

Energy Monitoring solution

Improved efficiency, more building value

:hager





Energy Monitoring System: enhance energy efficiency in your building

In today's world of growing populations and industrializing economies, electrical energy is more essential than ever – and so is energy efficiency. International norms such as IEC 60364-8-1 have laid the foundation to utilising electrical energy in the best-possible and most efficient manner. And this is exactly where our energy monitoring system comes in. It displays and clarifies. It provides information. It helps to interpret this data. And it helps you make better decisions when it comes to the designing, installation and day-to-day operation of low-voltage installations.

Read on to find out how simple the system is to use and what benefits it offers.

One system: all-encompassing effect

01

Measure & collect

Linked to Hager Smart meters, the agardio.manager server functions as the brain of our energy monitoring solution. It measures the consumption of your electrical installations by recording and querying the activities of connected devices.

- Ideal for Hager devices and any other modbus devices, thanks to the plug-in communication module
- Plug-and-play installation
- Easy configuration
- Integration of third-party devices such as gas, water or energy meters
- E-mail alerts if limits exceeded.



Energy meters



Multifunction measuring device for DIN rail



Multifunction measuring device for door installation



Air Circuit Breaker



H3+ MCCB



Third-party modbus devices



02

Monitor & analyse

Configure your system on a laptop or tablet – directly in a web browser, without the need for extra software.

- Different visualisation methods (complete application or individual consumer) for all applications
- All values can be exported in CSV format for further processing (e.g.: in Microsoft Excel).

Internet
browser



Wi-fi

Data Logger



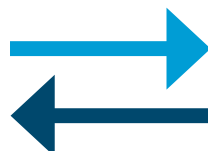
BACnet/IP

Through the BACnet/IP protocol, agardio also communicates with Building Management Systems.

03

Act

Make graphical comparisons and set alerts so you can intervene when energy consumption is too high.



24 V
Voltage supply

Energy monitoring server
(Modbus Master)





Small, intelligent – and always up to date with the current activity of up to 31 Modbus devices: our new energy monitoring server **agardio.manager**.

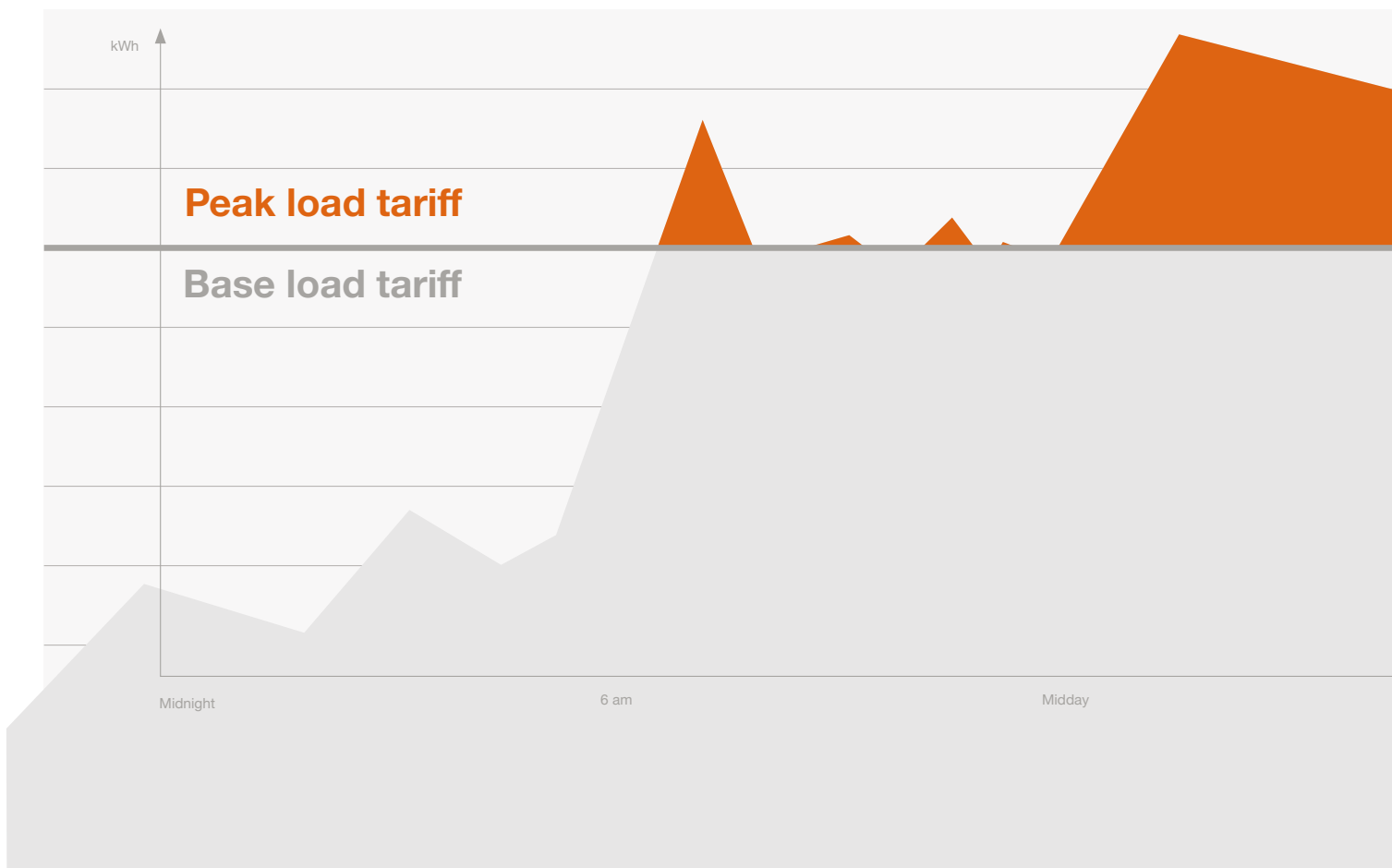
agardio.manager: **the difference** **between guesswork** **and knowledge.**

The real heart of the system – the **agardio.manager** – is rather unassuming. This tiny piece of highly intelligent technology is just six modules wide. But it packs a real punch: it records and queries the current activities of up to 31 Modbus-connected devices – and tells you precisely where there is potential for optimisation. And you? You can see instantly where efficiency gains are possible.

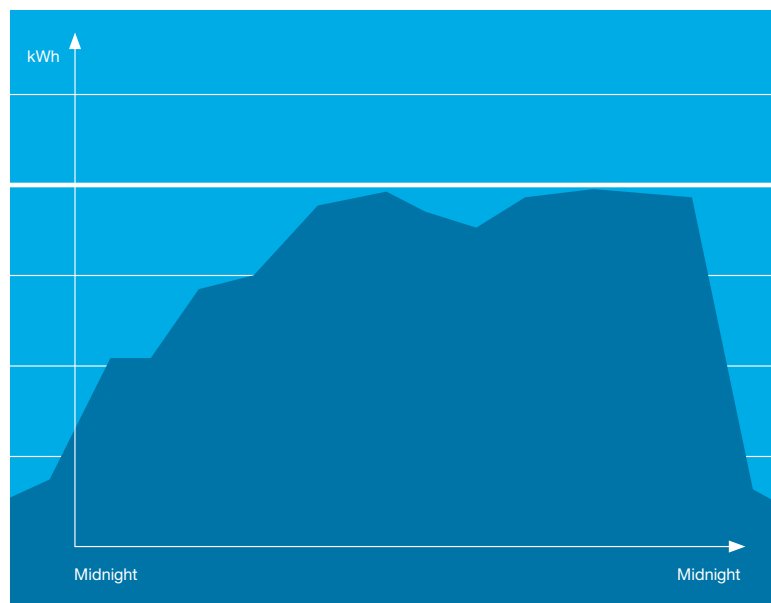
**Cut operating costs –
replace guesswork
with knowledge.**

Expanding intelligence.

Hidden money-wasters, limits being exceeded without your knowledge, sub-optimal operating conditions – in functional buildings, it's worth taking a closer look. We show you where potential problems lie by measuring current and output in order to localise expensive consumption peaks. Or by showing the power factor $\cos \varphi$ in order to introduce targeted reactive power compensation measures. And what about the network quality? A detailed look at the voltage and frequency provides valuable information – permanently.



We ensure energy transparency and safeguard network quality by supplying relevant data from up to 31 connected Modbus devices.



Clearly presented consumption diagrams reveal expensive consumption peaks. You can see at a glance how you can save money by simply changing your usage habits without reducing overall energy consumption.

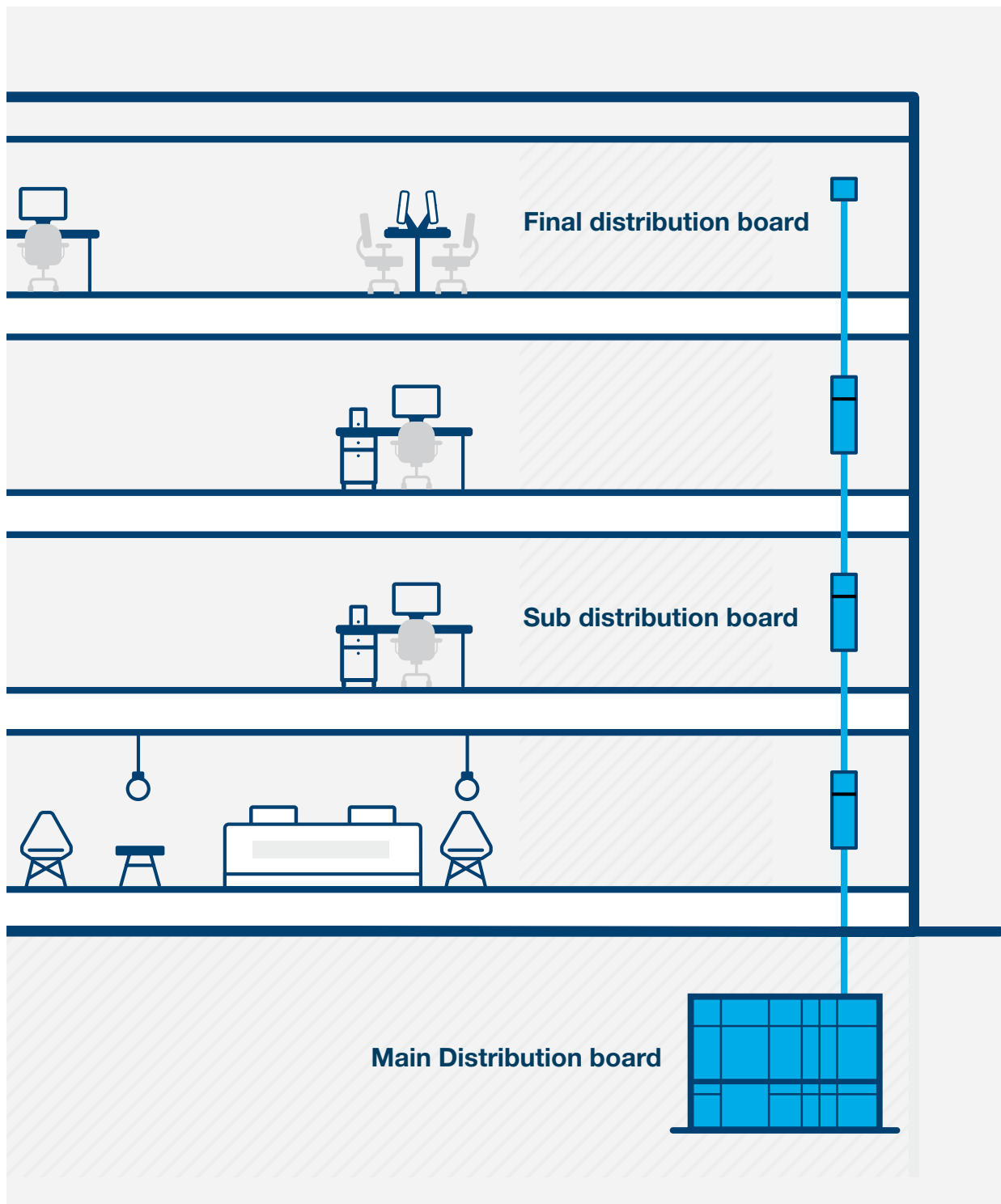


Measuring where it's worth it.

Our energy monitoring system keeps a close eye on the status of all the connected devices: in the main distributors, the floor distributors and the small distributors. This means that you are always in a position to make informed decisions. And you can respond more quickly. For example, you can set the system to send you e-mail notifications when limits are exceeded. You have a range of options to help you when, for example, grouping applications according to energy efficiency classes (EIEC) as per IEC 60364-8.

**Simply “plug and play”
to integrate the
appropriate Hager
measurement devices.**

See where potential exists.
Or the sources of problems.

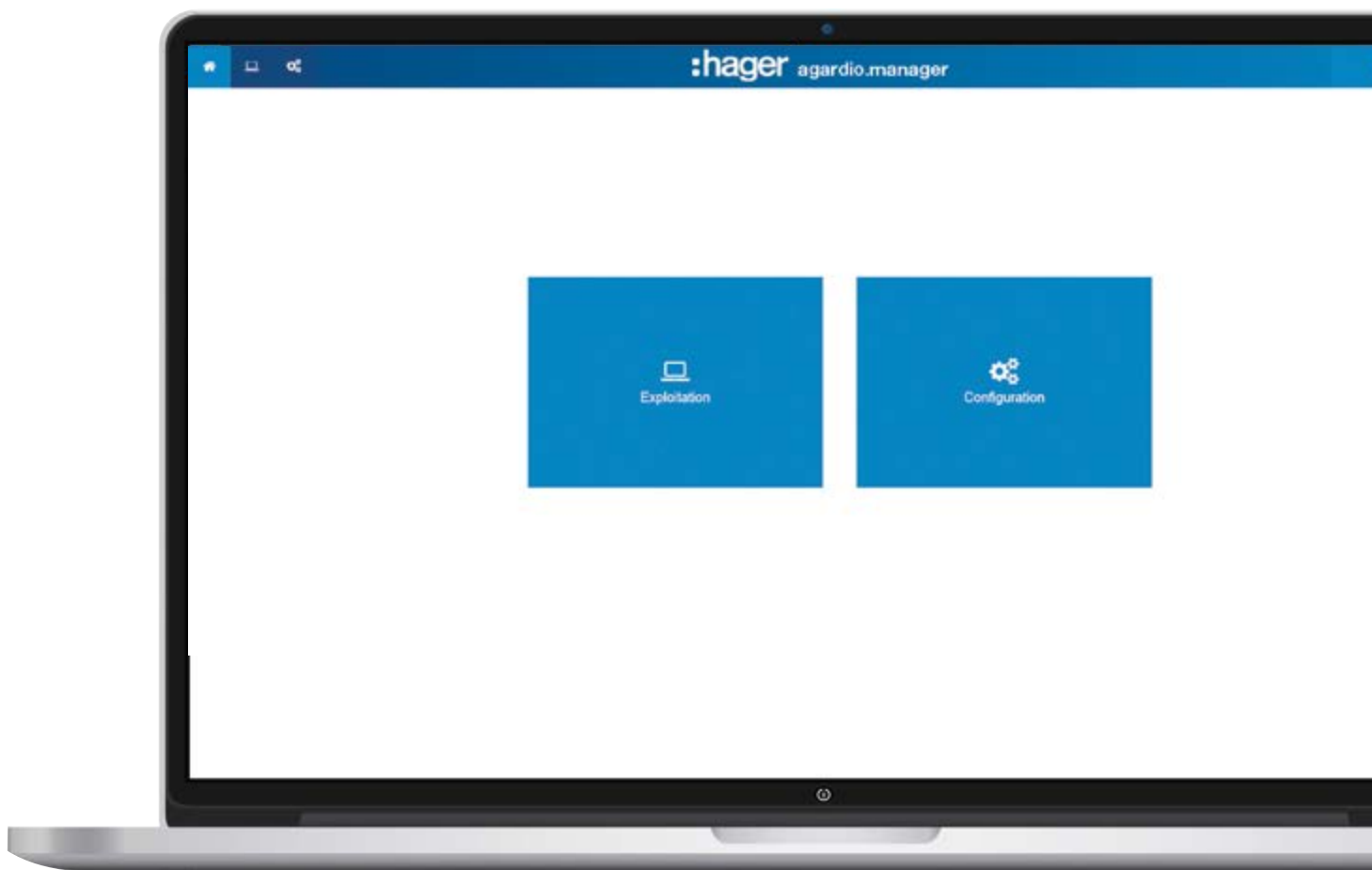


Click and go.



Unpack, connect,
start your browser, go.

Energy monitoring is simple. Instead of spending entire days programming your system, you can carry out configuration on a laptop or tablet – directly in a web browser, without the need for extra software or Modbus mapping tables. In other words, you don't need any programming skills or expensive third-party providers. All compatible measurement devices can be found in the product catalogue of the energy monitoring server and can be easily added to the project. All you have to do is enter the Modbus address in the server, configure it in the measurement device – and you're ready to go!.

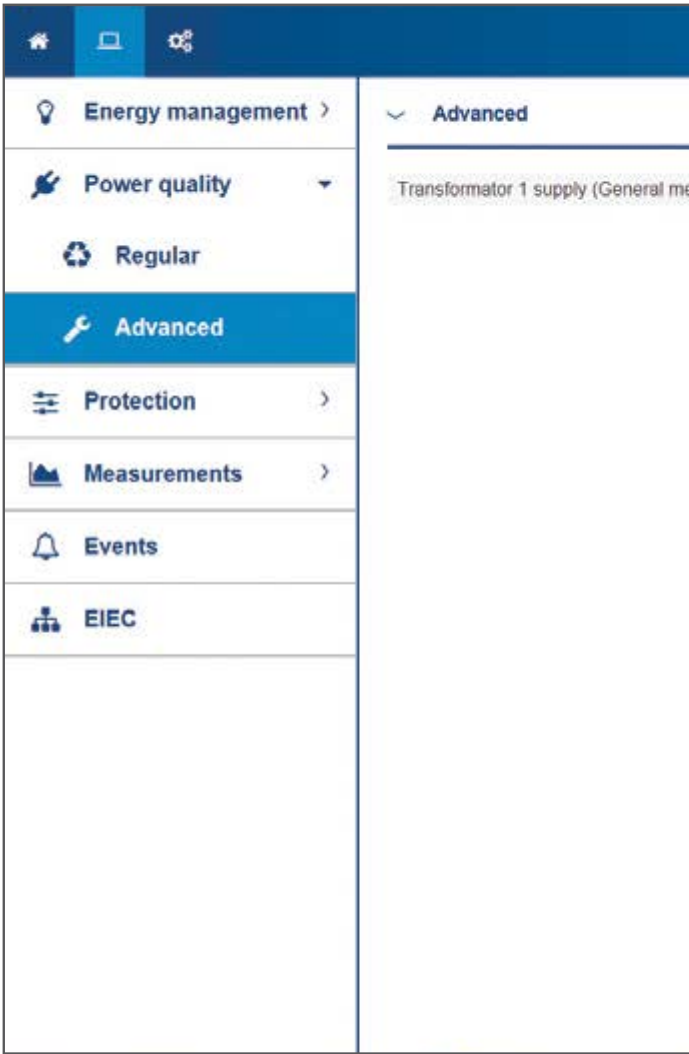


One, two, three – Hager
delivers results faster than
you can count.



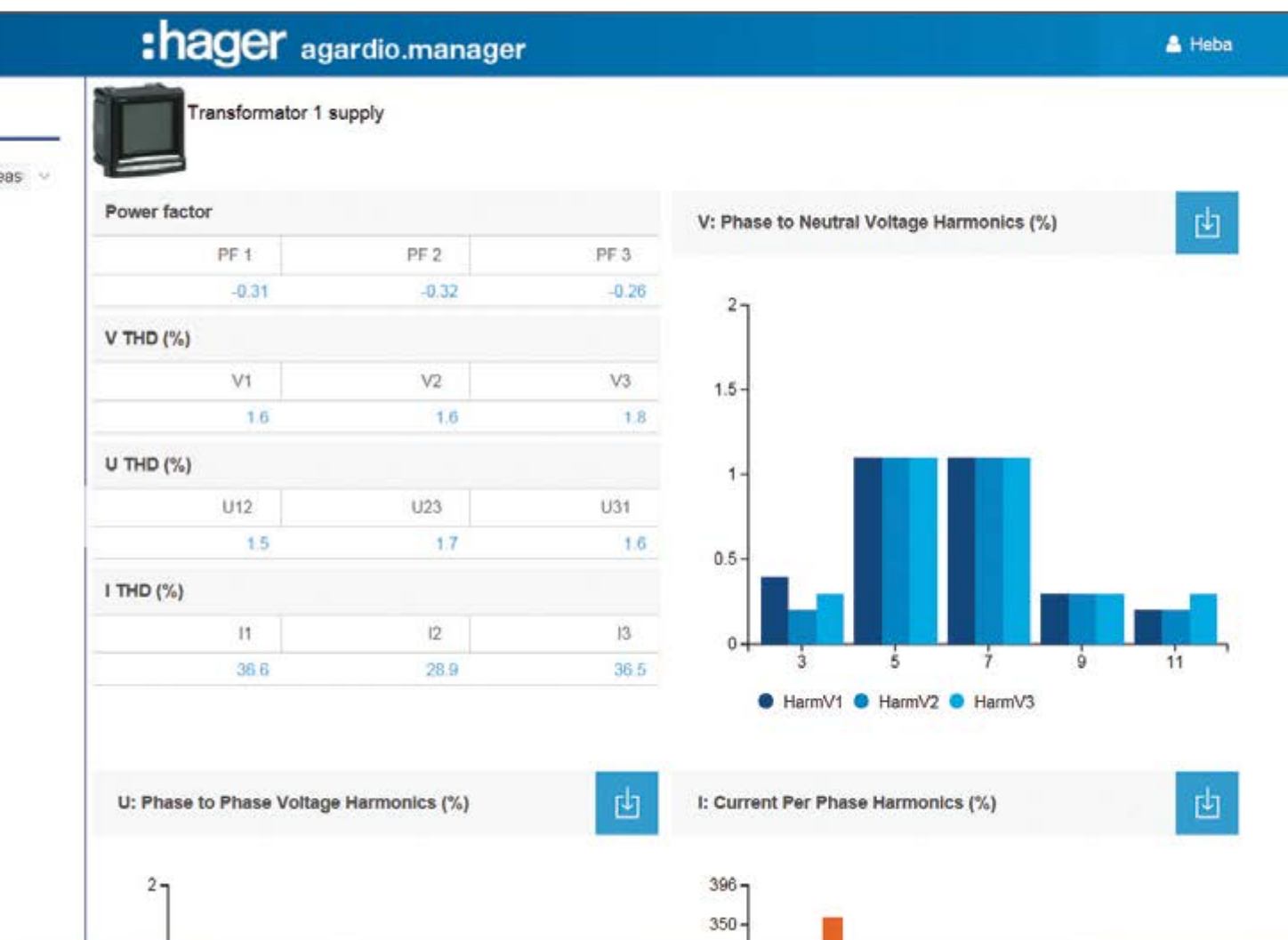
Seeing more leads to better decisions.

This is what it's like to be in the know: Visualisations by practitioners for practitioners. Clear, straightforward, informative. Regardless of where you are, you obtain valuable information about energy development and network quality. Compare current trends with your history – and only ever rely on data that is reliable and up to date. All values can be exported in CSV format for further processing in, for example, Microsoft Excel.



Now you'll always be in the picture:
thanks to different visualisation
methods for all the different applications.
The possibilities of visualization include:

- overview,
- current measured values,
- advanced graphical overview,
- historic measured values.



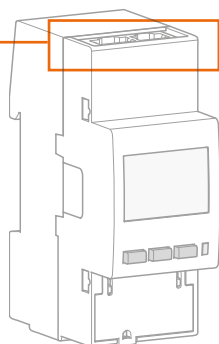
What used to be hidden, is now visible:
through analysis of the network quality,
you can increase system security and
availability. And you can localise the
source of increased harmonic
distortion quickly and easily.

Energy Meters: a complete and straightforward range

Our new range allows you to save space in your installation and to be connected regardless the measurement rating.

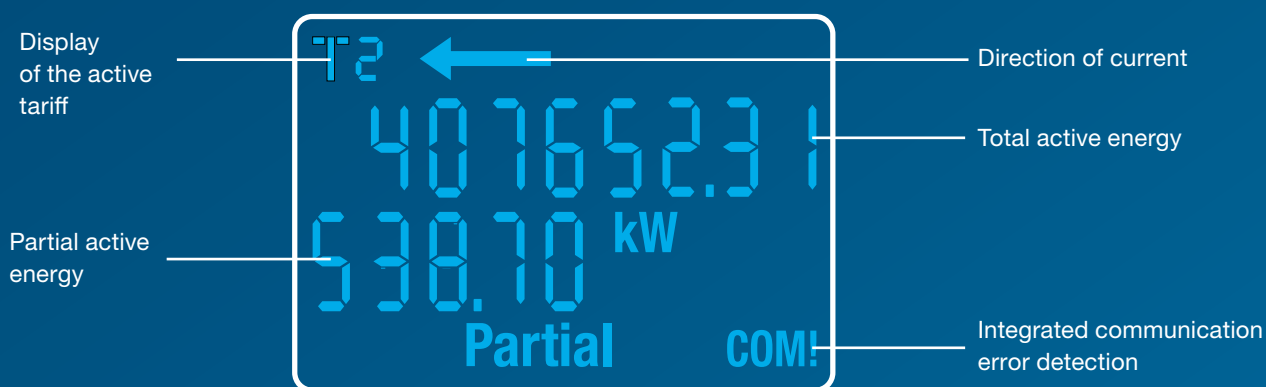


Modbus on RJ45 for
agardio versions



Easy to wire with Hager products

Simple and intuitive menus



The same level of functionality for all meters

All Hager meters enable the recovery of the following data:

- voltage,
- current,
- frequency,
- power factor,
- active energy and power.

If required by the ratings, it is possible to also measure more advanced parameters, such as the reactive and apparent power and energy measurements, as well as measuring the energy discharged in the network (exported energy).

All this information is saved by an internal memory in the meter.

Range overview



Reference	ECx140D	ECx180D	ECx180T
Selection criteria			
Connection	Single phase 40 A direct	Single phase 80 A direct	Single phase 80 A direct (3 track)
Supply voltage	230 V AC	230 V AC	230 V AC
Maximum current I _{max}	40 A	80 A	3 x 80 A
Precision class, active/reactive	Cl.1/Cl.B//Cl.2	Cl.1/Cl.B//Cl.2	Cl.1/Cl.B//Cl.2
Maximum permissible transformer rating	-	-	-
MID certification, required for use in re-invoicing	MID (depending on version)	MID	-
Connectivity			
Not connected	ECN140D	-	-
Pulsed communication	ECP140D	ECP180D	ECP180T
M-bus series communication	ECM140D	ECM180D	ECM180T
RS485 series communication	ECR140D	ECR180D	ECR180T
agardio Modbus communication		ECA180D	ECA180T
Functions and values recorded by the product			
Current	except on ECN140D)	•	•
Voltage	except on ECN140D)	•	•
Power factor	except on ECN140D)	•	•
Frequency	except on ECN140D)	•	•
Active power	except on ECN140D)	•	•
Apparent power		•	•
Reactive power		•	•
Active energy	•	•	•
Apparent energy			
Reactive energy		•	•
Partial resetting of consumption measurements		•	•
Energy import/export	except on ECN140D	•	•
Tariff control		•	•
Number of tariffs managed by: physical input/communication	ECN=0 tariffs ECM=2 tariffs ECR=8 tariffs	up to 8, depending on version	up to 4, depending on version
Instrumentation value	•	•	•
I/O function	except on ECN140D	depending on version	•
Configurable I/O function		depending on version	•
Tariff control by physical input		except ECA180D	•
Tariff control by communication system	depending on version	depending on version	depending on version
Saved by internal memory	•	•	•



ECx380D

ECx310D

ECx300C

Three phase 80 A direct	Three phase 125 A direct	Three phase via CT
400 V AC	400 V AC	400 V AC
80 A	125 A	5 A
CI.1/CI.B//CI.2	CI.1/CI.B//CI.2	CI.1/CI.B//CI.2
-	-	6000 A
MID	MID	MID

-	-	-
ECP380D	ECP310D	ECP300C
ECM380D	ECM310D	ECM300C
ECR380D	ECR310D	ECR300C
ECA380D	ECA310D	ECA300C

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up to 8, depending on version	up to 8, depending on version	up to 8, depending on version
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•	•	•
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•	•	•
depending on version	depending on version	depending on version
•	•	•

Measurement unit range



The main functions

A measurement unit enables analysis of the networks.

It records basic parameters, such as current, voltage, Cos Phi, power and energy, as well as harmonic disturbances and the reaction to different parameters.

Installed at the head of the installation and in sensitive networks, the measurement unit provides essential information to check the operating derivatives of a building.

01 Separate communication and memory expansion module can be added subsequently (on SM102E and SM103E),

02 Configuration of the minimum and maximum thresholds,

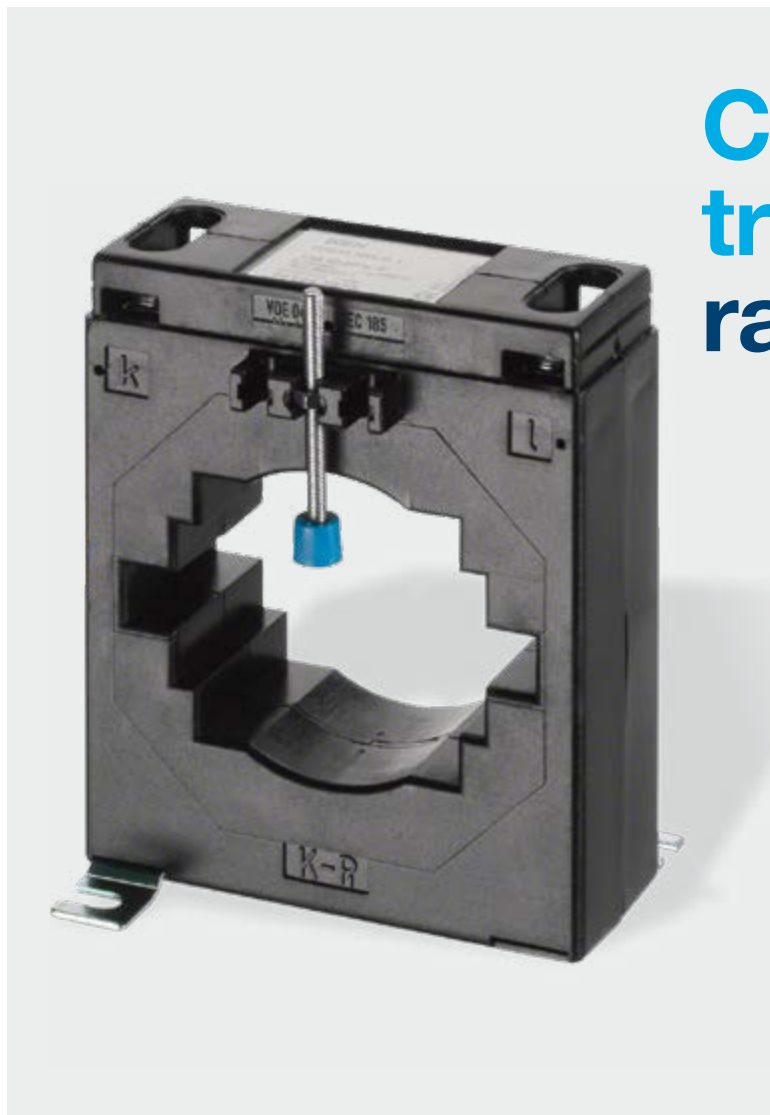
03 Tariff level controlled via communication.

Voltage	Type of measurement	Rating	Communication	No. of 17.5 mm modules	Package	Reference
400 V AC	Indirect	1 / 5 A	Modbus	4	1 pcs	SM101C
400 V AC	Indirect	1 / 5 A	Pulse (ref. SM200) Modbus RTU (ref. SM210)	Built-in	1 pcs	SM102E
400 V AC	Indirect	1 / 5 A	Pulse (ref. SM201) Modbus RTU (ref. SM210 or SM213) Ethernet (ref. SM213 or SM214)	Built-in	1 pcs	SM103E

Function selection guide

Reference	SM101C	SM102E	SM103E
Current	•	•	•
Voltage	•	•	•
Power factor	•	•	•
Frequency	•	•	•
Active power	•	•	•
Apparent power	•	•	•
Reactive power	•	•	•
Active energy	•	•	•
Apparent energy			
Reactive energy	•	•	•
Internal clock	•	•	•
Advanced internal clock function	•	•	•
Partial resetting of consumption measurements			
Import/export of energy	•	•	•
Tariff control	•	•	•
Instrumentation value			
I/O function	•	•	•
Configurable I/O function	•	•	•
Display of previous values			
Programming of the maximum demand threshold	•	•	•
Load profile			
Management of harmonics		•	•
Load profile			
Alarm function	•	•	•
Recording of measured values per day/week/month			
Minimum/maximum demand	•	•	•
Tariff control by physical input	•	•	•
Tariff control by communication system	•	•	•
Tariff control by the clock	•	•	•
Saved by internal memory			

Current transformer range



- 01 Current transformers equipped with twin current socket terminals,
- 02 Range dedicated to measuring the current on busbars and supply cables.

References

Prim./sec. rating	Precision	Power	Max. cable diameter	Max. size of supply bar	Type	Numerical reference	Commercial reference
50/5 A	1% Cl.1	1.5 VA	dia. 20 mm	20 x 10 mm 15 x 15 mm	BG213	706385	SRA00505
75/5 A	1% Cl.1	1.5 VA	dia. 28 mm	30 x 10 mm 25 x 15 mm 20 x 20 mm	BG113	713929	SRA00755
100/5 A	1% Cl.1	2.5 VA	dia. 20 mm	20 x 10 mm 15 x 15 mm	BG213	725003	SRA010051
125/5 A	1% Cl.1	2.5 VA	dia. 28 mm	30 x 10 mm 25 x 15 mm 20 x 20 mm	BG113	713932	SRA01255
150/5 A	1% Cl.1	2.5 VA	dia. 28 mm	30 x 10 mm 25 x 15 mm 20 x 20 mm	BG113	719933	SRA01505
200/5 A	1% Cl.1	2.5 VA	dia. 28 mm	30 x 10 mm 25 x 15 mm 20 x 20 mm	BG113	713934	SRA02005
250/5 A	1% Cl.1	2.5 VA	dia. 28 mm	30 x 10 mm 25 x 15 mm 20 x 20 mm	BG113	713935	SRA02505
300/5 A	1% Cl.1	5 VA	dia. 28 mm	40 x 12 mm	BG413	706386	SRI03005
400/5 A	1% Cl.1	5 VA	dia. 28 mm	40 x 12 mm	BG413	725000	SRI04005
600/5 A	1% Cl.1	5 VA	dia. 28 mm	40 x 12 mm	BG413	706387	SRI06005
800/5 A	1% Cl.1	5 VA	dia. 45 mm	60 x 10 mm 50 x 30 mm	BG613	713938	SRD08005
1000/5 A		5 VA	dia. 45 mm	60 x 10 mm 50 x 30 mm	BG613	713939	SRD10005
1000/5 A	1% Cl.1	15 VA	dia. 60 mm	80 x 10 mm 60 x 30 mm	BG814	725008	SRE100051
1250/5 A	1% Cl.1	15 VA	dia. 60 mm	80 x 10 mm 60 x 30 mm	BG814	713941	SRE12505
1250/5 A	1% Cl.1	15 VA	dia. 85 mm	100 x 30 mm 80 x 50 mm	BG1034	713944	SRF12505
1500/5 A	1% Cl.1	5 VA	dia. 45 mm	60 x 10 mm 50 x 30 mm	BG613	706388	SRD15005
1600/5 A	1% Cl.1	15 VA	dia. 60 mm	80 x 10 mm 60 x 30 mm	BG814	713942	SRE16005
1600/5 A	1% Cl.1	30 VA	dia. 85 mm	100 x 30 mm 80 x 50 mm	BG1034	713945	SRF16005
2000/5 A	1% Cl.1	15 VA	dia. 60 mm	80 x 10 mm 60 x 30 mm	BG814	713943	SRE20005
2000/5 A	1% Cl.1	30 VA	dia. 85 mm	100 x 30 mm 80x50 mm	BG1034	713946	SRF20005
2500/5 A	1% Cl.1	30 VA	dia. 85 mm	100 x 30 mm 80 x 50 mm	BG1034	713947	SRF25005
3000/5 A	1% Cl.1	15 VA	dia. 98 mm	120 x 50 mm	BG1254	713948	SRG30005
3000/5 A	1% Cl.1	15 VA	dia. 70 mm	120 x 70 mm	BG1274	713950	SRH30005

H3+ energy: Go further with intelligent and connected protection

Hager is complying with energy efficiency standards by adding new functions to its moulded case circuit breaker range. A Class 1 energy monitoring and communication system compatible with the Modbus RTU protocol can be used to configure the protection parameters, monitor energy consumption and manage alarms.

Energy performance

The h3+ moulded case can be coupled with the agardio.manager multi-energy manager, allowing it to be integrated in an energy efficiency environment.

This allows the energy consumption to be displayed centrally, while complying with the IEC 60364, NF 15-100 and ISO 50 001 standards. Class 1 measurement accuracy is guaranteed.

Service continuity

A specific auxiliary is used to trigger a fault alarm. This function helps prevent a total power outage. The user is notified in advance, allowing the appropriate action to be taken.

Secure connection

The functions are pre-wired to connectors. The bus connection uses an RJ45 connector, which means there is no risk of incorrect wiring. The power is supplied from the tool and no external source is required.



- 01 Integrated pre-alarm contact
- 02 Colour OLED screen
- 03 Configurable alarm contact
- 04 Communication port



Greater flexibility

The moulded case circuit breaker can be configured via the built-in screen, the panel display or the configuration tool. In the latter case, the interface used for configuration does not need to be installed since the software operates via the Webserver on your phone, tablet or PC.

Greater ease of use

Cut programming times for your installation by up to 80 % with the agardio.manager ecosystem. Pre-addressing is already done: a library of products is available in agardio.manager. There is therefore no need to complete the addressing table: you need only name the products.



Overview

- Over 300 variants
- Intelligent electronic tripping
- Breaking capacity up to 70 kA
- Measured value acquisition complies with MID
- Intelligent programming (h3+ energy only)



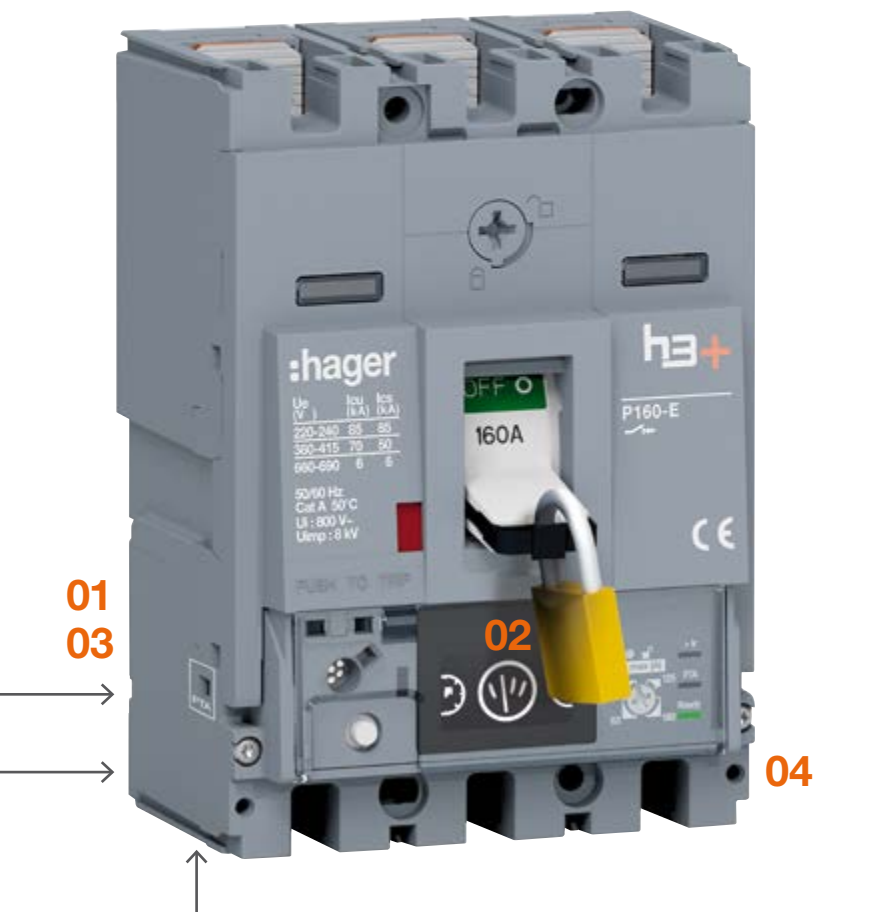
hager.fr/h3+

- Variants
- Trip units
- Tutorials
- Configuration
- Energy monitoring
- Auxiliary switch
- FAQ
- Hager recommendation

01
03

02

04

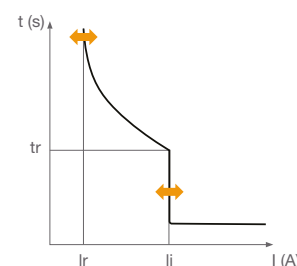




A needs-based approach

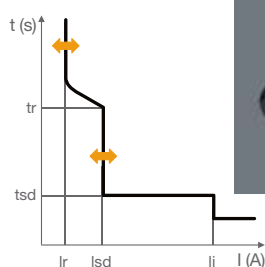
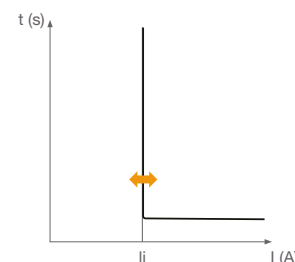
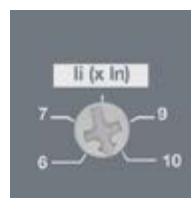
TM

h3+ circuit breakers equipped with magnetothermal trip units are designed for power distribution applications. They are used to protect the conductors and the loads supplied by the transformers or generators, and when the fault current is limited due to impedance caused by the length of the conductors. The settings are made using adjustment dials on the front of the products.



MAG (ICB)

h3+ circuit breakers equipped with magnetic trip units are designed for use in power distribution applications in which only magnetic protection *is required. They are mainly used to protect motors associated with a thermal relay and a power switch.

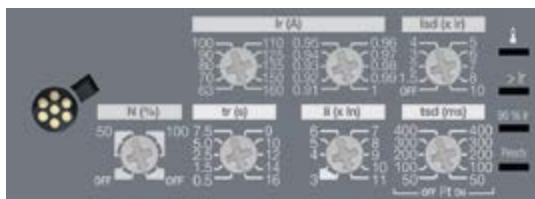


LSnl trip unit

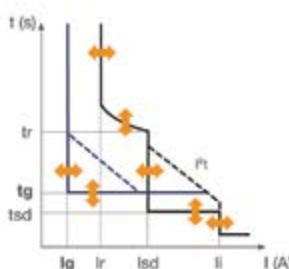
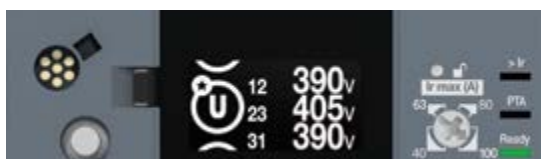
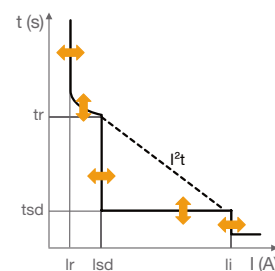
Designed to protect networks supplied by transformers or generators and for long cables, the LSnl version offers a solution adapted to this type of supply.

LSI and LSIG trip units

h3+ circuit breakers equipped with LSI trip units are designed for power distribution applications for protecting conductors and loads in cases where a wide range of protection settings is required.



Settings made using adjustment dials are accessible on the front of the products, and enable accurate adjustment of the protection and a trip curve independent of the ambient temperature.



Energy trip unit

Offering a similar protection than LSI trip unit, the Energy benefits from a class 1 energy monitoring and communication system compatible with Modbus RTU protocol that will allow them to configure protections parameters, monitor energy consumptions and manage alarms.

TM, MAG, LSnI, LSI, LSIG, Energy: six trip unit versions designed to effectively protect your installations and optimize the cost of your switchboards.

	TM		MAG		LSnI		LSI			LSIG		Energy		
	P160	P250	P160	P250	P160	P250	P160	P250	P630	P250	P630	P160	P250	P630
Breaking capacity	25, 50 or 70kA		50 or 70kA		50 or 70kA		50 or 70kA			40, 50, 70, 110 kA	25, 40, 50, 70 kA	50 or 70kA		40, 50, 70, 110 kA
Ratings	25 - 160 A	50 - 250 A	25 - 160 A	100 - 250 A	40 - 160 A	40 - 250 A	40 - 160 A	40 - 250 A	250 - 630 A	40, 100, 160, 250 A	250 - 630 A	40 - 160 A	40 - 250 A	250 - 630 A
No. of poles (P) and trip units (D)	3P3D or 4P4D (N: 0 -100%)		3P3D or 4P4D		3P3D or 4P4D (N: 0, 50 or 100%)		3P3D or 4P4D (N: 0, 50 or 100%)			3P3D or 4P4D (N: 0, 50 or 100%)		3P3D or 4P4D (N: 0, 50 or 100%)		
RCD add-on block	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Configuration tool												Yes		
Panel display												Yes		
Communicating version												Yes		

One partner, for everything you need.

01

Energy Distribution



03

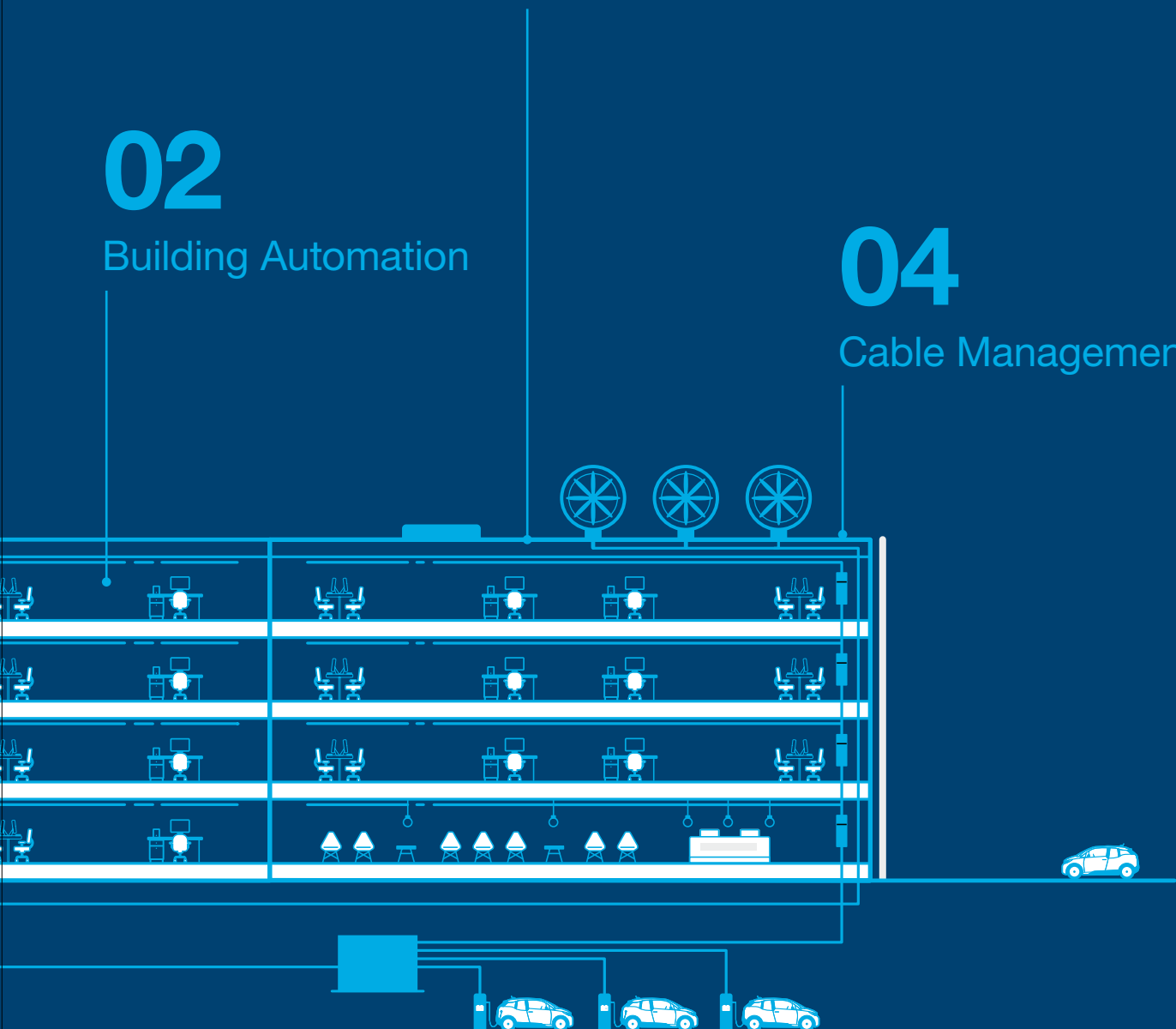
Energy Management

02

Building Automation

04

Cable Management





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