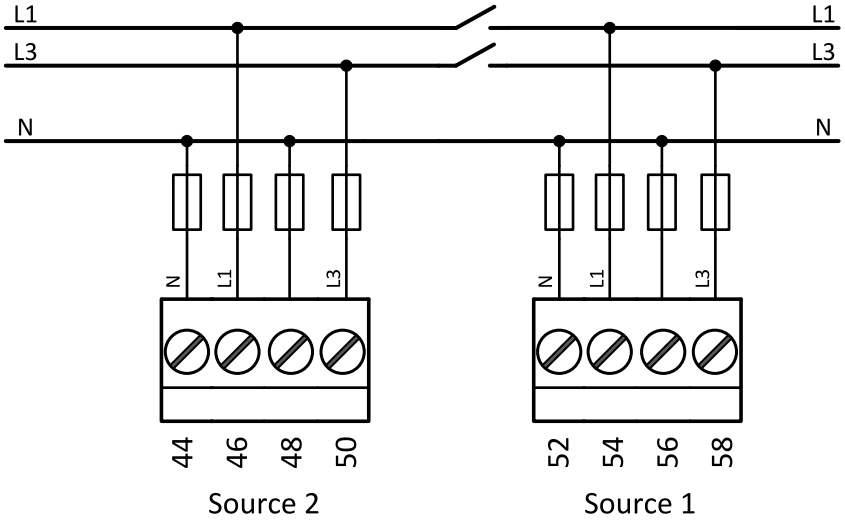


Image 4.12 Split phase L1L3 application

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

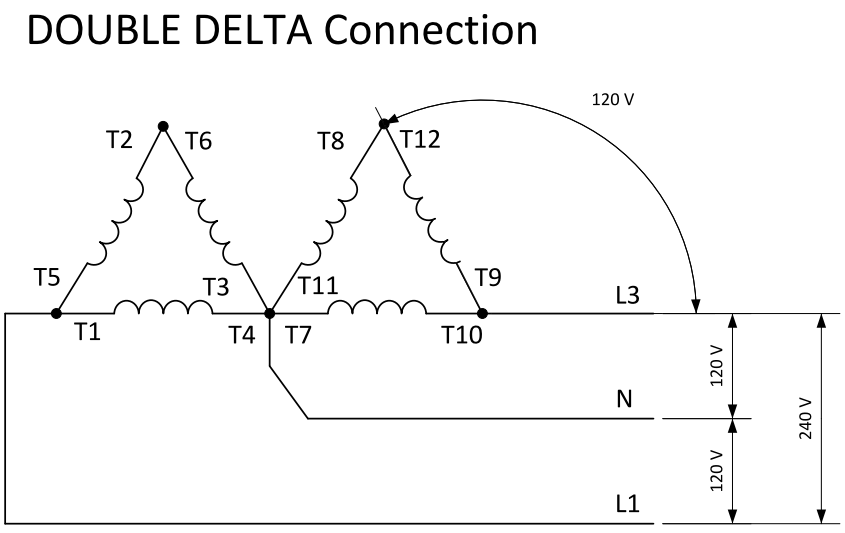


Image 4.13 Typical Split Phase generator wiring

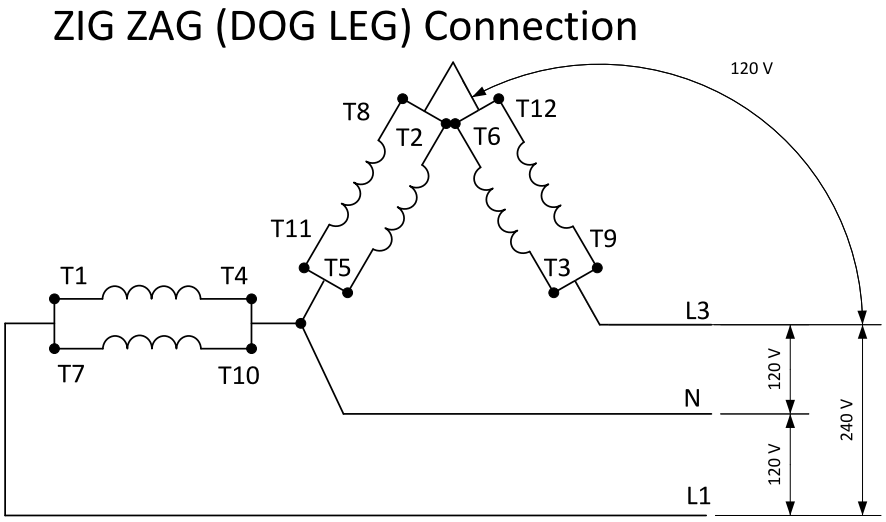


Image 4.14 Typical Split Phase generator wiring

Connection Type: Mono Phase

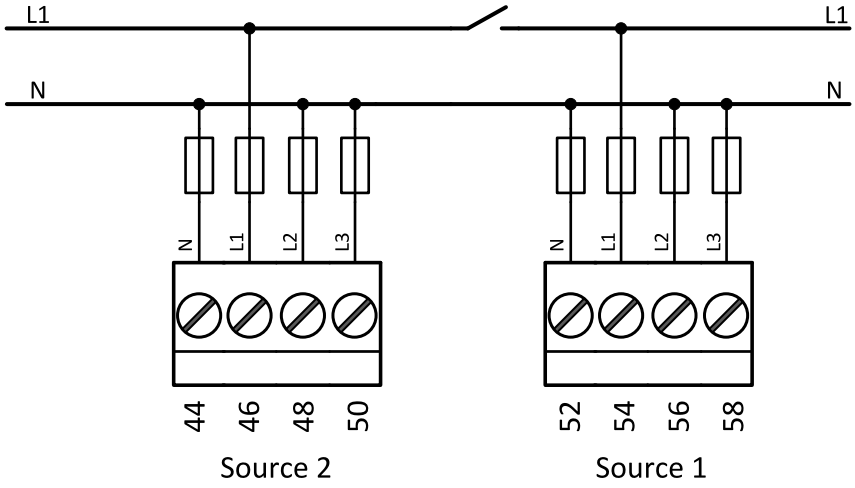


Image 4.15 Mono phase application

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

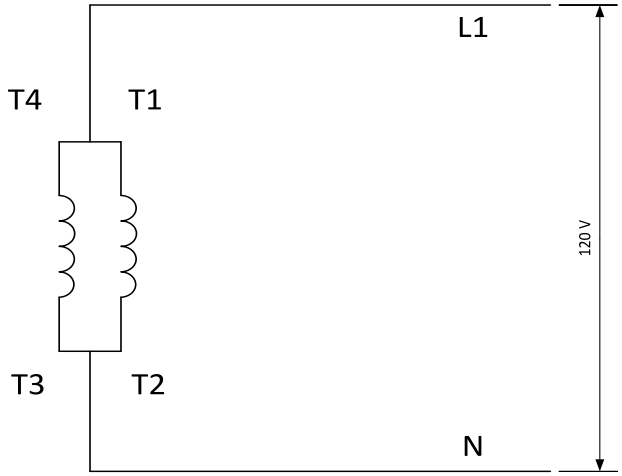


Image 4.16 Typical Mono Phase generator wiring

4.4.5 Binary inputs

Use minimally 1 mm^2 cables for wiring of Binary inputs.

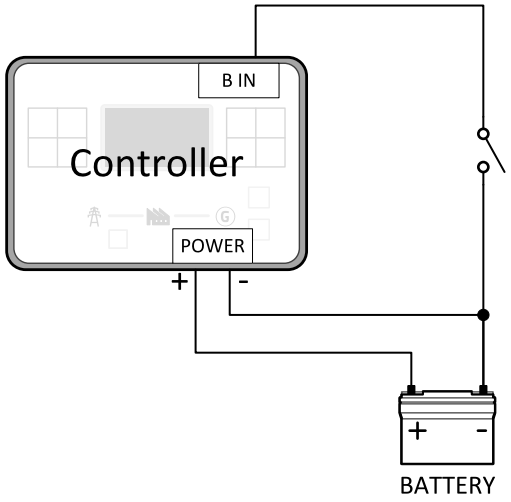


Image 4.17 Wiring binary inputs

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!

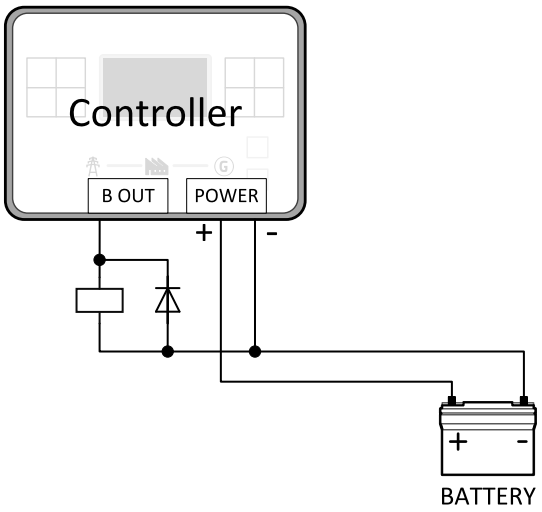


Image 4.18 Binary outputs wiring

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

4.4.7 Total Stop and Emergency Stop

LBI **TOTAL EMERGENCY STOP (PAGE 327)** and **EMERGENCY STOP (PAGE 316)** 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.

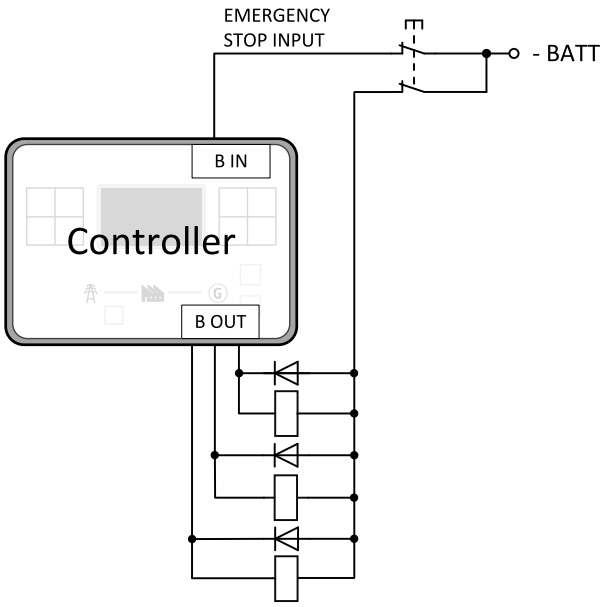


Image 4.19 Hard-wired emergency stop

IMPORTANT: Suppression diodes are not indicated, but required.

4.4.8 USB

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

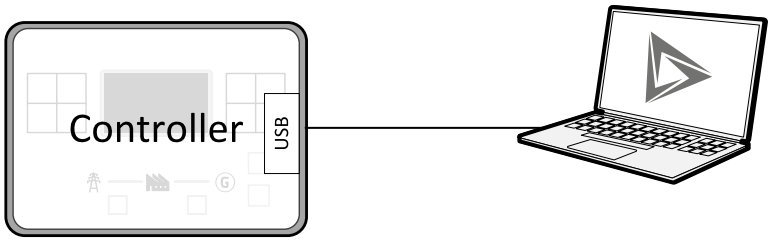


Image 4.20 USB connection

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

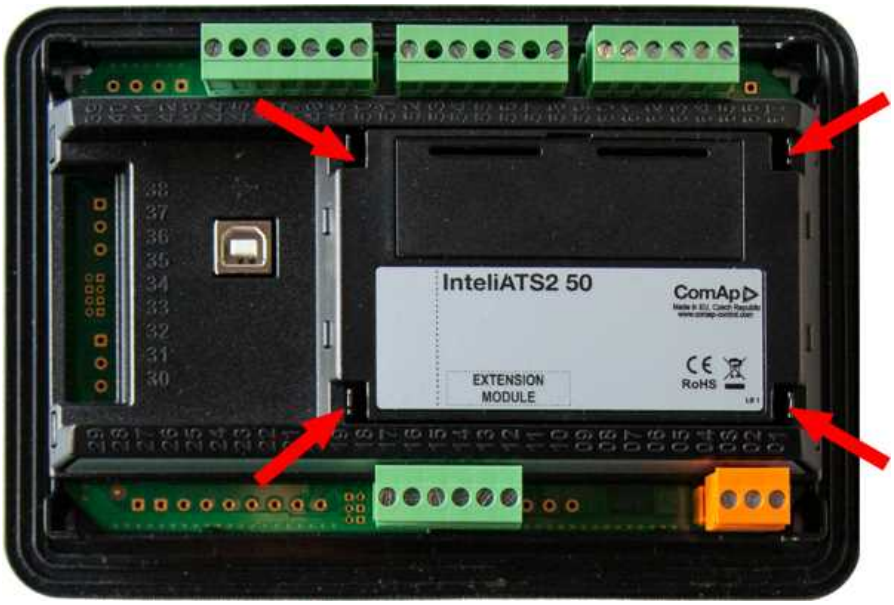
IMPORTANT: Power supply by USB is only for service purpose. Binary inputs and outputs are in logical 0. Also plug-in modules are not working.

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

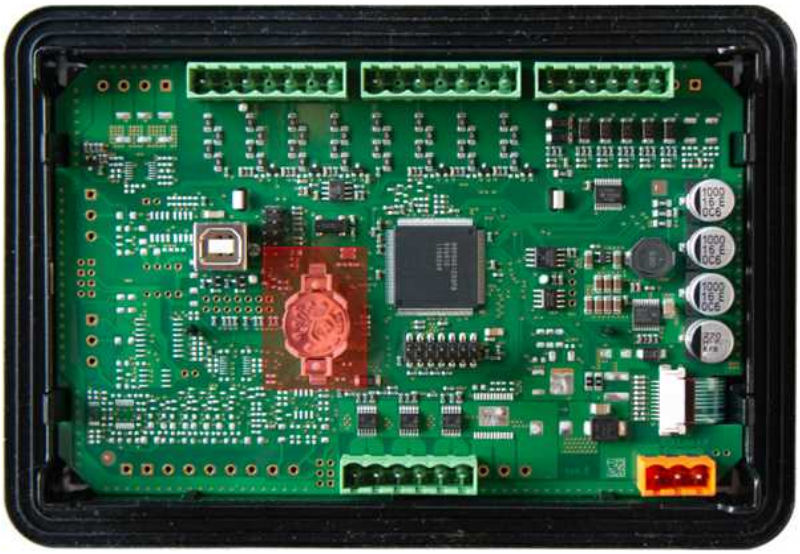
4.6.1 Backup battery replacement

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 323)**
BIN2	Circuit breaker feedback	**S2CB FEEDBACK (PAGE 324)**
BIN3	Source 1 Fail Block	**S1 FAIL BLOCK (PAGE 322)**
BIN4	Source 2 Switch Block	**S2 BLOCK (PAGE 323)**
BIN5	Transfer to Source 2	**TRANSFER TO S2 (PAGE 327)**
BIN6	Total Emergency Stop	**TOTAL EMERGENCY STOP (PAGE 327)**

5.1.2 Binary outputs

Number	Description	Function
BOUT1	Signal for engine to Start or Stop	**GEN START/STOP (PAGE 337)**
BOUT2	Control signal for Source 1 breaker	**S1CB CLOSE/OPEN (PAGE 342)**
BOUT3	Indication of Source 1 condition	**S1 HEALTHY (PAGE 341)**
BOUT4	Control signal for Source 2 breaker	**S2CB CLOSE/OPEN (PAGE 347)**
BOUT5	Indication of Source 2 condition	**S2 HEALTHY (PAGE 346)**
BOUT6	Controller not in AUTO mode	**NOT IN AUTO (PAGE 341)**

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

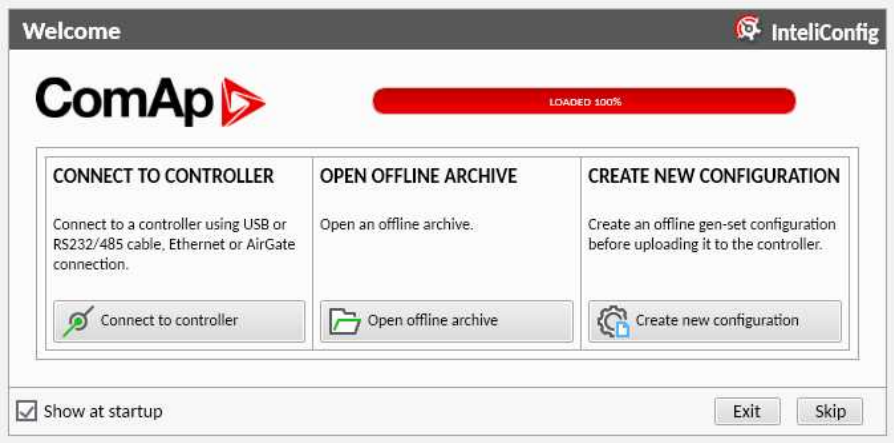


Image 5.1 First screen of InteliConfig – select connect to controller

Image 5.2 Second screen of InteliConfig – select detected controllers

Connection using WinScope 1000

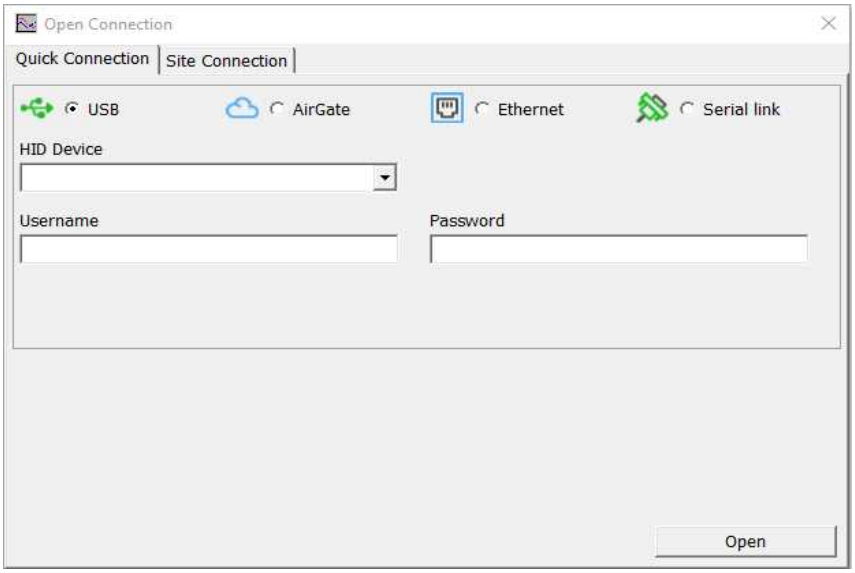


Image 5.3 WinScope 1000 screen – select USB connection

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

Note: *Username and password are not mandatory.*

5.2.2 RS232

It is possible to connect to the controller using RS232 direct connection (serial port or USB to RS232converter may be used). The following settings should be checked in the controller:

- **COM1 Mode (page 221)** = Direct
- **Controller Address (page 141)** must be set

Connection using InteliConfig

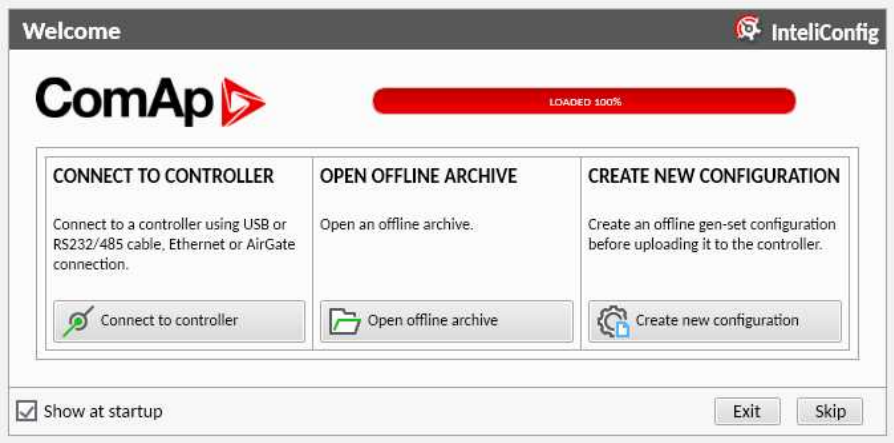


Image 5.4 First screen of InteliConfig – select connect to controller

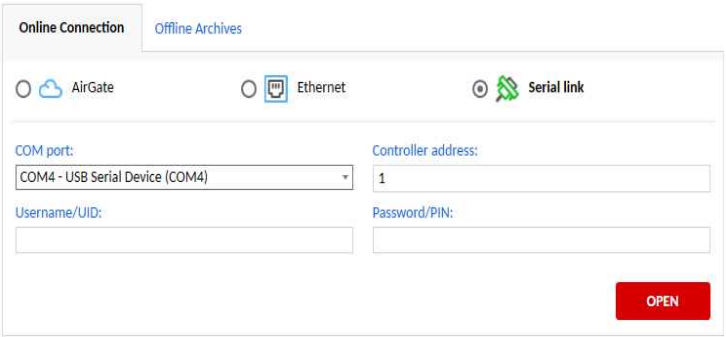


Image 5.5 Second screen of InteliConfig – select Serial link

Connection using WinScope 1000

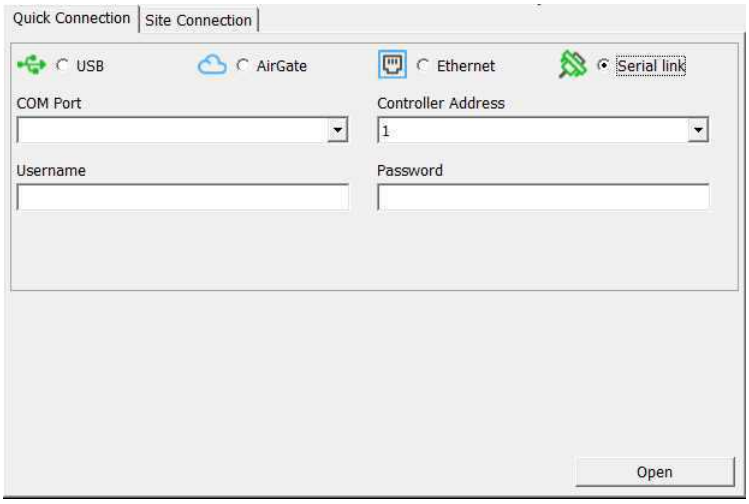


Image 5.6 WinScope 1000 screen – select serial link

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 141)** must be set to the same value as in the PC tool
- **IP Address Mode (page 251)** can be set to AUTOMATIC when there is DHCP service available. Otherwise it should be set to FIXED
- **IP Address (page 252)** is either set automatically or it can be adjusted to a specific requested value
- **Subnet Mask (page 252)** is either set automatically or it can be adjusted to a specific requested value
- **Gateway IP (page 253)** can be set here when it is used

Connection using InteliConfig

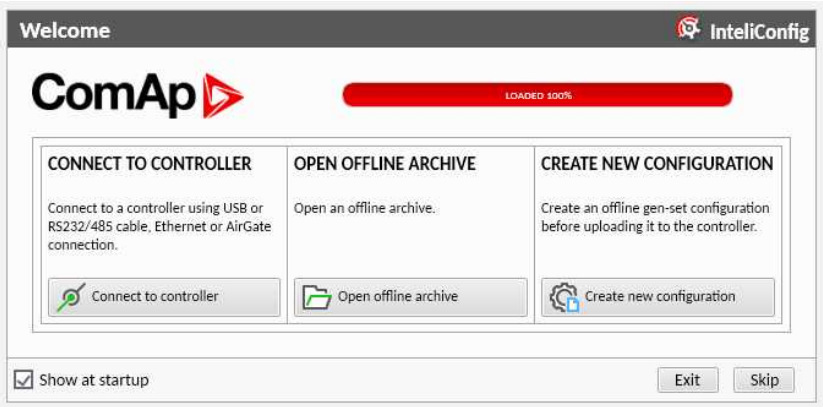


Image 5.7 First screen of InteliConfig – select connect to controller

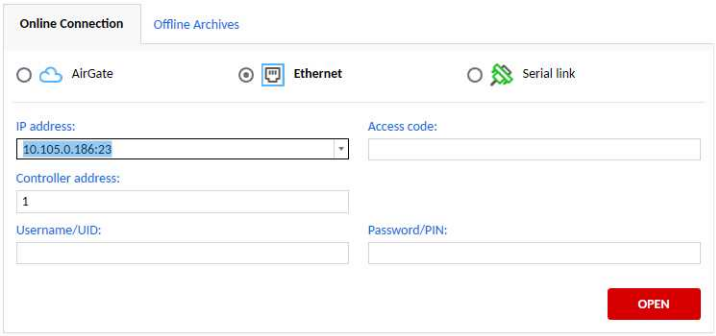


Image 5.8 Second screen of InteliConfig – select Internet / Ethernet

Connection using WinScope 1000

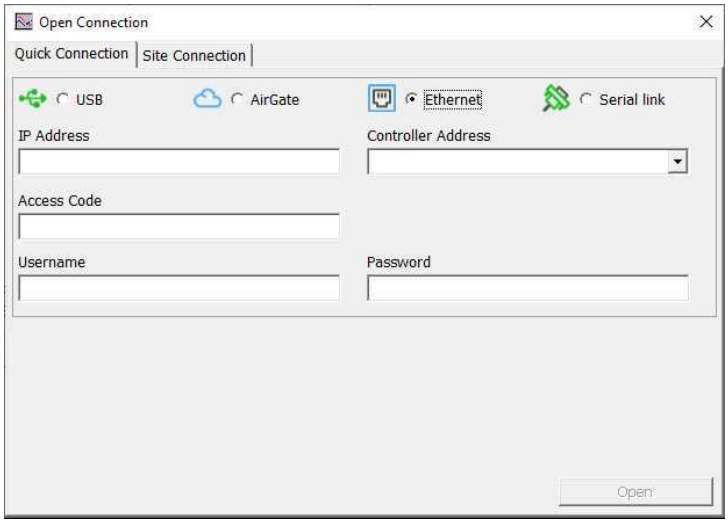


Image 5.9 WinScope 1000 screen – select Ethernet

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 141)** has to be set to the same value as in the PC tool
- **IP Address Mode (page 251)** must set to AUTOMATIC when there is DHCP service available. Otherwise it should be set to FIXED
- **IP Address (page 252)** is either set automatically or it can be adjusted to a specific requested value
- **Subnet Mask (page 252)** is either set automatically or it can be adjusted to a specific requested value
- **Gateway IP (page 253)** can be set here when it is used
- **AirGate Connection (page 255)** must be set to Enabled
- **AirGate Address (page 256)** 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 304)**
- AirGate Server → **AirGate Address (page 256)**
- **Controller Address (page 141)**
- 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.

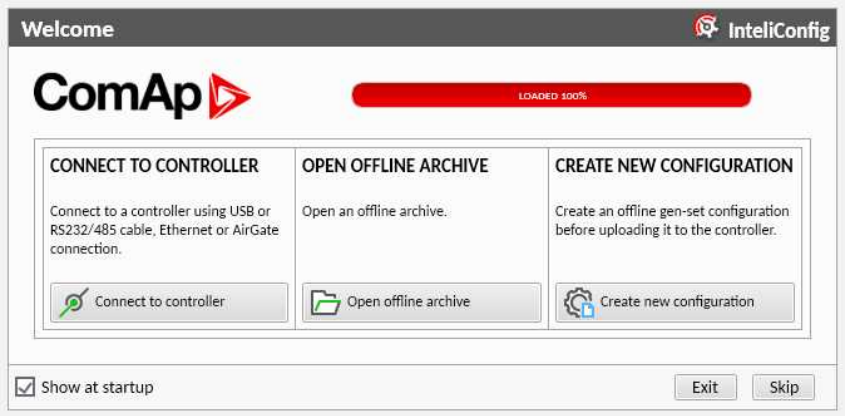


Image 5.10 First screen of InteliConfig – select connect to controller

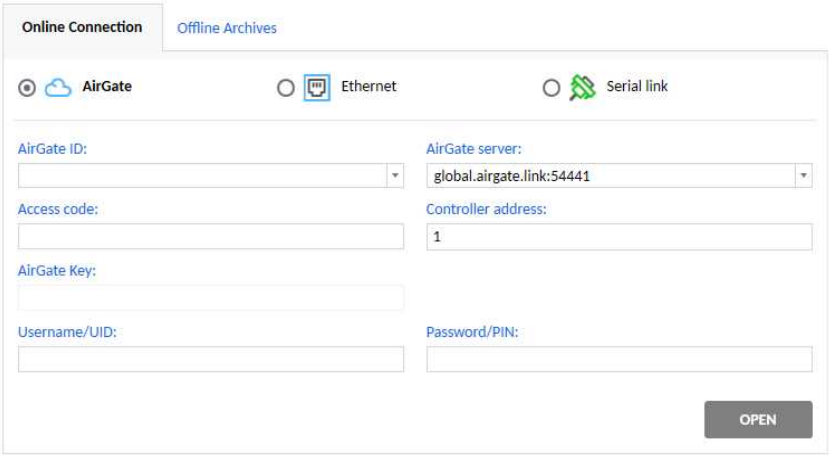


Image 5.11 Second screen of InteliConfig – AirGate

Connection using WinScope 1000

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

- **AirGate ID (page 304)**
- AirGate Server → **AirGate Address (page 256)**
- **Controller Address (page 141)**
- 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.**

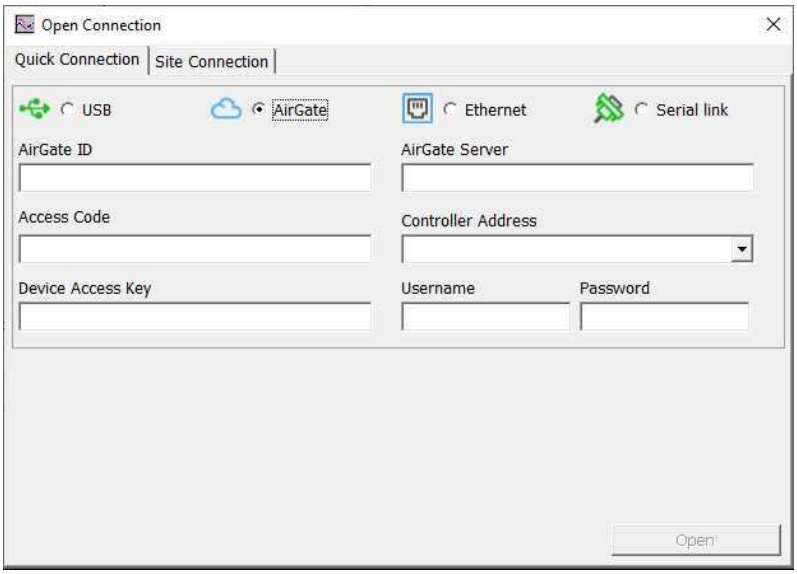


Image 5.12 WinScope 1000 screen – select AirGate

5.3 Operator Guide

5.3.1 Front panel elements

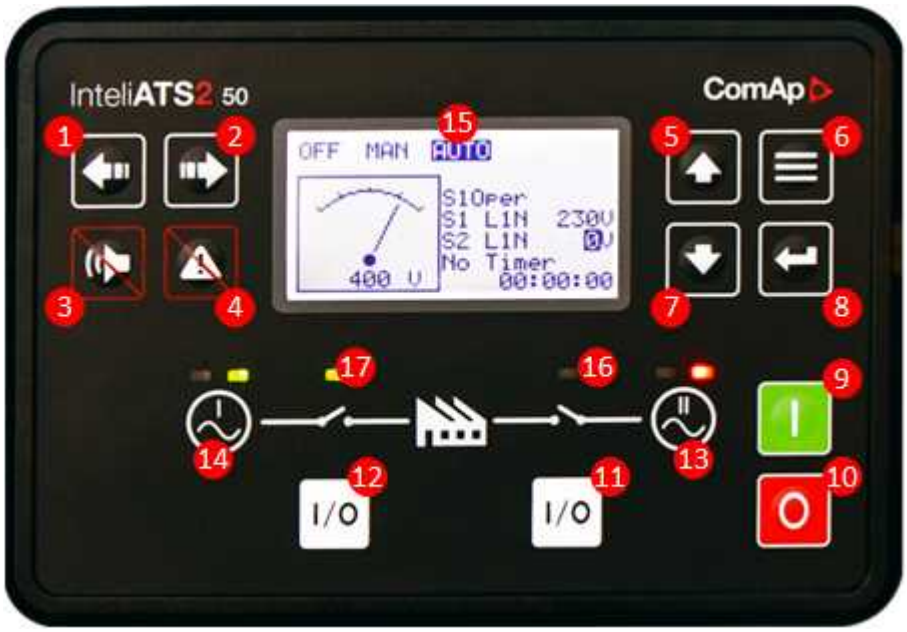


Image 5.13 Operator interface of InteliATS2 50

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		**START** button. Works in MAN mode and in Mains-Gen and Gen-Gen application. Press this button to initiate the start sequence of the engine.
10		**STOP** button. Works in MAN mode and in Mains-Gen and Gen-Gen application. Press this button to initiate the stop sequence of the engine.
11		**S2CB** button. Works in MAN mode only. Press this button to open or close the S2CB.
12		**S1CB** button. Works in MAN mode only. Press this button to open or close the S1CB.

Indicators and others

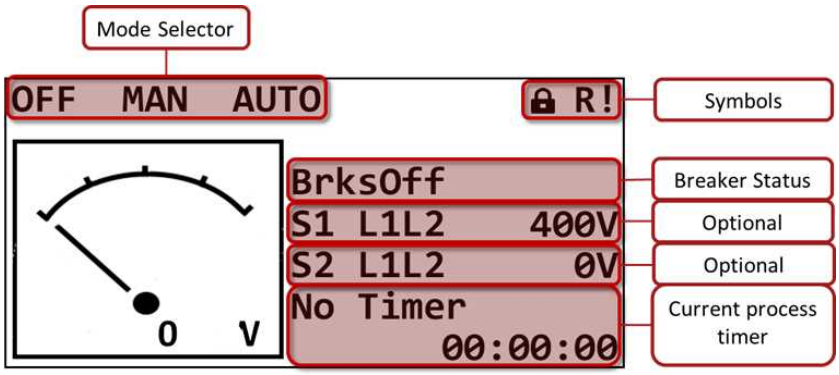
Position	Description
13	**Source 2** status indicator. There are two states – Source 2 OK (indicator is green) and Source 2 failure (indicator is red). Green LED is on if the Source 2 voltage and frequency is present and within limits. Red LED is activated when Source 2 failure occurs.
14	**Source 1**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



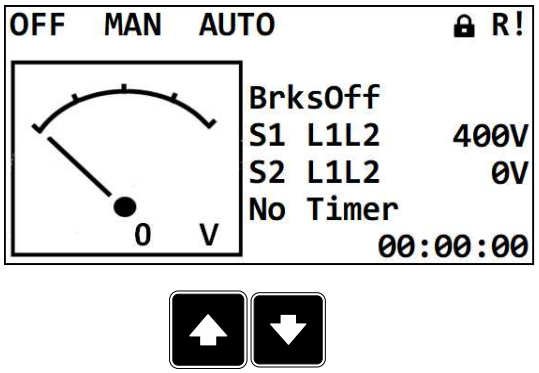
Symbols

- 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

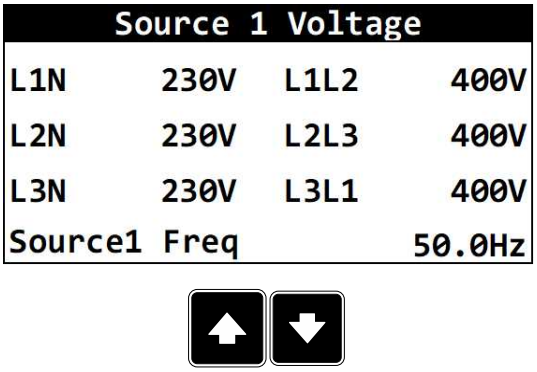
Optional

- Value can be chosen via setpoints **Main Screen Line 1 (page 139)** and **Main Screen Line 2 (page 139)**.

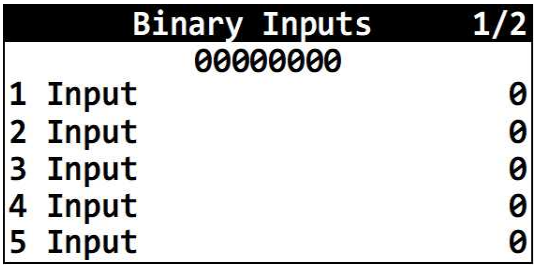
Measurement Screens



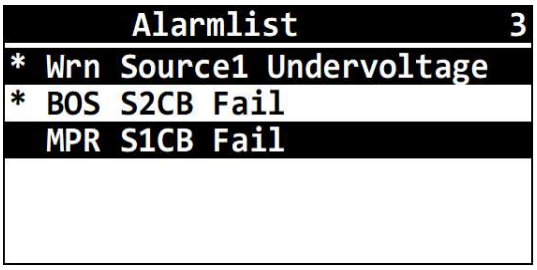
Note: *Use the Up and Down buttons to move between measurement pages.*



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



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

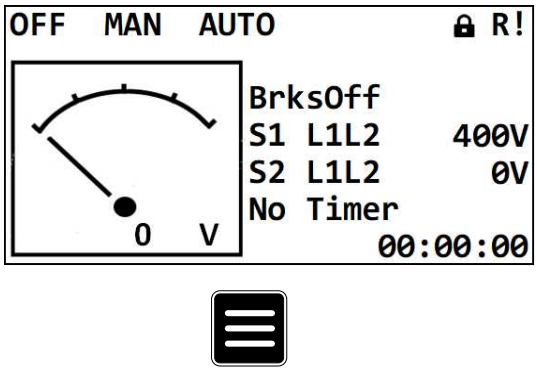


Note: *Use the Up and Down buttons to move between measurement pages.*

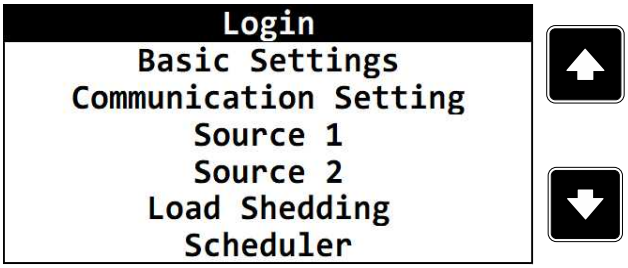
Note: *From all of these pages it is possible to switch seamlessly to the setpoint group page by pressing Page button.*

Note: *There are additional screens. Screen's visibility depends on actual configuration (usage of extension or communication modules, ECU etc.).*

Setpoint Screens

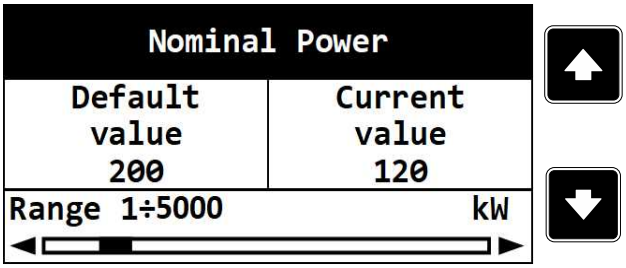


Note: *From all measurement pages you can easily go to the setpoint group page by pressing the Page button.*



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

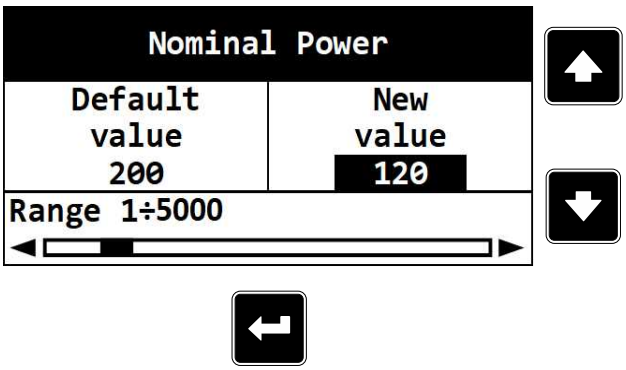
Note: *Use the Enter button to enter selected setpoint group.*



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.*

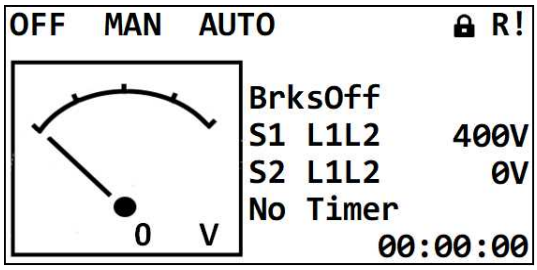


Note: *Use Up and Down button to set required value of selected setpoint.*

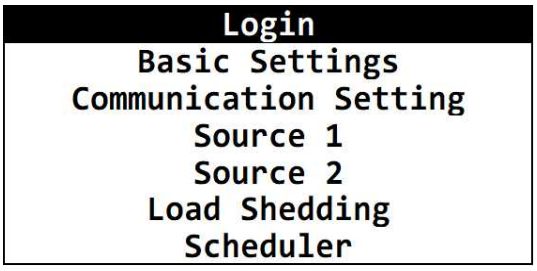
Note: *Use the Enter button to confirm adjusted value of setpoint.*

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.*

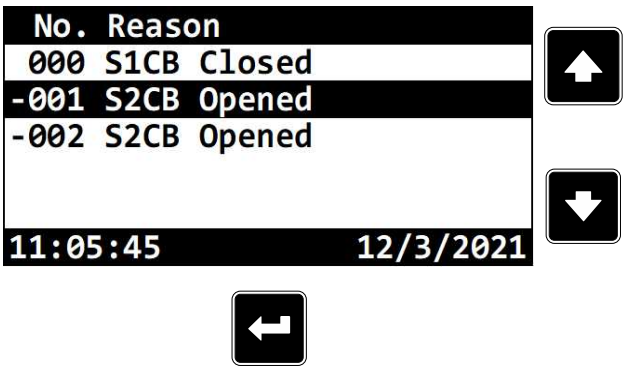
History Log



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

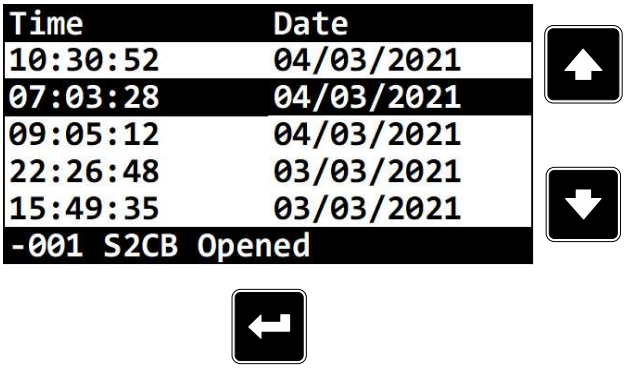


Note: *From setpoint group page we can fluently go to the history log pages by pressing the Page button.*



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.*



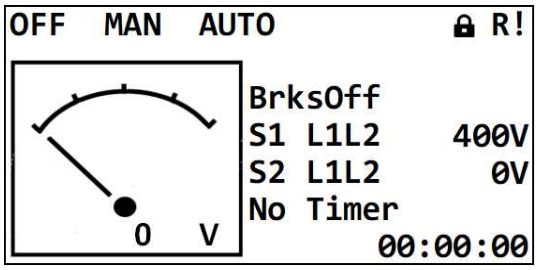
Note: *Use the Up and the Down button to select required alarm reason.*

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

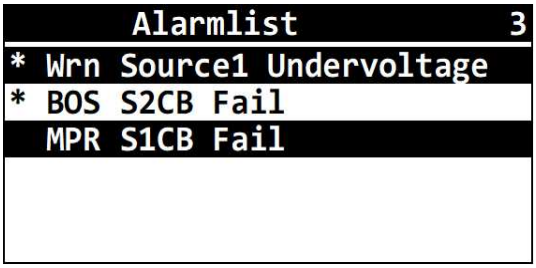
Note: *There are additional history screens. Screen's visibility depends on actual configuration (usage of extension or communication modules, ECU, controller model, etc.).*

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

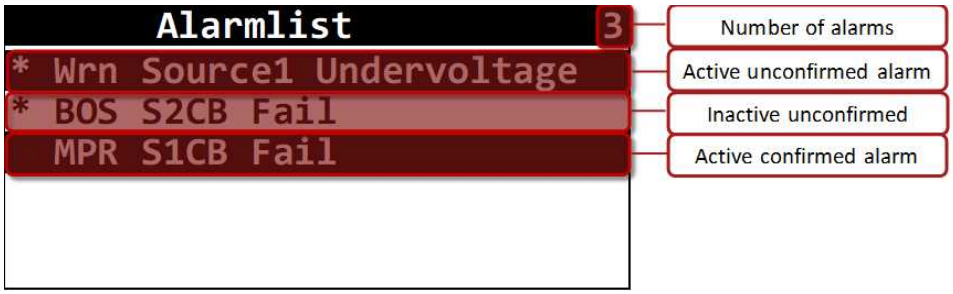
5.3.3 Browsing alarms



Note: *Use the Up button to move to alarm list from main measurement screen.*



- 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

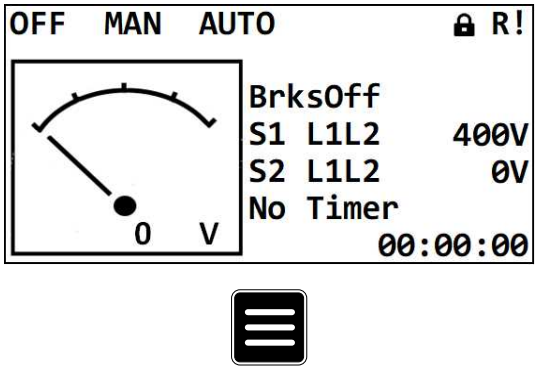
The controller comes to the customer with Production mode turned on, the default administrator password installed and with no prefilled email address for password reset. For security purposes, the following user access management alarms will appear. Detailed description of situation when the alarms are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

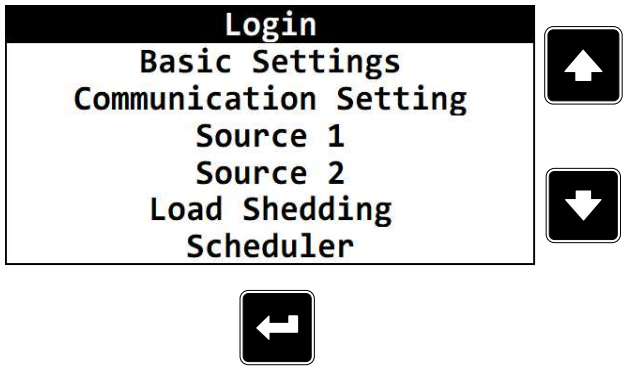
might be or is connected to an untrusted interface and cybersecurity rules are not fulfilled because there is default administrator password.

- **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

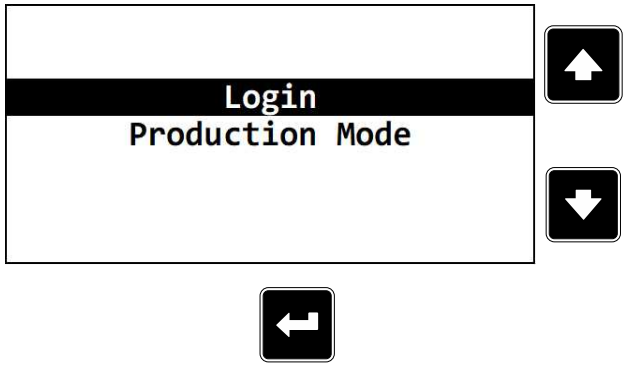


Note: *From all measurement pages you can easily go to the setpoint group page by pressing the Page button.*



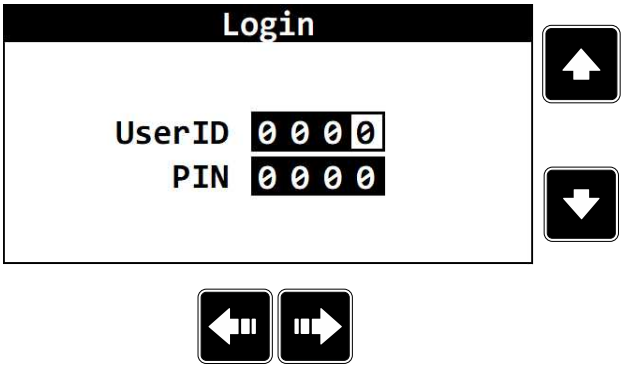
Note: *Use the Up and the Down button to select setpoint group Login.*

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



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

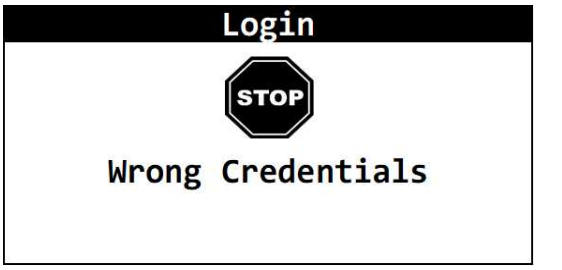
Note: *Use the Enter button to enter Login.*



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

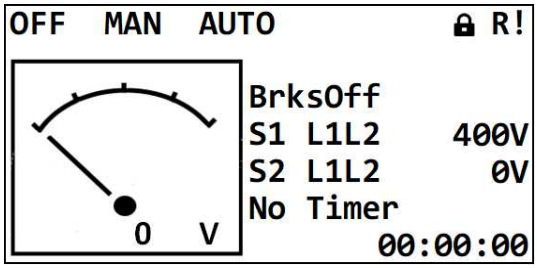
Note: *Use the Left and the Right buttons to move between digits.*

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

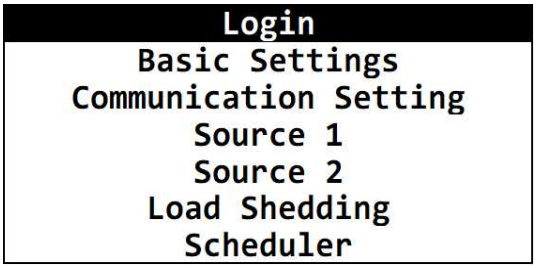


Note: *In case that invalid UserID or PIN are entered, the controller shows Wrong Credentials screen. Use the Enter button to enter Login again or the Page Button to go back to menu.*

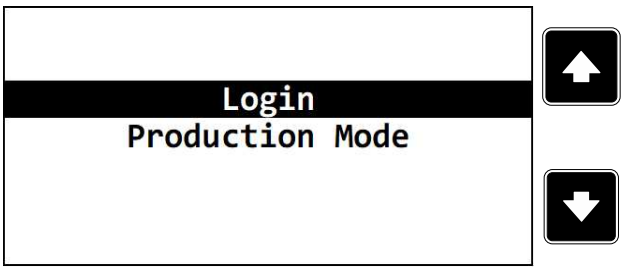
5.3.5 Production mode



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

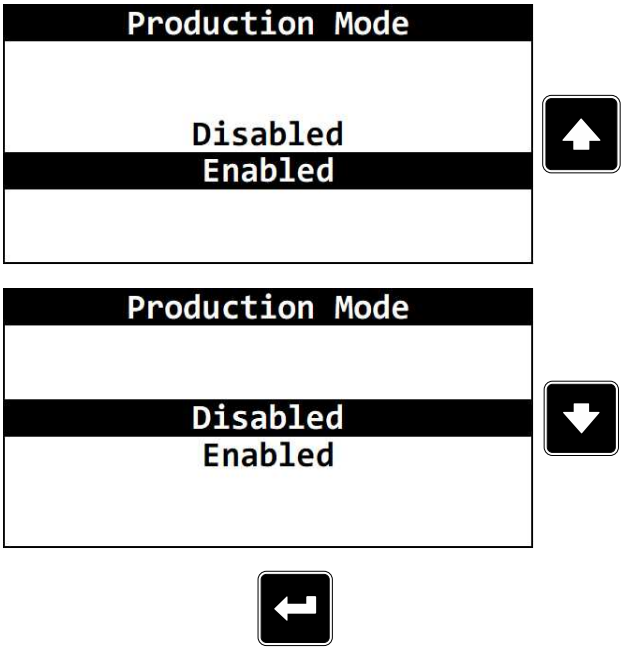


Note: *Use the Enter button to enter setpoint group Login.*



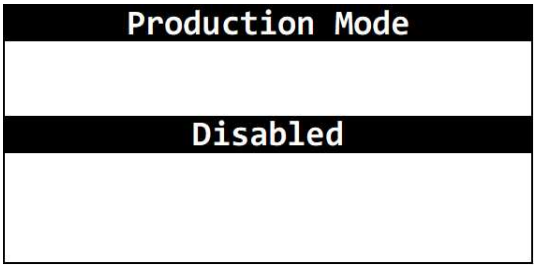
Note: *Use the Up and the Down Button to select Production Mode*

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



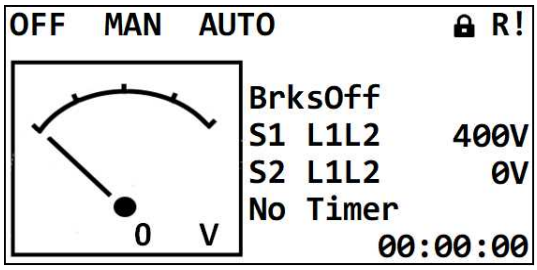
Note: *Use the Up and the Down Button to change to disabled*

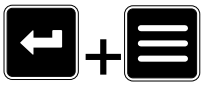
Note: *Use the Enter button to disable the Production Mode.*



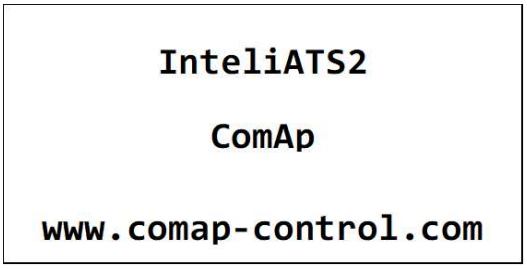
Note: *Once Disabled is confirmed by Enter button the option Enabled is no longer on the screen and therefore it is not possible to enable Production mode by HMI display screen. Use InteliConfig to enable the Production mode.*

5.3.6 Information screen

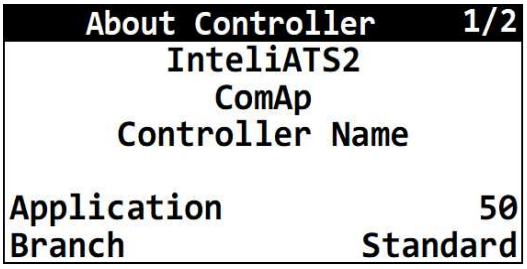




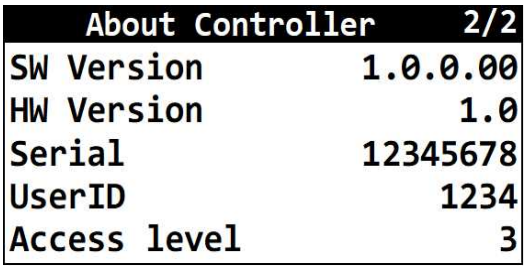
Note: *On Main measurement screen press the Enter and the Page button together. The Enter button has to be pressed first.*



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



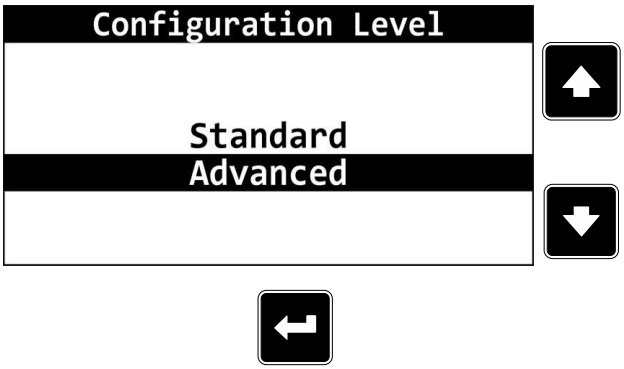
Note: *Use the Page button to move to the next page.*



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

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

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

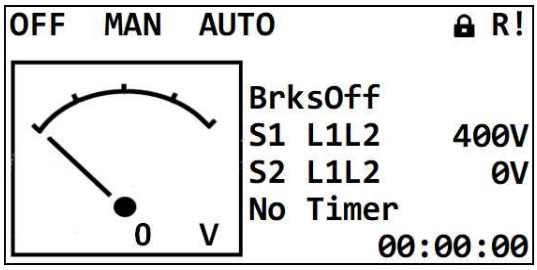


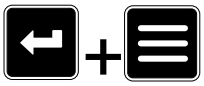
Note: *Use the Up and the Down button to select required configuration level.*

Note: *Use the Enter button to confirm selected configuration level.*

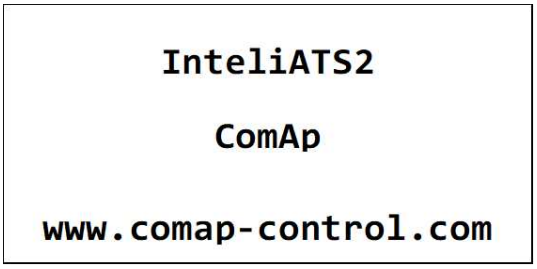
Note: *Use the Page button to move to the next page.*

5.3.7 Language selection

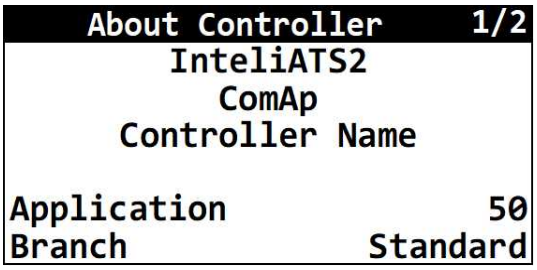




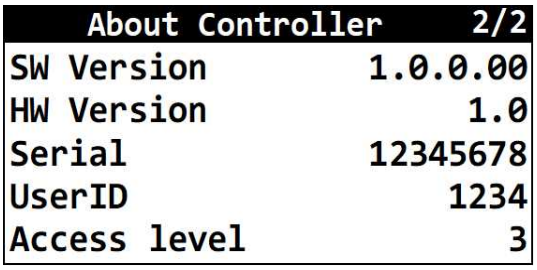
Note: *On Main measurement screen press the Enter and the Page button together. The Enter button has to be pressed first.*



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



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

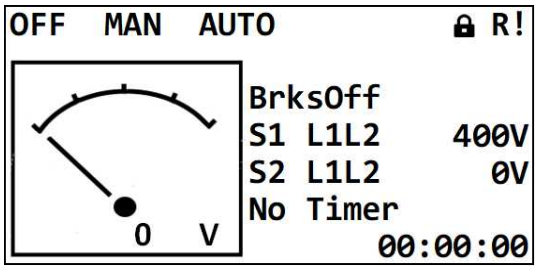


Note: *Use the Page button to move to the next page.*

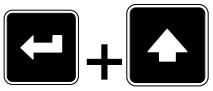
Note: *Use the Up and the Down button to select required language.*

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

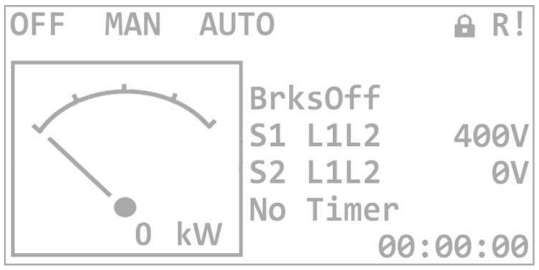
5.3.8 Display contrast adjustment

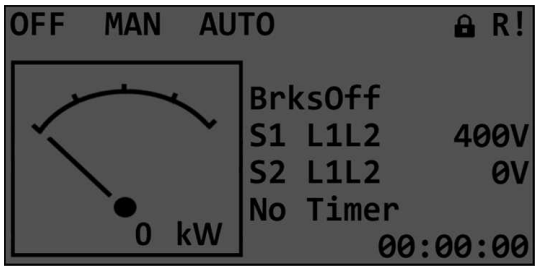


Note: *On any measurement screen press the Enter and the Down button together for lower contrast.*



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





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 SWITCH 01 (PAGE 352)	AIN Switch01On (page 197) AIN Switch01 Off (page 198)	AIN SWITCH01 (PAGE 330)
AIN SWITCH 02 (PAGE 352)	AIN Switch02 On (page 199) AIN Switch02 Off (page 200)	AIN SWITCH02 (PAGE 330)

The behavior of the switch depends on the adjustment of the setpoints.

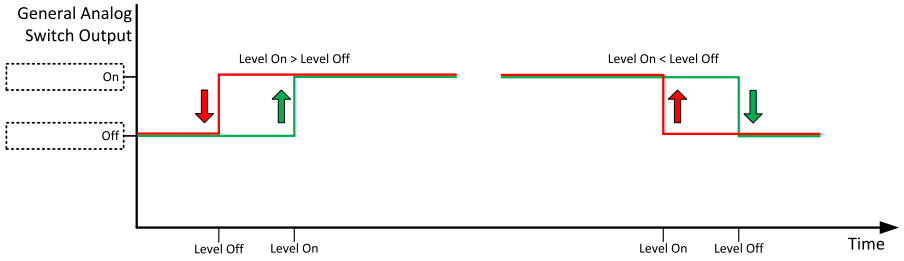


Image 12.1 Principle of analog switch

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.
- The breaker must respond within max. 5 seconds to a close and open command. Special attention should be paid to opening of motorized circuit breakers, as it could take more than 5 seconds on some types. In such cases it is necessary to use an undervoltage coil for fast opening.
- After opening the breaker, there is an internal delay before closing the breaker. Delay is 6 seconds – 5 seconds for OFF coil and 1 second for UV coil. After these 6 seconds, breaker can be closed again. There is no delay when opening a breaker.

Breaker control outputs

LBO	Output type	Description
S1CB CLOSE/OPEN (PAGE 342) S2CB CLOSE/OPEN (PAGE 347) NEUTRAL CLOSE/OPEN (PAGE 340)	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 within 5 s to a close or open command, otherwise an alarm is issued.
S1CB ON COIL (PAGE 344) S2CB ON COIL (PAGE 348) NEUTRAL ON COIL (PAGE 340)	ON coil	An output giving a 5s pulse used for control of close coils.
S1CB OFF COIL (PAGE 343) S2CB OFF COIL (PAGE 348)	OFF coil	An output giving minimum 5s pulse, or until the feedback deactivates it. Used for open coils.
S1CB UV COIL (PAGE 345) S2CB UV COIL (PAGE 349)	UV coil	The S2CB UV coil in Mains-Gen application is active when the engine is running (after **Minimal Stabilization Time (page 166)**). The S2CB UV coil in Mains-Mains application is active when the controller is switched on. The **S1CB UV COIL (PAGE 345)** output is active when the controller is switched on. The output is deactivated for at least 5 s in the moment the breaker has to be switched off.

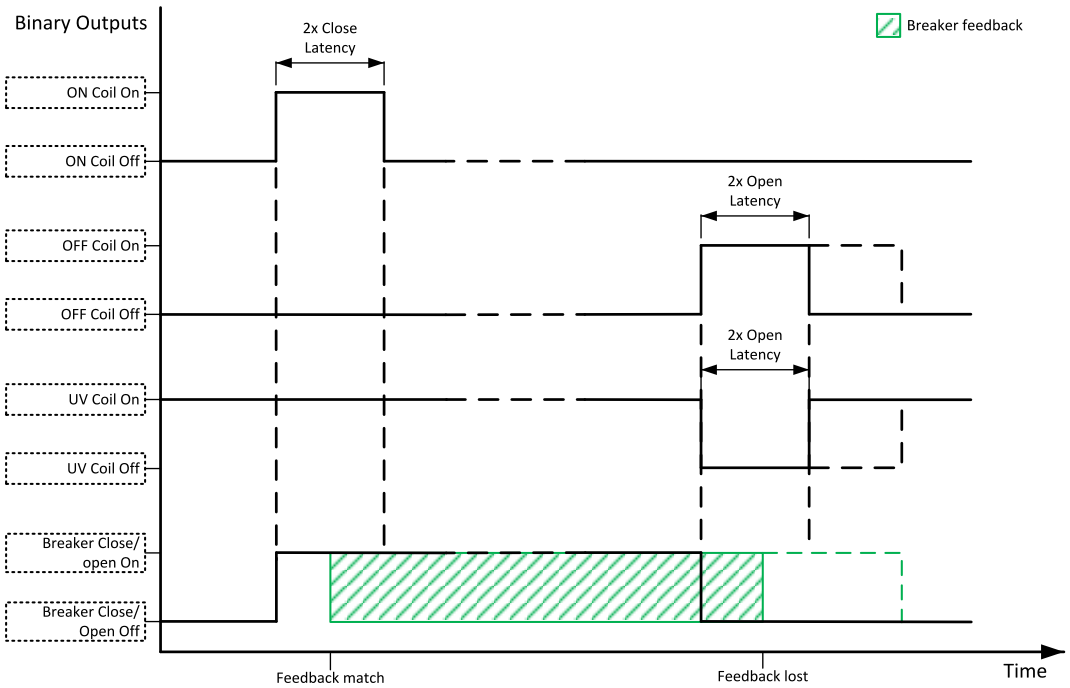
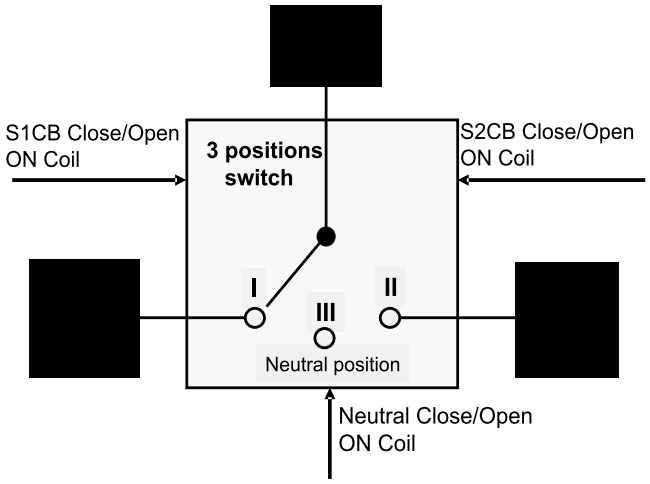


Image 12.2 Breaker control outputs

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).

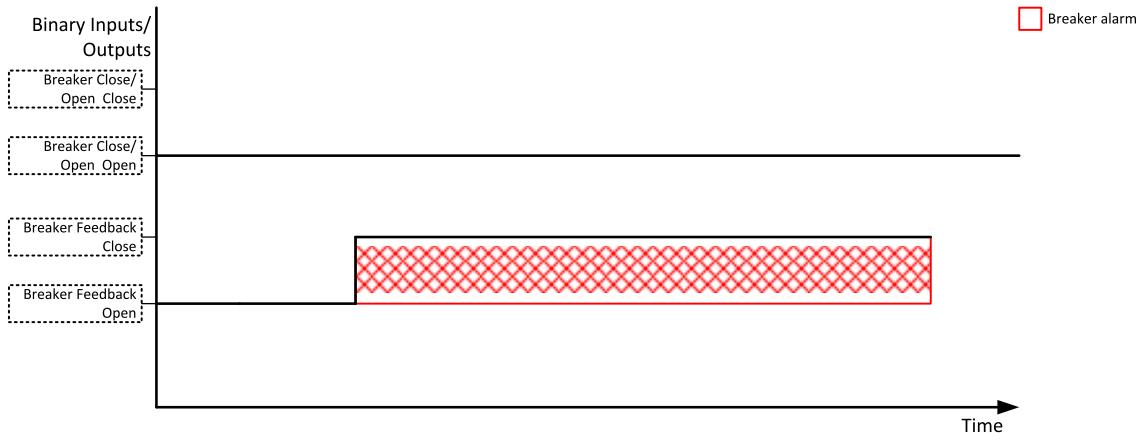


Image 12.3 Breaker failure – breaker close/open in steady position – open

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 for minimum 5 s otherwise according to the time set in **S1CB Close Delay (page 143)** or **S2CB Close Delay (page 164)** setpoints. 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.

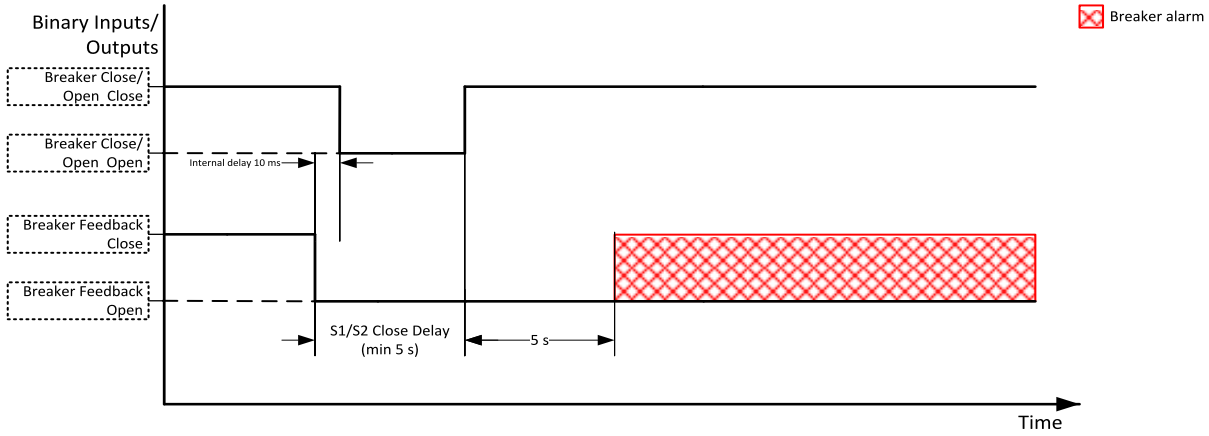


Image 12.4 Breaker failure – breaker close/open in steady position – close

When binary output breaker close/open opens there is 5 sec delay for breaker failure detection.

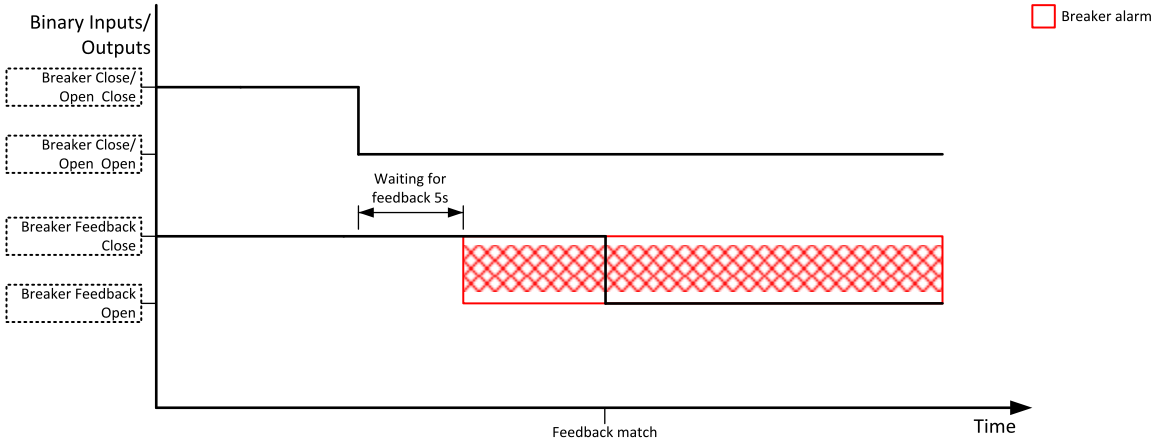


Image 12.5 Breaker failure – breaker close/open opens

When binary output breaker close/open closes there is 5 sec delay for breaker failure detection.

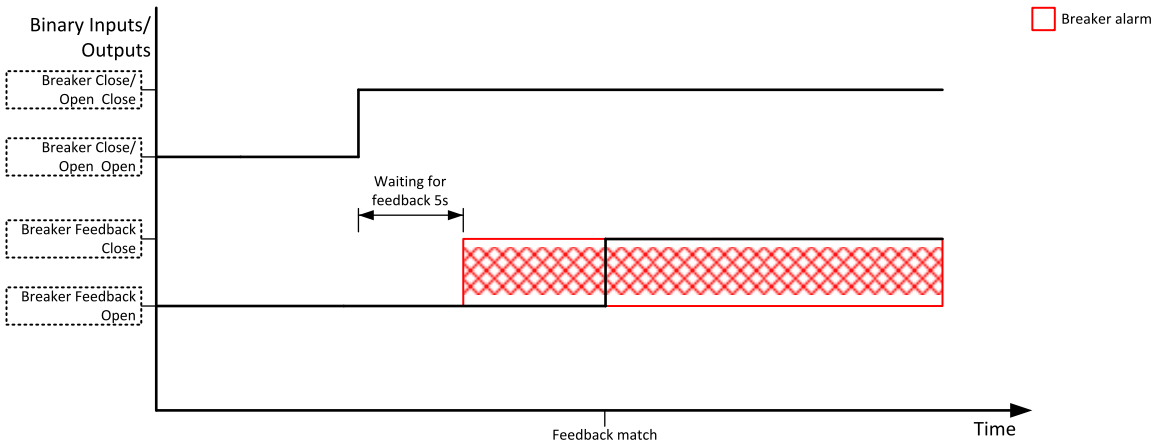


Image 12.6 Breaker failure – breaker close/open closes

5.4.3 Elevator Switch

Elevator switch functionality consists of:

- Setpoints: **Elevator Switch (page 134)**, **Pre Elevator Delay (page 134)**, **Post Elevator Delay (page 135)**
- LBO: **ELEVATOR SWITCH (PAGE 336)**

LBO **ELEVATOR SWITCH (PAGE 336)** is activated before predicted transfer of the load from one source to another.

Pre Elevator Delay (page 134) is adjusting the time how long **ELEVATOR SWITCH (PAGE 336)** 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 135)** has elapsed. **Post Elevator Delay (page 135)** starts when the opposite breaker is closed.

Predicted transfer happens when:

- LBI **TRANSFER TO S2 (PAGE 327)** 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 134)** timing the source which supplies the load goes to failure, LBO **ELEVATOR SWITCH (PAGE 336)** 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.*

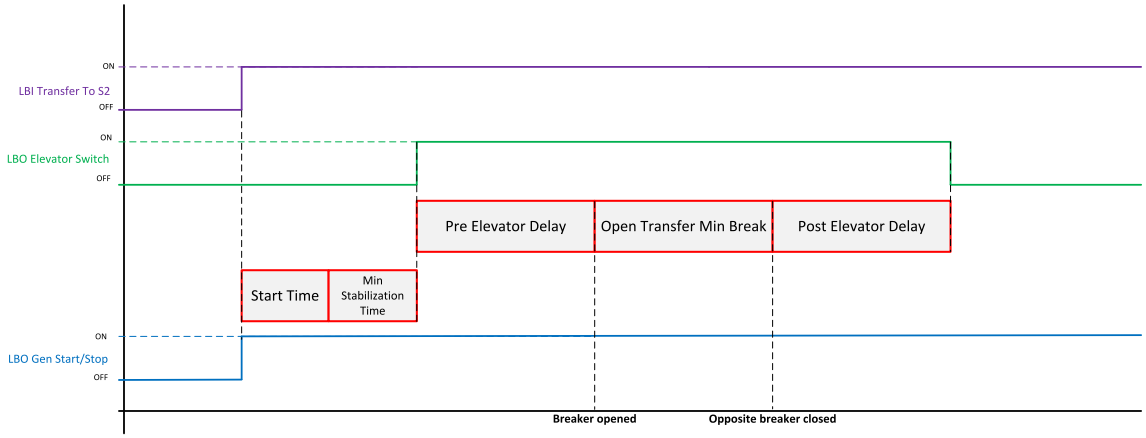


Image 12.7 Elevator switch when LBI **TRANSFER TO S2 (PAGE 327)** is activated

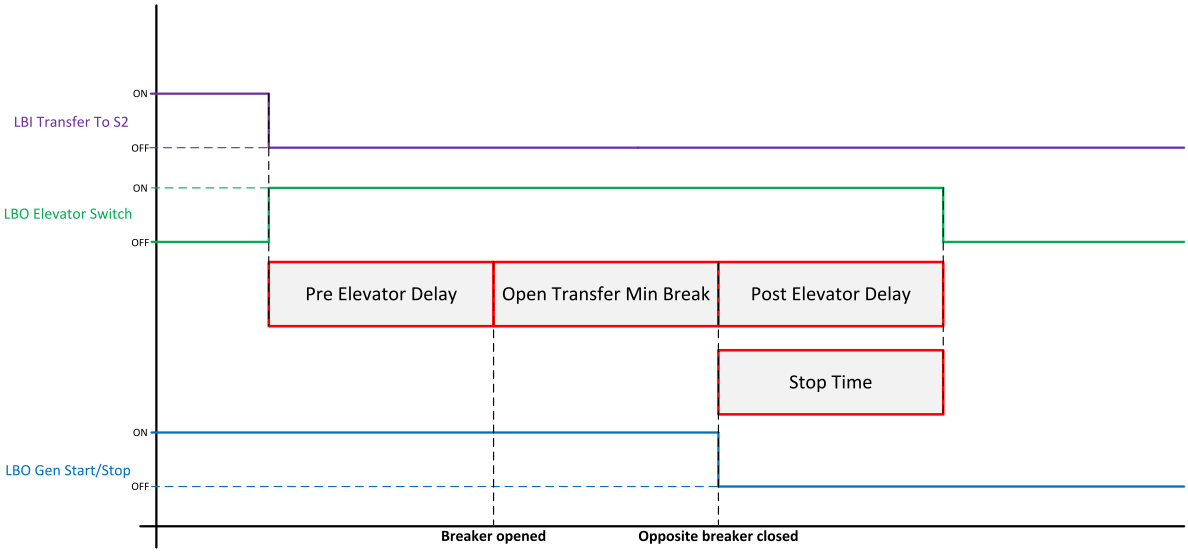


Image 12.8 Elevator switch when LBI **TRANSFER TO S2 (PAGE 327)** is deactivated

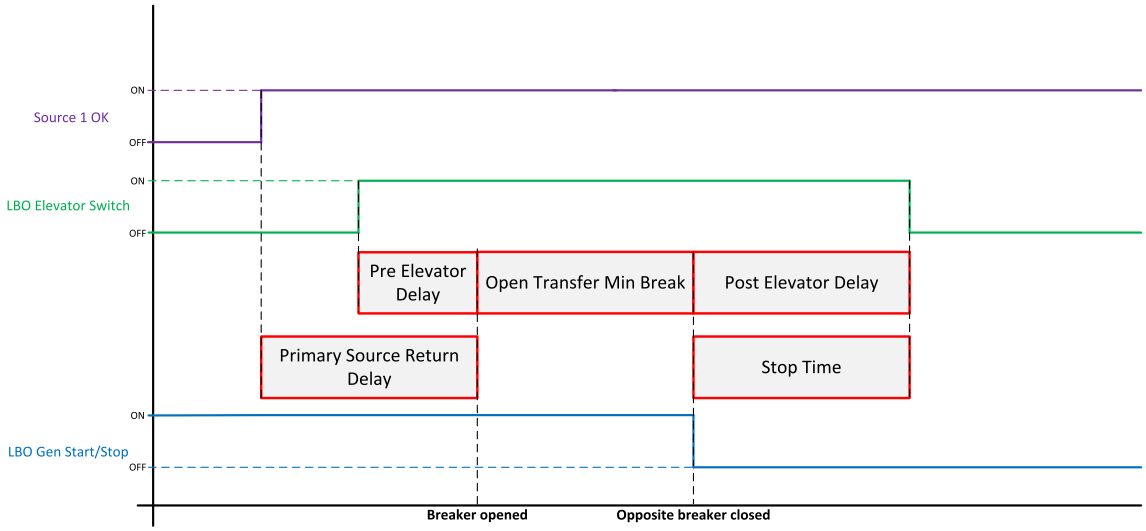


Image 12.9 Elevator switch when Source 1 returns

5.4.4 Evaluation of sources

Evaluation of sources depends on how the setpoints **Source 1 Measurement (page 150)** and **Source 2 Measurement (page 168)** are set and if LBIs **SOURCE 1 READY TO LOAD (PAGE 324)** and **SOURCE 2 READY TO LOAD (PAGE 324)** 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 for under/over voltage protections
- Generator frequency is within the limits defined by setpoints for under/over voltage protections
- LBI **SOURCE 1 READY TO LOAD (PAGE 324)** / **SOURCE 2 READY TO LOAD (PAGE 324)** 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 1 READY TO LOAD (PAGE 324)** / **SOURCE 2 READY TO LOAD (PAGE 324)** 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 206)**
- **Timer 1 Repetition (page 207)**
- **Timer 1 First Occur. Date (page 208)**
- **Timer 1 First Occur. Time (page 208)**
- **Timer 1 Duration (page 208)**
- **Timer 1 Repeated (page 209)**
- **Timer 1 Repeat Day (page 209)**
- **Timer 1 Day (page 210)**
- **Timer 1 Repeated Day In Week (page 210)**
- **Timer 1 Repeat Day In Month (page 210)**
- **Timer 1 Repeat Week In Month (page 211)**
- **Timer 1 Refresh Period (page 212)**
- **Timer 1 Weekends (page 213)**
- **Timer 1 Setup (page 207)**

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 206)****.*

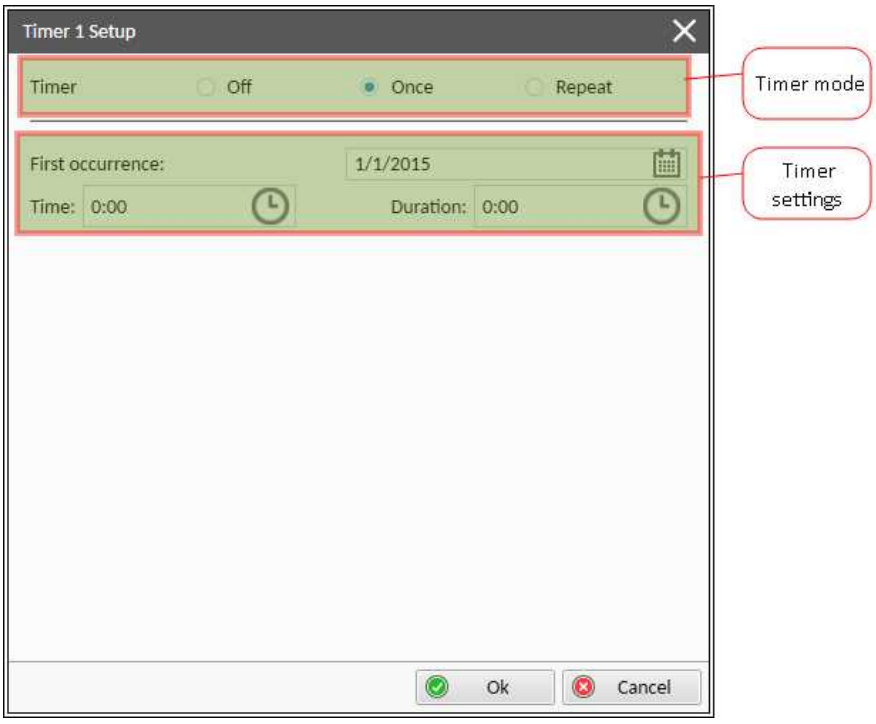


Image 12.10 Once mode – InteliConfig

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 206)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 207)** setpoint select Once mode. Then adjust **Timer 1 First Occur. Date (page 208)**, **Timer 1 First Occur. Time (page 208)** and **Timer 1 Duration (page 208)**.

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 206)****.*

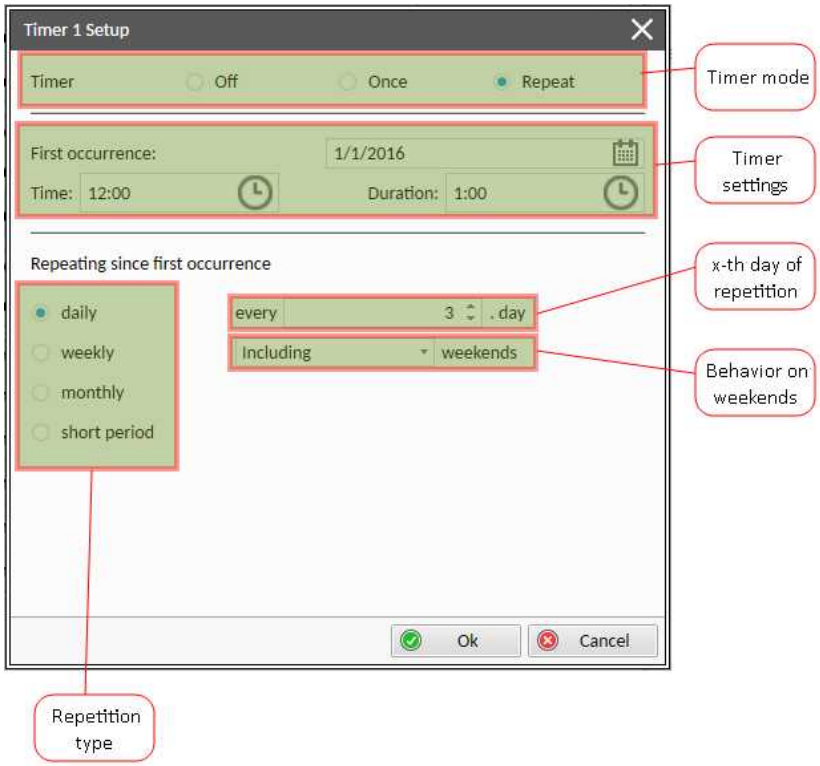


Image 12.11 Daily mode – InteliConfig

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 212)**) and behavior of timer on weekends (**Timer 1 Weekends (page 213)**).

> **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 206)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 207)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 208)**, **Timer 1 First Occur. Time (page 208)** and **Timer 1 Duration (page 208)**. In setpoint **Timer 1 Repeated (page 209)** select Daily and

adjust **Timer 1 Refresh Period (page 212)** (xth day of repetition) and **Timer 1 Weekends (page 213)** (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 206)****.*

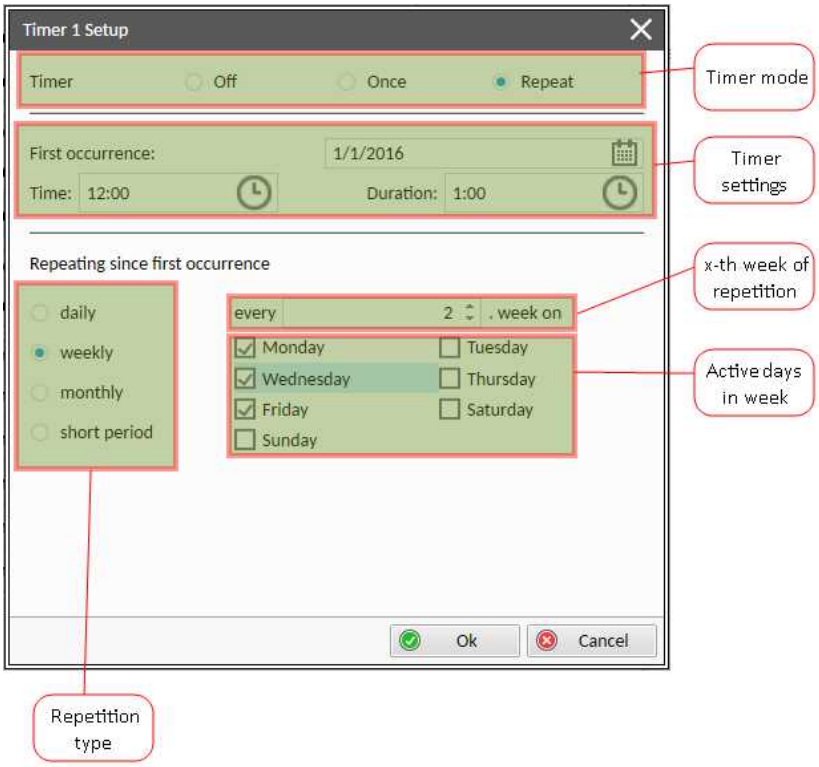


Image 12.12 Weekly mode – InteliConfig

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 212)**) and days when timer should be active (**Timer 1 Day (page 210)**).

> **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 206)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 207)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 208)**, **Timer 1 First Occur. Time (page 208)** and **Timer 1 Duration (page 208)**. In setpoint **Timer 1 Repeated (page 209)** select Weekly and adjust **Timer 1 Day (page 210)** (days when timer should be active) and **Timer 1 Refresh Period (page 212)** (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 206)****.*

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

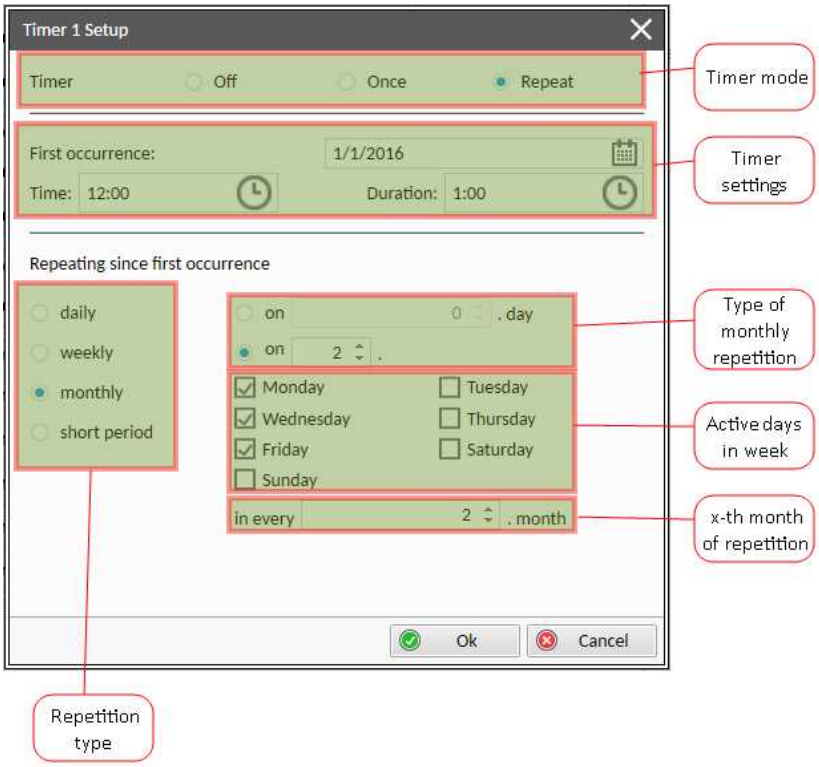


Image 12.13 Monthly mode – InteliConfig

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 210)**). 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.

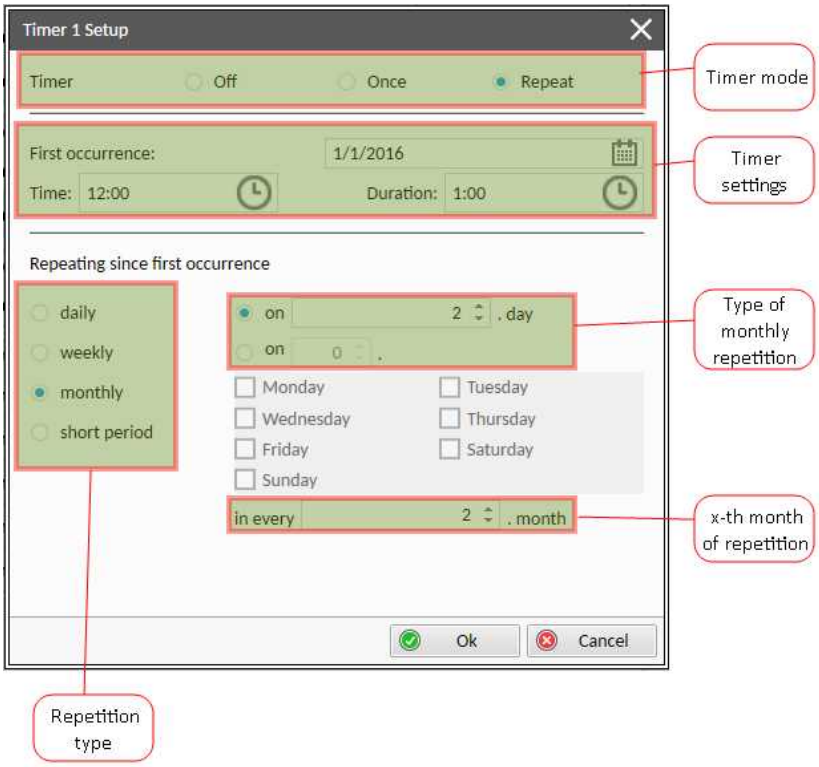


Image 12.14 Monthly mode – InteliConfig

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 206)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 207)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 208)**, **Timer 1 First Occur. Time (page 208)** and **Timer 1 Duration (page 208)**. In setpoint **Timer 1 Repeated (page 209)** select Monthly and adjust type of monthly repetition via **Timer 1 Repeat Day (page 209)**, **Timer 1 Refresh Period (page 212)** (xth month of repetition) and **Timer 1 Repeat Day In Month (page 210)** (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 206)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 207)** setpoint select Repeated mode. Than adjust **Timer 1 First Occur. Date (page 208)**, **Timer 1 First Occur. Time (page 208)** and **Timer 1 Duration (page 208)**. In setpoint **Timer 1 Repeated (page 209)** select Monthly and adjust type of monthly repetition via **Timer 1 Repeat Day (page 209)**, **Timer 1 Refresh Period (page 212)** (xth month of repetition), **Timer 1 Repeated Day In Week (page 210)** (days in week when timer is active) and **Timer 1 Repeat Week In Month (page 211)** (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 206)****.*

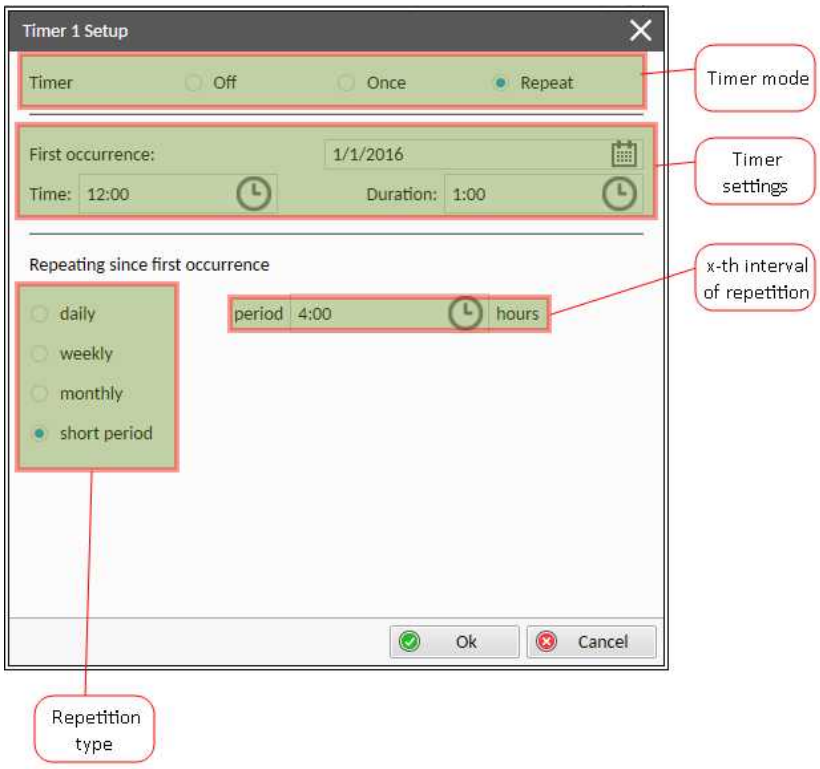


Image 12.15 Short period mode – InteliConfig

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 206)** setpoint. Then go to *Timer 1 Setup* and press the Enter button. In **Timer 1 Repetition (page 207)** setpoint select Repeated mode. Then adjust **Timer 1 First Occur. Date (page 208)**, **Timer 1 First Occur. Time (page 208)** and **Timer 1 Duration (page 208)**. In setpoint **Timer 1 Repeated (page 209)**, select Short Period and adjust **Timer 1 Refresh Period (page 212)** (interval of repetition).

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

5.4.6 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.

5.4.7 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 214)** or by logical binary input **GEO-FENCING ENABLE (PAGE 317)**.

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 215)** and **Home Longitude (page 215)** and radius named Fence Radius adjusted via setpoints **Fence Radius 1 (page 217)** and **Fence Radius 2 (page 219)**.

The Protection can be different for both circles and are adjusted via setpoints **Fence 1 Protection (page 216)** and **Fence 2 Protection (page 218)**.

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

5.4.8 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
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.*

5.4.9 Load Transfers

The controller is capable of providing the following transitions:

- Open transition

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). Typical example of open transition is AMF function.

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 150)** is set to S1 Fail:
  - The S1CB is opened
  - The timer for automatic start of the **Secondary Source Switch (page 142)** begins to count down.
  - After the timer has elapsed, the binary output **GEN START/STOP (PAGE 337)** is activated together with the timer **Start Time (page 164)**.
  - During the **Start Time (page 164)** the controller waits for parameters to be in the limits. Which parameters are taken into account depends on the setpoint **Source 2 Measurement (page 168)**. Once the parameters are OK, **Minimal Stabilization Time (page 166)** 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 166)** has elapsed, the S2CB breaker is closed.

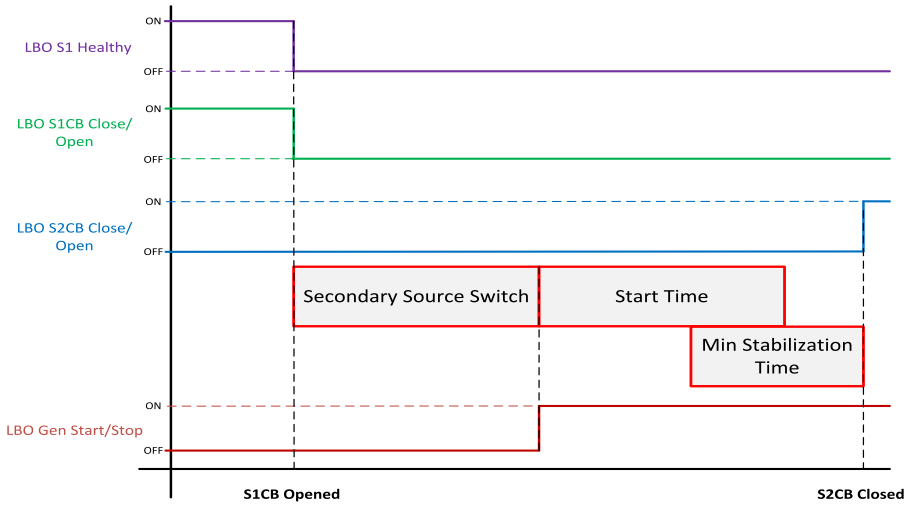


Image 12.16 Mains-Gen Source 1 Fail, S1CB Opens On = S1 Fail

› If the setpoint **S1CB Opens On (page 150)** is set to S2 OK:

» The timer for automatic start of the **Secondary Source Switch (page 142)** begins to count down.

» After the timer has elapsed, the binary output **GEN START/STOP (PAGE 337)** 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 168)**. Once the parameters are OK, **Minimal Stabilization Time (page 166)** 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 166)** has elapsed.

» When S1CB opens, **Open Transfer Min Break (page 143)** has to count down in order to close the S2CB.

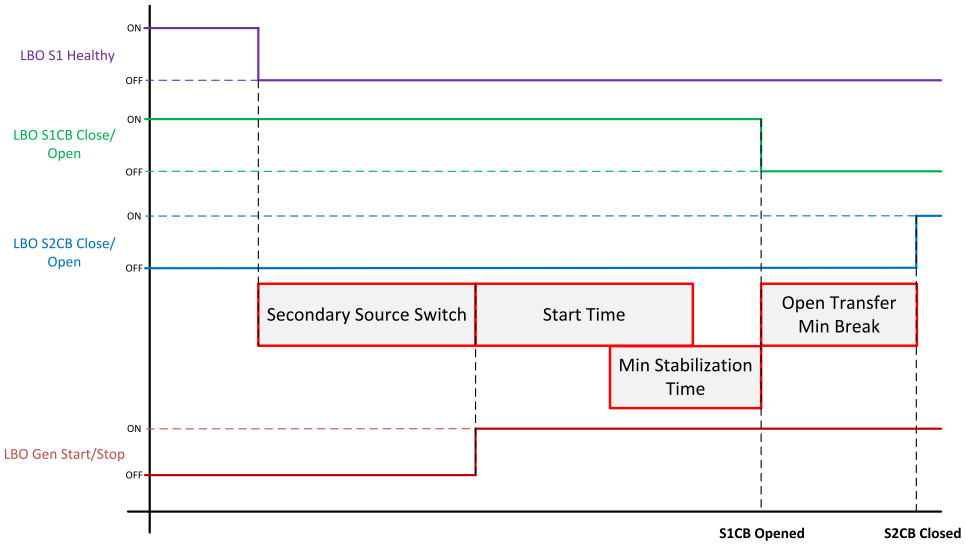


Image 12.17 Mains-Gen Source 1 Fail, S1CB Opens On = S2 OK

Source 1 Return

When the Source 1 is restored to normal,

- the timer **Primary Source Return Delay (page 142)** begins to count down.
- Once it is elapsed, the S2CB opens and **Open Transfer Min Break (page 143)** starts to count.
- The S1CB closes after the **Open Transfer Min Break (page 143)** count is finished.
- After the S1CB is closed the binary output **GEN START/STOP (PAGE 337)** is deactivated and the timer **Stop Time (page 165)** begins to count

During the **Stop Time (page 165)** 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 165)** is finished

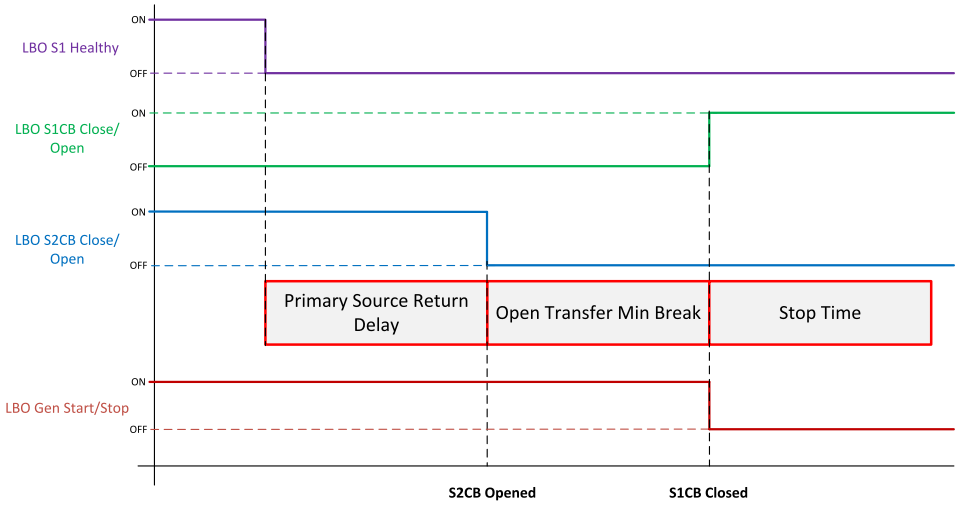


Image 12.18 Mains-Gen Source 1 Return

AMF Mains-Mains

Source 1 Fail

When the Source 1 failure is detected

- If the setpoint **S1CB Opens On (page 150)** is set to S1 Fail:
  - The S1CB is opened.
  - The timers **Open Transfer Min Break (page 143)** is counting down.
  - The S2CB closes after the timer has elapsed.
- If the setpoint **S1CB Opens On (page 150)** 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 143)** is counting down.
  - The S2CB closes after the timer has elapsed.
  - The timer **Open Transfer Min Break (page 143)** 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 142)** begins to count down.
- Once it is elapsed, the S2CB opens and **Open Transfer Min Break (page 143)** starts to count.
- The S1CB closes after the **Open Transfer Min Break (page 143)** count is finished.

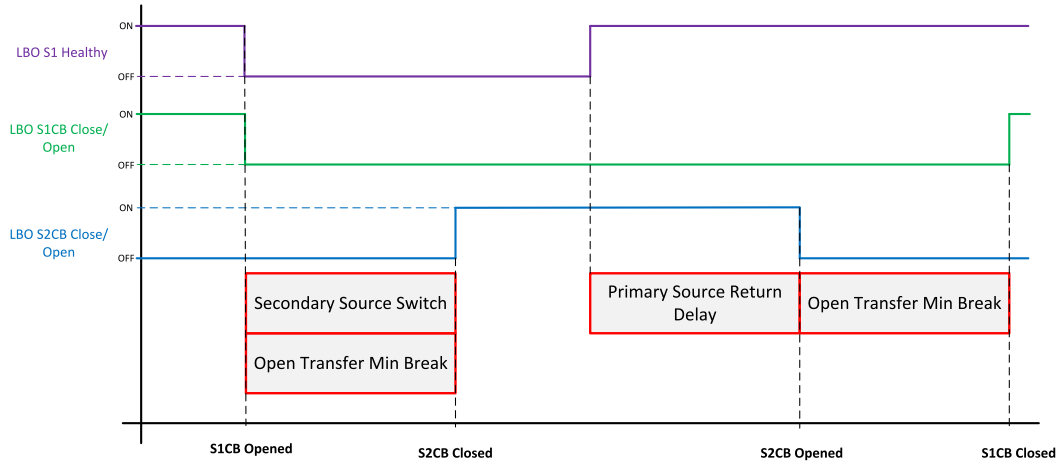


Image 12.19 AMF Mains-Mains Load Transfer

AMF Gen-Gen

In this application, there are 2 gen-sets. Left gen-set is considered as primary one, right gen-set is considered as secondary one.

> **IMPORTANT: LBI REMOTE START/STOP (PAGE 321) is trigger for starting of gen-set in AUTO mode. Without this LBI, primary or secondary gen-set is not started!**

Note: *Primary gen-set is always started and secondary gen-set is backup which is used only when there is fail on primary gen-set. To avoid unbalance of operating hours of gen-sets, function* ***Operating Hours Balancing (page 81)*** *is recommended to use.*

Source 1 Fail

When the Source 1 failure is detected

- If the setpoint **S1CB Opens On (page 150)** is set to S1 Fail:
  - The S1CB is opened.
  - The binary output **GEN START/STOP (PAGE 337)** is activated together with the timer **Start Time (page 164)**.
  - During the **Start Time (page 164)** the controller waits for parameters to be in the limits. Which parameters are taken into account depends on the setpoint **Source 2 Measurement (page 168)**. Once the parameters are OK, **Minimal Stabilization Time (page 166)** 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 166)** has elapsed, the S2CB breaker is closed.

- If the setpoint **S1CB Opens On (page 150)** is set to S2 OK:
  - The binary output **GEN START/STOP (PAGE 337)** 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 168)**. Once the parameters are OK, **Minimal Stabilization Time (page 166)** 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 166)** has elapsed.
  - When S1CB opens, **Open Transfer Min Break (page 143)** has to count down in order to close the S2CB.

Source 1 Return

When the Source 1 is restored to normal:

- The S2CB opens and **Open Transfer Min Break (page 143)** starts to count.
- The S1CB closes after the **Open Transfer Min Break (page 143)** count is finished.
- After the S1CB is closed the binary output **GEN START/STOP (PAGE 337)** is deactivated and the timer **Stop Time (page 165)** begins to count

During the **Stop Time (page 165)** 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 165)** is finished

5.4.10 Operating Hours Balancing

Note: *Gen-Gen application only.*

> **IMPORTANT: LBI REMOTE START/STOP (PAGE 321) is trigger for starting of gen-set in AUTO mode. Without this LBI, primary or secondary gen-set is not started!**

This function is used to balance the operating hours between gen-sets. When LBI **REMOTE START/STOP (PAGE 321)** is enabled, gen-set with fewer operating hours is started first. The current operating hours of the gen-sets are stored in the statistics:

- **Operating Hours Of Source 1 (page 285)**
- **Operating Hours Of Source 2 (page 286)**

These values can be adjusted:

- Directly, by modifying the statistic values (in InteliConfig by modification of statistic value)
- Indirectly, via the setpoints:
  - **Operating Hours Base S1 (page 187)**
  - **Operating Hours Base S2 (page 188)**

The setpoint **Operating Hours Max Difference (page 188)** defines the maximum allowed difference between the gen-sets' operating hours. Once this difference is reached, the second gen-set will start, the load will be transferred to it (according to the load transition setpoints), and the first gen-set will stop.

5.4.11 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 136)** 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 320)**
- **Remote MAN (page 320)**
- **Remote AUTO (page 319)**

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 151)** is enabled, the S1CB is opened/closed depending on whether the mains is present or not.

If the setpoint **Activity At OFF (page 151)** is disabled, the S1CB is opened permanently.

The buttons S1CB, S1CB, Start and Stop including the appropriate binary inputs for external buttons are not active.

Note: *When S2CB breaker is closed or LBI* ***Remote Start/Stop (page 321)*** *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 and Stop 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, 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.*

AUTO mode – Mains-Gen

The controller does not respond to the buttons Start, Stop, S1CB ON/OFF and S2CB ON/OFF. Engine start/stop request is evaluated from Mains failure/return or by active LBI **Transfer to S2 (page 327)** or LBI **Remote Start/Stop (page 321)**.

Mains-Mains Operating Modes

OFF mode – Mains-Mains

If the setpoint **Activity At OFF (page 151)** is enabled, the S1CB is opened/closed depending on whether the mains is present or not.

If the setpoint **Activity At OFF (page 151)** 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.*

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

Gen-Gen Operating Modes

OFF mode – Gen-Gen

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

The buttons S1CB, S2CB, Start and Stop including the appropriate binary inputs for external buttons are not active.

Note: *When any gen-set is running, it is not possible to switch controller to OFF mode.*

MAN mode – Mains-Gen

Note: *In Gen-Gen application, MAN mode is divided into MAN1 and MAN2 mode. Only difference between these modes is in Start and Stop buttons. In MAN1 mode, these buttons start/stop the left gen-set, in MAN2 mode, these buttons start/stop the right gen-set.*

The engine can be started and stopped manually using the Start and Stop buttons (or the external buttons wired to the appropriate binary inputs). When the engine is running, breaker can be closed.

Any active level 2 protection opens the closed 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.*

AUTO mode – Mains-Gen

> **IMPORTANT: LBI REMOTE START/STOP (PAGE 321) is trigger for starting of gen-set in AUTO mode. Without this LBI, primary or secondary gen-set is not started!**

The controller does not respond to the buttons Start, Stop, S1CB ON/OFF and S2CB ON/OFF .

Engine start/stop request is evaluated from **REMOTE START/STOP (PAGE 321)** and based on adjustment of **Operating Hours Balancing (page 81)** function.

5.4.12 Protections

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
History Record Only	Mains-Mains, Mains-Gen, Gen-Gen	1	Hst	NO	**YES**	NO	NO	NO	NO	NO	NO
AlarmList indication	Mains-Mains, Mains-Gen, Gen-Gen	1	ALI	**YES**	NO	NO	NO	NO	NO	NO	NO
Warning	Mains-Mains, Mains-Gen, Gen-Gen	1	Wrn	**YES**	**YES**	**YES**	NO	**YES**	NO	NO	**AL COMMON WRN (PAGE 332)**
Warning Source 1	Gen-Gen	1	Wrn1	**YES**	**YES**	**YES**	NO	**YES**	NO	NO	**AL COMMON WRN1 (PAGE 332)**
Warning Source 2	Gen-Gen	1	Wrn2	**YES**	**YES**	**YES**	NO	**YES**	NO	NO	**AL COMMON WRN2 (PAGE 333)**
Mains Protection Source 1	Mains-Mains, Mains-Gen	2	MP	NO	**YES**	NO	NO	NO	**YES**	NO	**AL COMMON MP (PAGE 331)**
Mains Protection Source 1 + Fault Reset	Mains-Mains, Mains-Gen	2	MPR1	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	NO	**AL COMMON MPR (PAGE 332)**
Mains Protection Source 2	Mains-Mains	2	MP2	NO	**YES**	NO	NO	NO	**YES**	NO	**AL COMMON MP2 (PAGE 331)**
Mains Protection Source 2 + Fault Reset	Mains-Mains	2	MPR2	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	NO	**AL COMMON MPR2 (PAGE 332)**

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
Breaker Open & Stop	Mains-Gen	2	BOS	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**AL COMMON BOS (PAGE 331)**
Breaker Open & Stop 1	Gen-Gen	2	BOS1	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**AL COMMON BOS 1 (PAGE 331)**
Breaker Open & Stop 2	Gen-Gen	2	BOS2	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**AL COMMON BOS (PAGE 331)**

Protection blocking

Several in-build protections in Mains-Gen and Gen-Gen application can be disabled by dedicated setpoint. Please see **Group: Source 1 Protections (page 183)** (Gen-Gen only) and **Group: Source 2 Protections (page 185)**.

Each setpoint offers following options.

Setpoint options

Options	Description
Enable	Protection is enabled
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)** and **PROTECTION FORCE DISABLE 2 (PAGE 318)** (Gen-Gen only).

User Protections

InteliATS2 50 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.

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.

Protection blocking

It is possible to configure one Protection Blocking to any **User Protections (page 87)**. 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.
Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**

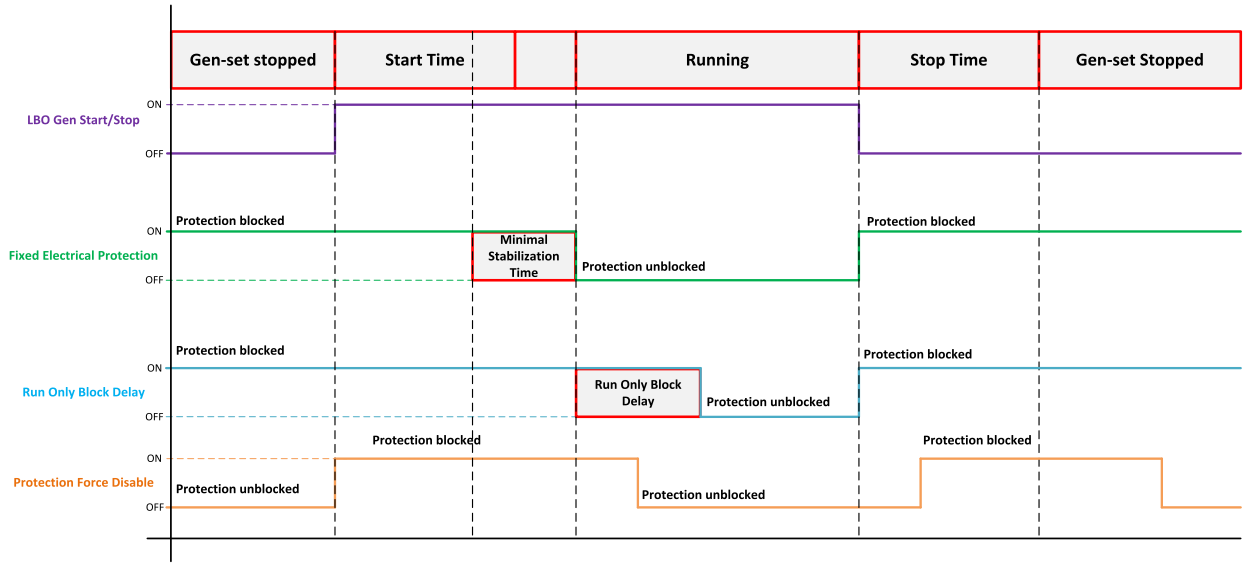


Image 12.20 Types of protection blocking

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.*

Protection states

Protection states are values with current state of each protection. These states can by used for external signalization of active protection or for any other logic.

All states are available in following values:

- **FIXED PROTECTIONS STATES 1 (PAGE 293)**
- User Protection States

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 91)**.
- 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 166)** has elapsed. They are blocked once generator is stopping or stopped.
- The alarm is evaluated only when LBI **PROTECTION FORCE DISABLE (PAGE 318)** 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 316)**, 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.

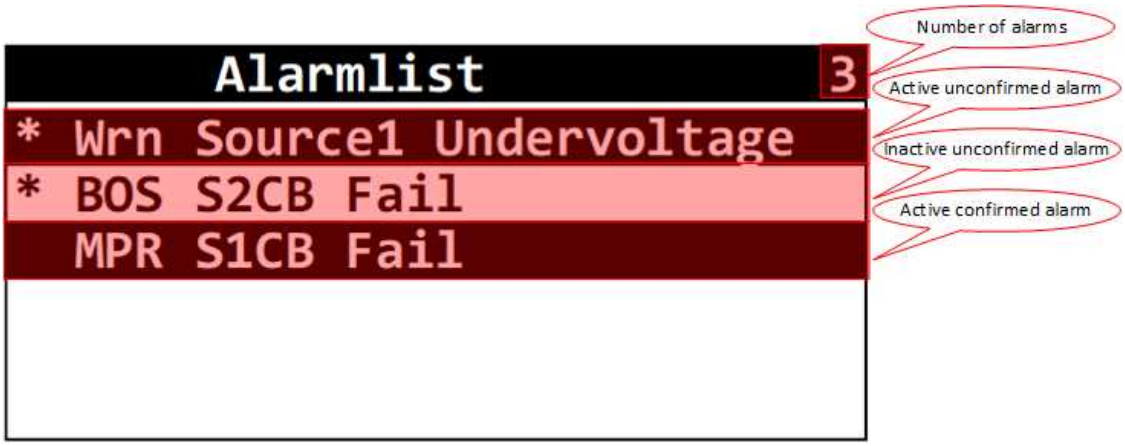


Image 12.21 Alarm List

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/Wrn1/Wrn2)

The alarm appears in the Alarm list and is recorded into the history log. Activates the output **AL COMMON WRN (PAGE 332)** as well as the standard alarm outputs (**HORN (PAGE 338)** and **ALARM (PAGE 335)**).

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 338)** and **ALARM (PAGE 335)**) 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 (BOS/BOS1/BOS2)

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 337)**. The Source 2 cannot be started again while there is a BOS alarm in the Alarm list. Activates the output **AL COMMON BOS (PAGE 331)** as well as the standard alarm outputs (**HORN (PAGE 338)** and **ALARM (PAGE 335)**).

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 332)** as well as the standard alarm outputs (**HORN (PAGE 338)** and **ALARM (PAGE 335)**).

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 332)** as well as the standard alarm outputs (**HORN (PAGE 338)** and **ALARM (PAGE 335)**).

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 91)** or new event is written in the **History log (page 76)**. The message will contain a copy of the **Alarm list (page 91)** or reasons from the **History log (page 76)**. To enable this function first to check the controller internet connection (**Subgroup: TCP/IP Settings (page 251)** for CM3-Ethernet or **Subgroup: Cellular Interface (page 225)** for CM2-4G-GPS). Then adjust setpoints **Event Message (page 268)**, **Wrn Message (page 269)**, **BOS Message (page 273)** to ON. Also enter a valid GSM phone number or email address to the setpoints **Telephone Number 1 (page 246)**, **Telephone Number 2 (page 247)**, **Telephone Number 3 (page 247)**, **Telephone Number 4 (page 248)**, **Email Address 1 (page 265)**, **Email Address 2 (page 266)**,**Email Address 3 (page 266)**, and **Email Address 4 (page 267)**.

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.

5.4.13 Source Failure detection

Source 1 Failure detection

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 154)** and **Source 1 Overvoltage (page 151)** for a time period longer than **Source 1 Overvoltage Delay (page 152)**.
- The Source 1 voltage balance is out of the limit given by the setpoint **Source 1 Voltage Unbalance (page 157)** for a time period longer than **Source 1 Voltage Unbalance Delay (page 157)**.
- The Source 1 frequency is out of the limits given by the setpoints **Source 1 Underfrequency (page 160)** and **Source 1 Overfrequency (page 158)** for a time period longer than **Source 1 < > Frequency Delay (page 162)**.
- Inactive unconfirmed alarm **Wrn S1CB Fail (page 361)** / **Wrn S1CB Fail To Open (page 362)** / **Wrn S1CB Fail To Close (page 362)** present in the alarmlist
- Phase rotation is incorrect (**ALI Source 1 Ph Rotation Opposite (page 366)**).
- Any Source 1 user protection of level 2 is present in the alarmlist.
- LBI **SOURCE 1 READY TO LOAD (PAGE 324)** 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 171)** and **Source 2 Overvoltage BOS (page 169)** for a time period longer than **Source 2 < > Voltage Delay (page 174)**.
- The Source 2 voltage balance is out of the limit given by the setpoint **Source 2 Voltage Unbalance (page 175)** for a time period longer than **Source 2 Voltage Unbalance Delay (page 175)**.
- The Source 2 frequency is out of the limits given by the setpoints **Source 2 Underfrequency (page 178)** and **Source 2 Overfrequency (page 176)** for a time period longer than **Source 2 <> Frequency Delay (page 181)**.
- Inactive unconfirmed alarm **Wrn S2CB Fail (page 362)** / **Wrn S2CB Fail To Close (page 362)** / **Wrn S2CB Fail To Open (page 362)** present in the alarmlist
- Phase rotation is incorrect (**ALI Source 2 Ph Rotation Opposite (page 366)**).
- Any Source 2 user protection of level 2 is present in the alarmlist.
- LBI **SOURCE 2 READY TO LOAD (PAGE 324)** is not active - if configured

5.4.14 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 327)** and **REMOTE START/STOP (PAGE 321)**.

- Activation of the LBI **REMOTE START/STOP (PAGE 321)** 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 327)** 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 321)** (fore more information **see Exercise timers on page 69**).

5.4.15 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

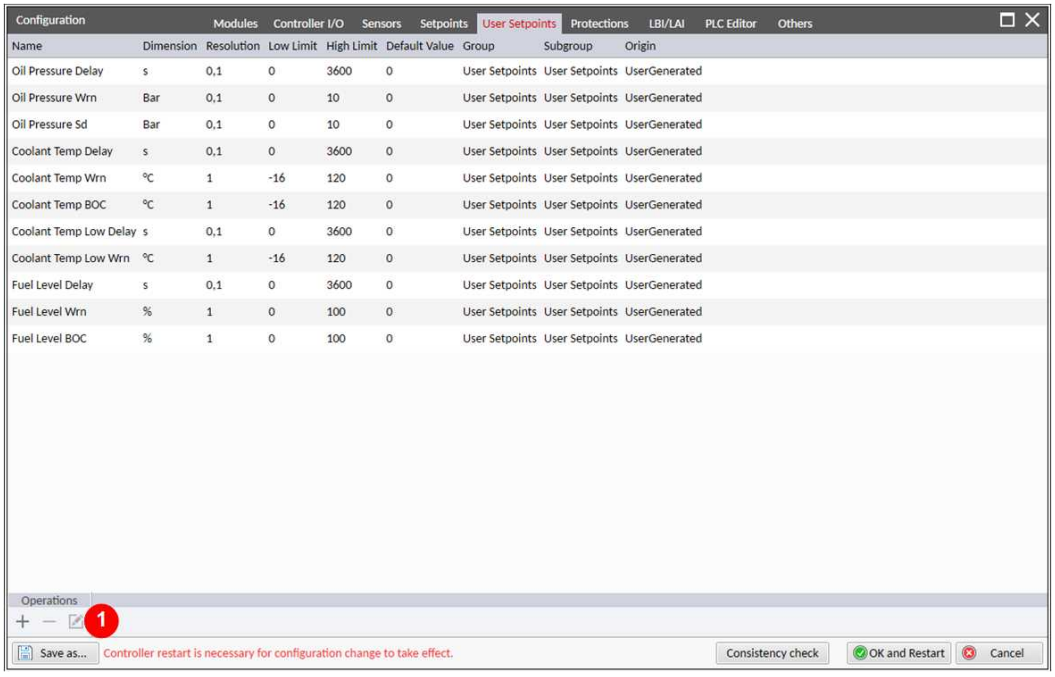
	User Button 1	**User Button 2**	**User Button 3**	**User Button 4**	**User Button 5**	**User Button 6**	**User Button 7**	**User Button 8**
PULSE	00 0A 00 00 00 47	00 14 00 00 00 47	00 1E 00 00 00 47	00 28 00 00 00 47	00 32 00 00 00 47	00 3C 00 00 00 47	00 46 00 00 00 47	00 50 00 00 00 47
TOGGLE	00 0B 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

5.4.16 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.



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

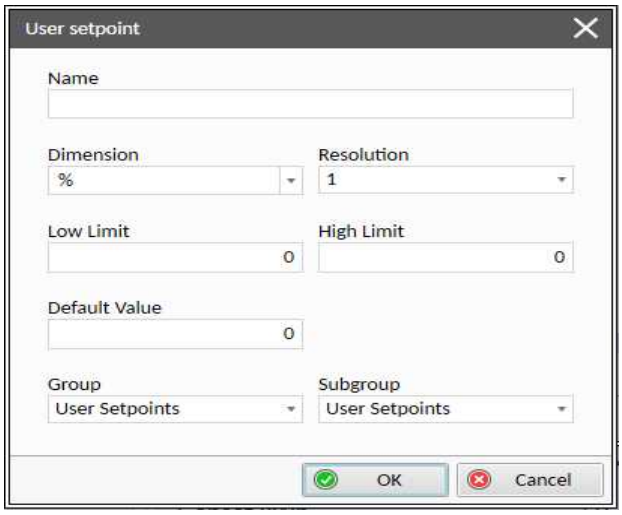


Image 12.22 Setting parameters of a user setpoint

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.

5.4.17 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 366)**
- **ALI Source 1 Ph Rotation Opposite (page 366)**

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 Role of the user who is currently logged-in must be assigned 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 96**) 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 96)** 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.
Role mask	Determines **Access to controller data (page 100)**

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 Role 1, unless production mode is activated (**see Production mode on page 97**).
- 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 99****.*

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 96)** 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 360)** 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 101**.

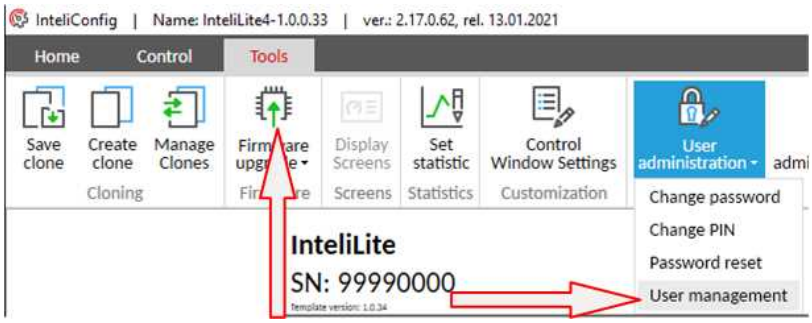
After reset procedure user accounts are in factory default state.

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 96)**.

Note: *Rules for the* ***User accounts (page 96)*** *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.*

Changing account properties

Select the account that needs to be edited and click on the "pencil" 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 360)** 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. **Role of the user who is currently logged-in must be assigned to the particular task**.

There are 4 roles available:

- Administrator role. All objects/commands are fixedly assigned to this role.
- Roles 1..3 are configurable roles. Each communication object/command can be assigned independently to each of these roles.
- Modbus client role. Each communication object/command can be assigned to this role.
- SNMP Manager role. Each communication object/command can be assigned to this role.

Reading data

For each object the Access right "Read" (R) is fixedly granted to each role. That means **reading of data** (except some system objects) **is available for any user**.

Writing data

For each object the Access right "Write" (W) can be granted to one or more roles. For each object the Access right "Write" (W) is fixedly granted to administrator role.

Special situations

There are several operations that require administrator level:

- Programming firmware
- Programming configuration
- Managing user accounts

These rights can not be granted to any other role.

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.*

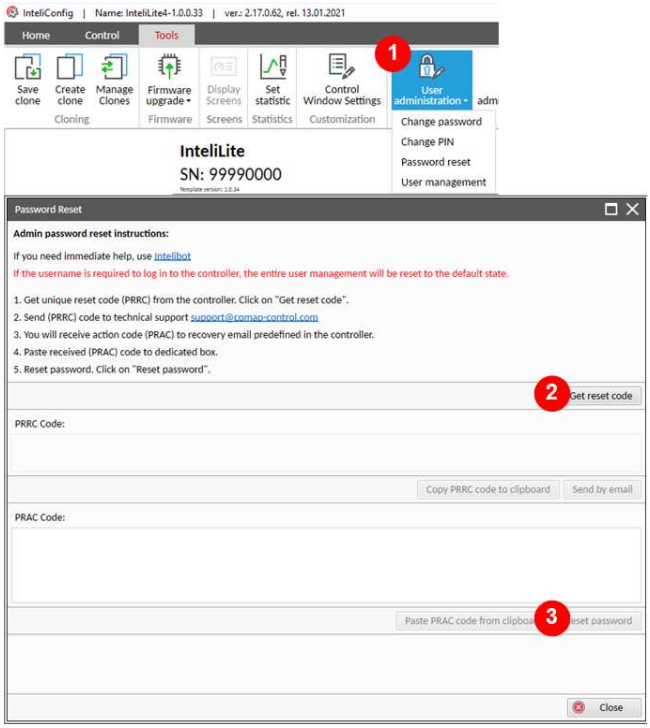
Resetting the administrator password

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,

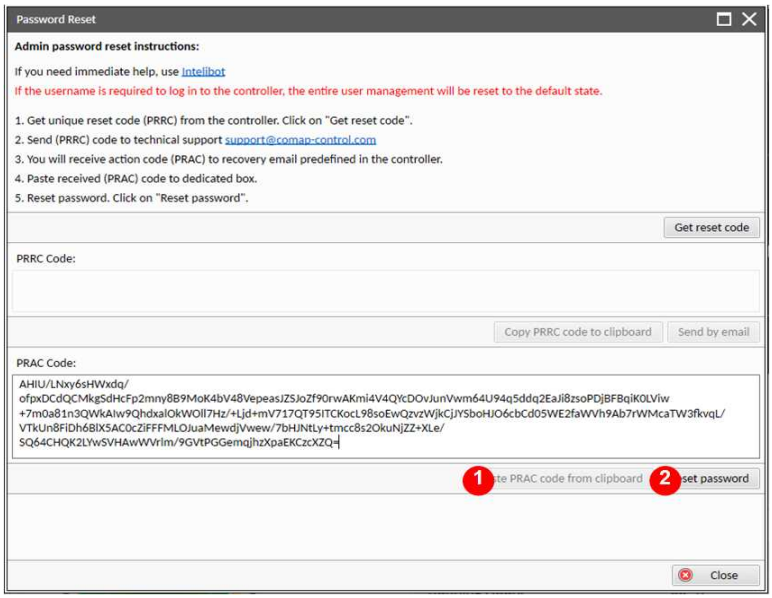
ComAp has received your request for resetting the password in the controller **N/A**, serial n umber **99990000**. Please perform following steps to finish the action.

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.

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6 Communication

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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 35**.

RS232 interface uses **COM1 Mode (page 221)** 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.*

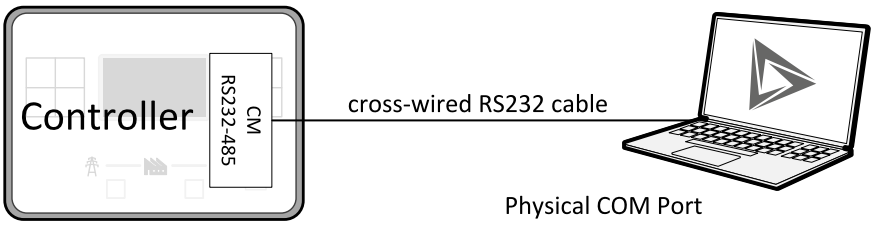


Image 13.1 Cross-wired RS232 cable is used

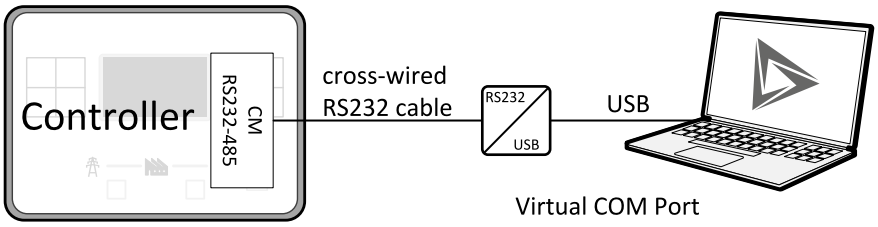


Image 13.2 Cross-wired RS232 cable and USB is used

Connection via RS485

Plug-in module CM-RS232-485 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 35**.

RS485 interface uses **COM2 Mode (page 223)** port of the controller.

Note: *Also USB-RS485 convertor can be used.*

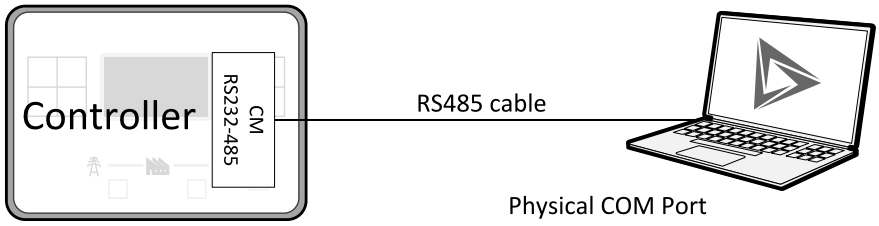


Image 13.3 Plug-in module CM RS232-485 is used

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 35**.

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.

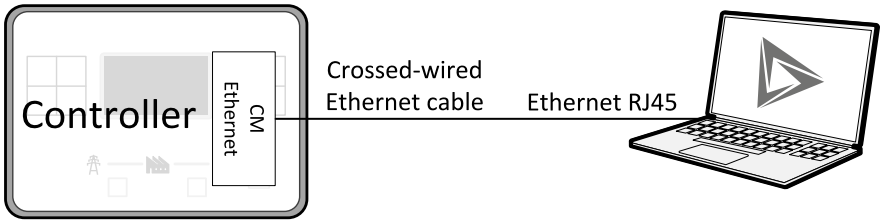


Image 13.4 Ethernet cable is used

Connection via USB

USB interface uses HID profile.

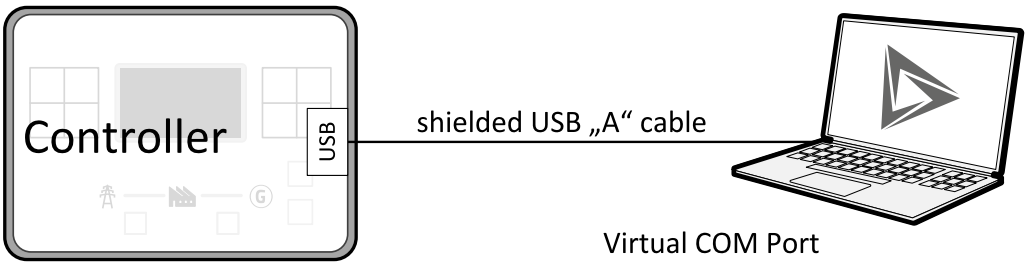


Image 13.5 Shielded USB type A cable is used

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.*

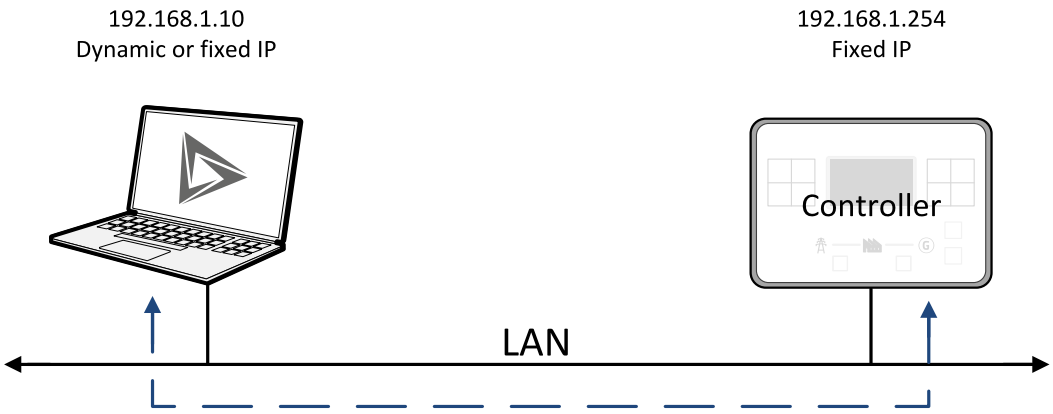


Image 13.6 Ethernet LAN connection

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 251)** to FIXED. In that case all setpoints of IP settings (**IP Address (page 252)**, **Subnet Mask (page 252)**, **Gateway IP (page 253)**, **DNS IP Address 1 (page 254)**) 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.*

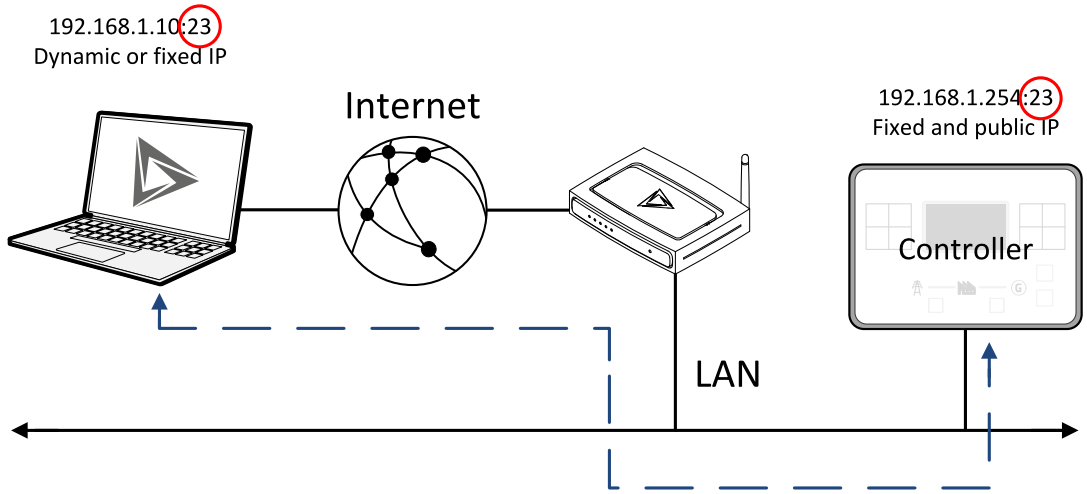
The second way to get the static IP address is to switch the CM3-Ethernet to automatic IP address mode. Adjust the setpoint **IP Address Mode (page 251)** to AUTOMATIC. In that case all IP settings are assigned by DHCP server. Then configure the DHCP server to assign always the same IP address (i.e. 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.



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 256)** 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 50 controller equipped with the CM2-4G-GPS communication module is able to send Event SMS according to the setting of setpoint:

- **Event Message (page 268)**

> ***Note:*** *First, the setpoint **Telephone Number 1 (page 246)** 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 50 controller equipped with the CM2-4G-GPS communication module is able to send Alarm SMS according to the setting of setpoints:

- **Wrn Message (page 269)**
- **BOS Message (page 273)**

Note: *First, the setpoint **Telephone Number 1 (page 246)** 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 50 controller equipped with the CM3-Ethernet communication module is able to send an Event Email according to the setting of setpoint:

- **Event Message (page 268)**

Note: *Setpoints **Email Address 1 (page 265)** and **SMTP Sender Address (page 263)** or **SMTP Server Address (page 263)** must be adjusted to enable this function.*

Note: *Time Mode (page 204) and Time Zone (page 203) 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 50 controller equipped with the CM3-Ethernet communication module is able to send Alarm Emails according to the setting of setpoints:

- **Wrn Message (page 269)**
- **BOS Message (page 273)**

Note: *Setpoints **Email Address 1 (page 265)** and **SMTP Sender Address (page 263)** or **SMTP Server Address (page 263)** must be adjusted to enable this function.*

Note: *Time Mode (page 204) and Time Zone (page 203) 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, SNMP v2 and SNMP v3

The SNMP Agent function is to be enabled by the setpoint **SNMP Agent (page 259)** in the CM-Ethernet setpoint group. The setpoints **SNMP RD Community String (page 261)** and **SNMP WR Community String (page 261)** 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 50 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 260)** and **SNMP Traps IP Address 2 (page 260)**. 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 v3 is supported for request-response operations. Security levels supported: auth-nopriv, auth-priv. All common protocols supported, up to AES256/SHA256 v3 is not supported for notifications, these are sent in v1/v2 format according to selected format.

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 221)** or **COM2 Mode (page 223)** into the Modbus position. The serial speed for MODBUS-RTU communication is adjusted by the setpoint **COM1 MODBUS Communication Speed (page 222)** or **COM2 MODBUS Communication Speed (page 224)**.
- 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 258)**.

MODBUS, MODBUS/TCP protocol can be used simultaneously with Web connection and direct Ethernet / AirGate connection.

> **IMPORTANT: Do not write setpoint repeatedly. 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

Data type	Meaning	Number of registers	Data maping
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 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

Register addresses	Number of registers	Access	Data type	Meaning
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
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 116)**

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 117)**

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 $0BC0_{hex}$ = **3008**$_{dec}$		Data 0064_{hex} = **100**$_{dec}$		CRC	

Response: (Numbers in Hex)							
01	06	0B	C0	00	00	8B	D2
Controller address	Modbus function	Register address $0BC0_{hex}$ = **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**.

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7 Technical data

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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
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

Binary inputs

Number	6
Close/Open indication	0-2 VDC close contact 6-36 VDC open contact

Binary outputs

Number	6
Max. current	BO1-6 = 0.5 A
Switching to	positive supply terminal

8 Appendix

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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 127)**.

List of setpoints

back to Controller objects

Group: Basic settings

Subgroup: Name

Controller Name

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	0 .. 15 characters [-]		
Default value	InteliATS2	**Alternative config**	NO
Step	[-]		
Comm object	8637	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Subgroup: Voltage settings

Connection type

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	Mono Phase / SplPhL1L2 / SplPhL1L3 / 3Ph3Wire / 3Ph4Wire / High Leg D [-]		
Default value	3Ph4Wire	**Alternative config**	NO
Step	[-]		
Comm object	11628	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Connection type:

Mono Phase	Single phase voltage measurement L1-N
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

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
3Ph4Wire	Grounded Star (Grounded Wye) connection – 3PY Three phase voltage measurement L1,L2,L3 with 120° phase shift
High Leg D	High Leg Delta connection Three phase voltage measurement L1,L2,L3

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Nominal Voltage Ph-N

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	80 .. 20 000 [V]		
Default value	231 V	**Alternative config**	NO
Step	1 V		
Comm object	20481	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal voltage (phase to neutral).			

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Nominal Voltage Ph-Ph

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	80 .. 40 000 [V]		
Default value	400 V	**Alternative config**	NO
Step	1 V		
Comm object	20456	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal voltage (phase to phase).			

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Source 1 VT Ratio

Setpoint group	Basic settings	**Related FW**	1.3.0
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, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Source 1 voltage potential transformers ratio. If no VTs are used, adjust the setpoint to 1.			

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Source 2 VT Ratio

Setpoint group	Basic settings	**Related FW**	1.3.0
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, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Source 2 voltage potential transformers ratio. If no VTs are used, adjust this setpoint to 1.			

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Subgroup: Frequency settings

Nominal Frequency

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	30.0 .. 65.0 [Hz]		
Default value	50.0 Hz	**Alternative config**	NO
Step	0.1 Hz		
Comm object	20453	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Nominal frequency (usually 50 or 60 Hz).			

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Subgroup: Breaker Control

Attempts To Close Breaker

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	1 .. 5 [-]		
Default value	2 [-]	**Alternative config**	NO
Step	1 [-]		
Comm object	19885	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint adjusts the amount of attempts the controller performs when a breaker is requested to be closed. **Example:** If the breaker feedback is not received at the end of the attempt, an alarm is not issued, unless it was the last attempt to close the breaker.			

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Subgroup: Battery protections

Battery Undervoltage

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	8.0 V .. **Battery Overvoltage (page 132)** [V]		
Default value	12.0 V	**Alternative config**	NO
Step	0.1 [V]		
Comm object	8387	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	**Battery Undervoltage (page 131)** .. 40.0 [V]		
Default value	30.0 V	**Alternative config**	NO
Step	0.1 V		
Comm object	9587	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 600 [s]		
Default value	60 s	**Alternative config**	NO
Step	1 s		
Comm object	8383	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Battery Undervoltage (page 131)** and **Battery Overvoltage (page 132)** protections.			

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Subgroup: Pulse Counters

Conversion Coefficient Pulse 1

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	0 ... 65 000 [-]		
Default value	1	**Alternative config**	NO
Step	1		
Comm object	10994	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Only if LBI **PULSE COUNTER 1 (PAGE 318)** 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 318)** and if the input pulses counter reaches value given by this setpoint, the counter value **Pulse Counter 1 (page 285)** 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	Engine settings	**Related FW**	1.3.0
Range [units]	0 ... 65 000 [-]		
Default value	1	**Alternative config**	NO
Step	1		
Comm object	10995	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Only if LBI **PULSE COUNTER 2 (PAGE 319)** 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 319)** and if the input pulses counter reaches value given by this setpoint, the counter value **Pulse Counter 2 (page 285)** 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: Elevator Switch Settings

Elevator Switch

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Disabled [-]	**Alternative config**	NO
Step	[-]		
Comm object	20327	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Setpoint enables or disables elevator switch functionality (for more information **see Elevator Switch on page 67**). Every time before predicted transfer of the load happens, LBO **ELEVATOR SWITCH (PAGE 336)** is activated to stop the elevator on the closest floor and open the door.			

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Pre Elevator Delay

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	0 .. 600 [s]		
Default value	10 s	**Alternative config**	NO
Step	0 s		
Comm object	20326	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 336)** 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.			

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Post Elevator Delay

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	0 .. 600 [s]		
Default value	10 s	**Alternative config**	NO
Step	0 s		
Comm object	20325	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
The delay defines how long after predicted transfer of the load the LBO **ELEVATOR SWITCH (PAGE 336)** is deactivated.			

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Conversion Coefficient Pulse 1

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	0 ... 65 000 [-]		
Default value	1	**Alternative config**	NO
Step	1		
Comm object	10994	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Only if LBI **PULSE COUNTER 1 (PAGE 318)** 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 318)** and if the input pulses counter reaches value given by this setpoint, the counter value **Pulse Counter 1 (page 285)** 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**	1.3.0
Range [units]	0 ... 65 000 [-]		
Default value	1	**Alternative config**	NO
Step	1		
Comm object	10995	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Only if LBI **PULSE COUNTER 2 (PAGE 319)** 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 319)** and if the input pulses counter reaches value given by this setpoint, the counter value **Pulse Counter 2 (page 285)** 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**	1.3.0
Range [units]	OFF / MAN / AUTO [-]		
Default value	OFF	**Alternative config**	NO
Step	[-]		
Comm object	8315	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Power On Mode

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	Previous / OFF [-]		
Default value	Previous	**Alternative config**	NO
Step	[-]		
Comm object	13000	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Disabled / Enabled [-]		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	9983	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Disabled / 1 .. 255 [min]		
Default value	Disabled	**Alternative config**	NO
Step	1 min		
Comm object	10121	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
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, Gen-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 338)** binary output. The **HORN (PAGE 338)** output is active when this timeout elapsed.
Horn reset	LBO **HORN (PAGE 338)** 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**	1.3.0
Range [units]	Enabled / Disabled		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23885	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	S1 L1N / S1 L1L2 / S1 f [-]		
Default value	PF	**Alternative config**	NO
Step	[-]		
Comm object	13346	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	S1 L1N / S1 L1L2 / S1 f [-]		
Default value	RPM	**Alternative config**	NO
Step	[-]		
Comm object	14628	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Enable / Disabled [-]		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	15889	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	1 .. 32 [-]		
Default value	1	**Alternative config**	NO
Step	1		
Comm object	24537	**Related applications**	Mains-Mains, Mains-Gen, Gen-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: Modbus Server Address

Modbus Server Address

Setpoint group	Communication Settings	**Related FW**	1.3.0
Range [units]	1 .. 247 [-]		
Default value	1	**Alternative config**	NO
Step	1		
Comm object	24188	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 or other devices can be interconnected (via RS485) and accessed from Modbus terminal. **IMPORTANT: This address is used only for MODBUS communication.** ***Note:*** *When opening connection to the controller it's address has to correspond with the setting in PC tool.*			

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Group: Source 1

Subgroup: Source 1 settings

Secondary Source Switch

Setpoint group	Source 1	**Related FW**	1.3.0
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.

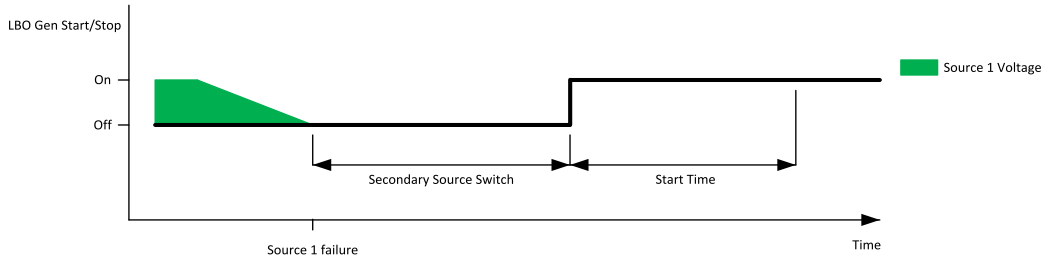

Image 18.1 Secondary Source Switch

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Primary Source Return Delay

Setpoint group	Source 1	**Related FW**	1.3.0
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**	1.3.0
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, Gen-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**	1.3.0
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, Gen-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 347)** output straight away (100 ms) after the **S1CB FEEDBACK (PAGE 323)** input deactivates.			

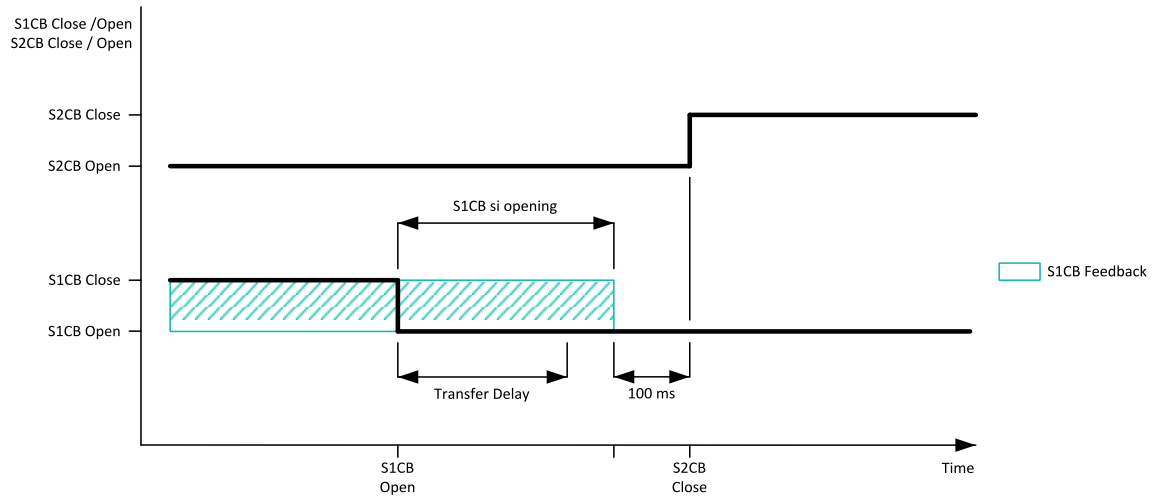

Image 18.2 Open Transfer Min Break

If some delay between **S1CB FEEDBACK (PAGE 323)** deactivation and closing of **S2CB CLOSE/OPEN (PAGE 347)** output is required, then the Open Transfer Min Break must be set to sum of "S1CB opening" + "Delay" time.

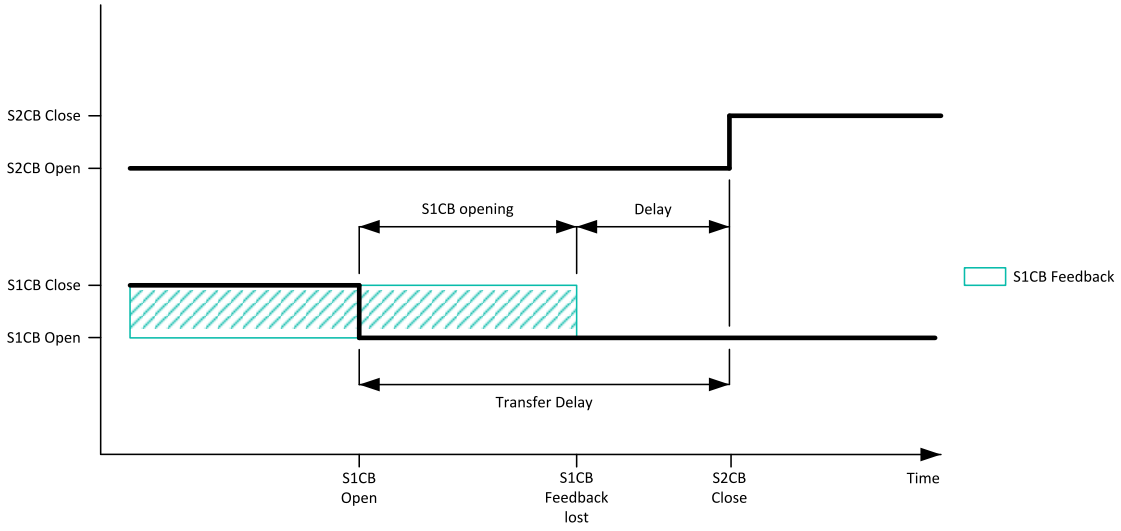

Image 18.3 Transfer Delay 2

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Source 1 Cooling Time

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	0 .. 300 [s]		
Default value	0 s	**Alternative config**	NO
Step	1 s		
Comm object	17696	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			

Cooling Time defines the period when LBO **GEN1 START/STOP (PAGE 337)** is still active before stop of the engine is required.

Reasons of the engine to stop:

- AUTO mode situations, 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.

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Source 1 Start Time

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	**Source 1 Minimal Stabilization Time (page 147)** .. 600 [s]		
Default value	20 s	**Alternative config**	NO
Step	1		
Comm object	17695	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			

The timer starts when LBO **GEN1 START/STOP (PAGE 337)** is active. When engine doesn't reach defined limits for Frequency and Voltage and LBI **SOURCE 1 READY TO LOAD (PAGE 324)** =0 (if configured), **BOS Start Fail (page 369)** alarm is issued and LBO **GEN1 START/STOP (PAGE 337)** is deactivated.

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Source 1 Stop Time

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	0 .. 3600 [s]		
Default value	60 s	**Alternative config**	NO
Step	1 s		
Comm object	17694	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			
The timer is triggered when LBO **GEN1 START/STOP (PAGE 337)** 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 1 READY TO LOAD (PAGE 324)** =1 (if configured) after the stop time expires the **Wrn Stop Fail (page 361)** alarm is issued			

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Source 1 Minimal Stabilization Time

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	1 .. 300 [s]		
Default value	5 s	**Alternative config**	NO
Step	1 s		
Comm object	17692	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			

Minimal time triggered in starting period during which the conditions for closing S1CB breaker have to be continuously fulfilled. (For more information about conditions **see Evaluation of sources on page 69**.)

Note: *In a case that the counting is terminated but the* ***Source 1 Start Time (page 145)*** *is not finished, the counting starts again.*

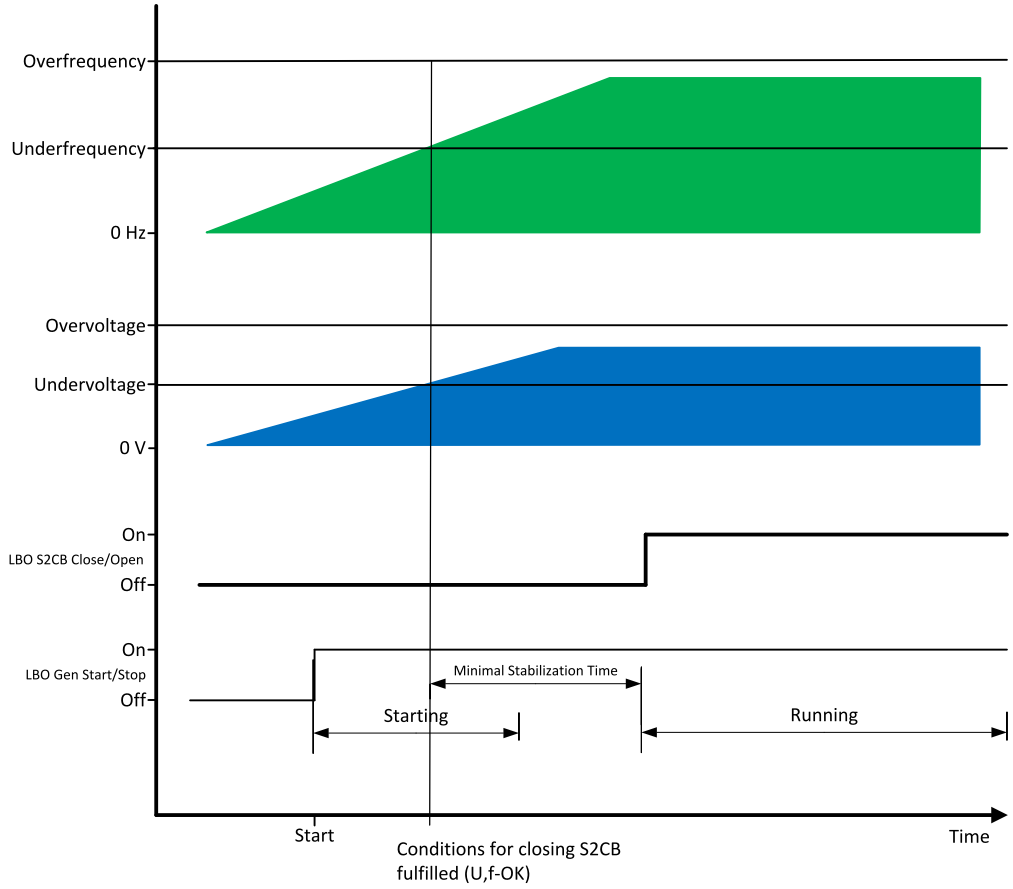

Image 18.4 Minimal Stabilization Time

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Source 1 Genset Stop Fail

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Disabled [-]	**Alternative config**	NO
Step	[-]		
Comm object	17693	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			

Enables / Disables the evaluation of the alarm **Wrn Stop Fail (page 361)**.

Enabled	The alarm **Wrn Stop Fail (page 361)** is evaluated
Disabled	The alarm **Wrn Stop Fail (page 361)** is not evaluated. When this option is selected the Auto Mode accepts the external start of the Gen-set.

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Source 1 Run Only Block Delay

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	0.0 .. 600.0 [s]		
Default value	5.0 s	**Alternative config**	NO
Step	0.1 s		
Comm object	10024	**Related applications**	Gen-Gen
Config level	Advanced		
Setpoint visibility	Only in Gen-Gen.		
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.

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Return From Secondary Source

Setpoint group	Source 1	**Related FW**	1.3.0
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 - S1OK	S2CB opens automatically after Primary Source Return delay has elapsed. S1CB is closed after Open Transfer Min Break has elapsed.
Auto - S2Fail	Automatic return to primary source is not performed until Source 2 fail occurs. Use this option to minimize number of transfers between sources.

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S1CB Opens On

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	S1 Fail / S2 OK [-]		
Default value	S2 OK	**Alternative config**	NO
Step	[-]		
Comm object	9850	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.*

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Source 1 Measurement

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED [-]	**Alternative config**	NO
Step	[-]		
Comm object	19575	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

Enables / Disables Source 1 Measurement.

ENABLED	Source 1 evaluation (S1 is OK or S1 is NOK) is based on frequency and voltages and on user protections and on the LBI **SOURCE 1 READY TO LOAD (PAGE 324)** – if it is configured .
DISABLED	Source 1 evaluation (S1 is OK or S1 is NOK) is based only on the LBI **SOURCE 1 READY TO LOAD (PAGE 324)** which has to be configured.

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Activity At OFF

Setpoint group	Source 1	**Related FW**	1.3.0
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 136)**		
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 150)** = S1 Fail. If the setpoint **S1CB Opens On (page 150)** = 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 150)**=S1 Fail. If the the setpoint **S1CB Opens On (page 150)** = S2 OK S1CB close command is issued in case Source 2 is operational (voltage and frequency is OK).

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Subgroup: Voltage protections

Source 1 Overvoltage

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	100 .. 150 [%]		
Default value	110 %	**Alternative config**	NO
Step	1 % of **Nominal Voltage Ph-Ph (page 129)**		
Comm object	20478	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Threshold for Source 1 overvoltage. All three phases are checked. Maximum out of three is used.

Note: *Name of setpoint for Gen-Gen application is Source 1 Overvoltage BOS.*

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Source 1 Overvoltage Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100 .. 150 [%]		
Default value	110 %	**Alternative config**	NO
Step	1 %		
Comm object	17686	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			
Threshold for Source 1 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.*			

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Source 1 Overvoltage Delay

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	**Alternative config**	YES
Step	0.1 s		
Comm object	20474	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Overvoltage (page 151)** protection.			

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Source 1 Overvoltage Hys

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	100 .. **Source 1 Overvoltage (page 151)** [%]		
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.

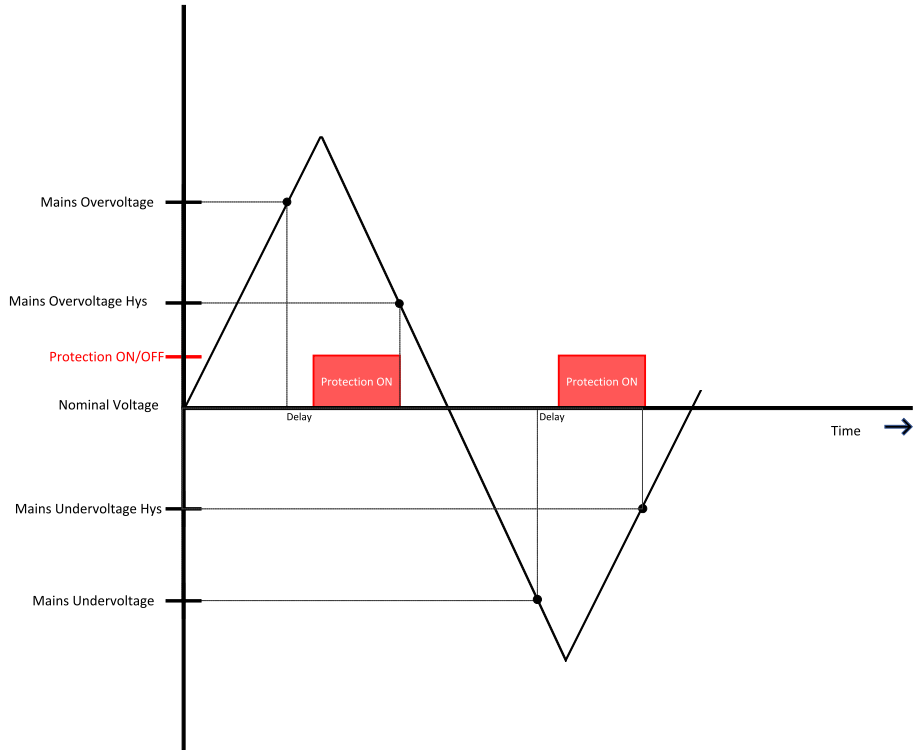

Image 18.5 Source 1 Overvoltage Hys

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Source 1 Undervoltage Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	0 .. 100 [%]		
Default value	60 %	**Alternative config**	NO
Step	1 %		
Comm object	17687	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			
Threshold for Source 1 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.*			

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Source 1 Undervoltage

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	0 .. 100 [%]		
Default value	60 %	**Alternative config**	YES
Step	1 % of **Nominal Voltage Ph-Ph (page 129)**		
Comm object	20477	**Related applications**	Mains-Mains, Mains-Gen, Gen-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. ***Note:*** *Name of setpoint for Gen-Gen application is Source 1 Undervoltage BOS.*			

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Source 1 Undervoltage Delay

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	0.0 .. 600.0 [s]		
Default value	2.0 s	**Alternative config**	YES
Step	0.1 s		
Comm object	20175	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Undervoltage (page 154)** protection.			

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Source 1 Undervoltage Hys

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	**Source 1 Undervoltage (page 154)** .. 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.

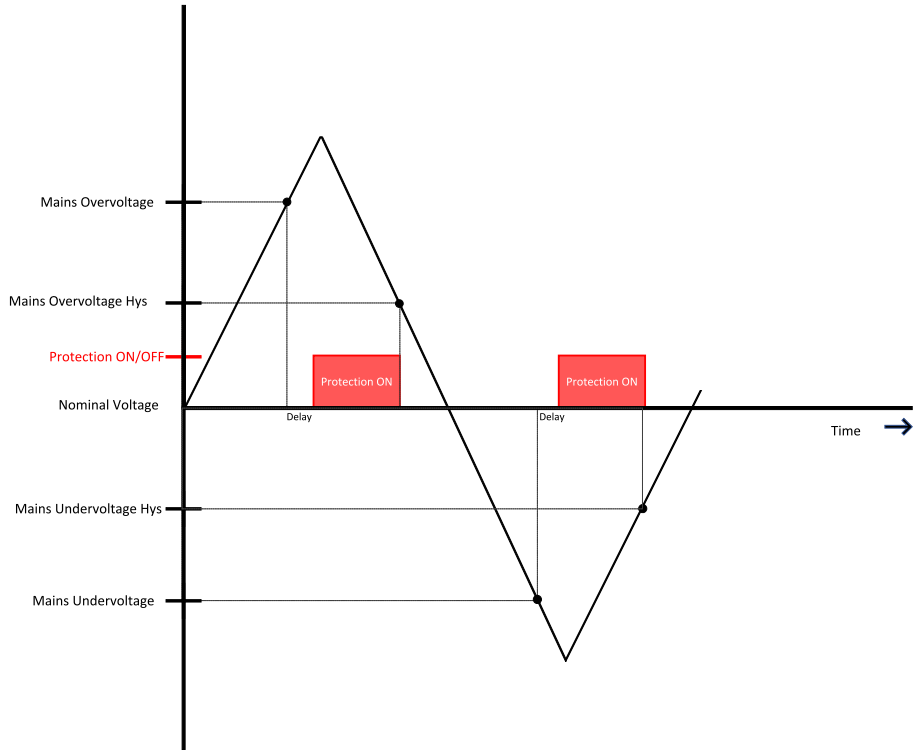

Image 18.6 Source 1 Undervoltage Hys

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Source 1 Voltage Unbalance

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	1 .. 150 [%] of **Nominal Voltage Ph-Ph (page 129)** or **Nominal Voltage Ph-N (page 129)**		
Default value	10 %	**Alternative config**	NO
Step	1 %		
Comm object	20455	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Threshold for Source 1 voltage unbalance.			

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Source 1 Voltage Unbalance Delay

Setpoint group	Source 1	**Related FW**	1.3.0
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, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Voltage Unbalance (page 157)** protection.			

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Subgroup: Frequency protections

Source 1 Overfrequency

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	100 .. 150 [%]		
Default value	102.0 %	**Alternative config**	NO
Step	1.0 % of **Nominal Frequency (page 130)**		
Comm object	20452	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold for Source 1 overfrequency. ***Note:*** *Name of setpoint for Gen-Gen application is Source 1 Overfrequency BOS.*			

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Source 1 Overfrequency Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	17688	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			
Threshold for Source 1 phase L1 overfrequency.			

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Source 1 Overfrequency Hys

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	100 .. **Source 1 Overfrequency (page 158)** [%]		
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.

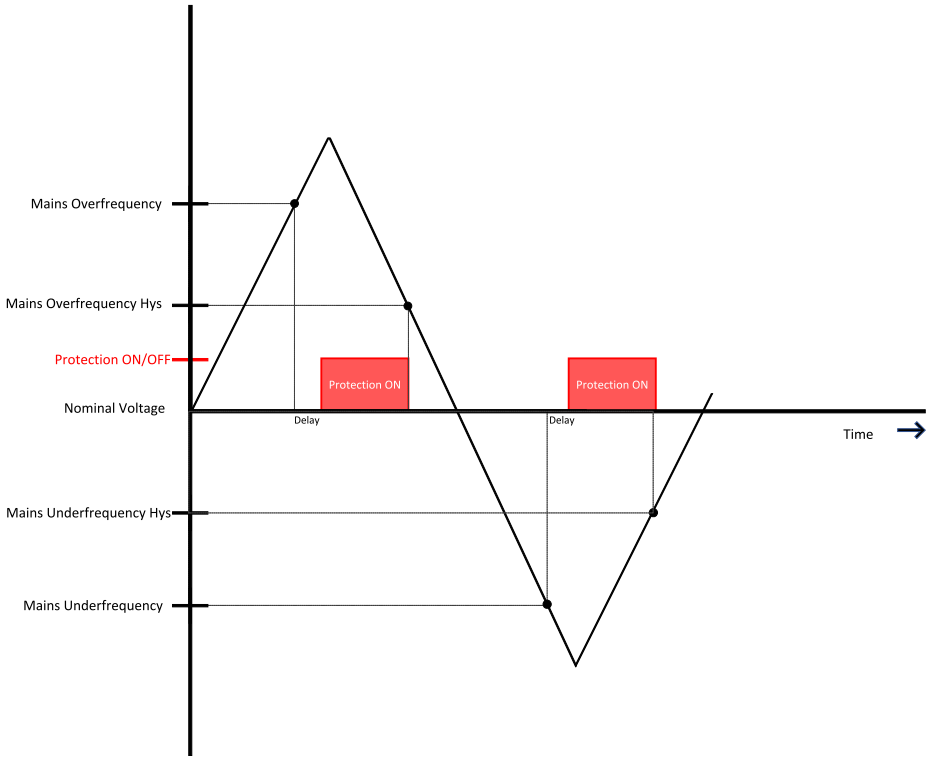

Image 18.7 Source 1 Overfrequency Hys

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Source 1 Underfrequency

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	50 .. 100 [%]		
Default value	98.0 %	**Alternative config**	NO
Step	1.0 % of **Nominal Frequency (page 130)**		
Comm object	20451	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Threshold for Source 1 underfrequency. ***Note:*** *Name of setpoint for Gen-Gen application is Source 1 Underfrequency BOS.*			

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Source 1 Underfrequency Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	17689	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Gen-Gen.		
Description			
Threshold for Source 1 phase L1 underfrequency.			

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Source 1 Underfrequency Hys

Setpoint group	Source 1	**Related FW**	1.3.0
Range [units]	**Source 1 Underfrequency (page 160)** .. 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.

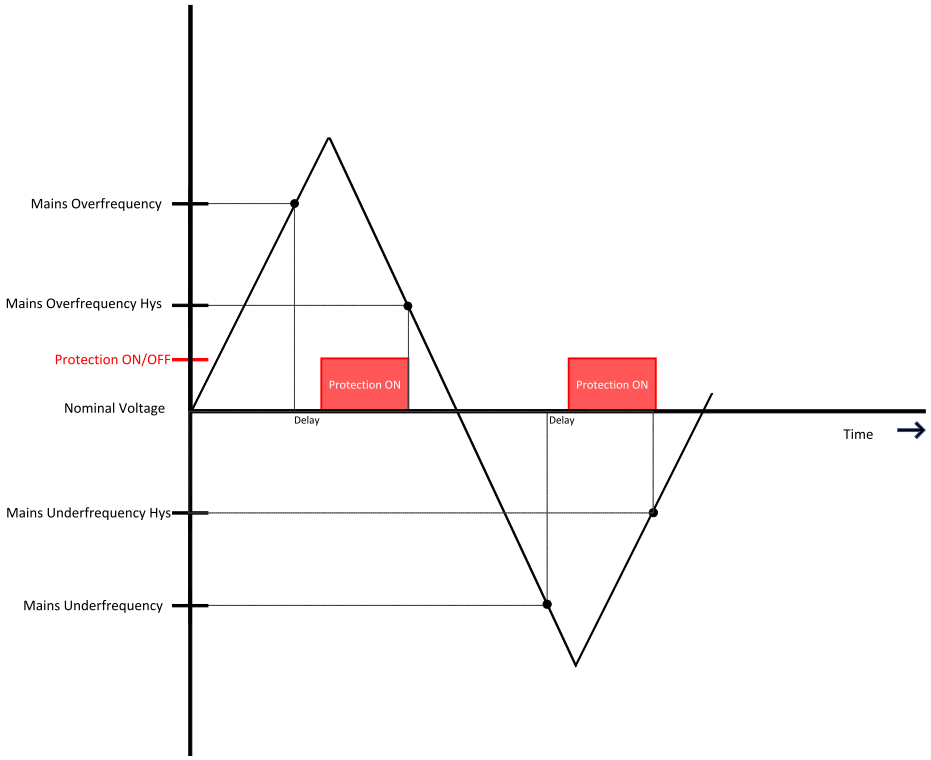

Image 18.8 Source 1 Underfrequency Hys

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Source 1 < > Frequency Delay

Setpoint group	Source 1	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Delay for **Source 1 Underfrequency (page 160)** and **Source 1 Overfrequency (page 158)** protection.			

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Subgroup: Phase Rotation

Phase Rotation

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	Clockwise / CounterCCW [-]		
Default value	Clockwise	**Alternative config**	NO
Step	[-]		
Comm object	15122	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	19709	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 181)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Group: Source 2

Subgroup: Source 2 settings

S2CB Close Delay

Setpoint group	Source 2	**Related FW**	1.3.0
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, Gen-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*.			

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Start Time

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	**Minimal Stabilization Time (page 166)** .. 600 [s]		
Default value	20 s	**Alternative config**	NO
Step	1		
Comm object	20329	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
The timer starts when LBO **GEN START/STOP (PAGE 337)** is active. When engine doesn't reach defined limits for Frequency and Voltage and LBI **SOURCE 2 READY TO LOAD (PAGE 324)** =0 (if configured), **BOS Start Fail (page 369)** alarm is issued and LBO **GEN START/STOP (PAGE 337)** is deactivated.			

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Stop Time

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	0 .. 3600 [s]		
Default value	60 s	**Alternative config**	NO
Step	1 s		
Comm object	9815	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
The timer is triggered when LBO **GEN START/STOP (PAGE 337)** 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 324)** =1 (if configured) after the stop time expires the **Wrn Stop Fail (page 361)** alarm is issued			

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Cooling Time

Setpoint group	Engine settings	**Related FW**	1.3.0
Range [units]	0 .. 300 [s]		
Default value	0 s	**Alternative config**	NO
Step	1 s		
Comm object	8258	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Cooling Time defines the period when LBO **GEN START/STOP (PAGE 337)** is still active before stop of the engine is required.

Reasons of the engine to stop:

- AUTO mode situations, 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.

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Minimal Stabilization Time

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	1 .. 300 [s]		
Default value	5 s	**Alternative config**	NO
Step	1 s		
Comm object	8259	**Related applications**	Mains-Gen, Gen-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 69**.)

Note: *In a case that the counting is terminated but the* ***Start Time (page 164)*** *is not finished, the counting starts again.*

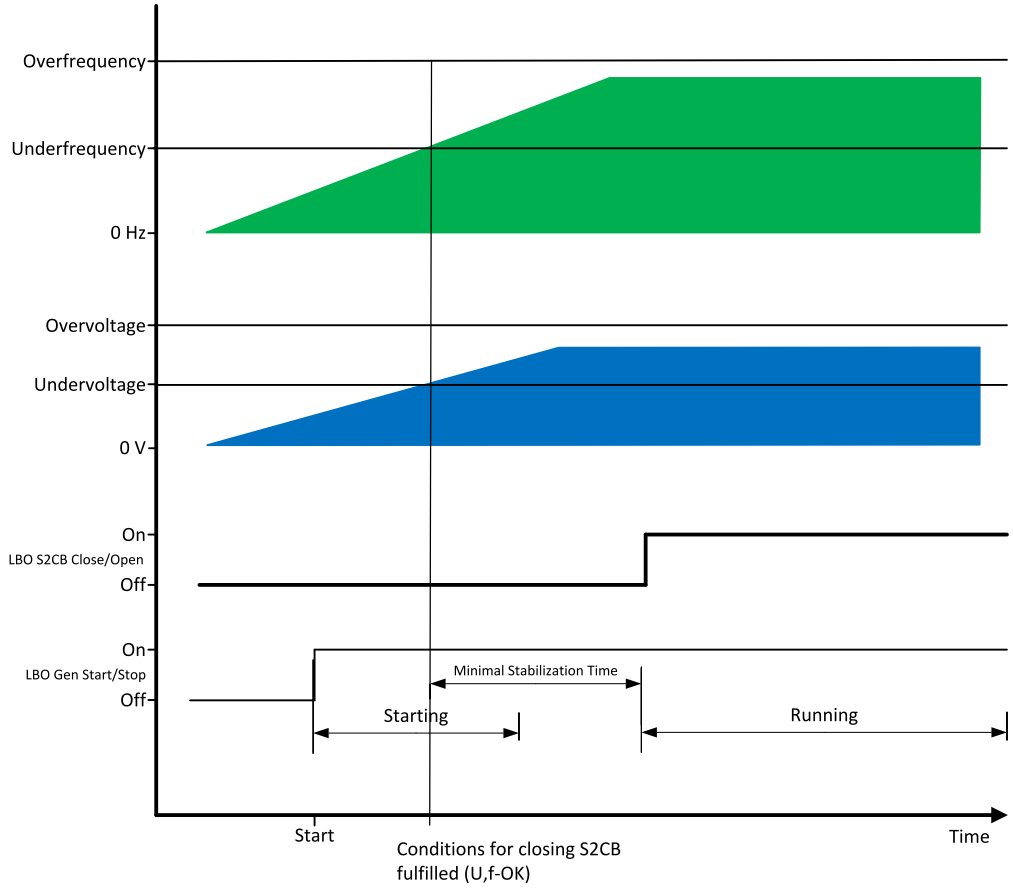

Image 19.1 Minimal Stabilization Time

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Run Only Block Delay

Setpoint group	Source 2	**Related FW**	1.3.0
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, Gen-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.			

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S2CB Opens On

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	S2 Fail / S1 OK [-]		
Default value	S1 OK	**Alternative config**	NO
Step	-		
Comm object	20351	**Related applications**	Mains-Mains, Gen-Gen
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).

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Source 2 Measurement

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED [-]	**Alternative config**	NO
Step	[-]		
Comm object	17011	**Related applications**	Mains-Gen, Gen-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 324)** – 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 324)** which has to be configured.

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Genset Stop Fail

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Disabled [-]	**Alternative config**	NO
Step	[-]		
Comm object	12377	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			

Enables / Disables the evaluation of the alarm **Wrn Stop Fail (page 361)**.

Enabled	The alarm **Wrn Stop Fail (page 361)** is evaluated
Disabled	The alarm **Wrn Stop Fail (page 361)** is not evaluated. When this option is selected the Auto Mode accepts the external start of the Gen-set.

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Subgroup: Voltage Protection

Source 2 Overvoltage BOS

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100 .. 150 [%]		
Default value	110 %	**Alternative config**	NO
Step	1 %		
Comm object	20469	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always.		
Description			
Threshold for Source 2 overvoltage. All three phases are checked. Maximum out of three is used. ***Note:*** *Name of setpoint for Mains-Mains application is Source 2 Overvoltage.*			

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Source 2 Overvoltage Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100 .. 150 [%]		
Default value	110 %	**Alternative config**	NO
Step	1 %		
Comm object	20467	**Related applications**	Mains-Gen, Gen-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.*			

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Source 2 Overvoltage Hys

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100 .. **Source 2 Overvoltage BOS (page 169)** [%]		
Default value	100 %	**Alternative config**	NO
Step	1 %		
Comm object	20465	**Related applications**	Mains-Mains, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			

Threshold defines the level of turning off Source 2 overvoltage protection.

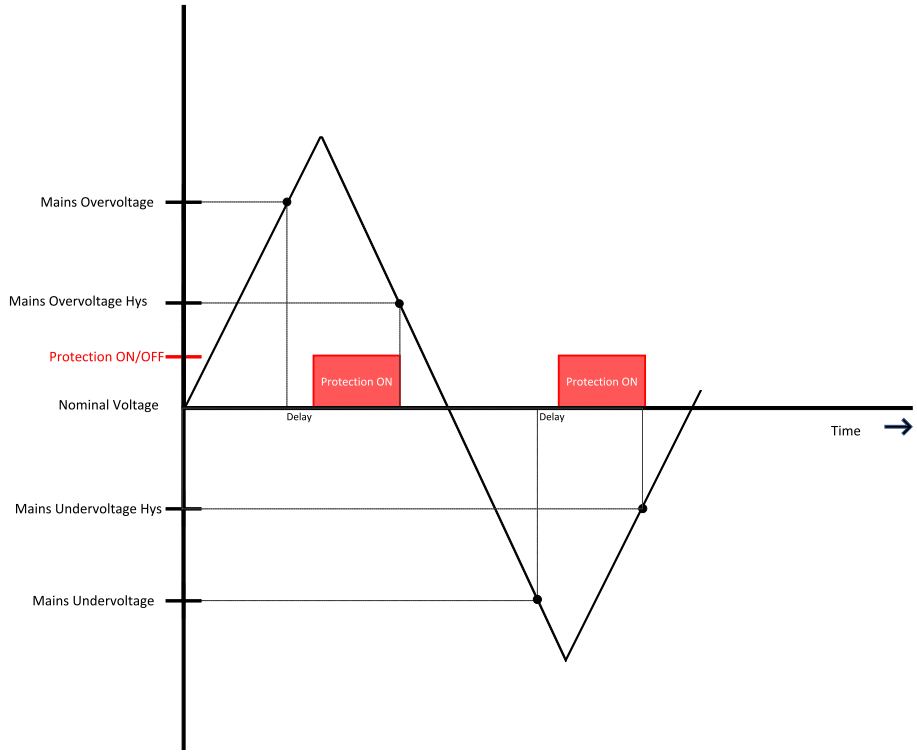

Image 19.2 Source 2 Overvoltage Hys

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Source 2 Undervoltage

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	0 .. 100 [%]		
Default value	60 %	**Alternative config**	NO
Step	1 %		
Comm object	20468	**Related applications**	Mains-Mains, Gen-Gen
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.			

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Source 2 Undervoltage BOS

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100 .. 150 [%]		
Default value	100 %	**Alternative config**	NO
Step	1 %		
Comm object	20468	**Related applications**	Mains-Gen, Gen-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.*			

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Source 2 Undervoltage Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	0 .. 100 [%]		
Default value	60 %	**Alternative config**	NO
Step	1 %		
Comm object	20466	**Related applications**	Mains-Gen, Gen-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.*			

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Source 2 Undervoltage Hys

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	**Source 2 Undervoltage (page 171)** .. 100 [%]		
Default value	100 %	**Alternative config**	NO
Step	1 %		
Comm object	20464	**Related applications**	Mains-Mains, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			

Threshold defines the level of turning off Source 2 undervoltage protection.

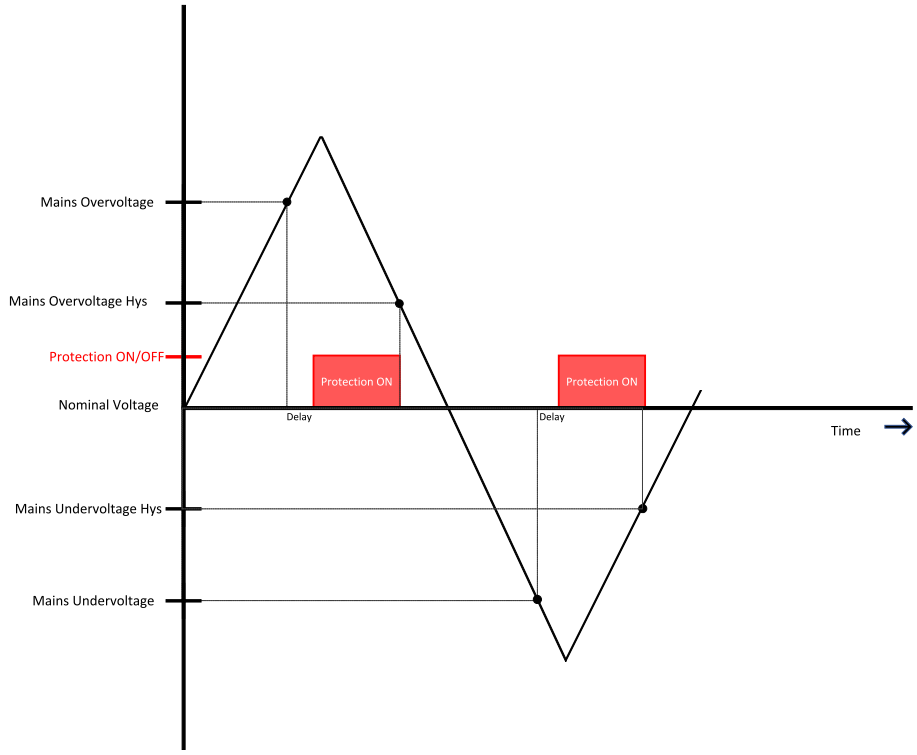

Image 19.3 Source 2 Undervoltage Hys

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Source 2 < > Voltage Delay

Setpoint group	Source 2	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		

Description

Delay for voltage protections.

Mains-Mains application	Mains-Gen application	
MP2 Source 2 L1 Overvoltage (page 376)	Wrn Source 2 L1 Overvoltage (page 363)	BOS Source 2 L1 Overvoltage (page 380)
MP2 Source 2 L1 Undervoltage (page 376)	Wrn Source 2 L1 Undervoltage (page 364)	BOS Source 2 L1 Undervoltage (page 380)
MP2 Source 2 L1L2 Overvoltage (page 376)	Wrn Source 2 L1L2 Overvoltage (page 363)	BOS Source 2 L1L2 Overvoltage (page 381)
MP2 Source 2 L1L2 Undervoltage (page 377)	Wrn Source 2 L1L2 Undervoltage (page 365)	BOS Source 2 L1L2 Undervoltage (page 381)
MP2 Source 2 L2 Overvoltage (page 377)	Wrn Source 2 L2 Overvoltage (page 363)	BOS Source 2 L2 Overvoltage (page 381)
MP2 Source 2 L2 Undervoltage (page 377)	Wrn Source 2 L2 Undervoltage (page 364)	BOS Source 2 L2 Undervoltage (page 382)
MP2 Source 2 L2L3 Overvoltage (page 377)	Wrn Source 2 L2L3 Overvoltage (page 364)	BOS Source 2 L2L3 Overvoltage (page 382)
MP2 Source 2 L2L3 Undervoltage (page 378)	Wrn Source 2 L2L3 Undervoltage (page 365)	BOS Source 2 L2L3 Undervoltage (page 382)
MP2 Source 2 L3 Overvoltage (page 378)	Wrn Source 2 L3 Overvoltage (page 363)	BOS Source 2 L3 Overvoltage (page 383)
MP2 Source 2 L3 Overvoltage (page 378)	Wrn Source 2 L3 Undervoltage (page 365)	BOS Source 2 L3 Overvoltage (page 383)
MP2 Source 2 L3L1 Overvoltage (page 378)	Wrn Source 2 L3L1 Overvoltage (page 364)	BOS Source 2 L3L1 Overvoltage (page 383)
MP2 Source 2 L3L1 Undervoltage (page 379)	Wrn Source 2 L3L1 Undervoltage (page 365)	BOS Source 2 L3L1 Undervoltage (page 384)

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Source 2 Voltage Unbalance

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	1 .. 150 [%] of **Nominal Voltage Ph-Ph (page 129)** or **Nominal Voltage Ph-N (page 129)**		
Default value	10 %	**Alternative config**	NO
Step	1 %		
Comm object	20432	**Related applications**	Mains-Mains, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Threshold for Source 2 voltage unbalance.			

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Source 2 Voltage Unbalance BOS

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	1 .. 150 [%] of **Nominal Voltage Ph-Ph (page 129)** or **Nominal Voltage Ph-N (page 129)**		
Default value	10 %	**Alternative config**	NO
Step	1 %		
Comm object	20432	**Related applications**	Mains-Gen, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Threshold for Source 2 voltage unbalance BOS.			

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Source 2 Voltage Unbalance Delay

Setpoint group	Source 2	**Related FW**	1.3.0
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, Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
Delay for **Source 2 Voltage Unbalance (page 175)** protection.			

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Subgroup: Frequency Protection

Source 2 Overfrequency

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20437	**Related applications**	Mains-Mains, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold for Source 2 overfrequency.			

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Source 2 Overfrequency BOS

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20437	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 overfrequency.			

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Source 2 Overfrequency Hys

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100.0 .. **Source 2 Overfrequency (page 176)** [%]		
Default value	102.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20435	**Related applications**	Mains-Mains, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			

Threshold defines the level of turning off Source 2 overfrequency protection.

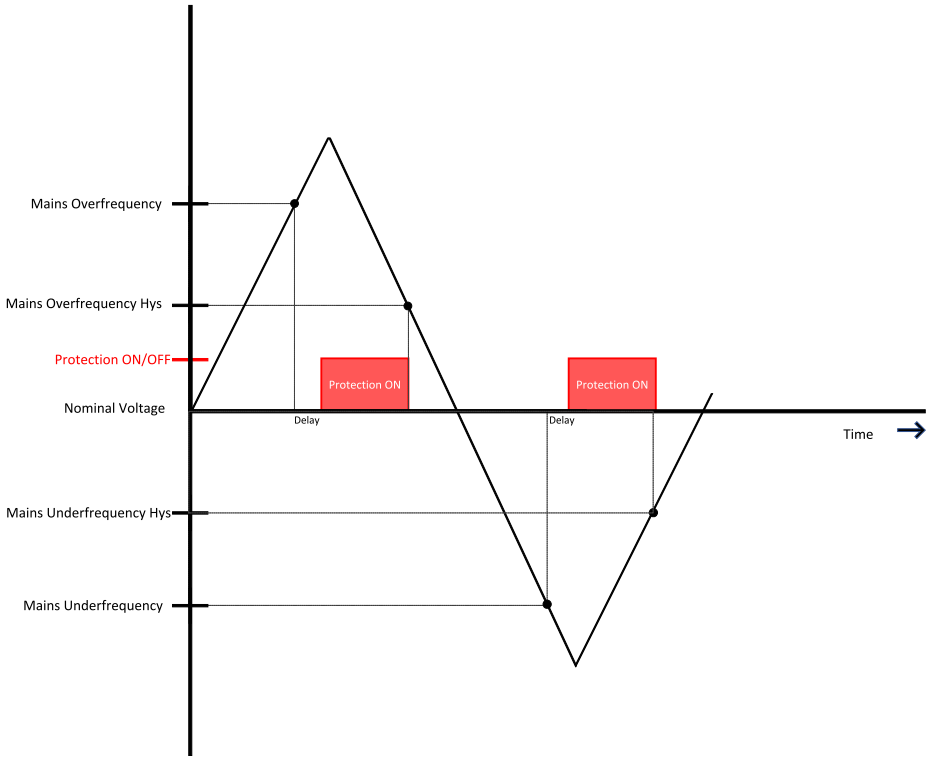

Image 19.4 Source 2 Overfrequency Hys

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Source 2 Underfrequency

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20436	**Related applications**	Mains-Mains, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			
Threshold for Source 2 underfrequency.			

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Source 2 Underfrequency BOS

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20436	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 underfrequency.			

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Source 2 Underfrequency Hys

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	**Source 2 Underfrequency (page 178)** .. 100.0 [%]		
Default value	100.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20434	**Related applications**	Mains-Mains, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Mains.		
Description			

Threshold defines the level of turning off Source 2 underfrequency protection.

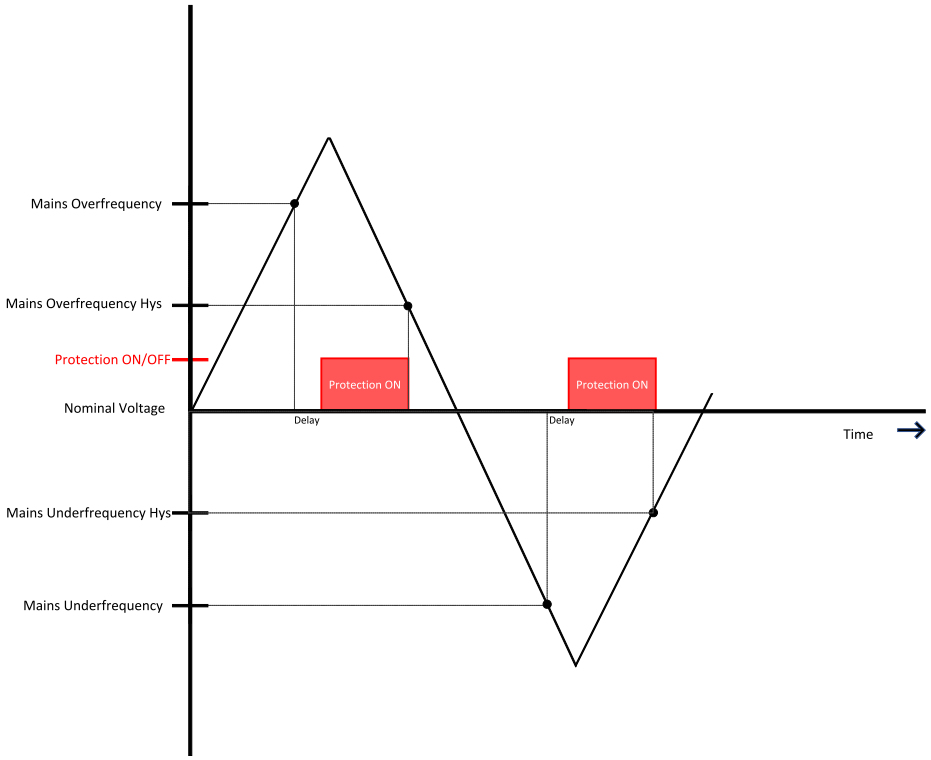

Image 19.5 Source 2 Underfrequency Hys

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Source 2 Overfrequency Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	100.0 .. 150.0 [%]		
Default value	102.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20439	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 overfrequency.			

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Source 2 Underfrequency Wrn

Setpoint group	Source 2	**Related FW**	1.3.0
Range [units]	50.0 .. 100.0 [%]		
Default value	98.0 %	**Alternative config**	NO
Step	0.1 %		
Comm object	20438	**Related applications**	Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only in Mains-Gen.		
Description			
Threshold for Source 2 phase L1 underfrequency.			

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Source 2 <> Frequency Delay

Setpoint group	Source 2	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Delay for frequency protections.

Mains-Mains application	Mains-Gen application	
MP2 Source 2 Overfrequency (page 379)	**Wrn Source 2 Overfrequency (page 366)**	**BOS Source 2 Overfrequency (page 385)**
MP2 Source 2 Underfrequency (page 379)	**Wrn Source 2 Uderfrequency (page 366)**	**BOS Source 2 Underfrequency (page 385)**

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Subgroup: Phase Rotation

Phase Rotation

Setpoint group	Basic settings	**Related FW**	1.3.0
Range [units]	Clockwise / CounterCCW [-]		
Default value	Clockwise	**Alternative config**	NO
Step	[-]		
Comm object	15122	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Enabled / Disabled / ExtDisable [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	19709	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 181)**.
Disabled	Protection is disabled.
ExtDisable	Protection is disabled by the state of LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Group: Source 1 Protections

Subgroup: Voltage protection

Source 1 < > Voltage Protection

Setpoint group	Source 1 Protections	**Related FW**	1.3.0
Range [units]	Enabled / Blocked / Protection Force Block [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	17682	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

This setpoint enables or disables Source 1 < > Voltage Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Source 1 Overvoltage (page 151)**, **Source 1 Undervoltage (page 154)**, **Source 1 Overvoltage Delay (page 152)**, **Source 1 Undervoltage Delay (page 155)**.
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Source 1 Voltage Unbalance Protection

Setpoint group	Source 1 Protections	**Related FW**	1.3.0
Range [units]	Enabled / Blocked / Protection Force Block [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	17681	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

This setpoint enables or disables Source 1 Voltage Unbalance Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Source 1 Voltage Unbalance (page 157)**, **Source 1 Voltage Unbalance Delay (page 157)**.
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Subgroup: Frequency protection

Source 1 Frequency Protection

Setpoint group	Source 1 Protections	**Related FW**	1.3.0
Range [units]	Enabled / Blocked / Protection Force Block [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	17680	**Related applications**	Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

This setpoint enables or disables Source 1 Frequency Protection.

Enabled	Protection is enabled. Behavior of protection is adjusted via setpoints **Source 1 Overfrequency (page 158)**, **Source 1 Underfrequency (page 160)**, **Source 1 < > Frequency Delay (page 162)**.
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Group: Source 2 Protections

Subgroup: Voltage protection

Source 2 < > Voltage Protection

Setpoint group	Source 2 Protections	**Related FW**	1.3.0
Range [units]	Enabled / Blocked / Protection Force Block [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	15668	**Related applications**	Mains-Gen, Gen-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 174)**, **Source 2 Overvoltage BOS (page 169)**, **Source 2 Undervoltage (page 171)**.
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Voltage Unbalance Protection

Setpoint group	Source 2 Protections	**Related FW**	1.3.0
Range [units]	Enabled / Blocked / Protection Force Block [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	15669	**Related applications**	Mains-Gen, Gen-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 175)**, **Source 2 Voltage Unbalance Delay (page 175)**, **Source 2 Undervoltage (page 171)**.
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Subgroup: Frequency protection

Source 2 Frequency Protection

Setpoint group	Source 2 Protections	**Related FW**	1.3.0
Range [units]	Enabled / Blocked / Protection Force Block [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	15670	**Related applications**	Mains-Gen, Gen-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 176)**, **Source 2 Underfrequency (page 178)**, **Source 2 <> Frequency Delay (page 181)**.
Blocked	Protection is evaluated, but alarm is not triggered.
Protection Force Block	Protection can be blocked by LBI **PROTECTION FORCE DISABLE (PAGE 318)**.

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Group: Operating Hours Balancing

Operating Hours Balancing

Setpoint group	Operating Hours Balancing	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	-		
Comm object	17671	**Related applications**	Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint enables balancing of operating hours in Gen-Gen application. Based on this function, Gen 1 and Gen 2 are started to keep the same operating hours. Maximal difference between operating hours is adjusted in setpoint **Operating Hours Max Difference (page 188)**. Operating hours of each Gen can be affected by setpoints **Operating Hours Base S1 (page 187)** and **Operating Hours Base S2 (page 188)**.			

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Operating Hours Base S1

Setpoint group	Operating Hours Balancing	**Related FW**	1.3.0
Range [units]	-20 000.0 .. 20 000.0 [h]		
Default value	0 h	**Alternative config**	NO
Step	0.1 h		
Comm object	17669	**Related applications**	Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint modifies the operating hours of gen-set used in balancing operation function. Negative value is decrement from operating hours, positive value is increment to operating hours. **Example:** Gen 1 has 1000 h. Gen 2 has 100 h. Adjust setpoint of Gen 2 to 900 h to have both controllers on "0" operating hours in balancing function.			

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Operating Hours Base S2

Setpoint group	Operating Hours Balancing	**Related FW**	1.3.0
Range [units]	-20 000.0 .. 20 000.0 [h]		
Default value	0 h	**Alternative config**	NO
Step	0.1 h		
Comm object	17670	**Related applications**	Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint modifies the operating hours of gen-set used in balancing operation function. Negative value is decrement from operating hours, positive value is increment to operating hours. **Example:** Gen 1 has 1000 h. Gen 2 has 100 h. Adjust setpoint of Gen 2 to 900 h to have both controllers on "0" operating hours in balancing function.			

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Operating Hours Max Difference

Setpoint group	Operating Hours Balancing	**Related FW**	1.3.0
Range [units]	0,1 .. 1000,0 [h]		
Default value	10 h	**Alternative config**	NO
Step	0,1 h		
Comm object	8956	**Related applications**	Gen-Gen
Config level	Advanced		
Setpoint visibility	Always		
Description			
This setpoint adjusts the maximal allowed difference of operating hours between Gen1 and Gen2. When difference is higher, swap of load between gen-sets is done.			

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Group: User Buttons

User Button 1

Setpoint group	User Buttons	**Related FW**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20826	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20827	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20828	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20829	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20830	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20831	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20832	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	COMMAND / MAN OFF / MAN ON [-]		
Default value	COMMAND	**Alternative config**	NO
Step	-		
Comm object	20833	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN SWITCH01 (PAGE 330)** is configured		
Description			

Threshold level for switching the binary output **AIN SWITCH01 (PAGE 330)** on. The value is measured from **AIN SWITCH 01 (PAGE 352)** analog input.

Image 24.1 General analog input 1 switch

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AIN Switch01 Off

Setpoint group	Analog Switches	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN SWITCH01 (PAGE 330)** is configured		
Description			

Threshold level for switching the binary output **AIN SWITCH01 (PAGE 330)** off. The value is measured from **AIN SWITCH 01 (PAGE 352)** analog input.

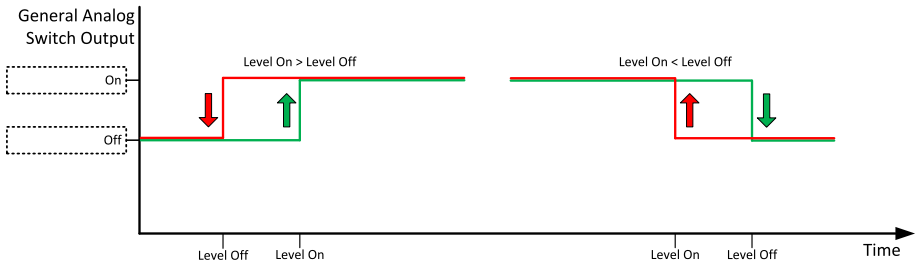

Image 24.2 General analog input 1 switch

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Subgroup: Analog Switches 2

AIN Switch02 On

Setpoint group	Analog Switches	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN SWITCH02 (PAGE 330)** is configured		
Description			

Threshold level for switching the binary output **AIN SWITCH02 (PAGE 330)** on. The value is measured from **AIN SWITCH 02 (PAGE 352)** analog input.

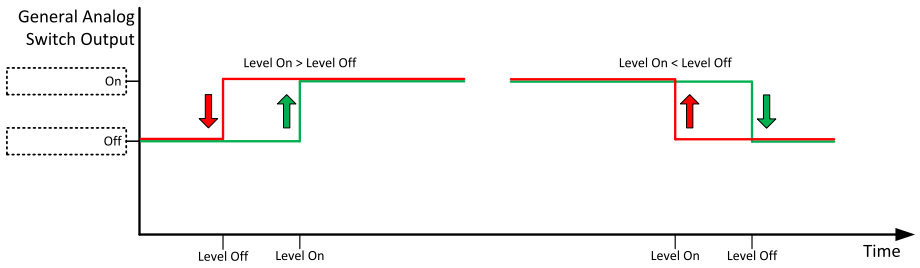

Image 24.3 General analog input 2 switch

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AIN Switch02 Off

Setpoint group	Analog Switches	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Visible only if the logical binary output **AIN SWITCH02 (PAGE 330)** is configured		
Description			

Threshold level for switching the binary output **AIN SWITCH02 (PAGE 330)** off. The value is measured from **AIN SWITCH 02 (PAGE 352)** analog input.

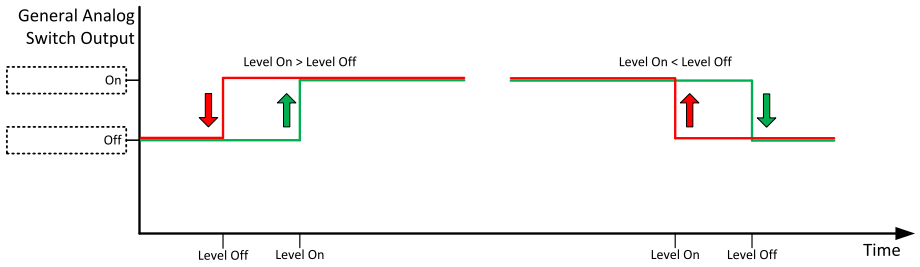

Image 24.4 General analog input 2 switch

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Group: Scheduler

Subgroup: Time & Date

Time

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	HH:MM:SS [-]		
Default value	00:00:00	**Alternative config**	NO
Step	[-]		
Comm object	24554	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Real time clock adjustment. ***Note:*** *RTC has backup battery.*			

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Date

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	DD/MM/YYYY [-]		
Default value	1.1.2015	**Alternative config**	NO
Step	[-]		
Comm object	24553	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Actual date adjustment.			

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Time Stamp act

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	Disabled / Condition / Always [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	10532	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

The setpoint selects the Time stamp function mode.

Disabled	The function is disabled.
Condition	While the binary input **TIME STAMP ACT (PAGE 327)** is active the Time stamps records are recorded into the history log with period adjusted by setpoint **Time Stamp Period (page 202)**. When binary input **TIME STAMP ACT (PAGE 327)** is not active, Time stamps records are recorded into the history log with period adjusted by setpoint **Time Stamp Period OFF (page 203)**.
Always	The Time stamps records are recorded into the history log with period adjusted by setpoint **Time Stamp Period (page 202)** all the time while the controller is switched on.

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Time Stamp Period

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	0 .. 240 [min]		
Default value	60 min	**Alternative config**	NO
Step	1 min		
Comm object	8979	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

Time interval for periodic history records. This period is used when **Time Stamp act (page 202)** is adjusted to option always or when **Time Stamp act (page 202)** is adjusted to option condition and LBI **TIME STAMP ACT (PAGE 327)** is active.

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Time Stamp Period OFF

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	0 .. 240 [min]		
Default value	0 min	**Alternative config**	NO
Step	1 min		
Comm object	17771	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Time interval for periodic history records.This period is used when **Time Stamp act (page 202)** is adjusted to option condition and LBI **TIME STAMP ACT (PAGE 327)** is not active.			

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Time Zone

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
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, Gen-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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DST Switching Mode

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	Disabled / Auto / Manual		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	20250	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 204)**.
- **DISABLED** – Time mode is fixedly set to STD and the function does not perform any changes of RTC time.

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Time Mode

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	STD / DST		
Default value	STD	**Alternative config**	NO
Step	[-]		
Comm object	20249	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			

In manual **DST Switching Mode (page 204)** 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.

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DST Period Rule

Setpoint group	Scheduler	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Selection of the rule that will be applied for the calculation of the DST validity period.			

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Subgroup: Timer 1

Timer 1 Function

Setpoint group	Scheduler	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		

Description

It is possible to choose from following timer functions. Binary output **EXERCISE TIMER 1 (PAGE 336)** is always activated when Timer is active regardless of chosen timer function. Timer functions require controller running in AUTO 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 336)** 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 321)** 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 322)** binary input.
Transfer To S2	When this option is chosen then the binary output of timer is internally connected to **TRANSFER TO S2 (PAGE 327)** binary input.

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Timer 1 Setup

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	[-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	10969	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Related setpoints for timer 1 are: › **Timer 1 Function (page 206)**			

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Timer 1 Repetition

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	Off / Once / Repeated [-]		
Default value	Off	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			
Defines repetition of **Timer 1 Function (page 206)**.			

Off	**Timer 1 Function (page 206)** will not be activated.
Once	**Timer 1 Function (page 206)** will be activated only one time.
Repeated	**Timer 1 Function (page 206)** will be repeatedly activated.

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Timer 1 First Occur. Date

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	[DD/MM/YYYY]		
Default value	01/01/2000	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			
Date of first occurrence of **Timer 1 Function (page 206)**.			

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Timer 1 First Occur. Time

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	[HH:MM]		
Default value	00:00	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			
Time of first occurrence of **Timer 1 Function (page 206)**.			

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Timer 1 Duration

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	[HH:MM]		
Default value	00:00	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			
Timer 1 Function (page 206) duration time.			

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Timer 1 Repeated

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	Daily / Weekly / Monthly / Short Period [-]		
Default value	Daily	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			

Repeated interval of **Timer 1 Function (page 206)**.

Daily	**Timer 1 Function (page 206)** is repeated every day.
Weekly	**Timer 1 Function (page 206)** is repeated every week in chosen days.
Monthly	**Timer 1 Function (page 206)** is repeated in chosen day every month or in chosen days of chosen week of month
Short Period	**Timer 1 Function (page 206)** is repeated in adjusted period.

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Timer 1 Repeat Day

Setpoint group	Scheduler	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			

Use this setpoint to adjust behavior of monthly repetition of the **Timer 1 Function (page 206)**.

Repeated Day	Chose one day in month when **Timer 1 Function (page 206)** will be activated.
Repeated Day In Week	Chose days in one week when **Timer 1 Function (page 206)** will be activated.

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Timer 1 Day

Setpoint group	Scheduler	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
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.			

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Timer 1 Repeated Day In Week

Setpoint group	Scheduler	**Related FW**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
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.*			

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Timer 1 Repeat Day In Month

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	1..31 [day]		
Default value	0	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			
Use this setpoint to chose the day in month when the **Timer 1 Function (page 206)** will be activated.			

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Timer 1 Repeat Week In Month

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	1 .. 5 [week]		
Default value	1 week	**Alternative config**	NO
Step	1 week		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			
This setpoint adjust the week of month in which the **Timer 1 Function (page 206)** will be activated.			

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Timer 1 Refresh Period

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	[-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		

Description

Refresh period of **Timer 1 Function (page 206)**. Meaning of this setpoint depends on type of repetition adjusted in **Timer 1 Repeated (page 209)**.

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 206)**, the **Timer 1 Function (page 206)** 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 206)**, the **Timer 1 Function (page 206)** will be activated in selected days adjusted by **Timer 1 Day (page 210)**.
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 206)**, the **Timer 1 Function (page 206)** will be activated in selected day of month adjusted by **Timer 1 Repeat Day In Month (page 210)** or in selected days of week of month adjusted by **Timer 1 Day (page 210)** and **Timer 1 Repeat Week In Month (page 211)**.
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 206)**, the **Timer 1 Function (page 206)** will be activated.

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Timer 1 Weekends

Setpoint group	Scheduler	**Related FW**	1.3.0
Range [units]	Including / Skip / Postpone [-]		
Default value	Including	**Alternative config**	NO
Step	[-]		
Comm object	0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Conditioned by the setpoint **Timer 1 Function (page 206)**		
Description			

Behavior of **Timer 1 Function (page 206)** on weekends.

Including	**Timer 1 Function (page 206)** counter is running on the weekends and **Timer 1 Function (page 206)** can be active.
Skip	**Timer 1 Function (page 206)** counter is running on the weekends but **Timer 1 Function (page 206)** isn't active.
Postpone	**Timer 1 Function (page 206)** counter isn't running on the weekends and **Timer 1 Function (page 206)** 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.

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Group: Geo-Fencing

Subgroup: Geo Fencing

Geo-Fencing

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
Range [units]	Disabled / Enabled / LBI Enable [-]		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	11681	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 216)** and **Fence 2 Protection (page 218)** are disabled.
Enabled	**Fence 1 Protection (page 216)** and **Fence 2 Protection (page 218)** are enabled.
LBI Enable	**Fence 1 Protection (page 216)** and **Fence 2 Protection (page 218)** are enabled only when logical binary input .**GEO-FENCING ENABLE (PAGE 317)** is active.

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Subgroup: Position

Home Latitude

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
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, Gen-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 215)*** *are used for counting* ***Fence Radius 1 (page 217)*** *and* ***Fence Radius 2 (page 219)****.*

Note: *This value can be also obtained automatically via logical binary input* ***GEO HOME POSITION (PAGE 317)****. 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**	1.3.0
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, Gen-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 215)*** *are used for counting* ***Fence Radius 1 (page 217)*** *and* ***Fence Radius 2 (page 219)****.*

Note: *This value can be also obtained automatically via logical binary input* ***GEO HOME POSITION (PAGE 317)****. 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**	1.3.0
Range [units]	HistRecOnl / Wrn / Sd / BOC[-]		
Default value	HistRecOnl	**Alternative config**	NO
Step	[-]		
Comm object	14610	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 217)**. Delay for protection is adjusted by setpoint **Fence 1 Delay (page 217)**.

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 217)**.
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 217)**.
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 217)**. ***Note:*** *Only in Mains-Gen application.*

Note: *Protection is activated also when GPS signal is lost for **Fence 1 Delay (page 217)**.*

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Fence Radius 1

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
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, Gen-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 216)** is activated after **Fence 1 Delay (page 217)**. ***Note:*** *The center of this circle area is defined by "Home" position – setpoints* ***Home Longitude (page 215)*** *and* ***Home Latitude (page 215)****.*			

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Fence 1 Delay

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
Range [units]	0..3600 [s]		
Default value	0 s	**Alternative config**	NO
Step	1 s		
Comm object	11682	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Delay for **Fence 1 Protection (page 216)**.			

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Subgroup: Fence 2

Fence 2 Protection

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
Range [units]	HistRecOnl / Wrn / Sd / BOC[-]		
Default value	HistRecOnl	**Alternative config**	NO
Step	[-]		
Comm object	14611	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 219)**. Delay for protection is adjusted by setpoint **Fence 2 Delay (page 219)**.

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 219)**.
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 219)**.
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 219)**. ***Note:*** *Only in Mains-Gen application.*

Note: *Protection is activated also when GPS signal is lost for **Fence 2 Delay (page 219)**.*

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Fence Radius 2

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
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, Gen-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 218)** is activated after **Fence 2 Delay (page 219)**. ***Note:*** *The center of this circle area is defined by "Home" position - setpoints* ***Home Longitude (page 215)*** *and* ***Home Latitude (page 215)****.*			

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Fence 2 Delay

Setpoint group	Geo-Fencing	**Related FW**	1.3.0
Range [units]	0..3600 [s]		
Default value	0 s	**Alternative config**	NO
Step	1 s		
Comm object	14609	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
Delay for **Fence 2 Protection (page 218)**.			

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Group: Plug-In Modules

Subgroup: Slot A

Slot A

Setpoint group	Plug-In Modules	**Related FW**	1.3.0
Range [units]	ENABLED / DISABLED [-]		
Default value	ENABLED	**Alternative config**	NO
Step	[-]		
Comm object	24280	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Direct / MODBUS [-]		
Default value	Direct	**Alternative config**	NO
Step	[-]		
Comm object	24522	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM1 Mode (page 221)**		
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**	1.3.0
Range [units]	8N1 / 8N2 / 8E1 [-]		
Default value	8N1	**Alternative config**	NO
Step	[-]		
Comm object	23867	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM1 Mode (page 221)**		
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**	1.3.0
Range [units]	Direct / MODBUS [-]		
Default value	Direct	**Alternative config**	NO
Step	[-]		
Comm object	24451	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM2 Mode (page 223)**		
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**	1.3.0
Range [units]	8N1 / 8N2 / 8E1 [-]		
Default value	8N1	**Alternative config**	NO
Step	[-]		
Comm object	23866	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
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, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **COM2 Mode (page 223)**		
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

Subgroup: Cellular Interface

Internet Connection

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	24315	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	2G / 3G / 4G / Automatic [-]		
Default value	Automatic	**Alternative config**	NO
Step	[-]		
Comm object	24132	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	internet	**Alternative config**	NO
Step	[-]		
Comm object	24363	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
Description			
APN (Access Point Name) of the network, provided by GSM operator.			

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APN Authentication

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	[-]		
Default value		**Alternative config**	
Step	[-]		
Comm object	23820	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Type of authentication used for the Access Point Name. ***Note:*** *An Access Point Name (APN) is the name of a gateway between a mobile network (GPRS, 4G, etc.) and another computer network (Internet).*			

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APN User Name

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	[-]		
Default value		**Alternative config**	
Step	[-]		
Comm object	24361	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
User Name used for the Access Point Name.			

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APN User Password

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	[-]		
Default value		**Alternative config**	
Step	[-]		
Comm object	24360	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Always		
Description			
Password used for the Access Point Name.			

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Connection Check IP1

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	[-]		
Default value	"empty"	**Alternative config**	NO
Step	[-]		
Comm object	23978	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		

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**	1.3.0
Range [units]	[-]		
Default value	"empty"	**Alternative config**	NO
Step	[-]		
Comm object	23977	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
Range [units]	[-]		
Default value	"empty"	**Alternative config**	NO
Step	[-]		
Comm object	23976	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
Range [units]	Automatic / Manual [-]		
Default value	Automatic	**Alternative config**	NO
Step	[-]		
Comm object	23988	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 225)** set to Automatic.

Automatic	DNS server addresses automatically obtained from a DHCP server are used
Manual	**DNS IP Address 1 (page 231)** and **DNS IP Address 2 (page 232)** 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**	1.3.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	**Alternative config**	NO
Step	[-]		
Comm object	24314	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 231)** 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 231)** 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**	1.3.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	**Alternative config**	NO
Step	[-]		
Comm object	23986	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 231)** 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 231)** 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**	1.3.0
Range [units]	ENABLED / DISABLED [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	23959	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Disabled/ Enabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23968	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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 256)**.

> **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**	1.3.0
Range [units]	[-]		
Default value	global.airgate.link	**Alternative config**	NO
Step	[-]		
Comm object	24364	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
Range [units]	1 .. 65535 [-]		
Default value	54440	**Alternative config**	NO
Step	1		
Comm object	24091	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
Range [units]	Disabled / Enabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23961	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	1 .. 65535 [-]		
Default value	23	**Alternative config**	NO
Step	[-]		
Comm object	23960	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 600 [s]		
Default value	60 s	**Alternative config**	NO
Step	1 s		
Comm object	24098	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	airgate.comap.cz global.airgate.link:9925	**Alternative config**	NO
Step	[-]		
Comm object	23962	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 "airgate.comap.czglobal.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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	23884	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	23883	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 15 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	23882	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	None / SSL-TLS / STARTTLS [-]		
Default value	None	**Alternative config**	NO
Step	[-]		
Comm object	23965	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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.

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Email Address 1

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24298	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.

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Email Address 2

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24297	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Email Address 3

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24145	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Email Address 4

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24144	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Subgroup: Message Settings

E-mail/SMS Language

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	Depends on CU languages [-]		
Default value	English	**Alternative config**	NO
Step	[-]		
Comm object	24299	**Related applications**	Mains-Mains, Mains-Gen, Gen-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. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Event Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	18971	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Wrn1 Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	17703	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Wrn1 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Wrn2 Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	17702	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Wrn2 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Wrn Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	8482	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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ALI Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	18993	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables ALI Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Hst Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10568	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Hst Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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MPR1 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	20345	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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MPR2 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	8484	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MPR2 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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MP1 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10117	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MP1 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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MP2 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	20369	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MP2 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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BOS Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10566	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables BOS Messages.			

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Telephone Number 1

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24296	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24295	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 3

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24143	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24142	**Related applications**	Mains-Mains, Mains-Gen, Gen-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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Subgroup: GPS Settings

GPS Tracking

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23975	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
Range [units]	DISABLED / ENABLED [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	23964	**Related applications**	Mains-Mains, Mains-Gen, Gen-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. The period of synchronization is 1 hour or when the cotnroller is reset or when the setpoint is reset (Enabled->Disabled->Enabled).			

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NTP Server

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	[-]		
Default value	pool.ntp.org	**Alternative config**	NO
Step	[-]		
Comm object	23963	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
NTP server address.			

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GPS Clock Sync

Setpoint group	CM-4G-GPS	**Related FW**	1.3.0
Range [units]	Enabled / Disabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23974	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
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, Gen-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**	1.3.0
Range [units]	MANUAL / AUTOMATIC / DISABLED [-]		
Default value	AUTOMATIC	**Alternative config**	NO
Step	[-]		
Comm object	23939	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 15 characters [-]		
Default value	192.168.1.254	**Alternative config**	NO
Step	[-]		
Comm object	23950	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **IP Address Mode (page 251)**		
Description			
The setpoint is used to set the address when you are in static mode . If **IP Address Mode (page 251)** 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 251)** is AUTOMATIC this setpoint is inactive. The IP address is assigned by the DHCP server. If **IP Address Mode (page 251)** 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**	1.3.0
Range [units]	Valid IP address [-]		
Default value	255.255.255.0	**Alternative config**	NO
Step	[-]		
Comm object	23949	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **IP Address Mode (page 251)**		
Description			
The setpoint is used to select the method how the Subnet Mask is adjusted. If **IP Address Mode (page 251)** 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 251)** is AUTOMATIC this setpoint is inactive. The Subnet Mask is assigned by the DHCP server. If **IP Address Mode (page 251)** is DISABLED Ethernet terminal is disabled.			

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Gateway IP

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	Valid IP address [-]		
Default value	192.168.1.1	**Alternative config**	NO
Step	[-]		
Comm object	23948	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **IP Address Mode (page 251)**		
Description			

The setpoint is used to select the method how the Gateway IP is adjusted.

If **IP Address Mode (page 251)** 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 251)** is AUTOMATIC this setpoint is inactive. The Subnet Mask is assigned by the DHCP server.

If **IP Address Mode (page 251)** is DISABLED Ethernet terminal is disabled.

A gateway is a device which connects the respective segment with the other segments and/or Internet.

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DNS Mode

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	Automatic / Manual [-]		
Default value	Automatic	**Alternative config**	NO
Step	[-]		
Comm object	23921	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 251)** set to Automatic.

Automatic	DNS server addresses automatically obtained from a DHCP server are used
Manual	**DNS IP Address 1 (page 254)** and **DNS IP Address 2 (page 254)** 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-Ethernet	**Related FW**	1.3.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	**Alternative config**	NO
Step	[-]		
Comm object	23947	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 251)** 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 251)** is AUTOMATIC this setpoint is inactive. The DNS server IP address is assigned by the DHCP server. If **IP Address Mode (page 251)** is DISABLED Ethernet terminal is disabled.			

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DNS IP Address 2

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	Valid IP address [-]		
Default value	8.8.8.8	**Alternative config**	NO
Step	[-]		
Comm object	23946	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 251)** 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 251)** is AUTOMATIC this setpoint is inactive. The DNS server IP address is assigned by the DHCP server. If **IP Address Mode (page 251)** is DISABLED Ethernet terminal is disabled.			

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IP Firewall

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	ENABLED / DISABLED [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	23920	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	DISABLED / ENABLED [-]		
Default value	ENABLED	**Alternative config**	NO
Step	[-]		
Comm object	23935	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 256)**. Also the standard TCP/IP is enabled.

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AirGate Address

Setpoint group	CM-4G-GPS; CM-Ethernet	**Related FW**	1.3.0
Range [units]	[-]		
Default value	global.airgate.link	**Alternative config**	NO
Step	[-]		
Comm object	24364	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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**	1.3.0
Range [units]	1 .. 65535 [-]		
Default value	23	**Alternative config**	NO
Step	1		
Comm object	23919	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Disabled / Enabled [-]		
Default value	Enabled	**Alternative config**	NO
Step	[-]		
Comm object	23917	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	1 .. 65535 [-]		
Default value	23	**Alternative config**	NO
Step	[-]		
Comm object	23918	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 600 [s]		
Default value	60 s	**Alternative config**	NO
Step	1 s		
Comm object	24098	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	DISABLED / ENABLED [-]		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	23937	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	Ethernet	**Related FW**	1.3.0
Range [units]	0 .. 600 [s]		
Default value	60 s	**Alternative config**	NO
Step	1 s		
Comm object	24097	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Disabled / SNMP v1/v2c / SNMP v3 [-]		
Default value	Disabled	**Alternative config**	NO
Step	[-]		
Comm object	23936	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoints Enables or disables Simple Network Management Protocol (SNMP) Agent. ***Note:*** *SNMP v3 has upgraded encryption, remote configuration, and security (extra setpoints are available).* ***Note:*** *It is supported only User-Based security model (USM, RFC-3414). View-based Access Control Model (VACM, RFC-3415) is not supported.*			

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SNMP Trap Format

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	v1Trap / v2Notif / v2Inform [-]		
Default value	v1Trap	**Alternative config**	NO
Step	[-]		
Comm object	23922	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Valid IP address [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	24095	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	Valid IP address [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	24094	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	public	**Alternative config**	NO
Step	[-]		
Comm object	23941	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **SNMP Agent (page 259)**		
Description			
SNMP Community String only for reading.			

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SNMP WR Community String

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..31 characters [-]		
Default value	private	**Alternative config**	NO
Step	[-]		
Comm object	23940	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **SNMP Agent (page 259)**		
Description			
SNMP Community String for writing and reading.			

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SNMP Engine User Name

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	-	**Alternative config**	NO
Step	[-]		
Comm object	23851	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if **SNMP Agent (page 259)** = SNMP v3		
Description			
User defined name, used for the controller identification at SNMP system.			

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SNMP Privacy Protocol

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	DES / 3DES / AES128 / AES256 [-]		
Default value	AES128	**Alternative config**	NO
Step	[-]		
Comm object	23853	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if **SNMP Agent (page 259)** = SNMP v3		
Description			
Selects SNMP v3 Privacy Protocol.			

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SNMP Authentication Protocol

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	MD5 / SHA / SHA256[-]		
Default value	SHA	**Alternative config**	NO
Step	[-]		
Comm object	23854	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if **SNMP Agent (page 259)** = SNMP v3		
Description			
Selects SNMP v3 Authentication Protocol.			

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SNMP Security Level

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	NONE/ AUTH-NOPRIV / AUTH-PRIV [-]		
Default value	NONE	**Alternative config**	NO
Step	[-]		
Comm object	23852	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if **SNMP Agent (page 259)** = SNMP v3		
Description			
Selects SNMP v3 security level. If NONE the agent will work in SNMP v2c mode.			

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Subgroup: E-mail Settings

SMTP Server Address

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	airgate.comap.cz global.airgate.link:9925	**Alternative config**	NO
Step	[-]		
Comm object	23942	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 "airgate.comap.czglobal.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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	23881	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 31 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	23880	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	0 .. 15 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	23879	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Range [units]	None / SSL-TLS / STARTTLS [-]		
Default value	None	**Alternative config**	NO
Step	[-]		
Comm object	23938	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed + conditioned by the setpoint **Internet Connection (page 225)**		
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.

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Email Address 1

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24298	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.

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Email Address 2

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24297	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Email Address 3

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24145	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Email Address 4

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	0..63 characters [-]		
Default value	[-]	**Alternative config**	NO
Step	[-]		
Comm object	24144	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Subgroup: Message Settings

E-mail/SMS Language

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	Depends on CU languages [-]		
Default value	English	**Alternative config**	NO
Step	[-]		
Comm object	24299	**Related applications**	Mains-Mains, Mains-Gen, Gen-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. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Event Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	18971	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Wrn1 Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	17703	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Wrn1 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Wrn2 Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	17702	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Wrn2 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Wrn Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	8482	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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ALI Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	18993	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables ALI Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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Hst Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10568	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables Hst Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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MPR1 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	20345	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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MPR2 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	8484	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MPR2 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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MP1 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10117	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MP1 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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MP2 Messages

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	20369	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables MP2 Messages. This setpoint is common for CM3-Ethernet and CM2-4G-GPS modules.			

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BOS Message

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
Range [units]	ON / OFF [-]		
Default value	ON	**Alternative config**	NO
Step	[-]		
Comm object	10566	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
This setpoint enables or disables BOS Messages.			

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Subgroup: NTP Settings

NTP Clock Synchronization

Setpoint group	CM-Ethernet	**Related FW**	1.3.0
Range [units]	DISABLED / ENABLED [-]		
Default value	DISABLED	**Alternative config**	NO
Step	[-]		
Comm object	23934	**Related applications**	Mains-Mains, Mains-Gen, Gen-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-Ethernet	**Related FW**	1.3.0
Range [units]	[-]		
Default value	pool.ntp.org	**Alternative config**	NO
Step	[-]		
Comm object	23933	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Config level	Standard		
Setpoint visibility	Only if relevant module is installed		
Description			
NTP server address.			

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Time Zone

Setpoint group	CM-4G-GPS CM-Ethernet	**Related FW**	1.3.0
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, Gen-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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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 276)**.

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

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Group: Source 1

Source 1 Frequency

Value group	Source 1	**Related FW**	1.3.0
Units	Hz		
Comm object	20519	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Frequency of Source 1.			

back to List of values

Source 1 Voltage L1-N

Value group	Source 1	**Related FW**	1.3.0
Units	V		
Comm object	20530	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 1 voltage on phase 1.			

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Source 1 Voltage L2-N

Value group	Source 1	**Related FW**	1.3.0
Units	V		
Comm object	20529	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 1 voltage on phase 2.			

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Source 1 Voltage L3-N

Value group	Source 1	**Related FW**	1.3.0
Units	V		
Comm object	20528	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 1 voltage on phase 3.			

back to List of values

Source 1 Voltage L1-L2

Value group	Source 1	Related FW	1.3.0
Units	V		
Comm object	20527	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 1 phase to phase voltage between L1 and L2 phases.			

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Source 1 Voltage L2-L3

Value group	Source 1	Related FW	1.3.0
Units	V		
Comm object	20526	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 1 phase to phase voltage between L2 and L3 phases.			

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Source 1 Voltage L3-L1

Value group	Source 1	Related FW	1.3.0
Units	V		
Comm object	20525	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 1 phase to phase voltage between L3 and L1 phases.			

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Source 1 Voltage Unbalance Ph-N

Value group	Source 1	Related FW	1.3.0
Units	V		
Comm object	19594	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual value of Source 1 voltage unbalance Ph-N.			

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Source 1 Voltage Unbalance Ph-Ph

Value group	Source 1	**Related FW**	1.3.0
Units	V		
Comm object	19595	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual value of Source 1 voltage unbalance Ph-Ph.			

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Group: Source 2

Source 2 Frequency

Value group	Source 2	**Related FW**	1.3.0
Units	Hz		
Comm object	20506	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Frequency of Source 2.			

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Source 2 Voltage L1-N

Value group	Source 2	**Related FW**	1.3.0
Units	V		
Comm object	20517	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 2 voltage on phase 1.			

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Source 2 Voltage L2-N

Value group	Source 2	**Related FW**	1.3.0
Units	V		
Comm object	20516	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 2 voltage on phase 2.			

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Source 2 Voltage L3-N

Value group	Source 2	**Related FW**	1.3.0
Units	V		
Comm object	20515	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 2 voltage on phase 3.			

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Source 2 Voltage L1-L2

Value group	Source 2	Related FW	1.3.0
Units	V		
Comm object	20514	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 2 phase to phase voltage between L1 and L2 phases.			

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Source 2 Voltage L2-L3

Value group	Source 2	Related FW	1.3.0
Units	V		
Comm object	20513	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 2 phase to phase voltage between L2 and L3 phases.			

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Source 2 Voltage L3-L1

Value group	Source 2	Related FW	1.3.0
Units	V		
Comm object	20512	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Source 2 phase to phase voltage between L3 and L1 phases.			

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Source 2 Voltage Unbalance Ph-N

Value group	Source 2	Related FW	1.3.0
Units	V		
Comm object	19596	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual value of Source 2 voltage unbalance Ph-N.			

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Source 2 Voltage Unbalance Ph-Ph

Value group	Source 2	**Related FW**	1.3.0
Units	V		
Comm object	19597	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual value of Source 2 voltage unbalance Ph-Ph.			

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Group: Controller I/O

Battery Volts

Value group	Controller I/O	**Related FW**	1.3.0
Units	V		
Comm object	8213	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Controller supply voltage.			

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Binary Inputs

Value group	Controller I/O	**Related FW**	1.3.0
Units	[-]		
Comm object	8235	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of the binary inputs of the controller.			

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Binary Outputs

Value group	Controller I/O	**Related FW**	1.3.0
Units	[-]		
Comm object	8239	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of the binary outputs of the controller.			

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Group: Statistics

Pulse Counter 1

Value group	Statistics	Related FW	1.3.0
Units	-		
Comm object	10986	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
This is the value of **PULSE COUNTER 1 (PAGE 318)** function. ***Note:*** *Maximum value is 1000000.*			

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Pulse Counter 2

Value group	Statistics	Related FW	1.3.0
Units	-		
Comm object	10987	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
This is the value of **PULSE COUNTER 2 (PAGE 319)** function. ***Note:*** *Maximum value is 1000000.*			

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Changeover Counter

Value group	Statistics	Related FW	1.3.0
Units	[-]		
Comm object	17712	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Counter of load transfers between Source 1 and Source 2.			

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Operating Hours Of Source 1

Value group	Statistics	Related FW	1.3.0
Units	Hrs		
Comm object	17710	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Counter of hours when load is powered by Source 1. ***Note:*** *Counting of hours is based on closed breaker of source.*			

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Operating Hours Of Source 2

Value group	Statistics	Related FW	1.3.0
Units	Hrs		
Comm object	17711	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Counter of hours when load is powered by Source 2. ***Note:*** *Counting of hours is based on closed breaker of source.*			

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Group: Info

Active Application

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	14446	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
This Value mirrors the active application in the controller. **Example:** Mains-Mains, Gen-Gen or Mains-Gen.			

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Breaker State

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	9245	Related applications	Mains-Mains, Mains-Gen, Gen-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.

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Timer Text

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	10040	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The value contains the "Current process timer" text which is shown on the main screen of the controller.			

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Connection Type

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	12944	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The text of this value represents the connection type which is adjusted in setpoint **Connection type (page 128)**.			

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SPI Module A

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	14447	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The name of plug-in module which is inserted in slot A.			

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Timer Value

Value group	Info	Related FW	1.3.0
Units	[HH:MM:SS]		
Comm object	14147	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The value contains the "Current process timer" value which is shown on the main screen of the controller.			

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ID String

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	24501	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Name of controller which is used in InteliConfig in command bar.			

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FW Version

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	24339	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Major and minor firmware version number.			

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Application

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	8480	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The value contains actual application in controller.			

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FW Branch

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	8707	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The value contains actual branch of firmware in controller.			

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Generator 1 State

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	62814	Related applications	Gen-Gen
Description			
The value contains actual "engine state" of Gen 1.			

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Generator 2 State

Value group	Info	Related FW	1.3.0
Units	[-]		
Comm object	62813	**Related applications**	Mains-Gen, Gen-Gen
Description			
The value contains actual "engine state" of Gen 2.			

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Group: Log Bout

Log Bout 1

Value group	Log Bout	**Related FW**	1.3.0
Units	[-]		
Comm object	9143	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Log Bout 2

Value group	Log Bout	**Related FW**	1.3.0
Units	[-]		
Comm object	9144	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Log Bout 3

Value group	Log Bout	**Related FW**	1.3.0
Units	[-]		
Comm object	9145	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Log Bout 4

Value group	Log Bout	**Related FW**	1.3.0
Units	[-]		
Comm object	9146	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Log Bout 5

Value group	Log Bout	Related FW	1.3.0
Units	[-]		
Comm object	9147	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Log Bout 6

Value group	Log Bout	Related FW	1.3.0
Units	[-]		
Comm object	9148	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Log Bout 7

Value group	Log Bout	Related FW	1.3.0
Units	[-]		
Comm object	9149	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of binary outputs.			

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Group: Fixed Protection States

Fixed Protections States 1

Value group	Fixed Protection States	**Related FW**	1.3.0
Units	[-]		
Comm object	20744	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Values of LBO Fixed Protections State.			

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Fixed Protections States 2

Value group	Fixed Protection States	**Related FW**	1.3.0
Units	[-]		
Comm object	20745	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Values of LBO Fixed Protections State.			

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Fixed Protections States 3

Value group	Fixed Protection States	**Related FW**	1.3.0
Units	[-]		
Comm object	20746	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Values of LBO Fixed Protections State.			

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Group: Date/Time

Time

Value group	Date/Time	Related FW	1.3.0
Units	HH:MM:SS		
Comm object	24554	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Shows setup time.			

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Date

Value group	Date/Time	Related FW	1.3.0
Units	DD.MM.YYYY		
Comm object	24553	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Shows setup date.			

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Time Mode

Value group	Date/Time	Related FW	1.3.0
Units	HH:MM:SS		
Comm object	20252	**Related applications**	Mains-Mains, Mains-Gen, Gen-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).			

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Exercise Timer 1

Value group	Date/Time	Related FW	1.3.0
Units	HH:MM:SS		
Comm object	19664	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Remaining time of Exercise Timer 1.			

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Group: CM-4G-GPS

Signal Strength

Value group	CM-4G-GPS	**Related FW**	1.3.0
Units	%		
Comm object	24302	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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Modem Status

Value group	CM-4G-GPS	**Related FW**	1.3.0
Units	[-]		
Comm object	24288	**Related applications**	Mains-Mains, Mains-Gen, Gen-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

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Network Status

Value group	CM-4G-GPS	**Related FW**	1.3.0
Units	[-]		
Comm object	23972	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			

The text of this value represents the status of the GSM modem.

Code	Description
Not availab	Not available
Available	Available
Attached	Attached

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Network Name

Value group	CM-4G-GPS	**Related FW**	1.3.0
Units	[-]		
Comm object	24147	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.*

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Network Mode

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24146	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
The type of data connection.			

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GPS Status

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	23973	Related applications	Mains-Mains, Mains-Gen, Gen-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.

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Latitude

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24268	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual GPS latitude. Positions on north hemisphere have positive value, position on south hemisphere have negative value.			

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Longitude

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24267	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual GPS longitude. Positions on east hemisphere have positive value, position on west hemisphere have negative value.			

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HomePosDist

Value group	CM-4G-GPS	Related FW	1.3.0
Units	km		
Comm object	11680	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual distance from home position. Home position is adjusted via setpoints **Home Latitude (page 215)** and **Home Longitude (page 215)** or by binary input **GEO HOME POSITION (PAGE 317)**.			

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Active Satellites

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24265	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Number of available satellites for GPS location.			

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Speed

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24264	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Actual speed of the controller calculated from the GPS coordinates.			

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AirGate ID

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24309	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Identification string generated by AirGate server for the purpose of establishing communication via InteliConfig or any other supported PC tool.			

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AirGate Status

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	23967	Related applications	Mains-Mains, Mains-Gen, Gen-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

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AirGate Servicing Node

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	23991	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			

IP address of AirGate 2 node to which the module is currently attached.

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Current IP Address

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23931	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			

Current IP address of the controller.

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Primary DNS

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	23984	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Current domain name server.			

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Secondary DNS

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	23983	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Backup domain name server.			

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Last Email Result

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24307	Related applications	Mains-Mains, Mains-Gen, Gen-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

Modem FW Version

Value group	CM-4G-GPS	Related FW	1.3.0
Units	[-]		
Comm object	24149	Related applications	Mains-Mains, Mains-Gen, Gen-Gen

Description
FW version of the modem.

back to List of values

Modem IMEI

Value group	CM-4G-GPS	Related FW	1.3.0
Units			
Comm object	23828	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
International Mobile Equipment Identity of modem.			

back to List of values

Group: CM-Ethernet

ETH Interface Status

Value group	CM-Ethernet	**Related FW**	1.3.0
Units	[-]		
Comm object	23924	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Current status of ethernet communication.			

back to List of values

Current IP Address

Value group	CM-Ethernet	**Related FW**	1.3.0
Units	[-]		
Comm object	23931	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Current IP address of the controller.			

back to List of values

Current Subnet Mask

Value group	CM-Ethernet	**Related FW**	1.3.0
Units	[-]		
Comm object	23930	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Current subnet mask.			

back to List of values

Current Gateway

Value group	CM-Ethernet	**Related FW**	1.3.0
Units	[-]		
Comm object	23929	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Current gateway address.			

back to List of values

Primary DNS

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23928	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Current domain name server.			

back to List of values

Secondary DNS

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23927	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
Backup domain name server.			

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AirGate ID

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23926	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0
Units	[-]		
Comm object	23915	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
IP address of AirGate 2 node to which the module is currently attached.			

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AirGate Status

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23910	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen

Description

Diagnostic code for AirGate connection. Helps in troubleshooting.

Code	Description
0	SIM card is not inserted
1	Controller registered, waiting for authorization
2	Not possible to register, controller blacklisted
3	Not possible to register, server has no more capacity
4	Not possible to register, other reason
5	Controller registered and authorized

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	1.3.0
Units	[-]		
Comm object	23925	Related applications	Mains-Mains, Mains-Gen, Gen-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	Cannot resolve SMTP server's IP address.
32	Error while reading email content data (24327).

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MAC Address

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23932	Related applications	Mains-Mains, Mains-Gen, Gen-Gen

Description

Current MAC address of the controller ethernet interface.

back to List of values

Ethernet PHY Mode

Value group	CM-Ethernet	Related FW	1.3.0
Units	[-]		
Comm object	23916	**Related applications**	Mains-Mains, Mains-Gen, Gen-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**	1.3.0
Units	[-]		
Comm object	14291	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0
Units	[-]		
Comm object	20743	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 1. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 2

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20827	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 2. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 3

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20828	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 3. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 4

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20829	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 4. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 5

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20830	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 5. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 6

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20831	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 6. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 7

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20832	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 7. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

User Button 8

Value group	User Buttons	Related FW	1.3.0
Units	[-]		
Comm object	20833	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Description			
State of User Button 8. ***Note:*** *For more information* ***see User Buttons on page 92****.*			

back to List of values

Group: Remote Control

RemoteControl2B 1

Value group	Remote Control	Related FW	1.3.0
Units	-		
Comm object	16671	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0
Units	-		
Comm object	16672	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0
Units	-		
Comm object	16673	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0
Units	-		
Comm object	16674	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0
Units	-		
Comm object	16683	**Related applications**	Mains-Mains, Mains-Gen, Gen-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

8.1.4 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 315)**.

Logical binary inputs alphabetically

back to Controller objects

LBI: A

Access Lock

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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: E

Emergency Stop

Related FW	1.3.0	**Related applications**	Mains-Gen, Gen-Gen
Comm object	40		
Description			
The gen-set shutdown procedure will start immediately when this input is activated. **GEN START/STOP (PAGE 337)** output is deactivated and S2CB is opened.			

back to Logical binary inputs alphabetically

LBI: F

Fault Reset Button

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	191		
Description			
Binary input has the same function as Fault Reset button on the InteliATS2 50 front panel.			

back to Logical binary inputs alphabetically

LBI: G

Geo Home Position

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 215)** and **Home Longitude (page 215)** 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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	218		
Description			
This binary input enables or disables **Fence 1 Protection (page 216)** and **Fence 2 Protection (page 218)** if **Group: Geo-Fencing (page 214)** is adjusted to value "LBI Enable".			

back to Logical binary inputs alphabetically

LBI: H

Horn Reset Button

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	192		
Description			
Binary input has the same function as Horn reset button on the InteliATS2 50 front panel.			

back to Logical binary inputs alphabetically

LBI: N

Neutral Position

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	1090		
Description			
This input switches a three position ATS switch to its neutral position – it activates the binary outputs **NEUTRAL CLOSE/OPEN (PAGE 340)** and **NEUTRAL ON COIL (PAGE 340)**. S1CB and S2CB are switched to off.			

back to Logical binary inputs alphabetically

LBI: P

Protection Force Disable

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	16		
Description			

Activation of this LBI blocks 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, Blocked (protection is turned off), Protection Force Block (protection is turned off by this LBI).*

back to Logical binary inputs alphabetically

Protection Force Disable 2

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	17		
Description			

Activation of this LBI blocks 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, Blocked (protection is turned off), Protection Force Block (protection is turned off by this LBI).*

back to Logical binary inputs alphabetically

Pulse Counter 1

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 135)** the counter value **Pulse Counter 1 (page 285)** 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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 136)** the counter value **Pulse Counter 2 (page 285)** 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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	620		
Description			
The controller is switched to the AUTO mode (there are three 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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	618		
Description			
The controller is switched to the MAN mode (there are three 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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	617		
Description			
The controller is switched to the OFF mode (there are three 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	1.3.0	Related applications	Mains-Gen, Gen-Gen
Comm object	38		
Description			

Use this input to start and stop the engine in AUTO mode.

> **IMPORTANT: LBI REMOTE START/STOP (PAGE 321) is trigger for starting of gen-set in AUTO mode. Without this LBI, primary or secondary gen-set is not started!**

Note: *Mains-Gen application only: 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 143)*** *the S2CB breaker is closed. Once the mains is OK, the* ***Primary Source Return Delay (page 142)*** *elapses and the S2CB breaker is opened. Then after* ***Open Transfer Min Break (page 143)*** *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.*

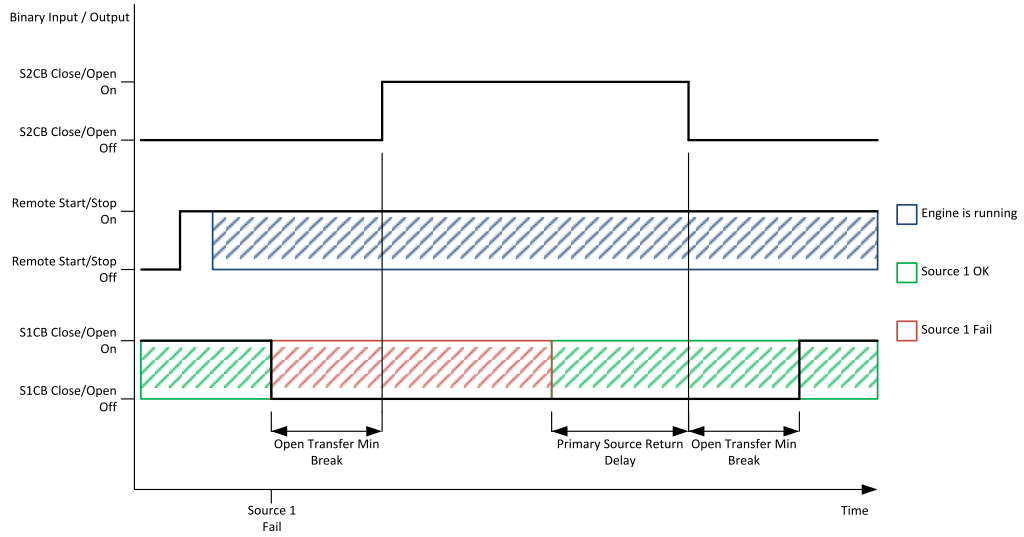

Image 30.1 Remote Start/Stop

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 Block

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	1451		
Description			
This binary input can allow or block the transfer to Source 1 in Auto mode. In case this binary input is activated when the load is already transferred to Source 1, the S1CB breaker opens immediately. If Source 1 is engine, it is stopped.			

back to Logical binary inputs alphabetically

S1 Fail Block

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 142)** is started and when it elapses S2CB is opened. When S2CB is opened after **Open Transfer Min Break (page 143)** the S1CB is closed. ***Note:*** *This input simulates healthy Source 1.*			

back to Logical binary inputs alphabetically

S1CB Button

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	194		
Description			
This binary input has the same function as S1CB button I/O on the InteliATS2 50 front panel. It is evaluated in MAN mode only.			

back to Logical binary inputs alphabetically

S1CB Feedback

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	65		
Description			

Use this input for indication whether the Source 1 circuit breaker is open or closed.

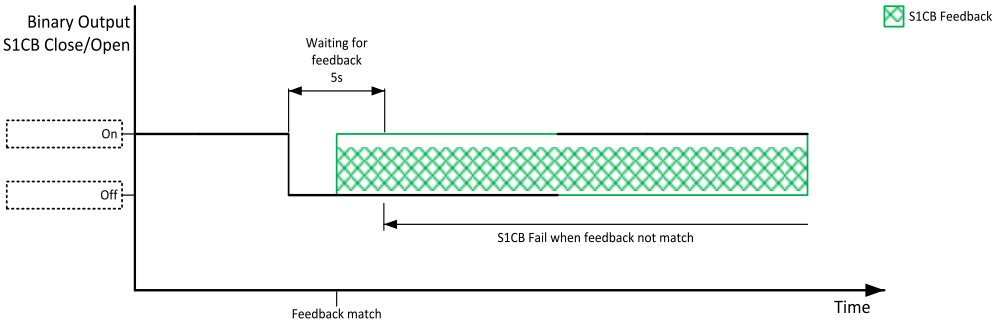

Image 30.2 S1CB Feedback

Note: *InteliATS2 50 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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	193		
Description			

Binary input has the same function as the S2CB button I/O on the InteliATS2 50 front panel. It is evaluated in MAN mode only.

back to Logical binary inputs alphabetically

S2CB Feedback

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	63		
Description			
Use this input for indication whether the Source 2 circuit breaker is open or closed.			

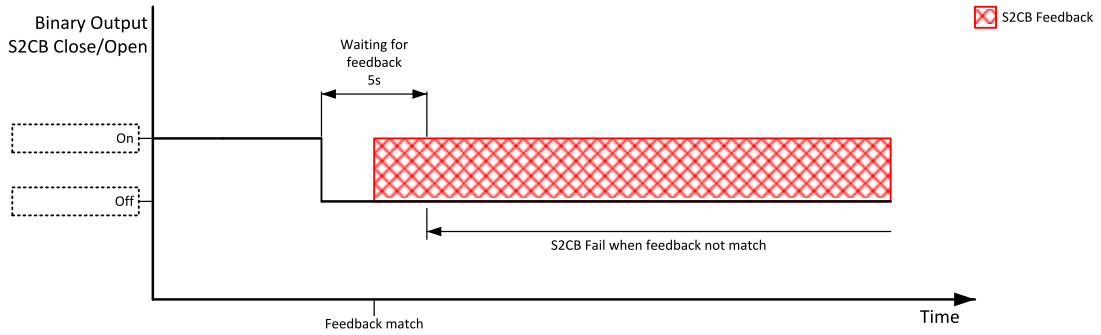

Image 30.3 S2CB Feedback 1

Note: *InteliATS2 50 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	1.3.0	**Related applications**	Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Gen, Gen-Gen
Comm object	1190		
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	1.3.0	**Related applications**	Mains-Gen, Gen-Gen
Comm object	189		
Description			
Binary input has the same function as Start Button on the InteliATS2 50 front panel. It is evaluated in MAN mode only.			

back to Logical binary inputs alphabetically

Stop Button

Related FW	1.3.0	Related applications	Mains-Gen, Gen-Gen
Comm object	190		
Description			
Binary input has the same function as Stop Button  on the InteliATS2 50 front panel. It is evaluated in MAN Mode only.			

back to Logical binary inputs alphabetically

Switch To AUT

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 326)** 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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 325)** is activated – CU goes to AUTO Mode (at this moment, LBIs Switch To MAN and Switch To AUT 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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 325)** 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

Time Stamp Act

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	125		
Description			
Binary input activates time stamp writing to history depending on Date/Time:Time stamp act and Time Stamp Per setpoints.			

back to Logical binary inputs alphabetically

Total Emergency Stop

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 337)**.			

back to Logical binary inputs alphabetically

Transfer to S1

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	1445		
Description			
When this binary input is activated in AUTO mode the transfer of the load to Source 1 is initiated. The timer Primary Source Return Delay is not counted.			

back to Logical binary inputs alphabetically

Transfer to S2

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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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 329)**.

Logical binary outputs alphabetically

back to Controller objects

LBO: A

AIN Switch01

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 197)** and **AIN Switch01 Off (page 198)**. The value is measured from **AIN SWITCH 01 (PAGE 352)** analog input.

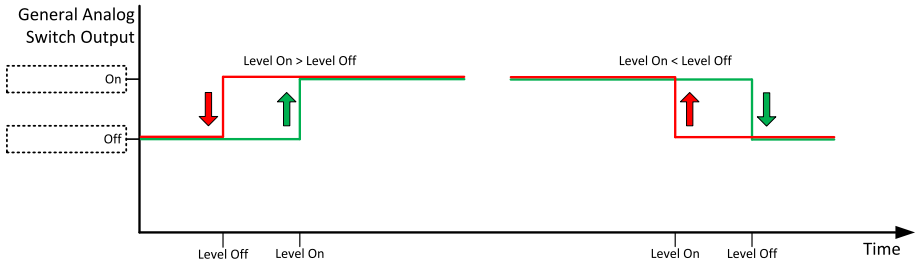

Image 30.4 General analog input 1 switch

back to Logical binary outputs alphabetically

AIN Switch02

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 199)** and **AIN Switch02 Off (page 200)**. The value is measured from **AIN SWITCH 02 (PAGE 352)** analog input.

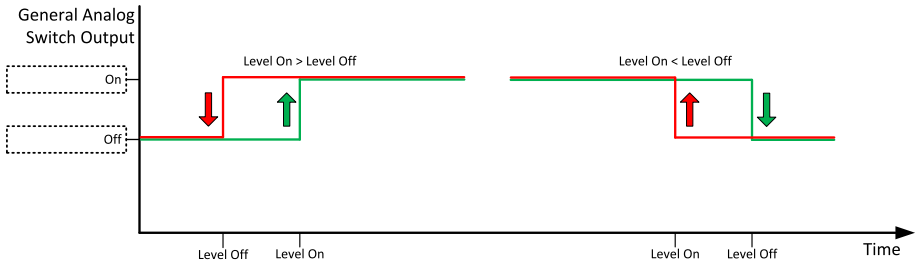

Image 30.5 General analog input 2 switch

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AL Common BOS 1

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	7339		
Description			
Output is activated when any BOS 1 alarm appears. The output opens, if: › No BOS1 alarm is active and › Fault reset button is pressed			

back to Logical binary outputs alphabetically

AL Common BOS

Related FW	1.3.0	Related applications	Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Gen-Gen
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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Gen-Gen
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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 Common Wrn1

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	7335		
Description			
Output is activated when any warning 1 alarm appears. The output opens, if: › No warning 1 alarm is active and › Fault reset button is pressed			

back to Logical binary outputs alphabetically

AL Common Wrn2

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	7336		
Description			
Output is activated when any warning 2 alarm appears. The output opens, if: › No warning 2 alarm is active and › Fault reset button is pressed			

back to Logical binary outputs alphabetically

AL S1 Fail

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 Freq Wrn

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	7343		
Description			
This output is active when any Source 1 fixed protection of type Wrn is active or inactive but not confirmed in the alarmlist.			

back to Logical binary outputs alphabetically

AL S1 Frequency

Related FW	1.3.0	Related applications	Gen-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 Wrn

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	7342		
Description			
This output is active when any Source 1 fixed voltage protection is active or inactive but not confirmed in the alarmlist.			

back to Logical binary outputs alphabetically

AL S1 Voltage

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.			

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AL S2 Frequency

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	2550		
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.			

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AL S2 Voltage

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 67**).			

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Exercise Timer 1

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 206)** subgroup. This output is active when Timer 1 is active.			

back to Logical binary outputs alphabetically

LBO: F

FltRes Button Echo

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	30		
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 316)** is activated.			

back to Logical binary outputs alphabetically

FltRes Button State

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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

LBO: G

Gen1 Start/Stop

Related FW	1.3.0	**Related applications**	Gen-Gen
Comm object	7328		
Description			
This LBO is used to start or stop the engine - Source 1.			

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Gen Start/Stop

Related FW	1.3.0	**Related applications**	Mains-Gen, Gen-Gen
Comm object	2582		
Description			
This LBO is used to start or stop the engine - Source 2. ***Note:*** *Name of LBO for Gen-Gen application is Gen2 Start/Stop.*			

back to Logical binary outputs alphabetically

LBO: H

Heartbeat

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 138)** has elapsed			

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HornRes Button Echo

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	2696		
Description			
LBO is active as long as it's button is pressed or it's LBI is active.			

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LBO: I

Initialized

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	1222		
Description			
This output is activated when the controller proceeded through initialization phase. (Initialization phase is restart or power up of the controller.)			

back to Logical binary outputs alphabetically

LBO: M

Mode AUTO

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	18		
Description			
This output is active whenever the controller is in MAN mode. ***Note:*** *In Gen-Gen application name of this LBO is Mode MAN 1.*			

back to Logical binary outputs alphabetically

Mode MAN 2

Related FW	1.3.0	Related applications	Gen-Gen
Comm object	7333		
Description			
This output is active whenever the controller is in MAN 2 mode.			

back to Logical binary outputs alphabetically

Mode OFF

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 50 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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	2591		
Description			
The output activates the neutral position coil of the three positions ATS switch. The pulse lasts for 5 seconds.			

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Not In AUTO

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	1248		
Description			
This output is active when controller isn't in AUTO mode.			

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Not Used

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	286		
Description			
Output has no function.			

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LBO: R

Ready To AMF

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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

LBO: S

S1 Healthy

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 361)** / **Wrn S1CB Fail To Open (page 362)** / **Wrn S1CB Fail To Close (page 362)**.
- active **ALI Source 1 Ph Rotation Opposite (page 366)**.

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S1 Ready To Load

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	2547		
Description			
This output is active when there is no Source 1 failure detected and S2CB breaker is opened.			

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S1CB Button Echo

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 50 controllers can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.*			

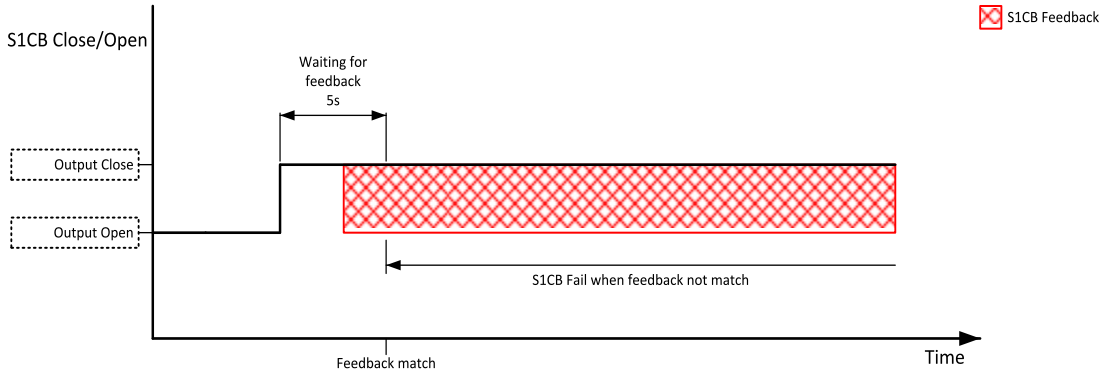

Image 30.6 S1CB Close command

back to Logical binary outputs alphabetically

S1CB OFF Coil

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.

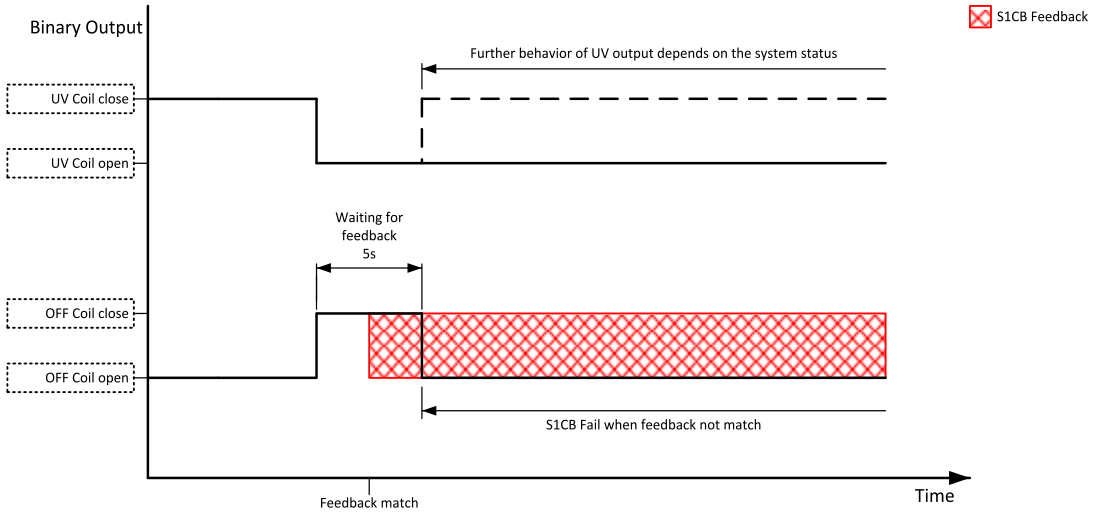

Image 30.7 S1CB OFF Coil command

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S1CB ON Coil

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	46		
Description			

The output is intended for control of close coil of S1CB circuit breaker.

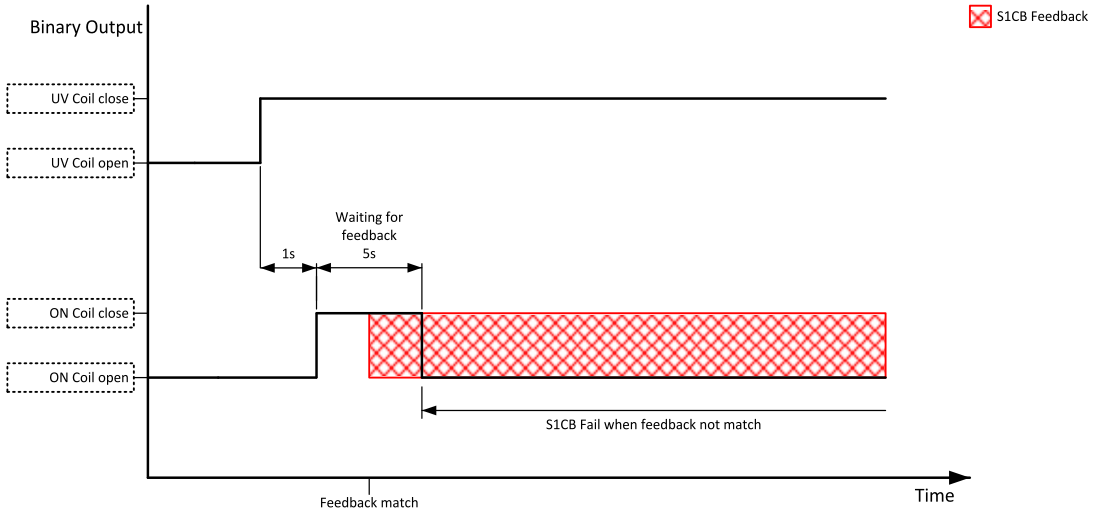

Image 30.8 S1CB ON Coil close command

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S1CB Status

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 323)**.
- In case the S1CB feedback is not configured the S1CB Status reflects the **S1CB CLOSE/OPEN (PAGE 342)** output.

back to Logical binary outputs alphabetically

S1CB UV Coil

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.

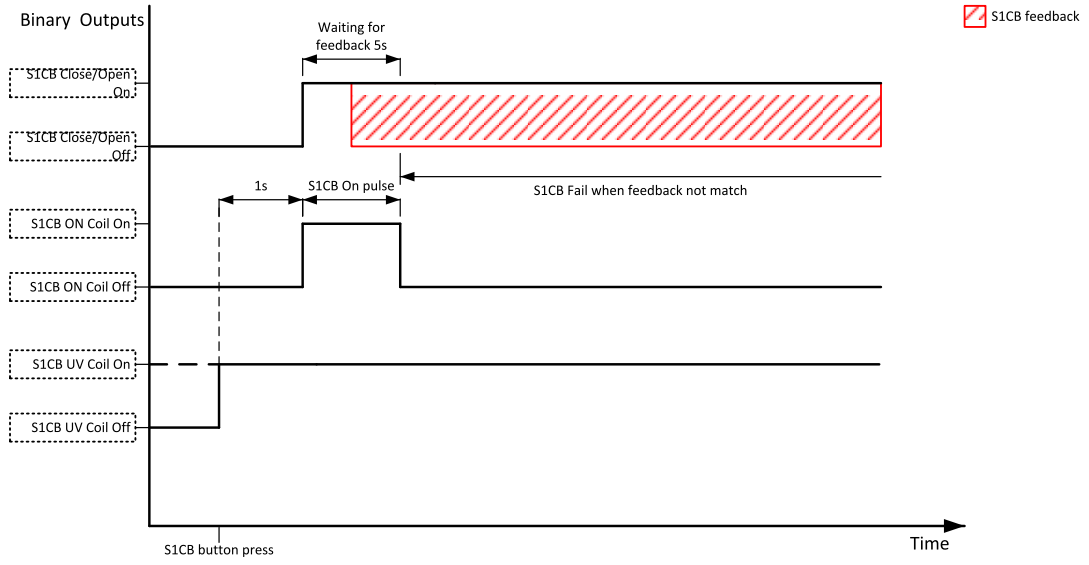

Image 30.9 S1CB UV Coil close command

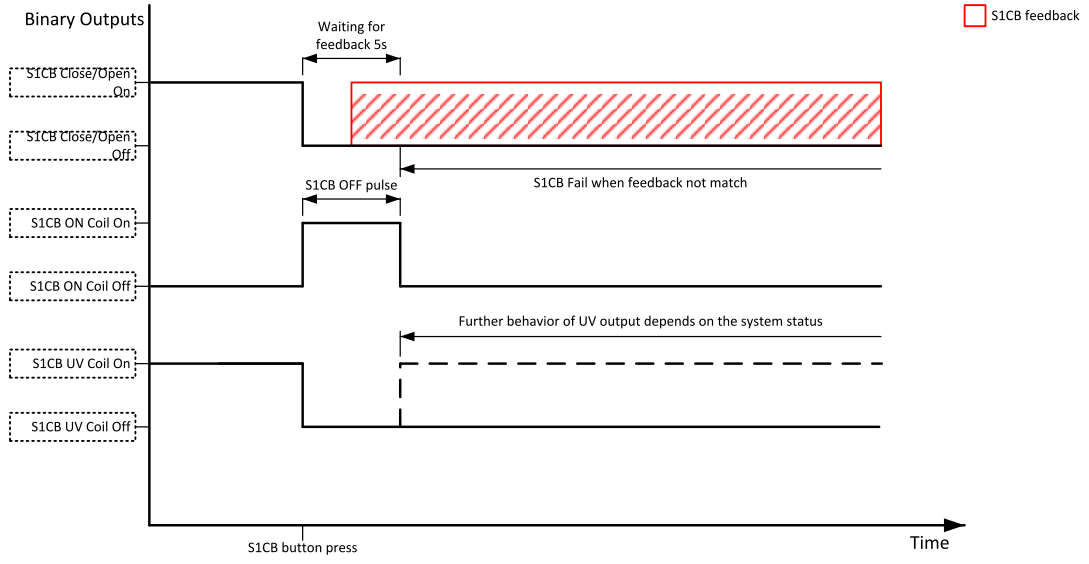

Image 30.10 S1CB UV Coil open command

back to Logical binary outputs alphabetically

S2 Healthy

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-Gen
Comm object	2551		
Description			

The LBO is active when Source 2 frequency and voltages are within the protection limits and LBI **SOURCE 2 READY TO LOAD (PAGE 324)** is active (when configured).

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 362)** / **Wrn S2CB Fail To Open (page 362)** / **Wrn S2CB Fail To Close (page 362)**.
- active **ALI Source 2 Ph Rotation Opposite (page 366)**.

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S2 Ready To Load

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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 50 controllers can work even without breaker feedbacks, in this case do not configure the feedback to binary inputs.*

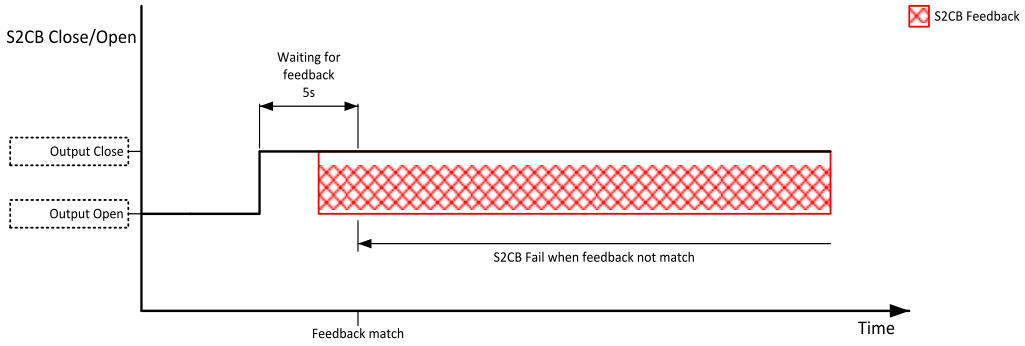

Image 30.11 S2CB Close command

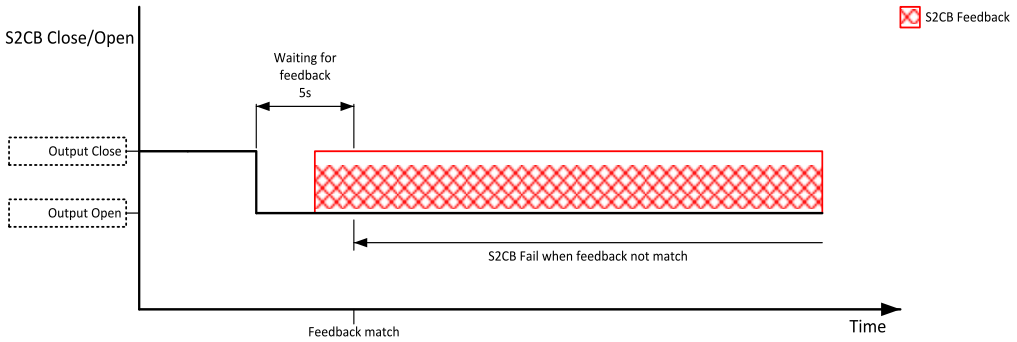

Image 30.12 S2CB Open command

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S2CB OFF Coil

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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.

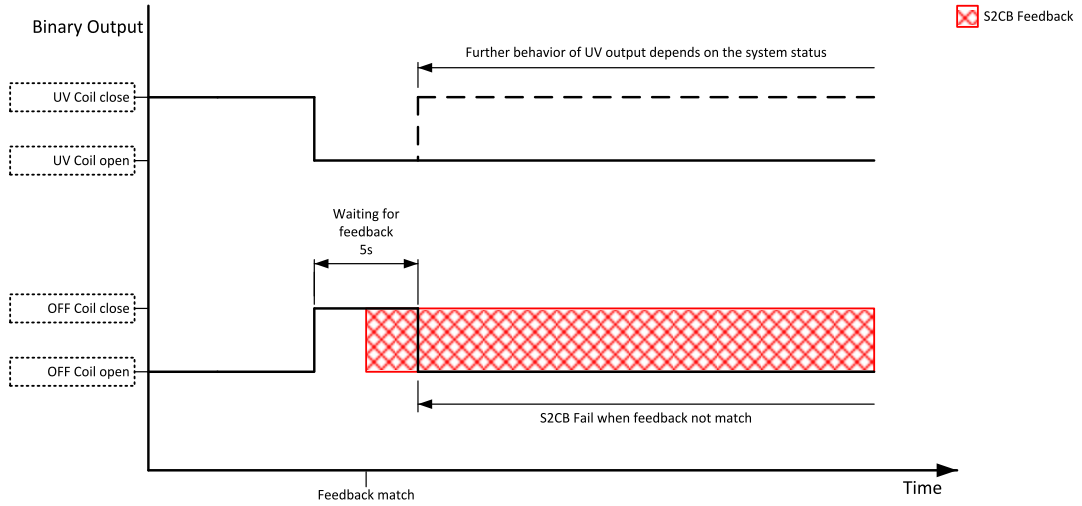

Image 30.13 S2CB OFF Coil command

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S2CB ON Coil

Related FW	1.3.0	Related applications	Mains-Mains, Mains-Gen, Gen-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.

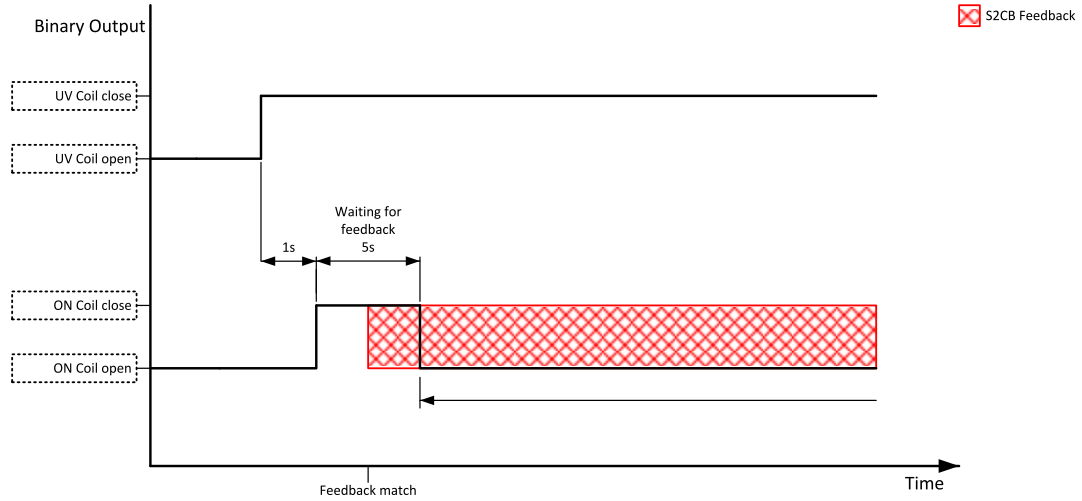

Image 30.14 S2CB ON Coil close command

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S2CB Status

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 324)**.
- In case the S2CB feedback is not configured the S2CB Status reflects the **S2CB CLOSE/OPEN (PAGE 347)** output

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S2CB UV Coil

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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.

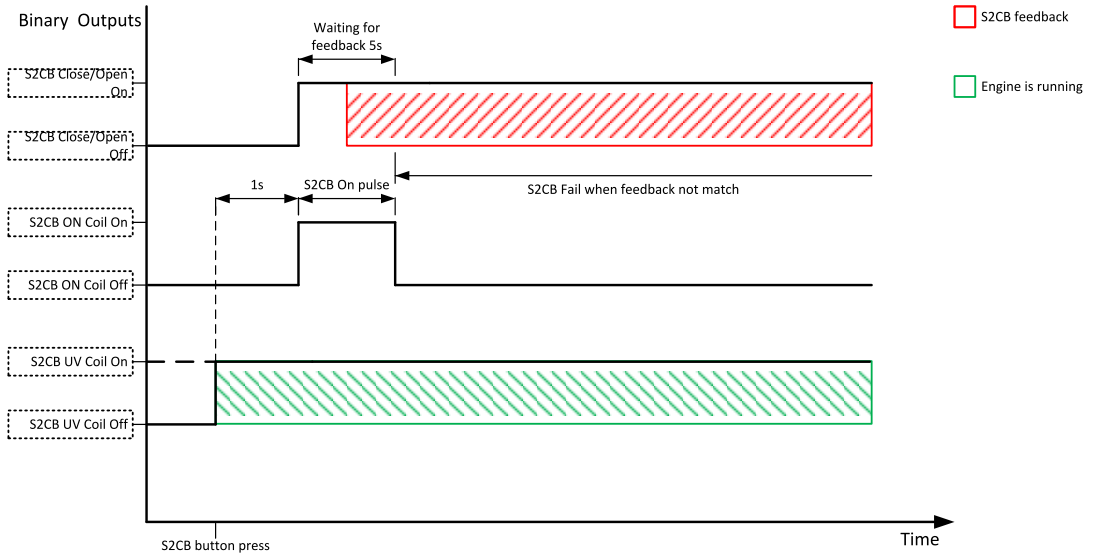


Image 30.15 S2CB UV Coil close command

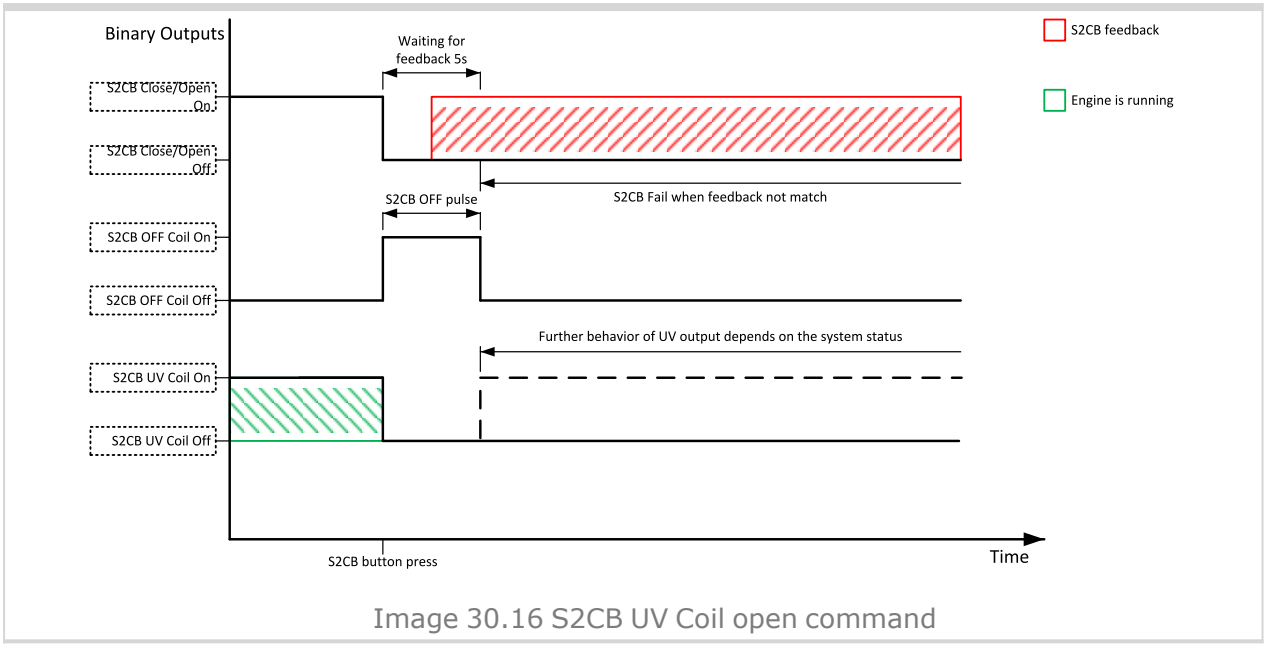


Image 30.16 S2CB UV Coil open command

back to Logical binary outputs alphabetically

Start Button Echo

Related FW	1.3.0	**Related applications**	Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Gen, Gen-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	1.3.0	**Related applications**	Mains-Gen, Gen-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

8.1.6 Logical analog inputs

What Logical analog inputs are:

Logical analog inputs are inputs for analog values.

AIN Switch 01

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 330)**. The behavior of the switch depends on the adjustment of the setpoints **AIN Switch01On (page 197)** and **AIN Switch01 Off (page 198)**.			

AIN Switch 02

Related FW	1.3.0	**Related applications**	Mains-Mains, Mains-Gen, Gen-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 330)**. The behavior of the switch depends on the adjustment of the setpoints **AIN Switch02 On (page 199)** and **AIN Switch02 Off (page 200)**.			

8.2 Alarms

What alarms are:

The controller evaluates two levels of alarms. For more information **see Alarm management on page 88**.

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, Gen-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, Gen-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, Gen-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, Gen-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, Gen-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, Gen-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, Gen-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, Gen-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, Gen-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, Gen-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 265)** 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, Gen-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 266)** 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, Gen-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 266)** 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, Gen-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 267)** 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, Gen-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 246)** 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, Gen-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 247)** and SMS wasn't send.

back to List of alarms level 1

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, Gen-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 247)** and SMS wasn't send.

back to List of alarms level 1

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, Gen-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 248)** and SMS wasn't send.

back to List of alarms level 1

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, Gen-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 265)** and email wasn't send.

back to List of alarms level 1

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, Gen-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 266)** 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, Gen-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 266)** 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, Gen-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 267)** 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, Gen-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 246)** 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, Gen-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 247)** and

	SMS wasn't sent.

back to List of alarms level 1

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, Gen-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 247)** and SMS wasn't sent.

back to List of alarms level 1

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, Gen-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 248)** and SMS wasn't sent.

back to List of alarms level 1

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, Gen-Gen
Description	This alarm is issued if TRAP will not be able to reach server.

back to List of alarms level 1

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, Gen-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

back to List of alarms level 1

Wrn PasswEnterBlock

Alarm Type	WRN
Alarmlist message	PasswEnterBlock
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-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, Gen-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, Gen-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 99)** 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, Gen-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

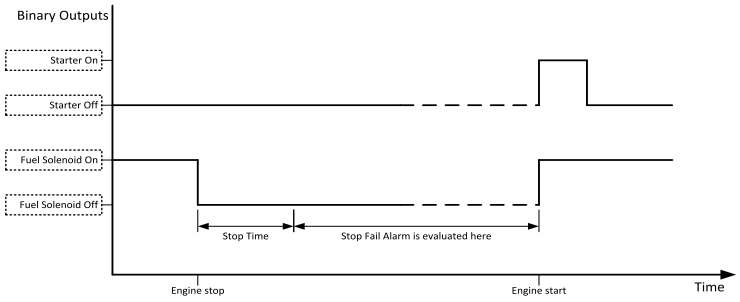
WRN Password reset e-mail addr is not set

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, Gen-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 Stop Fail

Alarm Type	WRN
Alarmlist message	Wrn Stop Fail
Alarm evaluated	While the engine shall be stopped
Related applications	Mains-Gen, Gen-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 324)** 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 168)** to Disable*  Image 30.17 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, Gen-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, Gen-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, Gen-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, Gen-Gen
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, Gen-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 S2CB Fail To Close

Alarm Type	WRN
Alarmlist message	Wrn S2CB Fail To Close
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 Source 2 L1 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L1 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 169)** › **Source 2 < > Voltage Delay (page 174)**

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, Gen-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 169)** › **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 L3 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 169)** › **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 L1L2 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L1L2 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 169)**

	› **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 L2L3 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L2L3 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 169)** › **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 L3L1 Overvoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3L1 > Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 169)** › **Source 2 < > Voltage Delay (page 174)**

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, Gen-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 172)** › **Source 2 < > Voltage Delay (page 174)**

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, Gen-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 172)** › **Source 2 < > Voltage Delay (page 174)**

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, Gen-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 172)** › **Source 2 < > Voltage Delay (page 174)**

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, Gen-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 172)** › **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 L2L3 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L2L3 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 172)** › **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 L3L1 Undervoltage

Alarm Type	WRN
Alarmlist message	Source 2 L3L1 < Voltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 172)** › **Source 2 < > Voltage Delay (page 174)**

back to List of alarms level 1

Wrn Source 2 Overfrequency

Alarm Type	WRN
Alarmlist message	Source 2 > Frequency
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 180)** › **Source 2 <> Frequency Delay (page 181)**

back to List of alarms level 1

Wrn Source 2 Uderfrequency

Alarm Type	WRN
Alarmlist message	Source 2 < Frequency
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 180)** › **Source 2 <> Frequency Delay (page 181)**

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, Gen-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, Gen-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, Gen-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 132)** › **Battery <> Voltage Delay (page 132)**

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, Gen-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 131)** › **Battery <> Voltage Delay (page 132)**

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, Gen-Gen
Description	This alarm is activated in Auto mode when the setpoint **Return From Secondary Source (page 149)** is set to manual, load is on Source 2, is returning back to Source 1 and the counter **Primary Source Return Delay (page 142)** 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, Gen-Gen
Description	Alarm is activated when binary input **EMERGENCY STOP (PAGE 316)** 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, Gen-Gen
Description	This alarm is active when LBI **TOTAL EMERGENCY STOP (PAGE 327)** 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 337)** 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, Gen-Gen
Description	This alarm is issued after Start Time has elapsed and parameters: LBI **SOURCE 2 READY TO LOAD (PAGE 324)** 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, Gen-Gen
Description	This alarm will occur when the **S2CB FEEDBACK (PAGE 324)** input does not match the expected position given by the **S2CB CLOSE/OPEN (PAGE 347)** 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.

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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, Gen-Gen
Description	This alarm will occur when the **S2CB FEEDBACK (PAGE 324)** input does not match the expected position given by the **S2CB CLOSE/OPEN (PAGE 347)** 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 Fence 1 Alarm

Alarm Type	BOS
Alarmlist message	BOS Fence 1 Alarm
Alarm evaluated	All the time
Related applications	Mains-Gen, Gen-Gen
Description	This alarm evaluates the GPS position of Source 2. The following setpoint are related to it:

	› **Geo-Fencing (page 214)** › **Fence 1 Protection (page 216)** › **Fence Radius 1 (page 217)**

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, Gen-Gen
Description	This alarm evaluates the GPS position of Source 2. The following setpoint are related to it: › **Geo-Fencing (page 214)** › **Fence 1 Protection (page 216)** › **Fence Radius 1 (page 217)**

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, Gen-Gen
Description	This alarm evaluates the Source 1 L1-N voltage. The following setpoints are related to it: › **Source 1 Overvoltage (page 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire or MonoPhase.*

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MP Source 1 L1 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 1 L1-N voltage. The following setpoints are related to it: › **Source 1 Undervoltage (page 154)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *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, Gen-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 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D.*

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MP Source 1 L1L2 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-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 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D.*

back to List of alarms level 2

MP Source 1 L2 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 1 L2-N voltage. The following setpoints are related to it: › **Source 1 Overvoltage (page 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

back to List of alarms level 2

MP Source 1 L2 Undervoltage

Alarm Type	MP

Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 1 L2-N voltage. The following setpoints are related to it: › **Source 1 Overvoltage (page 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

back to List of alarms level 2

MP Source 1 L2L3 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-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 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D.*

back to List of alarms level 2

MP Source 1 L2L3 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-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 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *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, Gen-Gen

Description	This alarm evaluates the Source 1 L3-N voltage. The following setpoints are related to it: › **Source 1 Overvoltage (page 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

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MP Source 1 L3 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 1 L3-N voltage. The following setpoints are related to it: › **Source 1 Undervoltage (page 154)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

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MP Source 1 L3L1 Overvoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-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 151)** › **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D or SplitPhase.*

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MP Source 1 L3L1 Undervoltage

Alarm Type	MP
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-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 151)**

	› **Source 1 Overvoltage Delay (page 152)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *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, Gen-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 157)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. › **Source 1 Voltage Unbalance Delay (page 157)** adjusts the alarm delay.

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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, Gen-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 157)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. › **Source 1 Voltage Unbalance Delay (page 157)** 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, Gen-Gen
Description	This alarm is active when Source 1 frequency is above the setpoint **Source 1 Overfrequency (page 158)** for the period longer than **Source 1 < > Frequency Delay (page 162)**.

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, Gen-Gen
Description	This alarm is active when Mains frequency is bellow the setpoint **Source 1 Underfrequency (page 160)** for the period longer than **Source 1 < > Frequency Delay (page 162)**.

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, Gen-Gen
Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it: › **Source 2 Overvoltage BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L1 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it: › **Source 2 Undervoltage (page 171)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L1L2 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L1L2 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 171)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L2 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: › **Source 2 Overvoltage BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L2 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: › **Source 2 Undervoltage (page 171)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L2L3 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L2L3 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 171)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L3 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: › **Source 2 Overvoltage BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L3 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: › **Source 2 Undervoltage (page 171)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L3L1 Overvoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 BOS (page 169)**

	› **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 L3L1 Undervoltage

Alarm Type	MP2
Alarmlist message	No
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-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 171)** › **Source 2 < > Voltage Delay (page 174)**

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MP2 Source 2 Overfrequency

Alarm Type	MP2
Alarmlist message	MP2 Source 2 Overfrequency
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm is active when Mains frequency is above the setpoint **Source 2 Overfrequency (page 176)** for the period longer than **Source 2 <> Frequency Delay (page 181)**.

back to List of alarms level 2

MP2 Source 2 Underfrequency

Alarm Type	MP2
Alarmlist message	MP2 Source 2 Underfrequency
Alarm evaluated	All the time
Related applications	Mains-Mains, Gen-Gen
Description	This alarm is active when Mains frequency is bellow the setpoint **Source 2 Underfrequency (page 178)** for the period longer than **Source 2 <> Frequency Delay (page 181)**.

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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, Gen-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 175)** adjusts the maximum allowed

	difference between the highest and lowest phase voltage at any given time. › **Source 2 Voltage Unbalance Delay (page 175)** adjusts the alarm delay.

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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, Gen-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 175)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. › **Source 2 Voltage Unbalance Delay (page 175)** adjusts the alarm delay.

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Parallel Work

Alarm Type	-
Alarmlist message	Parallel Work
Alarm evaluated	All the time
Related applications	Mains-Mains, Mains-Gen, Gen-Gen
Description	The alarm is triggered when parallel run exceeds 200 ms.

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BOS Source 2 L1 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it: › **Source 2 Overvoltage BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *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, Gen-Gen
Description	This alarm evaluates the Source 2 L1-N voltage. The following setpoints are related to it: › **Source 2 Undervoltage (page 171)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire or MonoPhase.*

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BOS Source 2 L1L2 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1L2 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D.*

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BOS Source 2 L1L2 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L1L2 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 171)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D.*

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BOS Source 2 L2 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are

	related to it: › **Source 2 Overvoltage BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

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BOS Source 2 L2 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-Gen
Description	This alarm evaluates the Source 2 L2-N voltage. The following setpoints are related to it: › **Source 2 Undervoltage (page 171)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

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BOS Source 2 L2L3 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2L3 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D.*

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BOS Source 2 L2L3 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L2L3 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 171)** › **Source 2 < > Voltage Delay (page 174)**

	Note: *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *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, Gen-Gen
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: › **Source 2 Overvoltage BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *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, Gen-Gen
Description	This alarm evaluates the Source 2 L3-N voltage. The following setpoints are related to it: › **Source 2 Undervoltage (page 171)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph4Wire.*

back to List of alarms level 2

BOS Source 2 L3L1 Overvoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L3L1 Overvoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 BOS (page 169)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D or SplitPhase.*

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BOS Source 2 L3L1 Undervoltage

Alarm Type	BOS
Alarmlist message	BOS Source 2 L3L1 Undervoltage
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-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 171)** › **Source 2 < > Voltage Delay (page 174)** ***Note:*** *Alarm is active only in case the setpoint* ***Connection type (page 128)*** *is set to 3Ph3Wire or High Leg D or SplitPhase.*

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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, Gen-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 175)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. › **Source 2 Voltage Unbalance Delay (page 175)** adjusts the alarm delay.

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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, Gen-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 175)** adjusts the maximum allowed difference between the highest and lowest phase voltage at any given time. › **Source 2 Voltage Unbalance Delay (page 175)** adjusts the alarm delay.

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BOS Source 2 Overfrequency

Alarm Type	BOS
Alarmlist message	BOS Source 2 Overfrequency
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-Gen
Description	This alarm is active when Source 2 frequency is above the setpoint **Source 2 Overfrequency (page 176)** for the period longer than **Source 2 <> Frequency Delay (page 181)**.

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BOS Source 2 Underfrequency

Alarm Type	BOS
Alarmlist message	BOS Source 2 Underfrequency
Alarm evaluated	Engine running
Related applications	Mains-Gen, Gen-Gen
Description	This alarm is active when Source 2 frequency is bellow the setpoint **Source 2 Underfrequency (page 178)** for the period longer than **Source 2 <> Frequency Delay (page 181)**.

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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 50 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 30.18 CM-RS232-485 interface

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

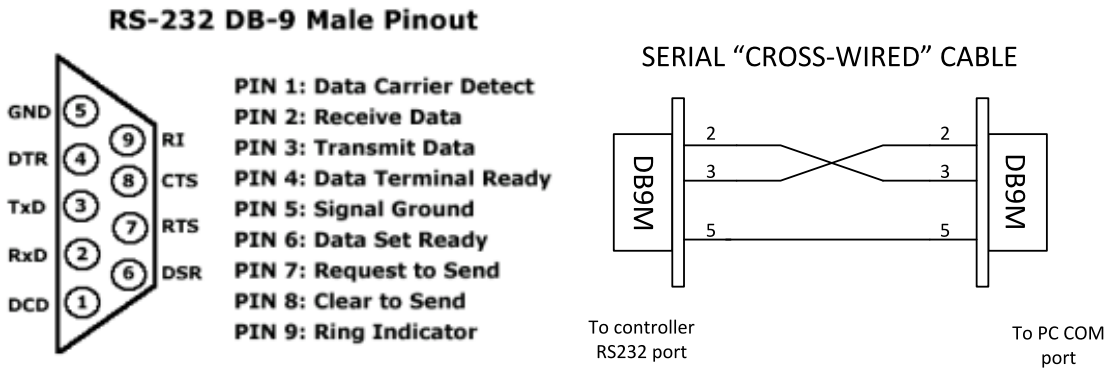

Image 30.19 Pinout of RS232 line

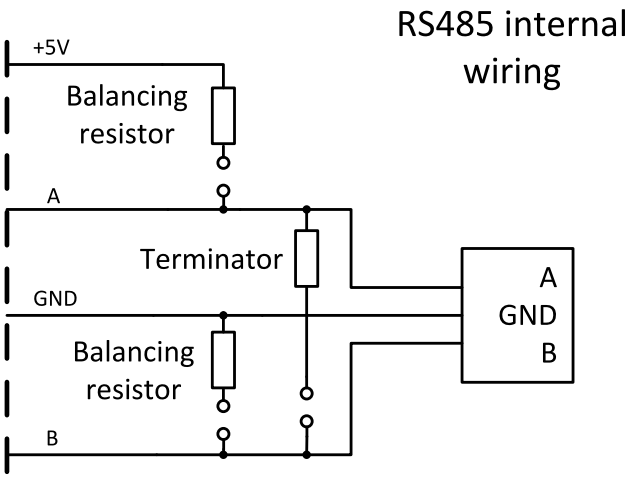

Image 30.20 Pinout of RS485 line

Image 30.21 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).

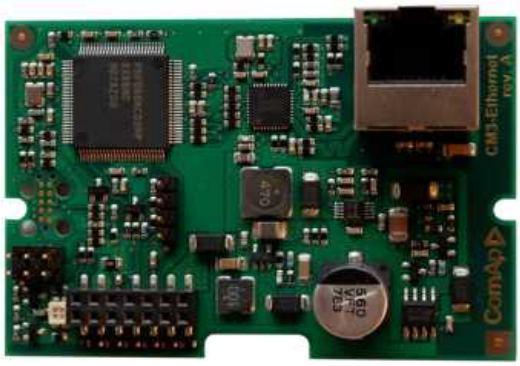

Image 30.22 CM3-Ethernet interface

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.

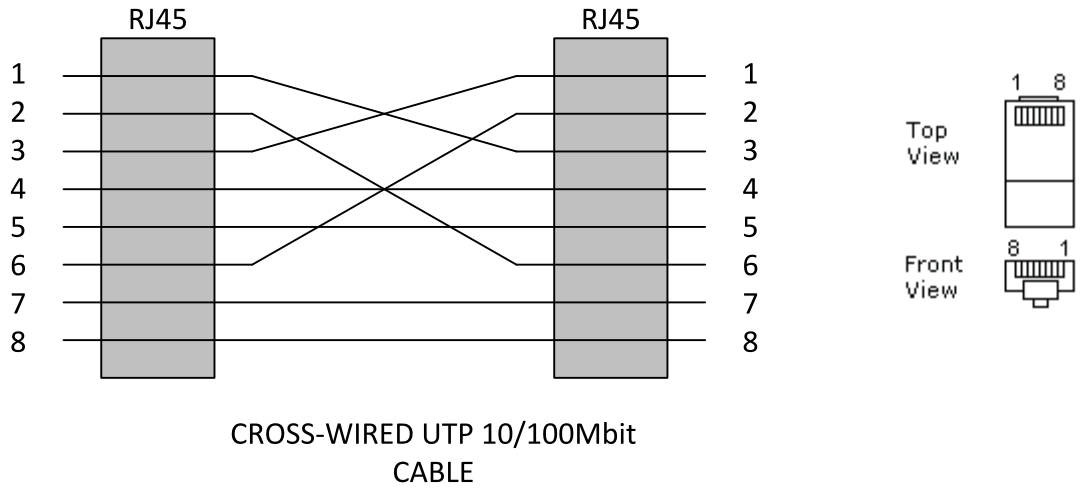

Image 30.23 Cross-wired cable

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 251)**.

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..

Image 30.24 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 225)** 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.

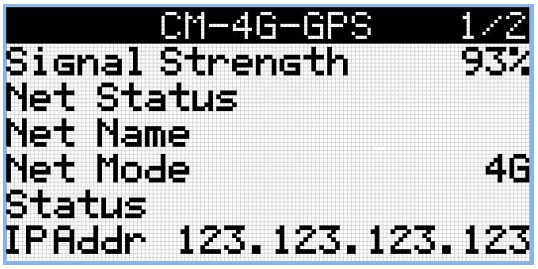

Image 30.25 Main screen of CM2-4G-GPS module

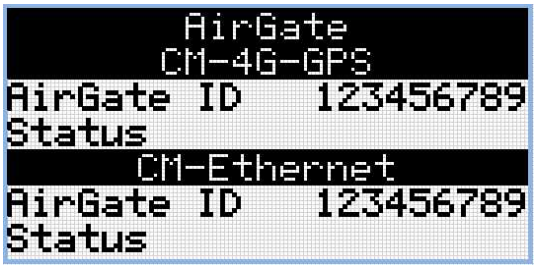

Image 30.26 Screen of AirGate

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 30.27 EM-BIO8-EFCP interface

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

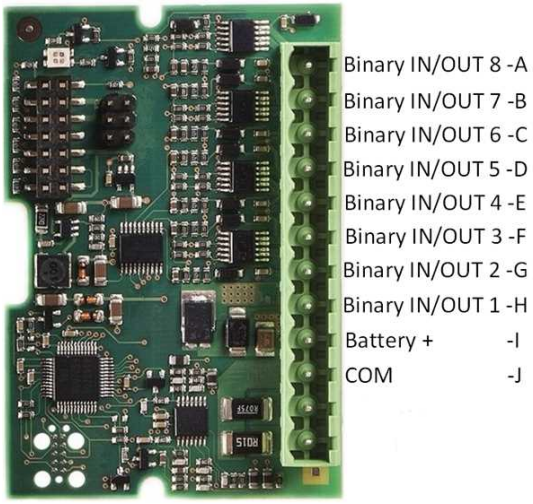

Image 30.28 Overview of EM-BIO8-EFCP

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