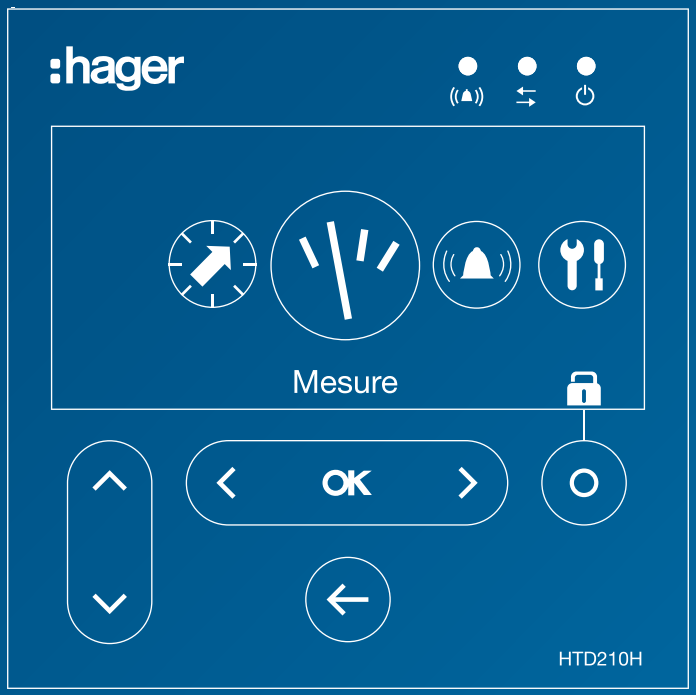
User manual

h3+/hw+

Panel display
HTD210H



:hager

Contents

Safety symbols

This documentation contains safety instructions you must observe for your personal safety or for the prevention of damage to property.

The safety instructions referring to your personnel are indicated in the documentation by a safety alert symbol. The safety instructions referring to property damage are indicated by the mention **NOTICE**.

The safety alert symbols and indications shown below are classified according to the degree of danger.

⚠ DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

Warning of property damage

This user manual contains instructions that you must observe to prevent property damage:

ATTENTION

ATTENTION indicates a property damage message.

ATTENTION also indicates important user notes and especially useful information on the product to which special attention shall be given so as to have the subsequent activities performed effectively and safely.

Safety instructions

Qualified personnel

The product or system described in this documentation should be installed, operated and maintained only by qualified staff.

No responsibility is assumed by Hager for any consequences arising out of the use of this equipment by unqualified staff.

Qualified personnel are those people who have the necessary skills and knowledge for building, operating and installing electrical equipment, and who have received training enabling them to identify and avoid the risks incurred.

Proper use of Hager products

Hager products should only be used for the applications described in the catalogue and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Hager. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be respected. The information in the relevant documentation must be observed.

Disclaimer of Liability

The contents of this documentation have been reviewed to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, Hager cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Disposal and recycling information

The disposal of the HTD210H panel display must be done in accordance with the regulations in force in the country concerned. Because it contains electronic components, the panel display must be processed separately from household waste.

In accordance with local laws and regulations, your panel display product must be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. The separate collection and recycling of your product and/or its battery at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

1 About this manual

Purpose of this document

This document provides information about configuration and operation of the HTD210H panel display.

Validity scope

This document applies to the HTD210H panel display used with h3 + Energy moulded case circuit breakers and hw+ air circuit breakers equipped with the sentinel Energy electronic trip unit.

Procedural instructions

Procedural instructions with a defined order are displayed in tables like the one below:

Button	Step/Action	Display
Touch key	1 Procedural instruction step 1 - Result of first action	Display view
Touch key	2 Procedural instruction step 2 - Result of second action	Display view
Touch key	3 Procedural instruction step 3 - Result of third action	Display view

Recommendation

The HTD210H panel display can only be connected to:

- h3+ Energy moulded case circuit breakers
- hw+ air circuit breakers equipped with the sentinel Energy electronic trip unit.

Applicability note

This manual is intended for the following persons:

- Panel builders and electrical installers
- System commissioning engineers and integrators
- Service and maintenance staff

Revisions

Revision no.	Date
b	04/2024

Related documents

Document title	Reference
HTD210H panel display installation instruction	6LE002194A
h3+ Moulded Case Circuit Breakers up to 630 A Technical catalogue	6LE005047A
h3+ Communication System manual	6LE002998A
HW1/HW2/HW4 air circuit breakers technical catalogue	6LE007334A
Installation manual for HW1 air circuit breakers	6LE007893A
Installation manual for HW2/HW4 air circuit breakers	6LE009206A
User manual for HW1 air circuit breakers	6LE007331A
HW1 user maintenance guide	6LE007897A
User manual for sentinel Energy hw+ electronic trip units	6LE008147A

Contact

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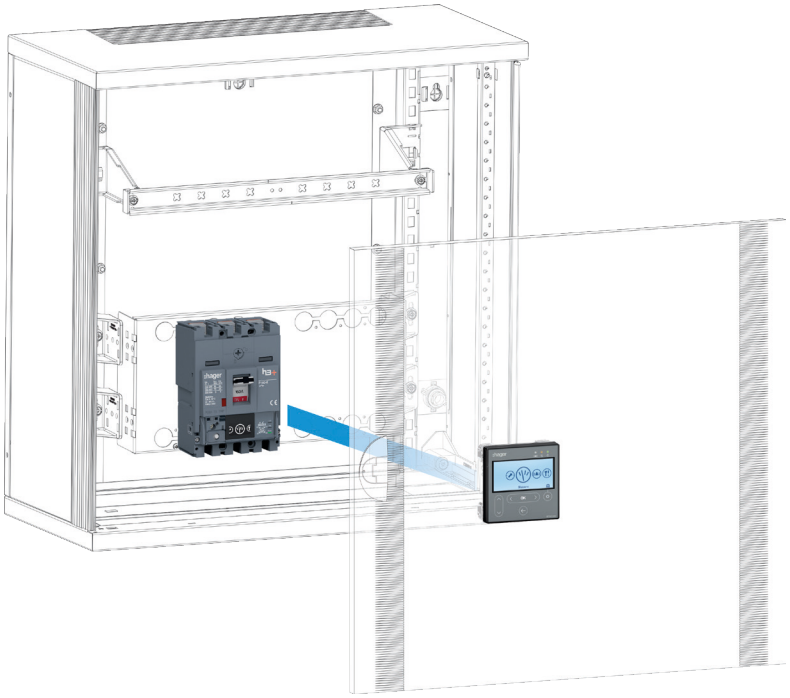
2 HTD210H panel display

The HTD210H panel display is an accessory for the range of h3 + Energy moulded case circuit breakers and hw+ air circuit breakers equipped with the sentinel Energy electronic trip unit. It allows the circuit breaker's information and measured values to be displayed and to set the parameters of its trip unit.

The HTD210H panel display is mainly intended for visualising measurements, defining protection settings and managing alarms.



The HTD210H panel display is usually mounted on the door of a control cabinet or a panel where the connected circuit breaker is installed.

Use with the h3+ Energy circuit breaker

Various adapters, each with a certain cable length, allow the HTD210H panel display to be mounted within easy reach of the observer.

Compared to the embedded display of the h3+ Energy circuit breaker, the HTD210H panel display has advanced functionalities.

It can visualise most of the measurements made, in addition to the 20 measurements covered by the embedded display of the h3+ Energy circuit breaker.

The HTD210H panel display also makes it possible to manage alarms and visualise log events (trips and alarms), which is not possible with the embedded display of the h3+ Energy circuit breaker.

Use with the hw+ sentinel Energy circuit breaker

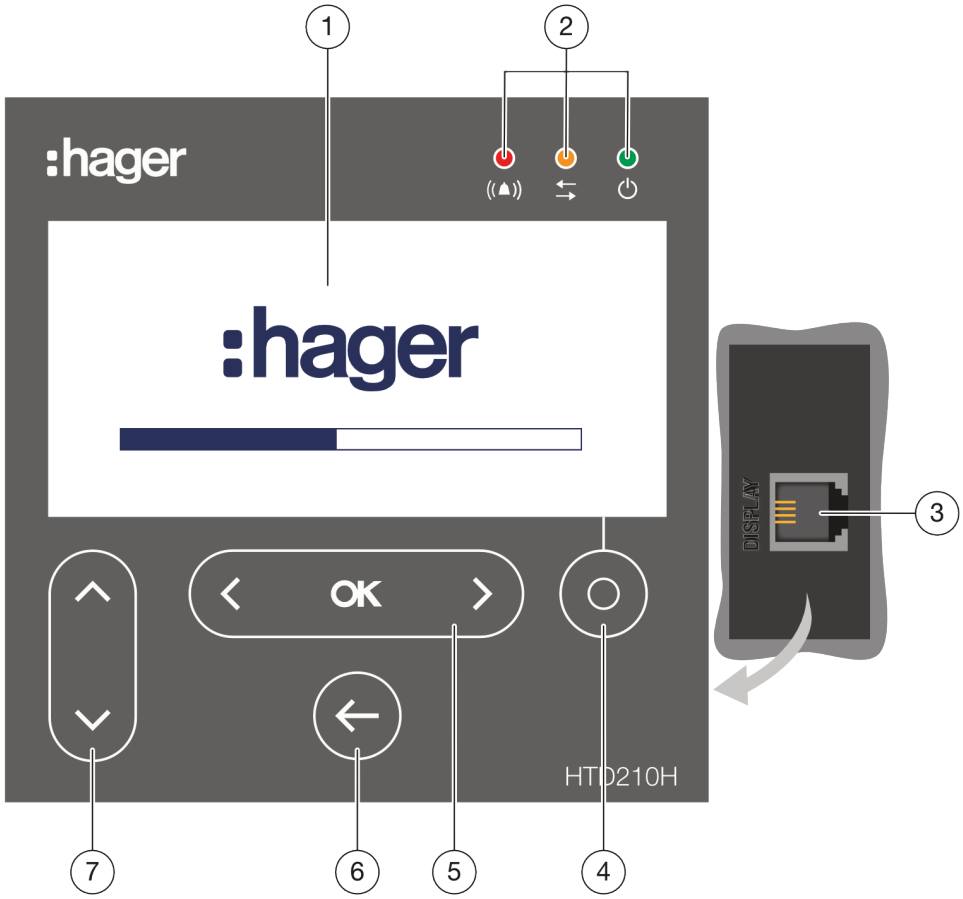
The HTD210H panel display can connect to the hw+ sentinel Energy circuit breaker using the HWY210H adapter.

The panel display displays most of the information provided by the sentinel Energy electronic trip unit.

It enables adjustment of the principal protection settings, alarms and measurements with the exception of protection profile B, advanced protections and other advanced parameters (see the table on page 16 for detailed information about the exceptions).

The panel display cannot be used to take control of the trip unit or to carry out test trip or opening/closing commands.

2.1 Components overview



	Display part	Description
1	Display	LCD display
2	LED	**Alarm – Communication – Operational**
3	RJ9 connector	Used to connect the cable between the h3+ Energy circuit breaker or the hw+ Energy air circuit breaker and the display.
4	**Contextual**button	The functionality of this button depends on the displayed menu.
5	**left** / **OK** / **right**buttons	Left and right navigation between menus. **OK**: Confirming input.
6	**back**button	One step back or exit the current menu. By holding the key the display changes to Live mode.
7	**up** / **down**key	Up and down navigation between menus and submenus.

Navigation

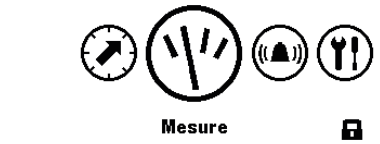
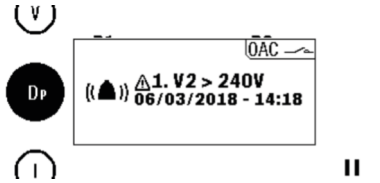
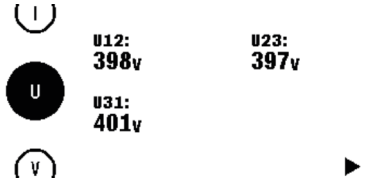
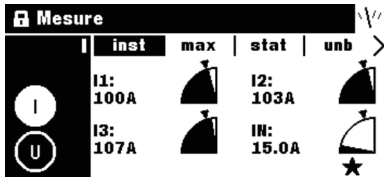
The navigation through the menus is done using the touch keys at the front of the device.

NOTE

Do not press the buttons, just touch the surface slightly.

Display

The display provides different screen views, depending on the corresponding functions:

Display	Menu
	Main menu
	Alarm pop-up window
	Live mode
	Menu (e.g. measure)

Standby function

By default the backlight of the display is always on. It can be deactivated in the Configuration menu. If the standby function is activated, the backlight switches on after touching any button. If a high priority alarm appears during standby, the display switches on and an alarm pop up window is displayed.

LED

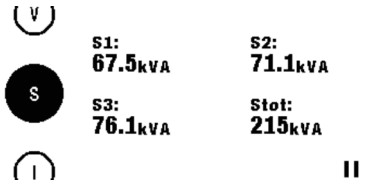
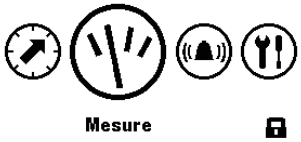
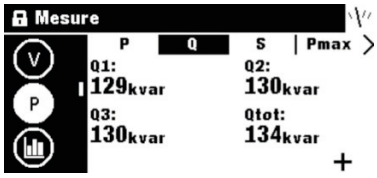
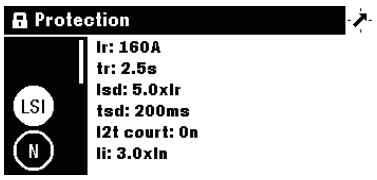
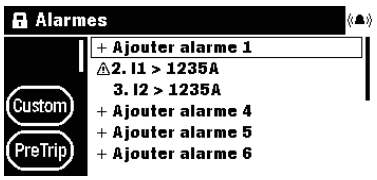
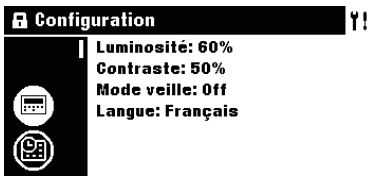
LED	Description	Behaviour
	Alarm with medium and high priority.	flashing red
	Communication with the circuit breaker.	flashing yellow
	The device is supplied with power and is ready.	Green

External ports

External port	Description
Display	Communication connection with the circuit breaker and the power supply of the display (RJ9 connector).

2.2 Menu functions

Overview of the available menu functions of the HTD210H panel Display.

Display	Menu	Functions
	**Live mode**	Standard view of the display - Visualisation of selected measurements (favourites).
	**Main menu**	- Accessing the menus.
	**Measurement**	- Visualisation of all measurements. - Setting the display of the measurements.
	**Protection**	- Management of the protection settings.
	**Alarms**	- Management of alarms (custom, optional, prealarm, trip, OAC).
	**Configuration**	- Configuration of the display. - Setting date and time. - Changing the password. - Measurement parameters. - Resetting min/max measurement values. - Erasing trip events and alarm events.
	**Information**	- Visualisation of trip events and alarm events. - Visualisation of technical information from the circuit breaker and the HTD210H panel display.

The following table describes what functions are available depending on the type of circuit breaker connected, either h3+ Energy, or hw+ sentinel Energy.

	h3+ Energy		hw+ sentinel Energy	
Function	**Read access**	**Write access**	**Read access**	**Write access**
Live mode	■	-	■	-
Measurements of currents, voltages, powers, power demands, power factors, harmonic distortion rates (THD), energies, frequencies, quadrant and phase sequence	■	-	■	-
Measurements of tariff energy meters	-	-	■	-
Protection setting L, S, I, G, N	■	■	■	■
Protection profile B setting	-	-	-	-
Advanced protection setting (submenus UV, OV, UF, OF, RP, Unb C, Unb V)	-	-	■	-
Alarm setting PTA 1	■	■	■	■
Alarm setting PTA 2	-	-	■	■
Optional alarms setting	■	■	■	■
Dip and Swell alarm setting	-	-	-	-
Communication modules setting	-	-	-	-
Electrical grid settings	■	■	■	■
Measurement settings	■	■	■	■
OAC output alarms setting	■	■	-	-
DI Digital input settings	-	-	-	-
Date and time setting	■	■	■	■
Bluetooth setting	-	-	-	-
Reset the measurement meters min/max	-	■	-	■
Erase the alarms history section	-	■	-	■
Erase the Trip history section	-	■	-	■
Erase other history sections	-	-	-	-
Basic information on the circuit breaker (name of the range, input, number of poles, product code, etc.)	■	-	■	-
Status information about the circuit breaker (On/ Off status, FS contact status, etc.)	■	-	■	-
Trip events history	■	-	■	-
Optional alarms history	■	-	■	-
Other history events (errors, diagnostic, etc.)	-	-	-	-
Serial number of the display	■	-	■	
Electromechanical trip test	-	-	-	-
Command to switch between protection profile A and B	-	-	-	-
Advanced protection inhibition command	-	-	-	-
Management of alarm priority display	■	■	-	-
Notifications of alarm trips (pop-ups)	■	-	■	-
Bluetooth activated warning	-	-	■	-

Only the menus corresponding to the functions available are displayed with an hw+ sentinel Energy circuit breaker.

In addition, the menus and displays of the panel display connected to the hw+ sentinel Energy circuit breaker will be available or not according to the type of rating plug installed (refer to the hw+ sentinel Energy circuit breaker electronic trip unit user manual).

Optional functions	**Meter Plus**	**Harmonic**	**Advanced**	**Ultimate**
Measurement of total harmonic distortion THDV and THDV	■	■	■	■
Analysis of individual harmonics	-	■	-	■
Measurement of voltage unbalances	-	■	■	■
Alarm for voltage dips and swells	-	■	■	■
Multi-tariff energy meters	■	■	-	■
Undervoltage protection - ANSI 27	-	-	■	■
Overvoltage protection - ANSI 29	-	-	■	■
Underfrequency protection - ANSI 81L		-	■	■
Overfrequency protection - ANSI 81H	-	-	■	■
Reverse active power protection - ANSI 32R	-	-	■	■
Phase unbalance protection - ANSI 46	-	-	■	■
Voltage unbalance protection - ANSI 47	-	-	■	■

2.3 Technical specifications

Electrical characteristics

Rated supply voltage DC	24 V (+/- 30 %) SELV
Current consumption	85 mA

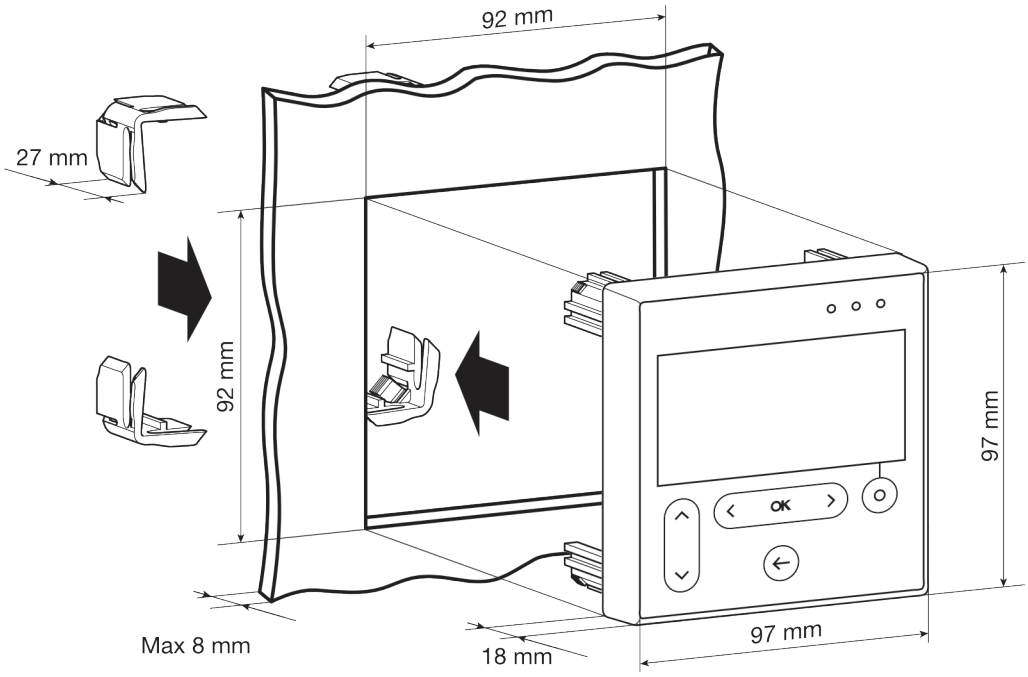
Environmental and mechanical characteristics

Operating temperature range	-10 °C…+55 °C
Storage temperature	-20 °C…+70 °C
Pollution degree	2
Installation category	III
IP class of front side	IP65
IP class of back side	IP20
Mechanical protection (front face)	IK07

Physical characteristics

Dimensions L x H x D	97 x 97 x 46 mm
Panel/door cut-out dimensions	92 x 92 mm
Weight	165 g
Display dimensions	37 x 78 mm
Type of connector	RJ9
Cable length max.	10 m

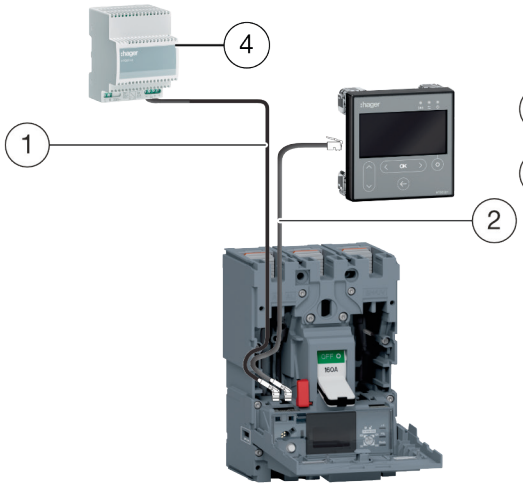
2.4 Dimensions and cut-outs



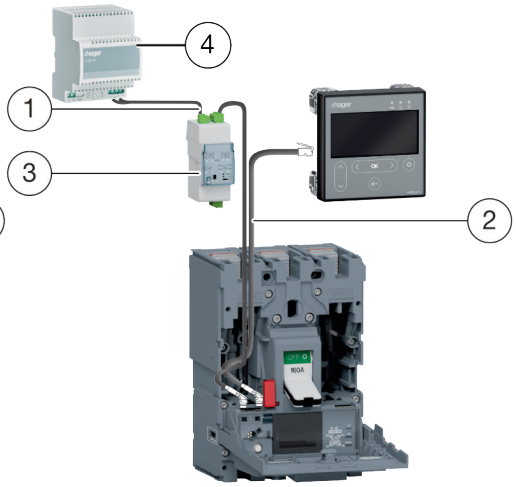
Dimensions	Width (mm)	Height (mm)	Depth (mm)
HTD210H	97	97	18 (45)
Panel cut-out	92	92	up to 8

2.5 Cables and accessories

For an h3+ Energy circuit breaker



Electrical power supply by CIP

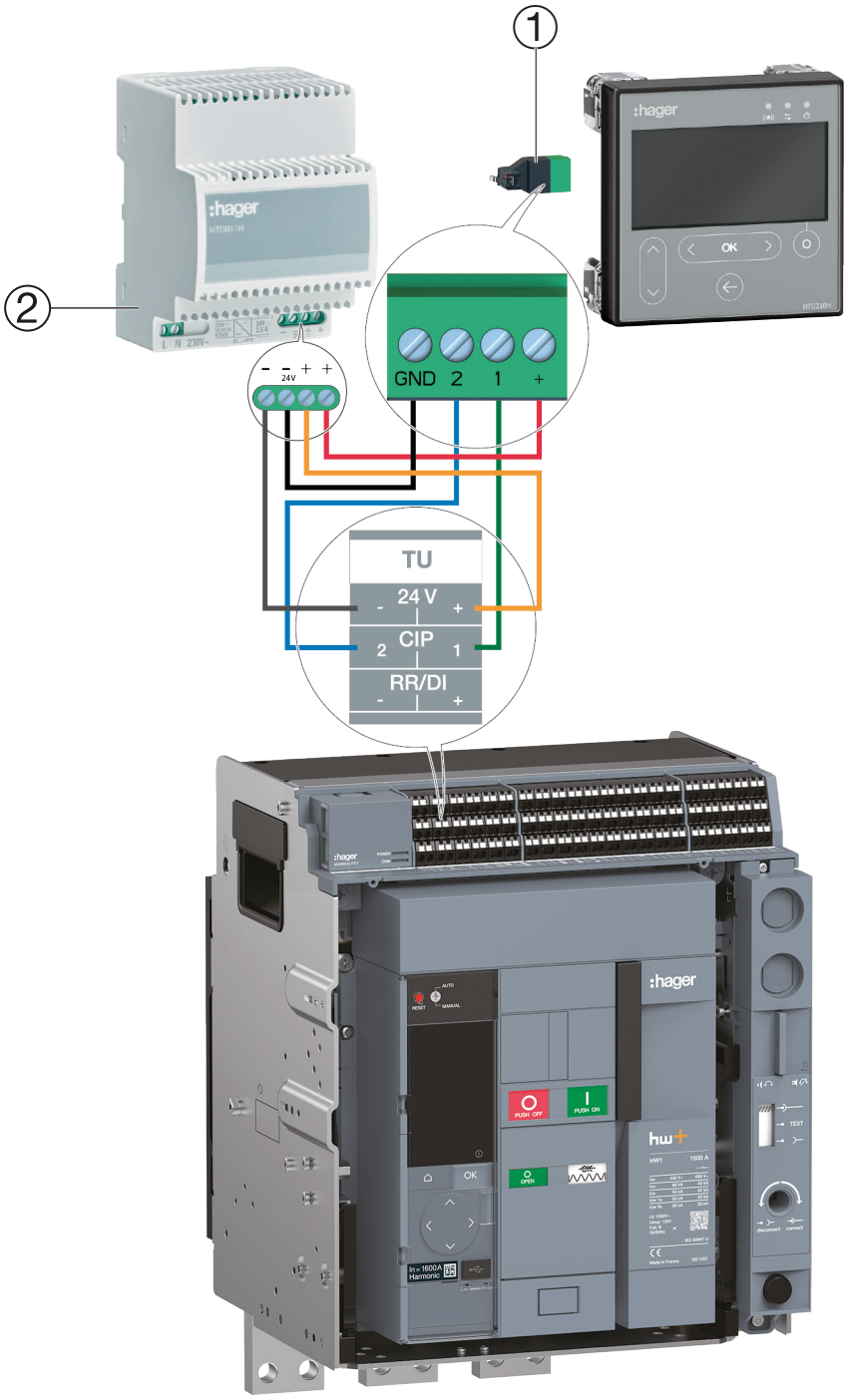


Electrical power supply via communication module.

1	CIP 24 V Adapter
2	CIP adapter for h3+
3	Modbus RTU h3+ communication module without I/O
4	Power supply 230 V AC/24 V DC

Reference	Description	Length (m)
HTC140H	CIP 24 V adapter	1.2
HTC310H	Modbus RTU h3+ communication module without I/O	-
HTC320H	Modbus RTU h3+ communication module with I/O	-
HTC330H	CIP adapter for h3+	0.5
HTC340H	CIP adapter for h3+	1.5
HTC350H	CIP adapter for h3+	3.0
HTC360H	CIP adapter for h3+	5.0
HTC370H	CIP adapter for h3+	10.0
HTG911H	Power supply 230 V AC/24 V DC	-

For an hw+ sentinel Energy



1	HWY210H adapter
2	Power supply 230 V AC / 24 DC

Reference	Description
HWY210H	RJ9 adapter for panel display

3 Connection and power supply

⚠ DANGER

Risk of electric shock

Risk of electric shock or risk of serious injuries.

- ➢ Make sure that the device is installed only by a qualified electrician according to the installation standards in force in the country.

ATTENTION

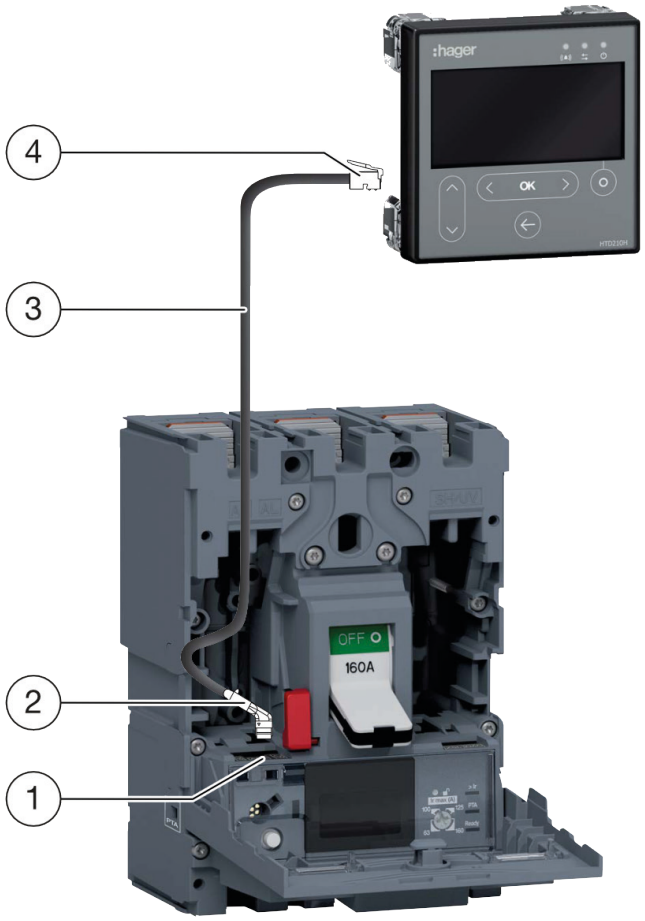
Risk of damaging the HTD210H panel display

Using the wrong adapter may result in damaging the device.

- ➢ Connect the RJ9 socket of the HTD210H panel display HTD210H to an h3+ Energy circuit breaker only with an original CIP Hager HTC3xxH adapter.
- ➢ Connect the RJ9 socket of the HTD210H panel display to an hw+ sentinel Energy circuit breaker only with an original Hager HWY210H adapter.

3.1 Connection to an h3+ Energy circuit breaker

3.1.1 Connecting the display



1	CIP socket
2	CIP connector of the CIP adapter
3	CIP adapter
4	RJ9 plug of the CIP adapter

Step	Action
1	Switch the connected circuit breaker into the "OFF" or "tripped" position. NOTE The front cover of the moulded case circuit breaker can only be opened in the “OFF” or “tripped“ position.
2	Open the front cover of the circuit breaker.
3	Insert the CIP connector of the CIP adapter into the CIP socket. ATTENTION Risk of damaging plug and socket. - Observe the orientation of the connector. - Do not force to push the connector into the plug.
4	Place the cable outside the circuit breaker. - Make sure not to pinch the cables.
5	Lead the cable to the HTD210H panel display.
6	Connect the RJ9 plug of the CIP adapter to the socket named "Display" on the back of the HTD210H panel display.

3.1.2 Connecting the power supply

ATTENTION

Risk of damage to electronic devices

Voltage over 32 V DC will cause damage to the HTD210H panel display.

- ➢ Use only the original Hager HTC3xxH CIP adapters to connect and power the HTD210H panel display.

The 24 V DC electrical power supply of the HTD210H panel display must be connected directly to the h3+ Energy circuit breaker. It is extended to the panel display via the CIP adapter HTC3xxH.

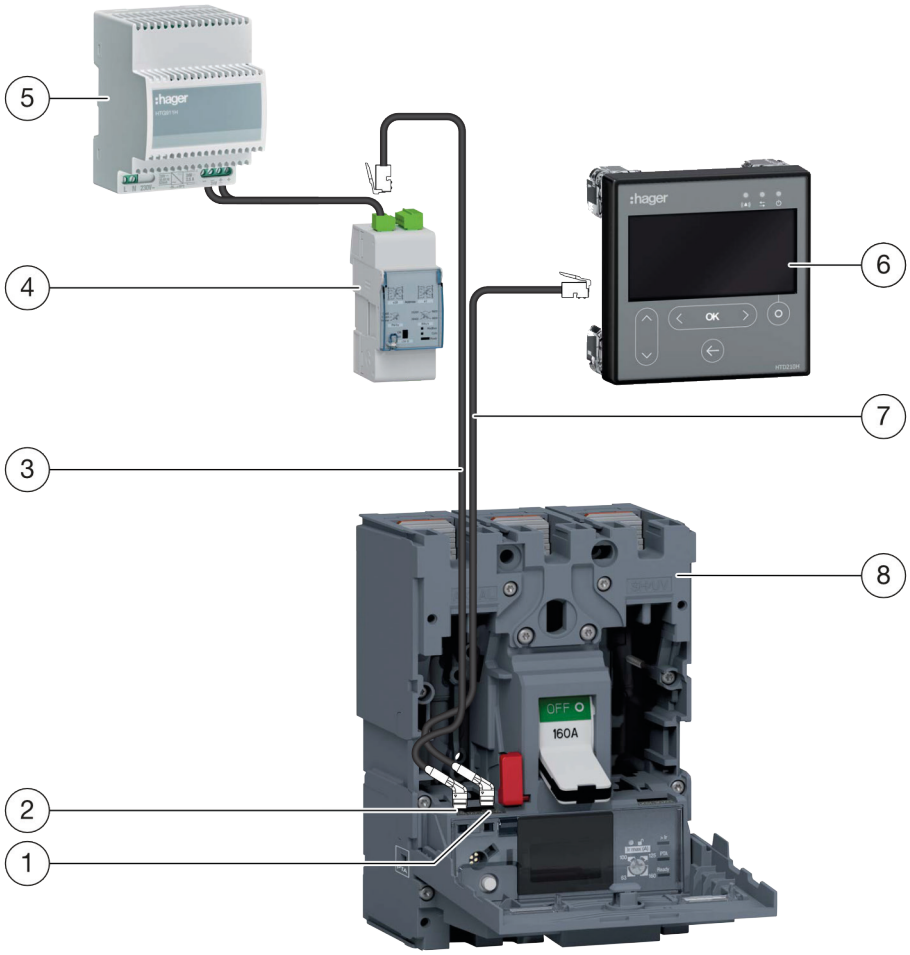
Various adapters, each with a certain cable length, allow the HTD210H panel display to be mounted within easy reach of the observer.

There are two ways of powering the h3+ Energy circuit breaker:

1. If the Modbus switch cover is connected to the h3+ Energy circuit breaker, the 24 V DC electrical power supply must be connected to the communication module.
2. If no Modbus communication module is connected, the 24 V DC electrical power supply must be connected to the circuit breaker.

It is recommended to use the HTG911H 24 V DC SELV power supply to ensure the isolation of the equipotential bonding between the cables of the h3+ Energy communication system.

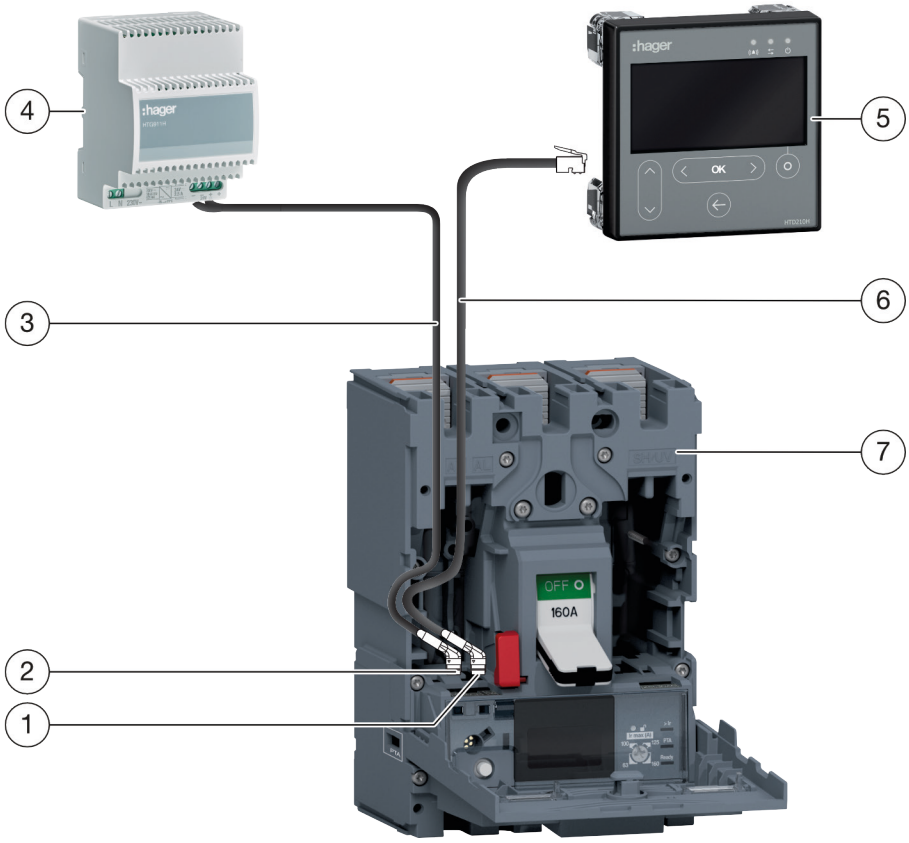
1 Power supply of the panel display via the Modbus communication module



1	CIP connector of the CIP adapter to connect to the panel display	**5**	Electrical power supply HTG911H
2	CIP connector of the CIP adapter to connect to the communication module	**6**	HTD210H panel display
3	CIP adapter to connect to the Modbus communication module	**7**	CIP adapter to connect to the panel display
4	Modbus communication module	**8**	h3+ Energy circuit breaker

Step	Action
1	Ensure that the communication module is connected to the circuit breaker. If it is not, insert the CIP connector of the second CIP adapter into the free female CIP socket. ATTENTION Risk of damaging plug and socket. - Observe the orientation of the connector.
2	Lead the second CIP adapter outside the circuit breaker.
3	Close the front cover of the circuit breaker.
4	Insert the RJ9 male plug of the second CIP adapter into the female COM socket of the Modbus communication module(HTC310H/HTC320H).
5	Ensure that the Modbus communication module (HTC310H/HTC320H) is connected to a 24 V DC electrical power supply. If this is not the case, connect the external power supply (HTG911H recommended) to the 24 V DC terminal of the communication module.

2 Powering the Panel display directly via an external electrical power supply



1	CIP connector of the CIP adapter to connect to the panel display	**5**	HTD210H panel display
2	CIP connector of the CIP adapter to connect with the electrical power supply	**6**	CIP adapter to connect to the panel display
3	CIP adapter to connect with the electrical power supply	**7**	h3+ Energy circuit breaker
4	HTG911H external power supply		

Step	Action
1	Insert the connector of the CIP 24 V adapter in the free CIP female socket of the circuit breaker. ATTENTION Risk of damaging plug and socket. - Observe the orientation of the connector.
2	Close the front cover of the circuit breaker.
3	Connect the external power supply (HTG911H recommended) with the 0 V/24 V wires of the CIP 24 V adapter.

3.2 Connection to an hw+ sentinel Energy circuit breaker

ATTENTION

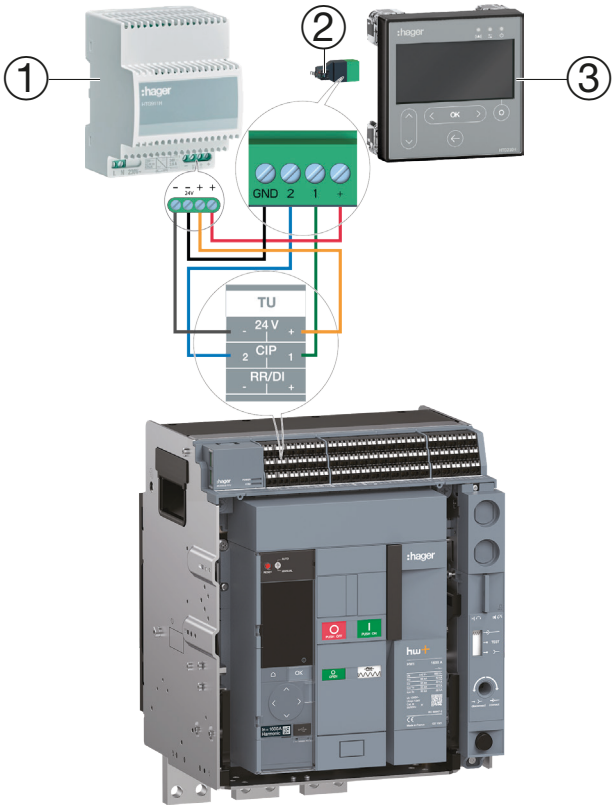
Risk of damage to electronic devices

Voltage over 32 V DC will cause damage to the HTD210H panel display.

- Use only original Hager HWY210H adapters to connect and power the HTD210H Panel display.
- The cables connected to the HWY210H adapter must be fastened to the door panel.
- Use a twisted pair data bus cable with 0.75 mm² cross section, 18 AWG or 19 AWG (for example "FD CP (TP) plus" from LAPP) to connect the CIP terminals of the circuit breaker to terminals 1 and 2 of the HWY210H adapter.

The 24 V DC electrical power supply must be connected directly to the HWY210H adapter.

The hw+ circuit breaker and HWY210H adapter must be connected to the same 24 V DC power supply. This power supply must be SELV (Hager HTG911H recommended reference model).



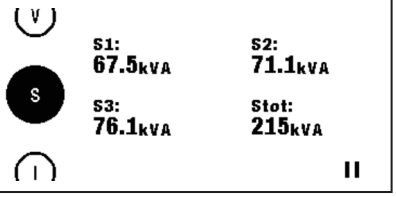
1	HTG911H external power supply
2	HWY210H adapter
3	HTD210H panel display

Step	Action
1	Remove the terminal block protection cover (if present).
2	Connect terminals 1 and 2 of the HWY210H adapter to terminals CIP 1 and 2 of the TU terminal of the hw+ sentinel Energy circuit breaker.
3	Connect the + and - terminals of the HWY210H adapter to a 24V DC power supply.
4	Connect the RJ9 plug of the HWY210H adapter to the socket named “Display” on the back of the HTD210H panel display.
5	Put the protection cover back on the terminal block.

3.3 First power-up

When first powered up, the panel display starts with the language settings menu after having displayed the startup screen. The default language is English. If this is appropriate, confirm with the **OK**key.

Changing the language:

Button	Step/Action	Display
	1. Select another language.	
	2. Confirm your selection. - The selected language will appear on the display. - The display switches to Live mode.	

NOTES

The language can also be changed within the Configuration menu (refer to Configuration menu on page 71).

It is recommended that the password be changed after the first power up (refer to Configuration menu on page 71).

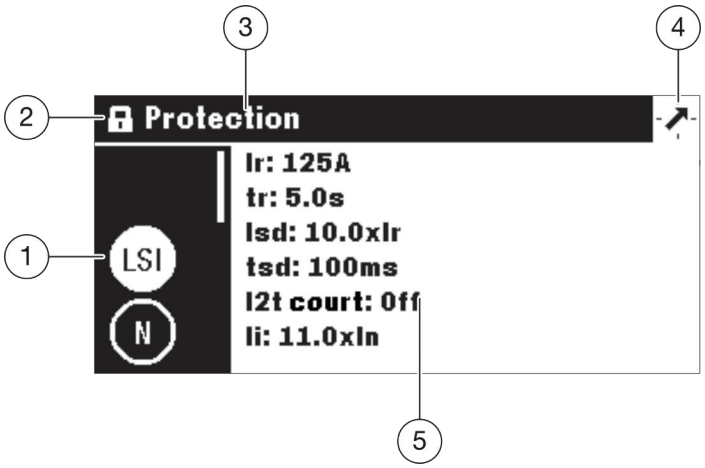
4 Display modes and navigation

This chapter gives an overview of the display modes and navigation within **Live mode** and the **Main menu**.

4.1 Navigation

Display principle

The display principle is nearly identical within all menus.



1	Submenus
2	Padlock symbol: Menu is protected
3	Name of menu
4	Icon of menu
5	Information window

Submenus

Each icon refers to a submenu. The activated submenu is highlighted. To select a submenu navigate to the submenu in question using up / down keys.

Padlock symbol

The padlock in locked position indicates that the content of this menu is protected by a password. To unlock the protection, refer to Locked/Unlocked mode on page 39.

An unlocked menu has no padlock symbol.

Information window

The information window displays several types of information depending on the selected submenu:

- Settings within submenus
- Information
- Second level submenus

All inputs are done using the touch keys.

Button	Name	Description
	**Contextual**	- Functionality depends on the displayed menu
	**left / OK / right**	- Left and right navigation within menus and submenus. - **OK**: Confirming entries (**Enter**).
	**Back**	- One step back. - Hold the key to exit the current menu and enter **Live mode**.
	**top / bottom**	- **Up** and **down** navigation within menus and submenus

Meaning of left / OK / right symbols in the manual

In this manual the, **left** / **OK** / **right** symbol is represented as follows depending on the key to use:

	Touch the **OK** key to confirm entries (**Enter**).
	Touch the **left** and/or **right** navigation key to scroll through values, for example.

4.2 Start-up screen

The panel display starts as soon as it is powered up. If the communication with the circuit breaker is operational, the start-up screen is displayed and the communication between the display and the circuit breaker is tested.

While the start up screen is displayed, the panel display is fetching its configuration settings stored in the circuit breaker. If the stored data is corrupted or empty (e.g. on first power up), default values will be set.

After the successful start-up sequence the display switches automatically to Live mode (see page 34) and the green LED indicates that the device is ready.

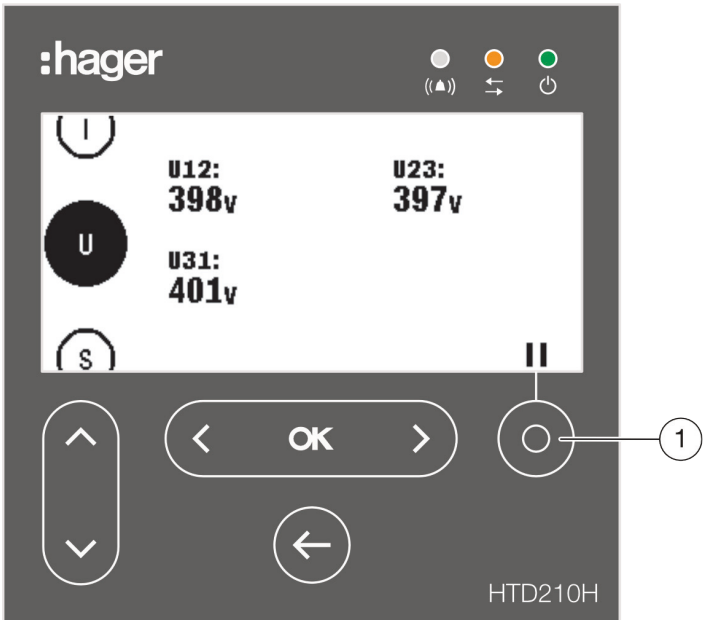
Start-up failure

If the start-up sequence has failed, the panel display shows various malfunction messages depending on the origin of the failure.

Please refer to the chapter Support on page 83 for a more detailed explanation.

4.3 Live mode

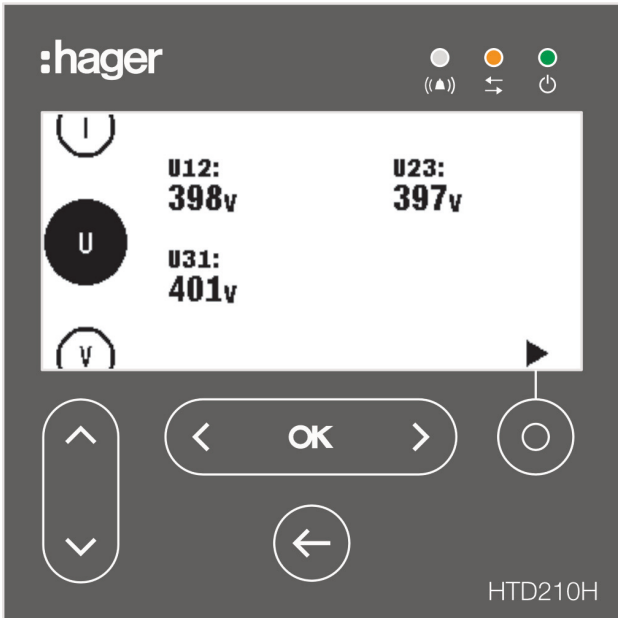
After start-up or if there is no user action within a menu for 2 minutes, the display switches automatically to Live mode.



Live mode displays the measurement screen views set as favourites in the Measure menu. To set the favourites refer to Setting favourites and representation on page 54.

The display shows each value for about 3 seconds and then scrolls to the next value.

Use the **Contextual** key ① to pause or to continue the animation.



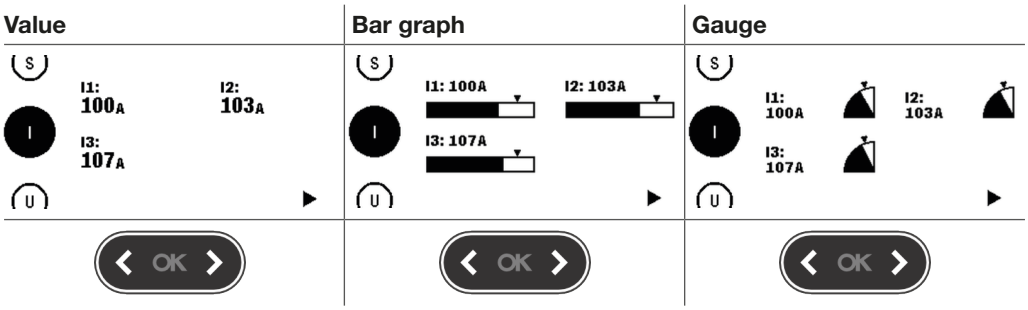
Live mode paused

NOTE

I, U and V measurement values are set as favourite by default. These values are displayed when Live mode is first started.

Display options within Live mode

The various representation options below are available for the display of currents, voltages and powers:



To change the type of the representation use the **left** or **right** keys.

NOTE

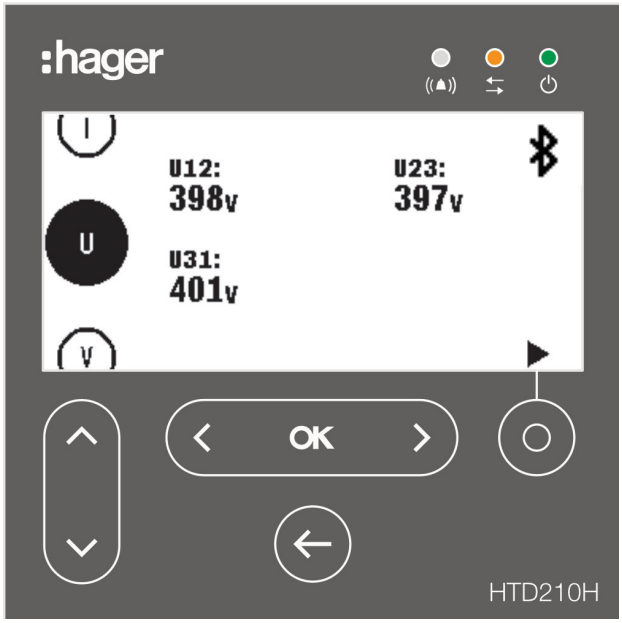
The representation chosen in the Live mode menu is automatically applied to the relevant screen view in the Measure menu.

Navigation in Live mode

Button	Navigation
	- Pause and start the Live animation.
	- Change the display representation: numerical, gauge, bar graph (possible during running or paused animation).
	- Open the Main menu (possible during running or paused animation).
	- Scroll up or down through the displayed favourite measurements (possible during running or paused animation).

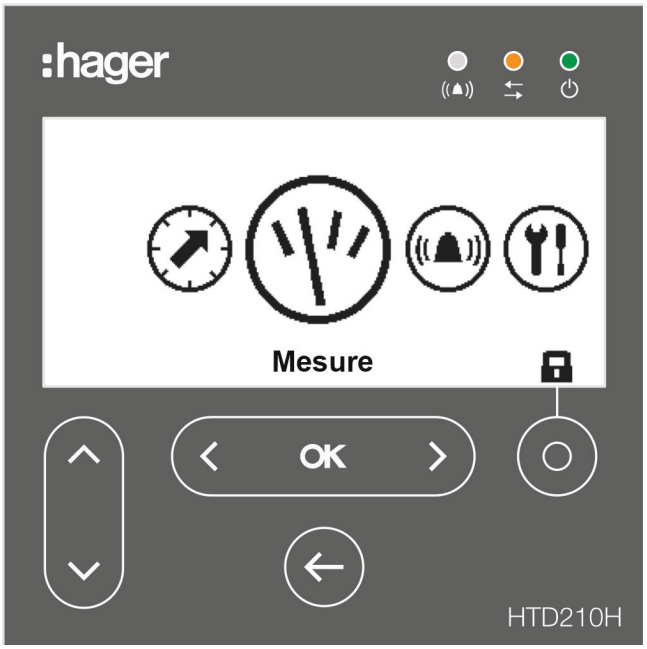
Bluetooth signalling in Live mode

With the hw+ sentinel Energy circuit breaker the icon is displayed in Live mode when the circuit breaker's Bluetooth communication is activated.

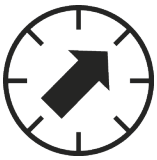


4.4 Main menu

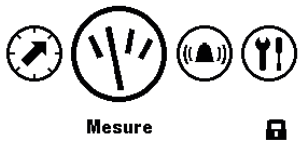
The Main menu gives access to the menus. By default, the Measurement menu is preselected.



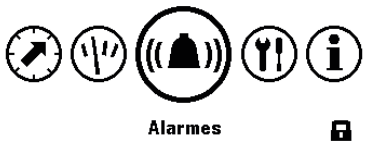
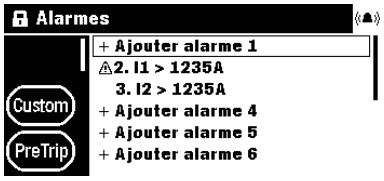
There are 5 menu items:

Symbol	Menu	Functions
	Protection	- Display and setting of the protection parameters.
	Measurement	- Display of the available measurements. - Setting favourites.
	Alarms	- Display and setting of alarms.
	Configuration	- Display and change of the settings of the connected circuit breaker and the panel display.
	Information	- Displaying information of the connected circuit breaker and the Panel display. - Displaying information about events/alarms. - Displaying the status of the circuit breaker.

Opening the Main menu from Live mode

Button	Step/Action	Display
OK or ←	1. Stopping Live mode. - The Main menu opens with the Measurement menu preselected.	

Selecting and opening a menu

Button	Step/Action	Display
OK	1. Select a menu.	
OK	2. Open the menu.	

4.5 Locked/Unlocked mode

Most of the menus and functions are protected with a password to prevent modification of some parameters.

Locked functions or menus are labelled with a padlock symbol.

Symbol	State	Description
	Locked	The function is password-protected and locked.
	Unlocked	The function is unlocked.
	Locked (flashing)	The selected menu or function is password-protected. Enter the password to unlock the function.

Locked menus

The following menus are locked by default:

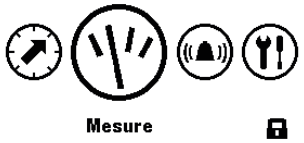
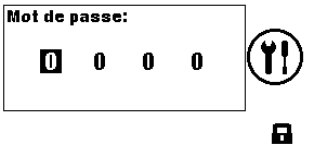
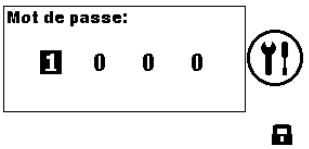
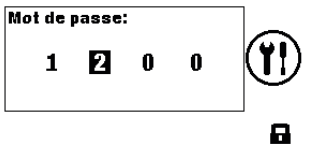
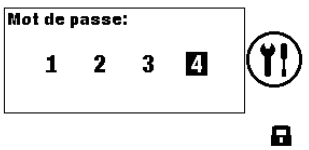
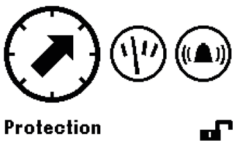
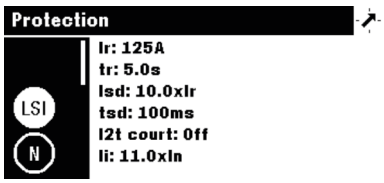
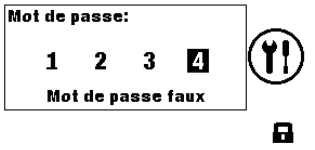
- Protection
- Alarms
- Configuration:
  - Date and time setting
  - Changing the password
  - Measurement parameters
  - Resetting min/max measurements
  - Erasing alarms and trip events

Password

The HTD210H panel display is delivered with the predefined password '3333'.

If the predefined password is not working, refer to your delivery documents for the predefined password.

Unlocking a menu or function using the password 1-2-3-4, for example

Button	Step/Action	Display
	1. Open the Main menu. - The closed padlock indicates that the display is locked.	
	2. Open the menu for entering the password. - The password consist of 4 digits.	
	3. Increase / decrease the value of the digits.	
	4. Select the next digit and set the values.	
	5. Confirm your entry.	
	RESULT: - The display is unlocked. - The lock symbol is open. - The submenus are no longer locked.	 
	If the password is incorrect, it must be entered again.	

4.6 Alarm warnings

Optional alarm or trip display priorities

The panel display manages the alarm warnings according to their level of priority:

Priority	Actions			
	Stored as alarm event	Stored in active alarms list*	Alarm pop-up window**	Alarm LED flashing
Low	x			
Average	x	x		x
High	x	x	x	x

(*) Stored in active alarms list: In Live mode only, an alarm icon is displayed above the context-sensitive key, as a context icon. If no alarm pop-up is displayed, the alarm can be recalled by touching the contextual key.

(**) Alarm pop-up window: The alarm pop-up is immediately displayed (regardless of mode).

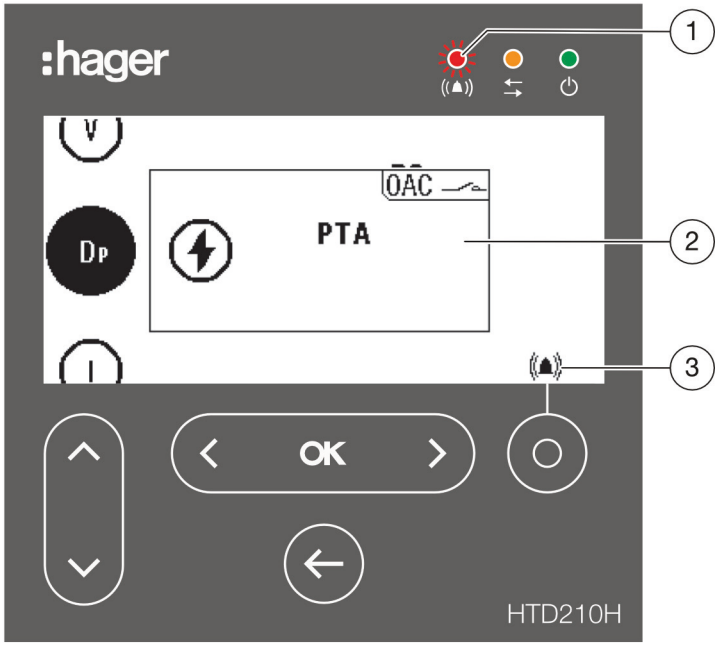
NOTE

When an alarm with low priority occurs, it is not notified by the display.

Alarm priority management is not available with the hw+ sentinel Energy circuit breakers.

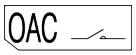
Alarm warnings

High priority alarms are signalled by an alarm pop-up window.

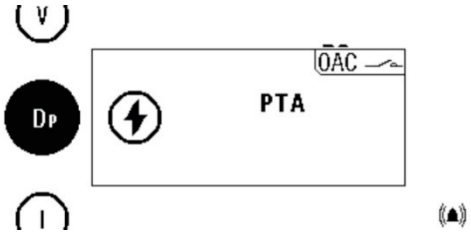
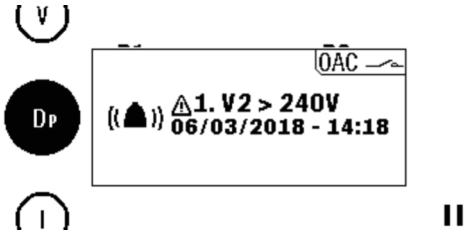


1	Alarm LED
2	Alarm pop-up window
3	List of active alarms icon

Alarm pop-up window description

	Trip alarm
	Alarm event
	Occurs when the active alarm has been assigned to the OAC output contact. It indicates that the OAC contact has switched to its active state. The OAC can be assigned to one of the 12 custom (or optional) alarms, the PTA overload pre-alarm or a system alarm (trip-unit internal error, trip-unit overtemperature, neutral-pole disconnection).

Alarm pop-up window example

	**Overload prealarm** Occurs when the load current of the circuit breaker has reached the defined threshold (default value: 90 % Ir).
	**Trip Test** On 08/06/2018 at 10h44 am, a trip test was carried out with the Hager Power setup software.
	**Custom alarm no. 1** Occurred on 06/03/2018 at 14:18; voltage on phase L2, V2 > 240 V.

Acknowledging alarm pop-up windows

Button	Step/Action
	1. Acknowledge the alarm pop-up window. - The pop-up disappears.
	2. Exit the alarm window without acknowledgement.

NOTE

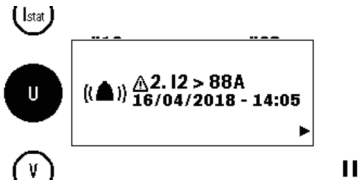
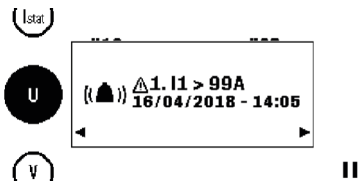
After being acknowledged, the alarm may be still active if the cause is not eliminated. In this case, the alarm window may be visible on the list of active alarms.

Active alarms list

All descriptions of active alarms with medium or high level of priority are accessible in the active alarms list using the **Contextual** key.

High priority level active alarm pop-ups can be recalled after having been acknowledged using the **Contextual** key when the alarm icon is displayed.

Active alarms with medium priority level can be displayed as pop-ups using the **Contextual** key when the alarm icon is displayed.

Button	Step/Action	Display
	1. Open the active alarms list.	
	2. In case of several active alarms: - Go to the next or previous alarm pop-up.	

5 Protection menu

This chapter gives an overview of the protection settings menu and the parameters of the connected circuit breaker.

5.1 Submenus

In the Protection menu the protection settings of the connected circuit breaker can be displayed and modified.

The modification of these settings is protected by a password, refer to Locked/ Unlocked mode on page 39.

As long as the menu is locked, the settings are protected against unauthorised changes.

Available submenus

Submenus	Attribute
LSI	L: Long-time protection S: Short-time protection I: Instantaneous protection
N	N: Neutral protection
Gnd	G: Earth fault protection
ZSI	Only available on the h3+ Energy P250 circuit breaker and hw+ sentinel Energy circuit breakers: - Short duration: Zone Selective Interlocking (ZSI) protection on short-time currents. - Earth: Zone Selective Interlocking (ZSI) protection on ground fault currents.

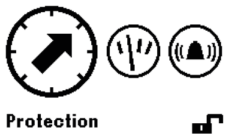
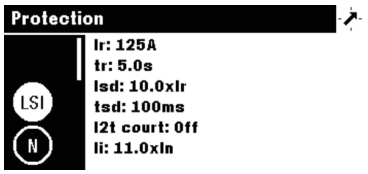
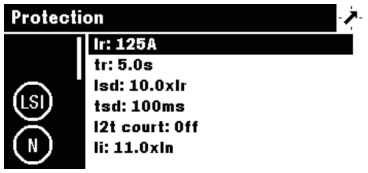
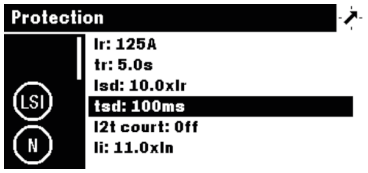
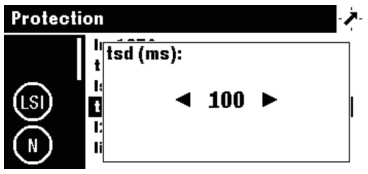
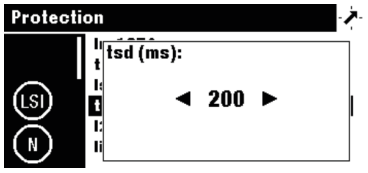
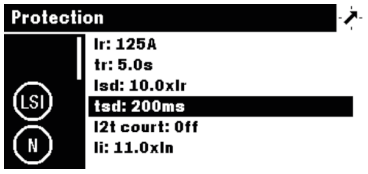
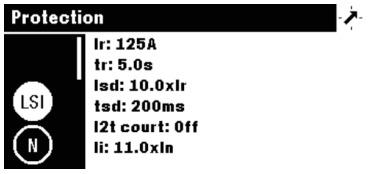
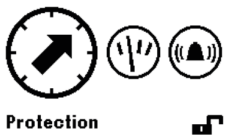
The following submenus are also available with an hw+ sentinel Energy circuit breaker equipped with an "Advanced" or "Ultimate" rating plug.

Submenus	Attribute
	Undervoltage protection - ANSI 27
	Overvoltage protection - ANSI 29
	Underfrequency protection - ANSI 81L
	Overfrequency protection - ANSI 81H
	Reverse active power protection - ANSI 32R
	Phase unbalance protection - ANSI 46
	Voltage unbalance protection - ANSI 47

5.2 Navigation and modifying settings

NOTE

The Display must be in Unlocked mode for modifying the settings, refer to Locked/ Unlocked mode on page 39.

Button	Step/Action	Display
	1. Open the Protection menu.	
	2. Select a submenu. - The selected submenu is highlighted. - The adjustable parameters are displayed in the information window.	
	3. Confirm your selection. - The first parameter in the data window is highlighted.	
	4. Select a parameter. - The selected parameter is highlighted.	
	5. Confirm your selection. - A pop-up window for editing the selected parameter opens.	
	6. Set the value desired for the setting desired.	
	7. Confirm the setting. - The new setting is displayed in the information window.	
	8. Return to the Protection menu.	
	9. Return to the Main menu.	

5.3 Submenus contents

Content for the h3+ Energy circuit breaker

	Attribute	Parameter	Unit	Description
LSI	L	Ir	A	Range dependent on In rating, set in increments of 1.
		tr	s	0.5, 1.5, 2.5, 5.0, 7.5, 9.0, 10.0, 12.0, 14.0, 16.0
	S	Isd	x Ir	1.5 to 10 in steps of 0.5; Off; default enabled, if disabled, tsd and I2t short will be hidden.
		tsd	ms	50, 100, 200, 300, 400
		I^2t short	-	On/Off; default value: Off; if enabled an I^2t curve is added to Short-time protection.
	I	Ii	x In	Range dependent on In rating, set in increments of 0.5.
N	N	IN/Ir (%)	% Ir	50 / 100 / Off; to be kept at Off for 3-pole circuit breakers.
Gnd	G	Earth	-	Off / 3-pole / 4-pole; default enabled; if disabled, Ig, tg and I2t earth will be hidden.
		Ig	x In	Range dependent on In rating, set in increments of 5.
		tg	ms	50, 100, 200, 300, 400, 500
		I^2t ground	-	On/Off; default value: Off; if enabled an I^2t curve is added to earth fault protection.
ZSI		Short	-	On/Off; default value: Off; if Isd is disabled, it will be masked.
		Earth	-	On/Off; default value: Off; if the Earth parameter is deactivated, it will be masked.

Content for the hw+ sentinel Energy circuit breaker

	Attribute	Parameter	Unit	Description
LSI	L	Ir	A	0.40xIn to 1.00xIn, in increments of 0.01; default value 0.40xIn
		tr	s	0.5, 1.5, 2.5, 5.0, 7.5, 9.0, 10.0, 12.0, 14.0, 16.0
		Curve	-	Thi/HVF I4t/EI I2t/VI It/SI I0.02t; default value Thi
	S	Isd	x Ir	Off; 1.0 to 10xIr in increments of 0.5; default value 1.5xIr
		tsd	ms	50 to 600 ms in increments of 50; default value 100 ms
		I^2t	-	On/Off; default value Off
	I	Ii	x In	Off; 1.5xIn to 15xIn in increments of 0.5; default value 1.5xIn
N	N	IN/Ir (%)	% Ir	50 to 200 %Ir, in increments of 50; default value 100 %Ir for a 4-pole circuit breaker
Gnd	G	Earth	-	On/Off; default value: Off on 3P; On on 4P; if deactivated, Ig, tg and I^2t ground will be hidden.
		Ig	x In	From 0.1 to 1.0xIn in increments of 0.1; default 0.2xIn
		tg	ms	50 to 600 with steps of 50
		I^2t	-	On/Off; default value Off
ZSI		Short	-	On/Off; default value: Off; if the Isd is deactivated, it will be hidden.
		Earth	-	On/Off; default value: Off; if the Gnd parameter is deactivated, it will be hidden.

The following submenus are also available with an hw+ sentinel Energy circuit breaker equipped with an "Advanced" or "Ultimate" rating plug.

They are only available on a read-only basis.

	Parameter	Unit	Description
UV	Configuration	-	Off, Trip, Alarm
	Inhibit	-	Off or On
	Voltage monitoring	-	L-L or L-N
	Activation threshold	V	100 to 1000 V in increments of 5
	Activation delay	s	0.1 to 300 s in increments of 0.1
OV	Configuration	-	Off, Trip, Alarm
	Inhibit	-	Off or On
	Voltage monitoring	**-**	L-L or L-N
	Activation threshold	V	100 to 1000 V in increments of 5
	Activation delay	s	0.1 to 300 s in increments of 0.1
UF	**Configuration**	**-**	Off, Trip, Alarm
	Inhibit	-	Off or On
	Activation threshold	Hz	45 Hz to Fn with steps of 0.1
	Activation threshold	% Fn	-
	Activation delay	s	0.1 to 300 s in increments of 0.1
OF	Configuration	-	Off, Trip, Alarm
	Inhibit	**-**	Off or On
	Activation threshold	Hz	Fn to 65 Hz with steps of 0.1
	Activation threshold	% Fn	-
	Activation delay	s	0.1 to 300 s in increments of 0.1
RP	Configuration	-	Off, Trip, Alarm
	Inhibit	-	Off or On
	Activation threshold	kW	-
	Activation threshold	% Pn	4.0 to 15.0 % in increments of 0.5
	Activation delay	s	0.1 to 300 s in increments of 0.1
Unb C	Configuration	-	Off, Trip, Alarm
	Inhibit	-	Off or On
	Activation threshold	%	2 to 90 % in increments of 1
	Activation delay	s	0.5 to 60 s with steps of 0.1
Unb V	Configuration	-	Off, Trip, Alarm
	Inhibit	-	Off or On
	Activation threshold	kW	2 to 90 % in increments of 1
	Activation delay	s	0.5 to 60 s with steps of 0.1

NOTE

The ZSI submenu is only available on h3+ Energy P250 circuit breakers and hw+ sentinel Energy circuit breakers. For more explanations on the ZSI, see the h3+ communication system manual and the sentinel Energy trip unit user hw+ sentinel Energy electronic trip unit user manual.

(See Related documents on page 10).

6 Measurement menu

This chapter gives an overview of the Measurement menu contents of the connected circuit breaker.

6.1 Submenus

In the Measurement menu, most measurements of the corresponding circuit breaker can be displayed.

NOTE

The display of the individual measured values (value, bar graph or gauge), depends on the favourite settings specified in the Measurement menu or in Live mode.

Easy navigation

To allow clear navigation within the Measurement menu, the information is sorted by submenu (current, voltage, power …) and label (P, Q, S, Pmax ...).

Each measurement view provides a contextual menu for setting the favourites and the representation of measured values.

Available submenus

Symbol	Functions
I	Current measurements
U	Phase-to-phase voltage measurements
V	Phase-to-neutral voltage measurements
P	Active power, reactive power, apparent power and maximum values
	Power demand (averaged values)
PF	Power factor and cos ϕ
THD	Total harmonic distortion
E	Energy
Et	Active tariff energy meters (available only with the hw+ sentinel Energy circuit breaker equipped with a "Meter Plus", "Harmonic", "Advanced" or "Ultimate" rating plug)
F	Frequency and others

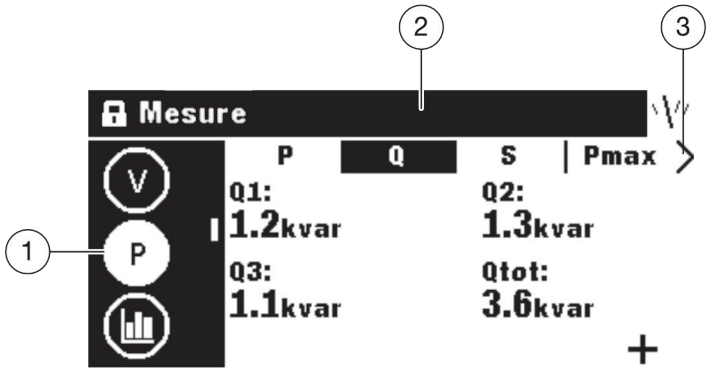
NOTE

The "THD" submenu is available only with the hw+ sentinel Energy circuit breaker equipped with a "Meter Plus", "Harmonic", "Advanced" or "Ultimate" rating plug.

The "Et" submenu is available only with the hw+ sentinel Energy circuit breaker equipped with a "Meter Plus", "Harmonic" or "Ultimate" rating plug.

6.2 Navigation within the Measurement menu

Navigation in the Measurement menu is done vertically to select a submenu.
Navigation in a submenu is done horizontally to select a specific section.



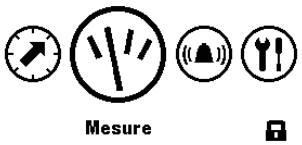
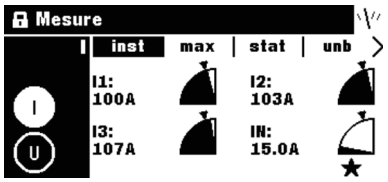
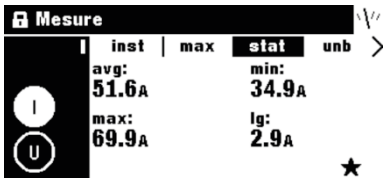
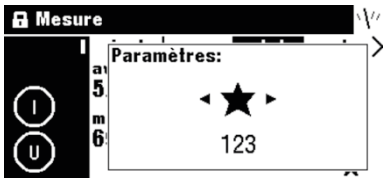
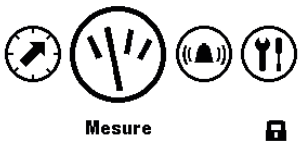
1	**Submenus** - The selected submenu icon is highlighted. - To navigate: 
2	**Labels of screen view** - The selected screen view label is highlighted. - To navigate: 
3	**Icon Other views** - Indicates that there are more screen views.

6.3 Setting favourites and representation

Each screen view can be selected as a favourite to be displayed in Live mode.

The following screen views are selected as default favourites and are displayed in Live mode.

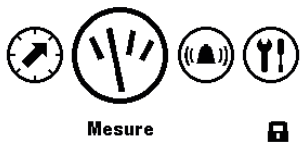
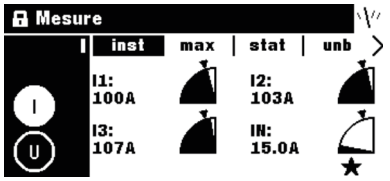
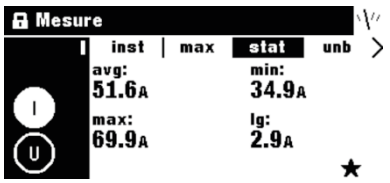
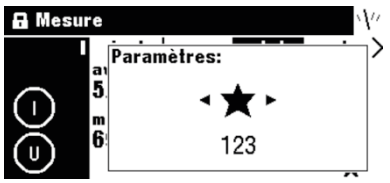
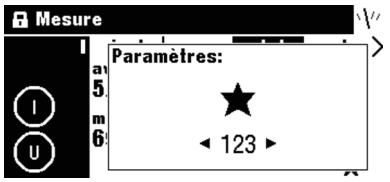
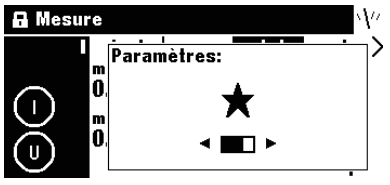
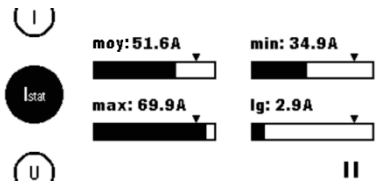
Setting favourites

Button	Step/Action	Display
	1. Open the Measurement menu	
	2. Select a submenu. - The selected submenu icon is highlighted.	
	3. Select the desired screen view. - The selected screen view label is highlighted. - The screen view status is displayed in the lower right corner: Parameter already set as favourite ★ Parameter not set as favourite +	
	4. Open the Settings pop up window.	
	5. Set or unset the favourite status as follows: Unset as favourite ★123 Set as favourite ★123	
	6. Exit the Measurement menu. RESULT: Back in Live mode the favourite screen views are displayed.	

Changing the representation

For most of the screen views, the following 3 representation options are available:

Digital	Gauge	Bar graph
◄ 123 ►	◄  ►	◄  ►

Button	Step/Action	Display
	1. Open the Measurement menu	
	2. Select a submenu. - The selected submenu icon is highlighted.	
	3. Select the desired screen view. - The selected screen view label is highlighted.	
	4. Open the Settings pop up window.	
	5. Select the representation settings	
	6. Select the desired kind of representation.	
	7. Confirm your selection. RESULT: Back in Live mode the favourite screen views are displayed.	

6.4 Measurement parameters

Current

inst	max	stat	unb	misc
[A]: rms current I1, I2, I3 and IN (neutral)	[A]: last maximum rms current I1, I2, I3 and IN (neutral) (with timestamp); can be reset.	[A] avg: arithmetic mean current of I1, I2 and I3 [A] min: minimum instantaneous rms current between I1, I2 and I3 [A] max: maximum instantaneous rms current between I1, I2 and I3 [A] Ig: rms value of the calculated current Ig	[%]: Unbalanced I1, I2, I3, IN vs. arithmetic mean current avg. The unbalanced values have a plus or minus sign.	[A] max: last maximum current value between I1, I2, I3; can be reset. [A] Ig Max: last maximum rms value of the calculated current Ig; can be reset. [%] Unb Max: last Maximum of unbalanced current; can be reset.

Voltage – phase-to-phase

inst	max	min	unb	avg
[V] U12: rms phase 1 to phase 2 voltage. [V] U23: rms phase 2 to phase 3 voltage. [V] U31: rms phase 3 to phase 1 voltage.	[V] U12: last maximum rms of U12 (timestamp); can be reset. [V] U23: last maximum rms of U23 (timestamp); can be reset. [V] U31: last maximum rms of U31 (timestamp); can be reset.	[V] U12: last minimum rms of U12 (timestamp); can be reset. [V] U23: last minimum rms of U23 (timestamp); can be reset. [V] U31: last minimum rms of U31 (timestamp); can be reset.	[%] U12: unbalanced U12 voltage vs average phase-to-phase voltage. [%] U23: unbalanced U23 voltage vs average phase-to-phase voltage. [%] U31: unbalanced U31 voltage vs average phase-to-phase voltage. [%] max: maximum unbalanced voltage vs average phase-to-phase voltage.	[V] U: arithmetic mean of U12, U23 and U31. [V] max: maximum of arithmetic mean of U12, U23 and U31; can be reset.

NOTE

The "unb" section is available only with the hw+ sentinel Energy circuit breaker equipped with a "Harmonic", "Advanced" or "Ultimate" rating plug.

Voltage – Phase to neutral

inst	max	min	unb	avg
[V] V1N: rms phase 1 to neutral voltage. [V] V2N: rms phase 2 to neutral voltage. [V] V3N: rms phase 3 to neutral voltage.	[V] V1N: last maximum rms of V1N (timestamp); can be reset. [V] V2N: last maximum rms of V2N (timestamp); can be reset. [V] V3N: last maximum rms of V3N (timestamp); can be reset.	[V] V1N: last minimum rms of V1N (timestamp); can be reset. [V] V2N: last minimum rms of V2N (timestamp); can be reset. [V] V3N: last minimum rms of V3N (timestamp); can be reset.	[%] V1N: unbalanced V1N voltage vs average phase-to-neutral voltage. [%] V2N: unbalanced V2N voltage vs average phase-to-neutral voltage. [%] V3N: unbalanced V3N voltage vs average phase-to-neutral voltage. [%] max: maximum of unbalanced voltage vs average phase-to-neutral voltage.	[V] V: arithmetic mean of V1N, V2N and V3N. [V] max: maximum of arithmetic mean of V1N, V2N and V3N; can be reset.

NOTE

The "unb" section is available only with the hw+ sentinel Energy circuit breaker equipped with a "Harmonic", "Advanced" or "Ultimate" rating plug.

Power / Max power

P	Q	S	Pmax	Qmax	Smax
[kW] P1, P2, P3: active power per phase. [kW] Ptot: total active power.	[kvar] Q1, Q2, Q3: reactive power per phase. [kvar] Qtot: total reactive power.	[kVA] S1, S2, S3: apparent power per phase [kVA] Stot: total apparent power.	[kW] P1, P2, P3: active power per phase; can be reset. [kW] Ptot: total active power; can be reset.	[kvar] Q1, Q2, Q3: reactive power per phase; can be reset. [kvar] Qtot: total reactive power; can be reset.	[kVA] S1, S2, S3: apparent power per phase; can be reset. [kVA] Stot: total apparent power; can be reset.

Power demand / max. power demand

P	Q	S	Pmax	Qmax	Smax
[kW] P1, P2, P3: active power demand per phase. [kW] Ptot: total active power demand.	[kvar] Q1, Q2, Q3: reactive power demand per phase. [kvar] Qtot: total reactive power demand.	[kVA] S1, S2, S3: apparent power demand per phase. [kVA] Stot: total apparent power demand.	[kW] P1, P2, P3: max. active power demand per phase; can be reset. [kW] Ptot: max. total active power demand; can be reset.	[kvar] Q1, Q2, Q3: max. reactive power demand per phase; can be reset. [kvar] Qtot: max. total reactive power demand; can be reset.	[kVA] S1, S2, S3: max. apparent power demand per phase; can be reset. [kVA] Stot: max. total apparent power demand per phase; can be reset.

Power factor

Pow. Fact.	cos φ
PF1, PF2, PF3: power factor per phase	cos φ 1, cos φ 2, cos φ 3: fundamental power factor per phase
PF tot: total power factor	cos φ Tot: total fundamental power factor

Total harmonic distortion

U [%]	V [%]	I [%]
U12: THD of U12	V1N: THD of V1N	I1: THD of I1
U23: THD of U23	V2N: THD of V2N	I2: THD of I2
U31: THD of U31	V3N: THD of V3N	I3: THD of I3
		IN: THD of neutral current (only with hw+ sentinel Energy circuit breaker)
		IMax: THD maximum between I1, I2 and I3 (only with h3+ Energy circuit breaker)

NOTE

For an hw+ sentinel Energy circuit breaker the THD submenu is available only with a "Meter Plus", "Harmonic", "Advanced" or "Ultimate" rating plug.

Energy

Ea	Er	Es	Partial
[kWh] Ealn: Direct active energy	[kVARh] ErIn: Direct reactive energy	[kVAh] Es: Apparent energy	[kWh] Ealn: Direct active energy, partial energy meter
[kWh] EaOut: Reverse active energy	[kVARh] ErOut: Reverse reactive energy		[kWh] EaOut: Reverse active energy, partial energy meter

Active tariff energy meters

(available only with the hw+ sentinel Energy circuit breaker equipped with a "Meter Plus", "Harmonic", "Advanced" or "Ultimate" rating plug)

Ea	Er	Es
kWh] Ealn: Imported active energy (consumed)	[kVARh] ErIn: Imported reactive energy (consumed)	[kVAh] Es: Apparent energy
[kWh] EaOut: Active energy exported (produced)	[kVARh] ErOut: Reactive energy exported (produced)	

Network

F

Network

Frequency [Hz]

Quadrant: Power quadrant

Rot. field: current order of phases 1, 3, 2 or 1, 2, 3.

7 Alarms menu

This chapter gives an overview of the Alarms menu.

Setting and editing alarms will be explained.

7.1 Submenus

In the Alarms menu the following parameters can be set and modified:

- Custom or optional alarms
- Overload prealarm
- Trip alarms
- OAC output contact

The modification of these settings is protected by a password, refer to Locked/ Unlocked mode on page 39.

Submenu	Attribute
Custom	Custom or optional alarm - Up to 12 alarms can be defined to monitor a measurement event by definition of thresholds and time delays. Several parameters allow to set the condition for activation and the priority level.
PreTrip	Overload prealarm - The PTA or PTA1 overload prealarm is a predefined alarm that determines the behaviour of the PTA LED on the h3+ Energy circuit breaker and its PTA output contact. - It is signalled by the PTA icon on the display of the hw+ sentinel Energy circuit breaker. - When the prealarm reaches its alert zone, the PTA contact switches on the h3+ Energy circuit breaker, the PTA icon switches from flashing to steady on the hw+ sentinel Energy circuit breaker and the PTA alarm window appears on the panel display. - This menu allows the PTA prealarm to be set on the h3+ Energy circuit breaker or the PTA1 and PTA2 prealarms on the hw+ sentinel Energy circuit breaker.

Trip	Trip alarm (only for h3+ Energy circuit breakers)
	- There are 5 kinds of Trip alarm corresponding to the following trip events:
	  - LTD trip L
	  - STD trip S
	  - Instantaneous trip I
	  - Earth fault protection G,
	  - Trip test.
	For a Trip alarm, only its priority level can be set.

OAC	OAC output contact (only for h3+ Energy circuit breakers)
	- One of the following alarm types can be assigned to the OAC output contact:
	  - PTA overload prealarm
	  - Custom alarm
	  - System alarm
	  - Default assigned to overload prealarm PTA.
	- The behaviour of the OAC contact can be set to the following modes:
	  - Automatic (no acknowledgement required)
	  - Latching (needs to be acknowledged via Modbus communication)

NOTE

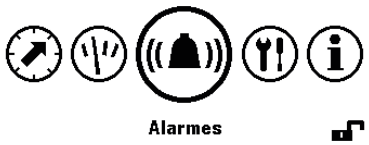
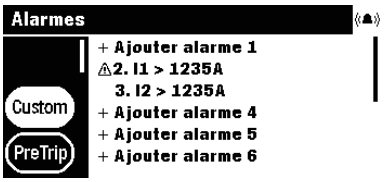
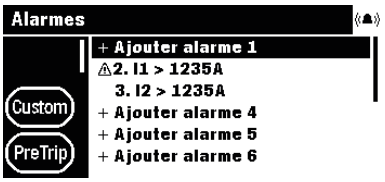
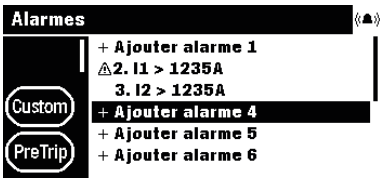
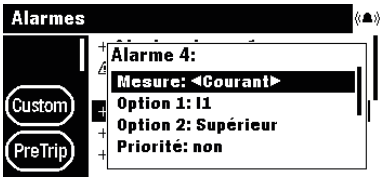
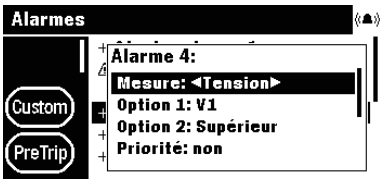
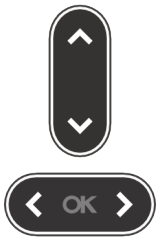
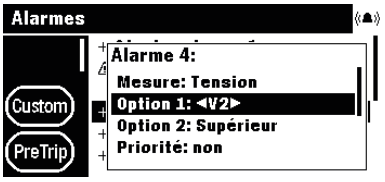
The Trip and OAC submenus are not available with the hw+ sentinel Energy circuit breaker.

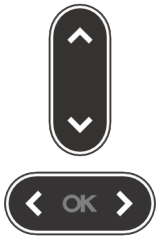
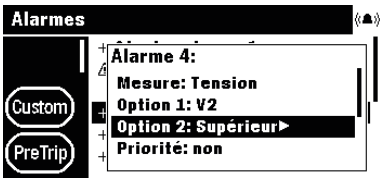
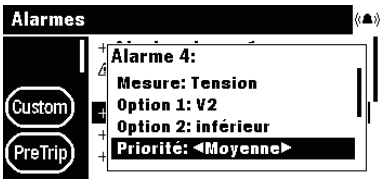
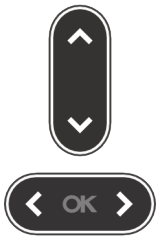
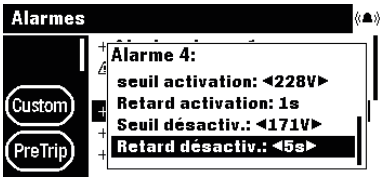
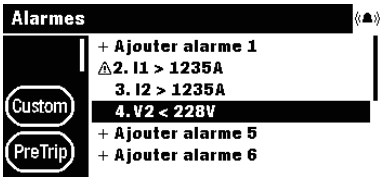
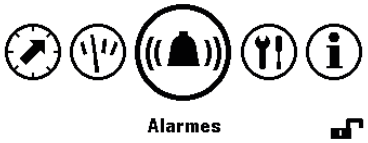
7.2 Navigation and setting

NOTE

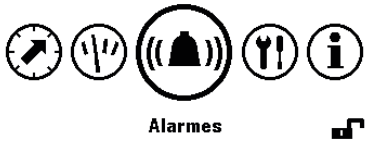
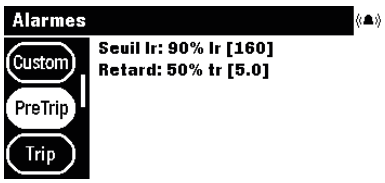
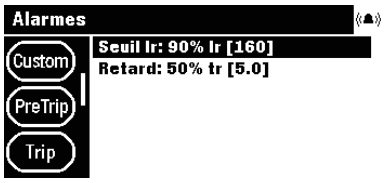
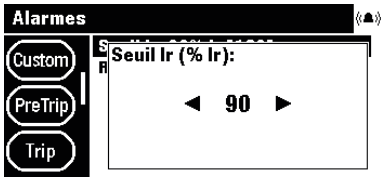
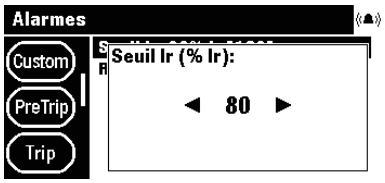
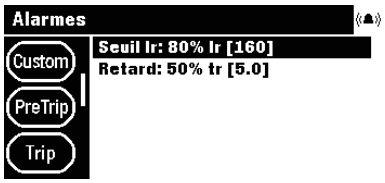
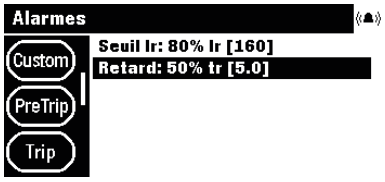
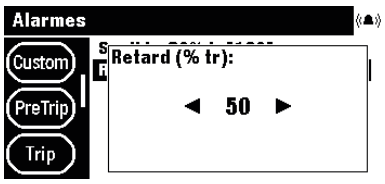
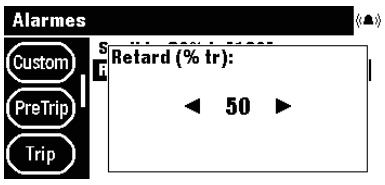
The display must be unlocked to set alarms, see Locked/Unlocked mode on page 39.

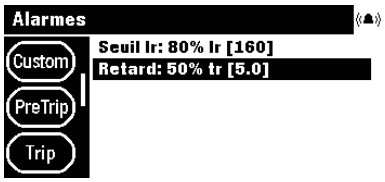
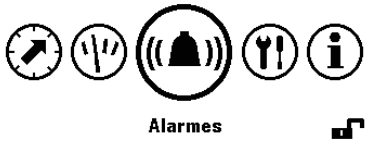
Displaying and setting custom alarms

Button	Step/Action	Display
	1. Open the Alarms menu.	
	2. Select "Custom" - All configured or unconfigured alarms are displayed.	
	3. Confirm your selection. - The first parameter of the custom alarms list is highlighted.	
	4. Select the desired alarm to display or to modify the settings.	
	5. Confirm your selection. - The alarm settings window opens. - The first parameter **Measure** has to be set. This parameter defines the type of measurement to be assigned to this custom alarm.	
	6. Select the type of measurement.	
	7. Select and set the complementary attribute of this type of measurement.	

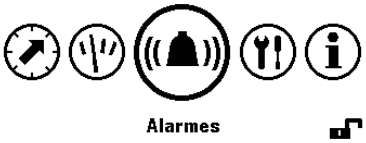
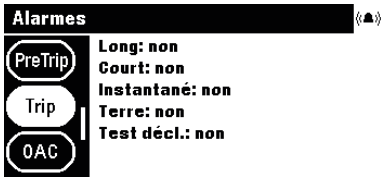
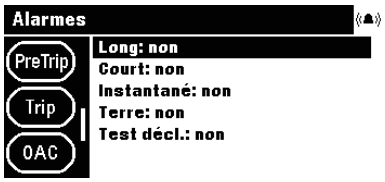
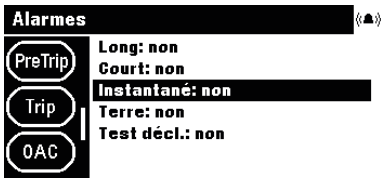
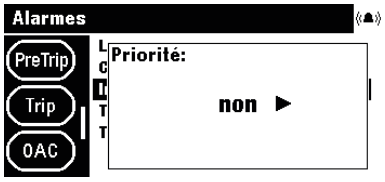
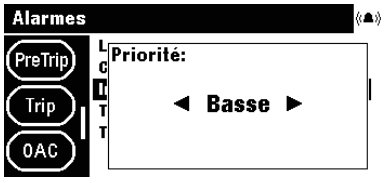
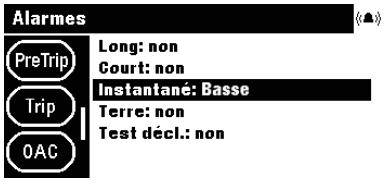
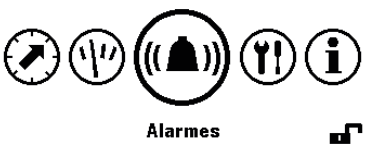
Button	Step/Action	Display
	8. Select and set the alarm activation condition (Option 2).	
	9. Select and configure the alarm priority (only for h3+ Energy circuit breakers).	
	10. Select and set activation thresholds and time delays: - threshold: Pick-up value - threshold: Drop-out value - time delay: Pick-up delay - time delay: Drop-out delay	
	11. Confirm the settings. - The new alarm is configured.	
	12. Return to the Alarms menu.	

Displaying and setting overload prealarms.

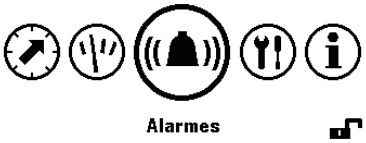
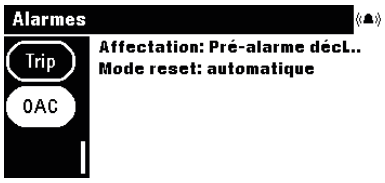
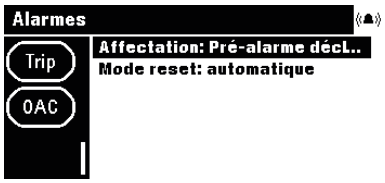
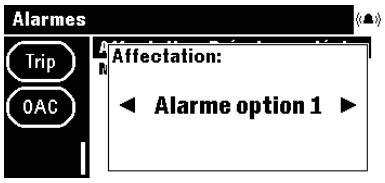
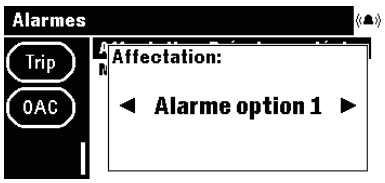
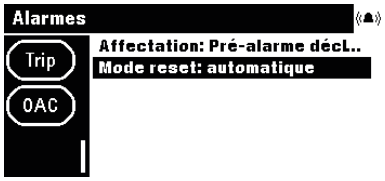
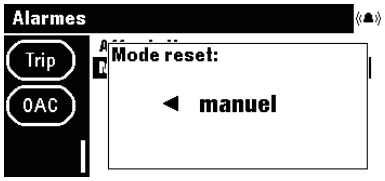
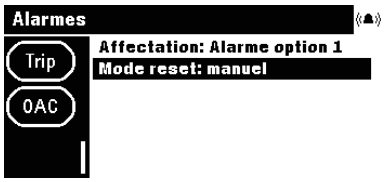
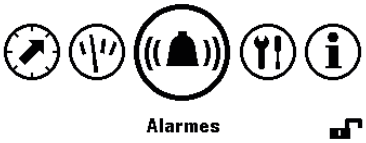
Button	Step/Action	Display
	1. Open the Alarms menu.	
	2. Select "PreTrip" (overload prealarm). - The selected submenu icon is highlighted. - The adjustable parameters are displayed in the information window.	
	3. Confirm your selection. - The threshold parameter is highlighted.	
	4. Confirm the selection of the threshold parameter. - The threshold pop-up is displayed.	
	5. Set the overload pre-alarm threshold Ir.	
	6. Confirm the Ir threshold.	
	7. Select the time delay parameter.	
	8. Confirm your selection.	
	9. Configure the overload prealarm time delay (default value: 50 % of tr).	

Button	Step/Action	Display
	10. Confirm the overload prealarm time delay. - The new parameters for the alarm type are set.	
	11. Return to the Alarms menu.	

Displaying and setting Trip alarms

Button	Step/Action	Display
	1. Open the Alarms menu.	
	2. Select trip. - The selected alarm type is highlighted. - The adjustable parameters are displayed in the information window.	
	3. Confirm your selection. - The first parameter is highlighted.	
	4. Select the parameter to be modified.	
	5. Confirm your selection. - The alarm settings pop-up opens.	
	6. Select a value.	
	7. Confirm the setting. - The new value for this parameter is set. To set the other parameters return to step 3.	
	8. Return to the Alarms menu.	

Displaying and configuring the OAC output contact

Button	Step/Action	Display
	1. Open the Alarms menu.	
	2. Select OAC. - The selected submenu icon is highlighted.	
	3. Confirm your selection. - The assignment parameter is highlighted.	
	4. Confirm the selection of the assignment parameter. - The assignment pop-up window is displayed.	
	5. Select the alarm to be assigned to the OAC output contact.	
	6. Confirm the setting. - The alarm selected is assigned to the OAC output contact.	
	7. Select the Reset mode parameter of the OAC output contact.	
	8. Confirm your selection. - The Reset mode pop-up window is displayed.	
	9. Set and confirm the reset mode. - The OAC output contact is defined.	
	10. Return to the Alarms menu.	

7.3 Submenus contents

NOTE

The measurement attributes within the "Custom" submenu depend on the 3-pole/4-pole configuration of the circuit breaker. Therefore not all combinations of the listed parameters are always possible.

Custom

Type of measurement	Option 1 (measurement attribute)	Option 2 (alarm activation condition on Option 1)
Current	I1, I2, I3, IN, IMax, I1Unb, I2Unb, I3Unb, IMaxUnb, Iavg	Over, Under
Earth	-	Over, Under
Voltage	V1, V2, V3, VN, VMax, VMin, V1Unb, V2Unb, V3Unb, VMaxUnb, Vavg, U12, U23, U31, Umax, Umin, U12Unb, U23Unb, U31Unb, UmaxUnb	Over, Under
Power	P1+, P2+, P3+, Ptot+, P1-, P2-, P3-, Ptot-, Q1+, Q2+, Q3+, Qtot+, Q1-, Q2-, Q3-, Qtot-, S1, S2, S3, Stot	Over, Under
Pow. Fact.	PF1, PF2, PF3, PF tot, cosφ1, cosφ2, cosφ3, cosφTot	Lagging (inductive), leading (capacitive)
THD	I1, I2, I3, V1, V2, V3, U12, U23, U31	Over
Frequency	-	Over, Under
Demand	I1, I2, I3, IN, Iavg, P, Q, S	Over, Under
Quadrant	Quadrant 1, Quadrant 2, Quadrant 3, Quadrant 4	-
Phase sequence	L1>L2>L3, L1>L3>L2	-
Capa./induc.	Capa., ind.	-

NOTE

If a custom or optional alarm is defined and set to None priority, the alarm is not notified by pilot lamp or by a message on the display.

For more explanations on the measurement parameters, see the h3+ communication system manual or the sentinel Energy trip unit user manual (see Related documents on page 10).

PreTrip

Parameter	Unit	Description
PTA1 threshold Ir	% Ir	60 to 95 %; default value: 90, adjustable in steps of 5.
PTA1 time tr	% tr	5 to 80 %; default value: 50, adjustable in steps of 5.
PTA2 threshold Ir	% Ir	60 to 95 %; default value: 90, adjustable in steps of 5.
PTA2 time tr	% tr	5 to 80 %; default value: 50, adjustable in steps of 5.

The PTA2 parameters are available only with the hw+ sentinel Energy circuit breaker.

Trip

Parameter	Description
Long	Set alarm priority for LTD tripping; default High.
Short	Set alarm priority for STD tripping; default High.
Instantaneous	Set alarm priority for Instantaneous tripping; default High.
Earth	Set alarm priority for Earth tripping; default High.
Trip Test	Set alarm priority for STD tripping; default High.

OAC

Parameter	Description
Assignment	Default overload prealarm; to assign an alarm* to the OAC output contact of the h3+ Energy circuit breaker.
Reset mode	Locking / Automatic; Set behaviour of OAC contact; Locking: acknowledgement required through Modbus to set OAC contact back to normal position; Automatic: no acknowledgement required; default Automatic.

(*) List of alarms that can be assigned to the OAC output contact.

Assignments to alarm types

Alarm type	Assignment
	no parity
PTA overload prealarm	Ir prealarm
System alarm	Overtemperature
	Neutral pole breach
	Internal error
Custom alarm	Custom alarm 1
	Custom alarm 2
	...
	Custom alarm 12

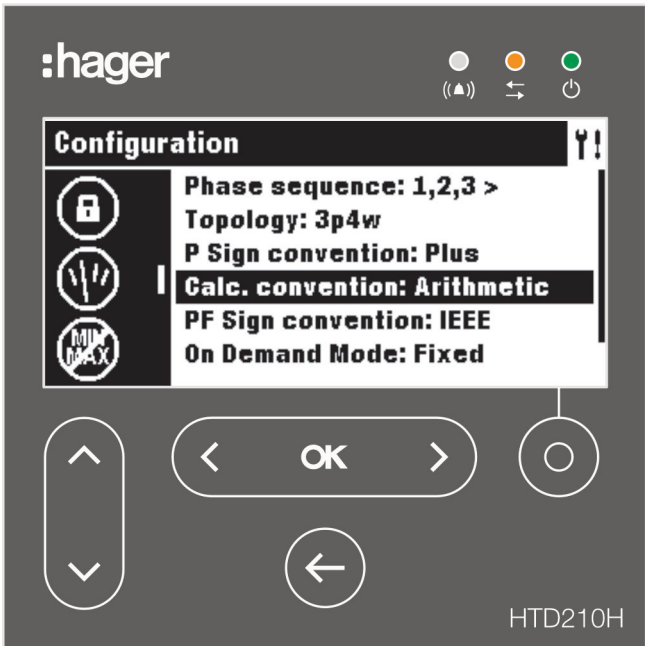
NOTE

The Trip and OAC submenus are not available with the sentinel Energy circuit breaker.

8 Configuration menu

This chapter gives an overview of the Configuration menu and the adjustable parameters of the connected circuit breaker.

8.1 Submenus



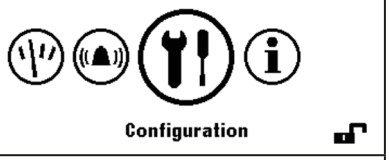
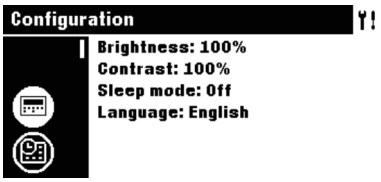
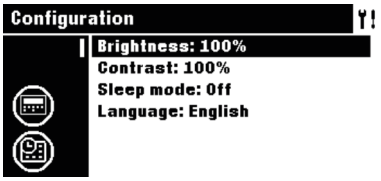
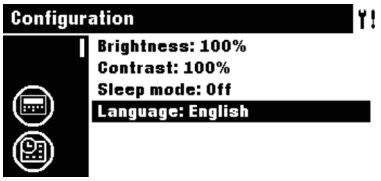
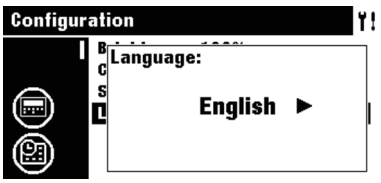
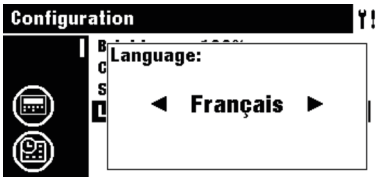
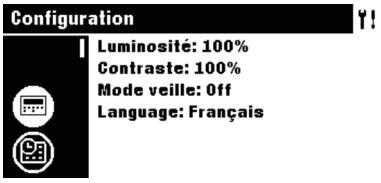
The settings are password protected, refer to Locked/Unlocked mode on page 39 to unlock the function.

Available submenus

Submenus	Function
	Setting the display
	Date and time setting
	Changing the password
	Setting the measurements
	Resetting min/max measurements
	Erasing custom alarms
	Erasure of trip events

8.2 Navigation and setting

The following example explains how to adjust the settings in the Configuration menu in general. The individual settings for each parameter may differ.

Button	Step/Action	Display
	1. Open the Configuration menu.	
	2. Select a submenu. - The selected submenu is highlighted.	
	3. Confirm your selection. - The first parameter that can be adjusted is highlighted.	
	4. Select a parameter. - The selected parameter is highlighted.	
	5. Confirm your selection. - The contextual window of the selected parameter opens.	
	6. Select a value.	
	7. Confirm the setting. - The new setting takes effect. To set other parameters return to step 4.	
	8. Return to the Configuration menu.	

8.3 Submenus contents

NOTE

Except for the Display settings submenu, the display must be unlocked before changes are possible, refer to Locked/Unlocked mode on page 39.

Display settings

Parameter	Description	Values
Brightness	Setting for the brightness of the display.	20 – 100 % (increment 20)
Contrast	Setting the contrast of the display.	0 – 100 % (increment 25)
Display mode	Display mode off: The backlight of the display switches off after 5 minutes if no interaction occurs. Touching a button reactivates the backlight.	On, Off
Language	Setting the language of the display.	English, Japanese, French, German, Italian, Spanish, Portuguese, Chinese

Date and time setting

Parameter	Description	Format
Date	Setting the current date.	DD/MM/YYYY
Time	Setting the current time.	HH:MM

Password change

Parameter	Description	Format
Password change	Changing the current password.	**** [4 digits]

Measurement parameters

Parameter	Description	Values
Phase sequence	Defining the sequence of the connected phases.	L1>L2>L3 / L1>L3>L2; default value: L1>L2>L3
NSP (only on h3+ Energy circuit breaker)	Defining the topology of the connected phases. (On 3P circuit breakers only 3P topology is available).	3P/3P+N
Power sign convention	Definition of the power sign convention: power supply of the circuit breaker from the top (positive) or power supply of the circuit breaker from the bottom (negative).	Positive / Negative; default value: Positive
Calculation convention	Defining the calculation convention of Qtot, Stot, Eap, ErOut, ErIn and PF.	Vector/Arithmetic; default value: Vector
PF sign convention	Defining the sign convention of the power factor.	IEC / IEEE; default value: IEC
Demand mode	Definition of the type of integration of averaged values.	Fixed / Sliding / Bus sync.; default value: Fixed
Demand period	Defining the duration of the time window of averaged measurements.	From 5 to 60 min (h3+ Energy circuit breaker), 1 to 60 min (hw+ sentinel Energy circuit breaker), adjustable in increments of 1; default value: 30 min
Nominal voltage Un	Definition of the nominal voltage between phase Un	From 208 to 690 V
Freq. Nominal Fn	Nominal Power definition Pn	50 or 60 Hz
Nominal power Pn	Nominal Power definition Pn	50 to 9995 kW in increments of 5
ENVA	Taking neutral potential into account when measuring voltages and powers	On or Off; cannot be deactivated on 4-pole; On by default for 3-pole
ENCT	Taking the neutral current measurement into account	On or Off; cannot be deactivated on 4-pole; Off by default for 3-pole
Tariff	Activation of the multi-tariff energy meters function	On or Off

NOTE

The parameters Un, Fn, Pn, ENCT, ENVA and Tariff parameters are available only with the hw+ sentinel Energy circuit breaker.

The Tariff parameter is available only with the hw+ sentinel Energy equipped with a "Meter Plus", "Harmonic" or "Ultimate" rating plug.

For more explanations on the measurement parameters, see the h3+ communication system manual and the sentinel Energy trip unit user manual.

Reset of all minimum and maximum measurement values

Category	Description
Reset all min / max	Reset of **all** the min / max values.
Reset current min / max	Reset of current min / max values.
Reset voltage min / max	Reset of voltage min / max values.
Reset power min / max	Reset of power min / max values.
Reset PF min / max	Reset of power factor min / max values.
Reset freq. min / max	Reset of frequency min / max values.
Reset THD min / max	Reset of the min/max values of harmonic distortion rates.
Reset P max on demand	Reset of the averaged power min / max values.
Reset energies	Reset of all energies.

Erasure of alarm events

Category	Description
Erase all alarm events	Erasure of **all** alarm events.

Erasure of trip events

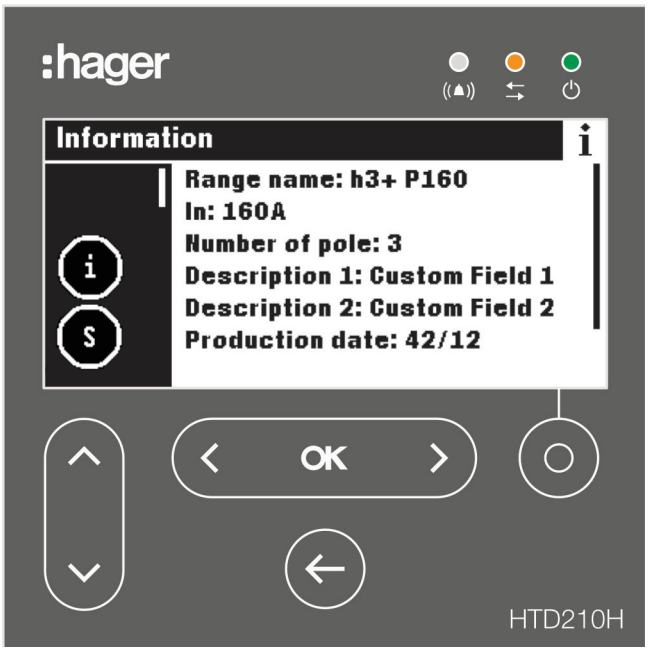
Category	Description
Erase all trip events	Erasure of **all** trip events.

9 Information menu

This chapter gives an overview of the Information menu and the information displayed.

9.1 Submenus

The Information menu displays various kinds of information about the connected circuit breaker



In this menu no user inputs or adjustments are possible. Only information is displayed.

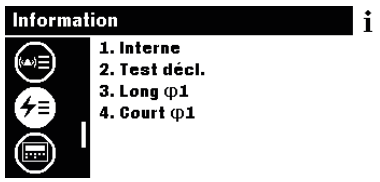
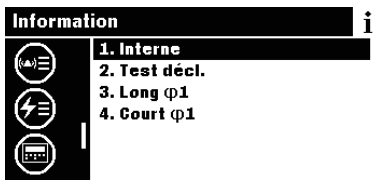
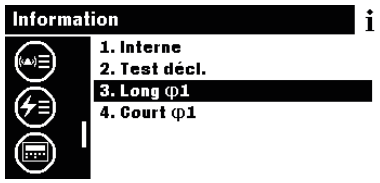
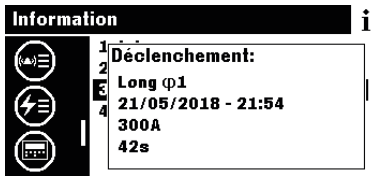
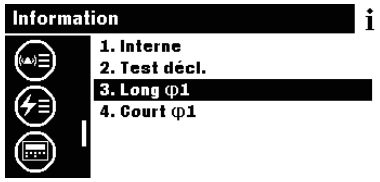
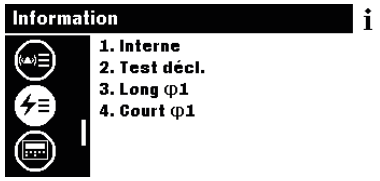
Available submenus

Symbol	Functions
	Circuit breaker information
	Status of the circuit breaker and other information
	History of alarm events (up to 40 events)
	History of trip events (up to 40 events)
	Serial number

9.2 Navigation in the circuit breaker information submenu

Button	Step/Action	Display
	1. Open the Information menu.	
	2. Scroll up and down to view more entries and their information or status.	
	3. Return to the Information menu.	

9.3 Navigation in log of alarm events and log of trip events

Button	Step/Action	Display
OK	1. Open the Information menu.	
▲ ▼	2. Select the log of alarm events submenu or the log of trip events submenu. - The selected submenu is highlighted; e.g. the history of trip events.	
OK	3. Confirm your selection. - The first entry in the data window is highlighted.	
▲ ▼	4. Select an event.	
OK	5. Confirm the event to view additional information. - An information pop-up opens.	
←	6. Close the pop up.	
←	7. Return to the Information menu.	

9.4 Submenus contents

Circuit breaker information

h3+ Energy circuit breaker

Parameter	Description
Range name	Name of the circuit breaker range.
In	In rating of the circuit breaker.
Number of poles	Number of poles of the circuit breaker.
Description 1	Custom field 1 free for additional description of the connected circuit breaker.
Description 2	Custom field 2 free for additional description of the connected circuit breaker.
Production date	Production date of the connected circuit breaker in Day/Year.
Serial number	Identification number of the connected circuit breaker.

hw+ sentinel Energy circuit breaker

Parameter	Description
Range name	Name of the circuit breaker range.
In	Rated value In given by the rating plug of the circuit breaker.
Number of poles	Number of poles of the circuit breaker.
Option	Information on the type of rating plug installed Basic, Meter Plus, Harmonic, Advanced, Ultimate.
Description	Description of the circuit breaker saved after commissioning with the Hager Power setup software.
Settings	Date of last commissioning with the Hager Power setup software.
Product code	Product code of the circuit breaker.
Last maintenance	Date of the last maintenance.
Maintenance type	Maintenance type.
Next maint.	Date of the next maintenance.
Production date	Production date of the connected circuit breaker in Day/Year.
Serial number	Identification number of the connected circuit breaker.

Circuit breaker status

h3+ Energy circuit breaker

Parameter	Description
AX status	Used only if the AX/AL Energy accessory is mounted. ON/OFF status of the circuit breaker.
AL status	Used only if the AX/AL Energy accessory is mounted. - ON: circuit breaker tripped - OFF: circuit breaker not tripped
Meter AX	Used only if the AX/AL Energy accessory is mounted. Number of operation cycles since the last reset.
Meter AL	Used only if the AX/AL Energy accessory is mounted. Number of trips since the last reset.
PTA	Current status of the PTA output contact.
OAC	Current status of the OAC output contact.
Operating time	Cumulative operating time (hours).

hw+ sentinel Energy circuit breaker

Parameter	Description
Circuit breaker status	On = circuit breaker closed; Off = circuit breaker open.
FS status	FS fault signal contact: On or Off.
Meter On/Off	Number of openings/closings.
Trip meter	Number of trips.
Protection profile	Protection profile currently active: A or B.
Oper. time	Cumulative operating time (hours).

Custom alarm events

The history of custom alarms is sorted from latest (rank 1) to earliest (rank up to 40). For date and time of the alarm event, select the alarm and use the **OK** key.

Trip events history

The history of trip alarms is sorted from latest (rank 1) to earliest (rank up to 10). For date and time of the alarm event, select the alarm and use the **OK** key.

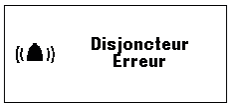
Serial number

Serial number of the HTD210H panel display

10 Support

Malfunction cases

In case of a malfunction of the panel display, note the LED signal lamps and the displayed popups.

Alarm LED	Comm. LED	Ready LED	Contextual message	Recommendation
OFF	OFF	OFF		- Check if an external supply is powering and connected to one of both CIP terminals of the circuit breaker. - Check the CIP adapter between display and circuit breaker by replacing it. - Get in touch with your Hager contact.
Flashing	Flashing	ON		Circuit breaker failure. - Check the status of the circuit breaker (message on the built-in display, LED indication on the circuit breaker) and refer to the h3+ communication system manual or the sentinel Energy hw+ electronic trip units user manual. - If the circuit breaker is recognised as defective, replace it. - Get in touch with your Hager contact.
Flashing	OFF	ON		- Check the CIP adapter between display and circuit breaker by replacing it. - Reconnect the panel display. - Get in touch with your Hager contact if the message is still present.
Flashing	OFF	ON		- Check the compatibility of the circuit breaker with the current panel display. - Get in touch with your Hager contact.
Flashing	OFF	ON		- The panel display may be defective. Restart the circuit breaker and the panel display. - Get in touch with your Hager contact if the message is still present.

Password lost

If your password is lost, the panel display can be unlocked by creating a new password with the Hager Power setup software.

To do this connect the Hager Power setup software to the circuit breaker.

Go to the Settings>Passwords in the application

For the hw+ sentinel Energy circuit breaker, click "Reset".

The panel display password returns to its default value "3333".

For the h3+ Energy circuit breaker, click "Reset". Then enter the serial number of the panel display which can be found in the Information menu or on the label at the back of device. Note the password displayed in the application, enter the new password to unlock, then press and hold the panel display's contextual button to finalise the reset.

Set a new password in the Configuration menu.

If further assistance is required, contact your Hager representative or local Hager technical support (contact details for your country can be found on the Hager website).

11 Appendix

Information on the software licences for the HTD210H panel display

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“Workstation” means a hardware component in which an individual is able to give commands (whether by keyboard or otherwise) that are followed by the Font Software or implement the Font Software, regardless of the location in which the Font Software resides.

“Warranty Period” means the period of validity of the warranties given by Monotype in this Agreement. Monotype’s standard Warranty Period is ninety (90) days from delivery. If you enter into this agreement through the Monotype affiliate Monotype GmbH and the agreement is governed by the laws of Germany, the warranty period is twelve (12) months from delivery.

Monotype Font Software For Desktop End User License Agreement (v220701)

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