

DualSmart

Installation and operating instructions



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Powering Business Worldwide

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1. Product information

The DualSmart is a compact emergency lighting device for the continuous supply of the emergency luminaires in the event of a failure of the general lighting. It continuously monitors the grid supply, and automatically detects a failures or interruptions and switches to battery mode to maintain illumination. The device ensures the operational readiness of the connected emergency luminaires by means of automatic test equipment.

2. Current instructions, applicable documents

This assembly and operating manual describes the intended use of the DualSmart.

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The safety instructions and information contained must be observed. This document cannot include all variants of the local framework. Therefore, in addition to this document, the local accident prevention regulations and general safety regulations applicable to the area of operation must also be observed. Store the assembly and operating instructions in the immediate vicinity of the DualSmart. All persons working with the system must have access to these assembly and operating instructions at all times.

Before commencing any work on the emergency lighting system, carefully read these instructions and the instructions for all components contained in the emergency lighting system. It is possible to manage the DualSmart via additional devices or via mobile app (BSMS). In these cases, refer to the associated documentation. For the battery used, it is essential to observe the safety data sheet and associated manufacturer's documentation

2.1. Information on the operating instructions

This operating manual describes the safe and proper handling of the system. The specified safety instructions and instructions as well as the local accident prevention regulations and general safety regulations applicable to the area of operation must be observed. Before starting any work on the system, read the operating instructions in full, especially the safety chapter and the respective safety instructions.

Some of the illustrations and circuit diagrams in this manual are for illustrative purposes only of the facts described. Wherever:

- Dimensionally accurate work or
- precise drawings or circuit diagrams adapted to the special features of the site are required, the drawings and plans that have been specially prepared for the lighting installation must be complied with.

2.2. Applicable documents

Components from other manufacturers are installed in the systems (e.g. batteries). These purchased assemblies have been subjected to risk assessments by their manufacturers. The conformity of the designs with the applicable European and national regulations has been declared by the manufacturers of the components

2.3. Liability and warranty.

All information in this operating manual has been compiled taking into account the applicable regulations, the state of the art and our many years of knowledge and experience. The operating instructions must be kept in the immediate vicinity of the emergency lighting system and accessible at all times for all persons working on or with the system.

Read these operating instructions carefully before starting any work on and with the system!

For any defects associated with the supply and installation of CEAG emergency lighting systems and luminaires may occur due to other standards and regulations prescribed in complete installation packages in connection with CEAG products, CEAG Notlichtsysteme GmbH assumes no liability and/or warranty. In addition, observe all laws, standards and guidelines of the country in which the plant is built and operated.

CEAG does not assume any warranty or liability for damages or consequential damages arising from

- non-intended use,
- failure to comply with regulations and rules of conduct for the safe operation of the system,
- unauthorized or improper changes in the connections and settings of the system or in the programming,
- operation of unapproved or unsuitable devices or groups of devices on the DualSmart system.

3. Information

3.1. Target groups

- Operator (instructed person):
 - Control of the integrity and functionality of the system
 - Disposal
- Installation personnel (electrician):
 - Storage at the point of use
 - Installation of the DualSmart system
 - Maintenance
 - Dismantling of the system
- Commissioning personnel qualified in accordance with DIN EN 50110-1 and VDE 0105-1:2024-11:
 - Installation and removal of the battery
 - Programming of the system
 - Commissioning with test and test report

3.2. Meaning of signal words

⚠ DANGER!

This signal word indicates an imminent danger.
If it is not avoided, death or serious injuries are the result.

⚠ WARNING!

This signal word refers to a possibly imminent danger. If it is not avoided, death or serious injuries can be the result.

⚠ CAUTION!

This signal word refers to a possibly imminent danger.
If it is not avoided, minor injuries can be the result.

❗ NOTE

This signal word refers to any property damage that may occur

3.3. Safety information

⚠ DANGER!

Danger to life due to electric shock in case of physical contact with live parts.

When working on potentially live parts, follow these 5 safety rules:

- Disconnecting the electrical system from the power supply (7.5. Disconnecting from the power sources, page 23).
- Protect against re-energizing.
- Verify that there is no voltage.
- Carry out earthing and short circuiting.
- Barrier off adjacent live parts from contact.

⚠ WARNING!

Risk of injury due to electric shock.

- Use the device only as intended.
- Only operate the device in an undamaged condition.
- Only allow the device to be opened by instructed personnel.

When planning an emergency lighting system with a DualSmart, check whether the planned electrical installations are sufficient for the operating environment. Special environmental conditions (e.g. hazardous areas or areas with an aggressive atmosphere) require special facilities and installations. At a minimum, the following organisational measures must be defined in writing and adhered to:

- Information and reporting obligations (start, duration, end of work)
- Securing measures during the execution of the work, e.g. replacement lighting, protection against re-energizing (e.g. removal of fuses, lock switches, information signs)
- Protection and safety devices for personnel carrying out work on the system.
- Protection and safety equipment against hazards posed by neighbouring parts of the plant (e.g. security grids, barriers, securing traffic routes)

Damage to health and equipment due to electrostatic discharge.

- When working on the system, ESD protection must be observed!

3.4. Personal protective equipment

When working on and with the system, it is always necessary to wear:

- Protective work clothing
- Tight-fitting workwear (tear resistance, no wide sleeves, no rings and other jewellery, etc.)
- Safety shoes
- Footwear electrostatically conductive in accordance with the EN 345 standard and for protection against heavy, falling parts

⚠ WARNING!

During transport or loading and unloading, there is a risk of injury due to falling parts. The battery may be damaged or destroyed by improper transport.

- Do not lift heavy material over people.
- Always move the battery with care and caution.
- Use suitable slings and hoists with sufficient load capacity.

Risk of severe crushing due to falling equipment.

Improper installation may result in serious personal injury or property damage.

- Install the DualSmart only in compliance with all safety regulations.
 - Use a mounting form that is appropriate to the weight of the DualSmart and allows for safe installation.
 - Use mounting material with a suitable load capacity.
 - Wear personal protective equipment during assembly and installation.
-

Use the device and the associated components only in technically perfect condition, taking into account all safety and hazard instructions in the assembly and operating instructions of the components used.

Faults that may impair the function or safety of the system must be reported immediately to the competent authorities and rectified. The operator is obliged to take immediate measures. Operational safety is only guaranteed if the systems are used as intended.

3.5. Intended use

The device is used exclusively for the power supply, monitoring and control of an emergency lighting system. The operation is program-controlled. Configuration is reserved for qualified personnel who are qualified according to DIN EN 50110-1 and VDE 0105-1:2024-11, with special knowledge of the legal and technical basics for the construction and operation of an emergency lighting system. Only luminaires that have either been manufactured by EATON CEAG or comply with the normative and technical specifications for emergency lighting and are equipped with suitable monitoring modules from EATON CEAG may be operated on the DualSmart. If required, download the relevant information for conformity assessment from the EATON CEAG website (www.eaton.de/ceag).

The system is designed for operation with system luminaires (CG-S). The system can operate up to a maximum of 160 system luminaires (CG-S), with 20 luminaires per circuit. The connection of self contained luminaires is not permitted. For more information on maximum power allowed, see C(See more in chapter “13 Technical specification”, on page 38).

Operational safety is only guaranteed if the systems are used as intended. Property damage and personal injury may occur if the DualSmart is not used by specially trained personnel, if it is used for purposes for which it is not intended, or if it is used incorrectly. In order to avoid hazards and to ensure optimum performance, no changes, extensions or modifications may be made to the centrally supplied system with power limitation that have not been expressly approved by the manufacturer. Work that is required for extensions, conversions or repairs that are not described in these instructions must be carried out by specially trained specialist and service personnel (from the manufacturer EATON CEAG or EATON CEAG authorized partners). Parameterization is carried out exclusively by specialist personnel with special knowledge of the legal and technical basis for the installation and operation of an emergency lighting system.

3.6. Definition

ADR: European Agreement concerning the International Carriage of Dangerous Goods road (for most of Europe)

CEWA GUARD STAR (CG-S): EATON CEAG technology that enables functional testing and control of luminaires in the circuit.

PERC: DualSmart is a specific type of automatic test system (ATS) according to EN 62034-2013

RID: Regulations for the International Carriage of Dangerous Goods by Rail (for the most part) parts of Europe, North Africa and the Middle East)

4. Classification key, CE conformity

The DualSmart complies with the requirements of EN 62034 „Automatic test systems for battery-operated emergency lighting“ in all versions and is classified as type PERC.

The DualSmart has been designed and manufactured in accordance with the following EC directives:

- EN 50171 Central power supply systems
- EN 62368-1 Equipment for audio/video, information and communication technology
- EN 62485-5 Safety requirements for secondary batteries and battery systems
- EN 62034 Automatic testing systems for battery-operated emergency lighting for escape routes
- IEC 60068-2 Environmental influences
- IEC 60529 Degrees of protection by enclosures (IP code)
- EN 61000-2/-3 Electromagnetic compatibility (EMC)

5. Transport

⚠ WARNING!

During transport or loading and unloading, there is a risk of injury due to falling parts.

- Do not carry the device alone.
- Use hoists.
- Wear personal protective equipment.

❗ Note

The device may be damaged or destroyed by improper transport.

- Always move the device with care and caution.
- Only use suitable slings and hoists with sufficient lifting capacity.
- Avoid dust and moisture ingress.
- Ensure that all transport routes are clear (sufficient width and clear height for all transport movements).
- Ensure that there are sufficient alternative spaces for people in case loads tip or slip off.
- Only use means of transport (e.g. pallet trucks, forklift trucks, etc.), slings (trusses, chains, ropes, etc.) and securing equipment (wedges, squared timbers, guides, tensions, safety ropes, etc.) in technically perfect condition and with sufficient load-bearing capacity.
- Observe all information on transport conditions, transport situation, attachment points on the transport packaging or on the device.
- Only personnel who are qualified in accordance with applicable transport regulations may handle, pack, or move the device. All transport activities must comply with national and international safety and hazard control standards.

Batteries must be transported upright. Batteries that do not show any damage in any way will not be transported as dangerous goods according to the Road Dangerous Goods Ordinance (ADR) or the Railway Dangerous Goods Ordinance (RID). They must be secured against short circuit, slipping, falling over or damage. Batteries can be stacked in a suitable way, secured on pallets (ADR or RID, special regulation 598). Pallets must not be stacked. Batteries whose containers are leaking or damaged must be packed and transported as dangerous goods of class 8, UN No. 2794.

5.1. Transport inspection

Check delivery immediately upon receipt for completeness and transport damage. In the event of externally recognizable transport damage, do not accept delivery or only accept it with reservations. Do not stack pallets on top of each other. Follow the handling instructions on the packaging. During transport, all measures must be taken to avoid transport damage for the products that are marked as fragile.

5.2. Storage

⚠ WARNING!

Fire hazard when cleaning the batteries! Electrostatic discharge or moisture can cause a short circuit of the battery terminals!

- Clean the battery body only with a damp, not wet, cloth.

Remove and avoid contamination (such as dust) on the surfaces. The storage area should meet the following requirements:

- Protect the battery from weather, moisture and flooding.
- Protect battery against direct and indirect sunlight.
- Keep packages closed until assembly and stored in compliance with the installation and storage markings on the outside.

Compare the storage conditions of the battery with the associated documentation. For optimal durability, keep the storage time as short as possible. In case of a longer storage period, check the open-circuit voltage every 6 months and compare it with the permissible minimum voltage in the battery data sheet. If the measured open-circuit voltage falls below the minimum voltage, charge the battery.

6. DualSmart overview

6.1. STS-enclosure

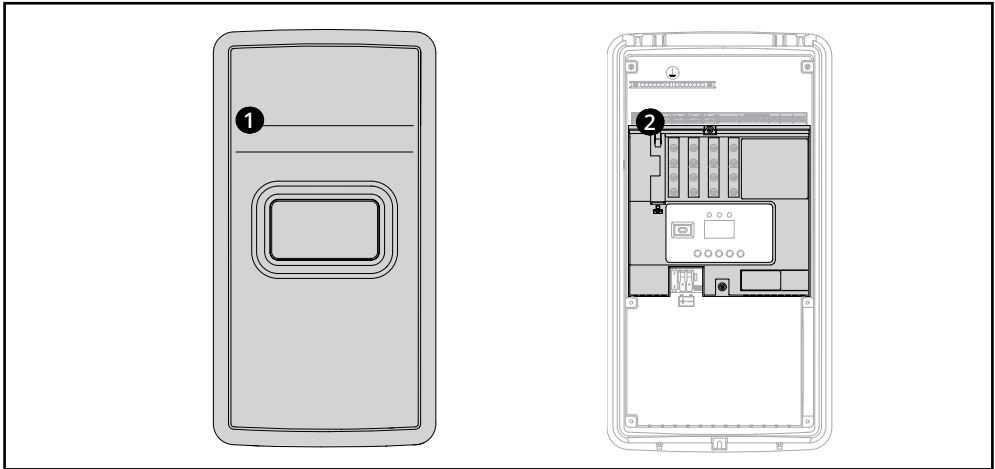


Fig. 1: Front view (STS enclosure)

Pos.	Description	Pos.	Description
1	Housing cover (STS housing)	2	Safety cover

The housing protects the DualSmart from external influences. When the cover is removed, the electronics are protected by the safety cover.

6.2. Device design

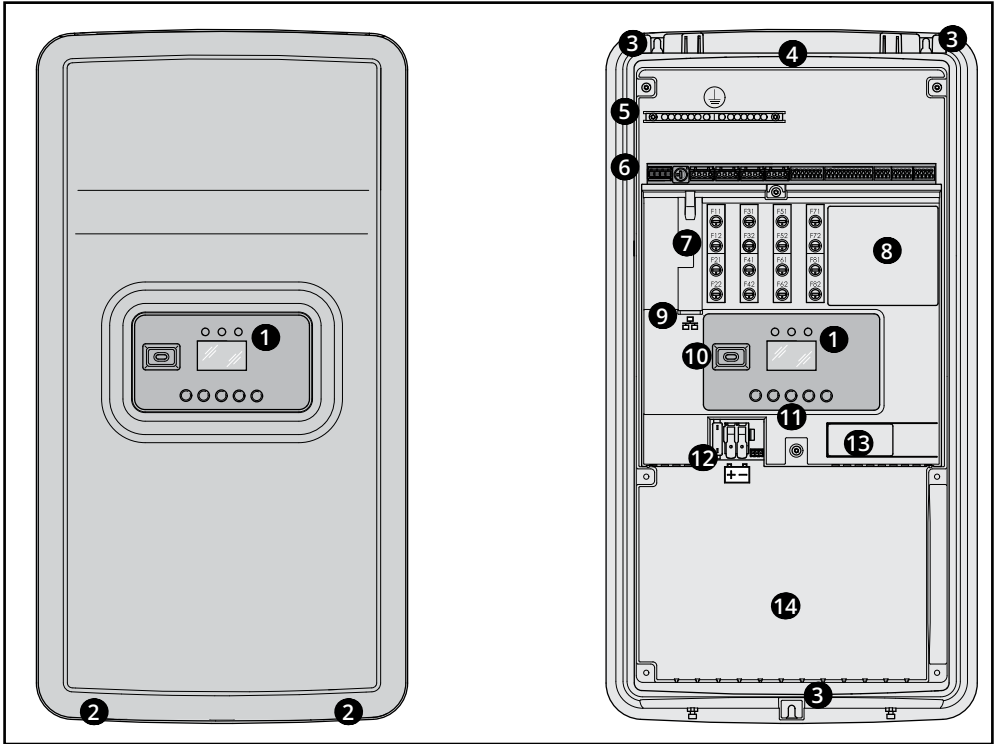


Fig. 2: Device setup using STS-enclosure

Pos.	Description	Pos.	Description
1	Display with status-LEDs	2	Cover locking screws
3	Mounting holes	4	Cable entries
5	Grounding terminal block	6	Terminalblock (See more in chapter “7.3 Additional Information ESF30 Enclosure”, on page 21)
7	Fuses and circuits	8	Type label
9	Ethernet interface	10	USB-C interface
11	Control buttons	12	Battery terminal
13	EPAS, QR-Code	14	Battery compartment

The other DualSmart housing variants MET (IP65 metal housing), ESF30 (30 minutes function retention) and HYG (hygiene applications) have a similar internal structure and differ only in the external properties of the housing.

6.3. Control and display elements

The status of the device is shown via the display and the status LEDs or via connected remote displays (e.g. group controller, RCM).

The system is operated via the buttons under the display or, if necessary, via Bluetooth Connecting to the mobile app.

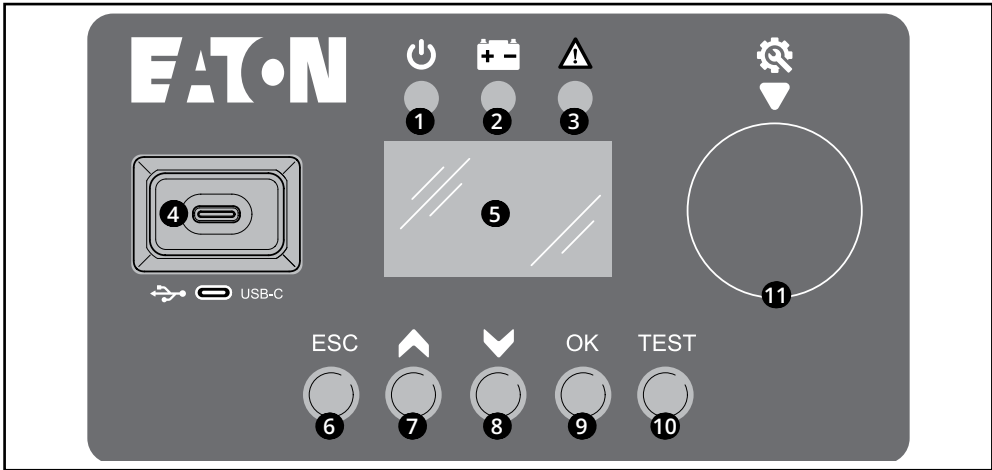


Fig. 3: Display & Controls

Pos.	Description	Pos.	Description
①	LED: Ready (Signal Scheme 14, page 33)	②	LED: Electrical source for safety services (Signal Scheme 14, page 33)
③	LED: Fault (Signal Scheme 14, page 33)	④	USB-C interface
⑤	Display (6.4. Display, page 15)	⑥	ESC-Button (10.3. Menu Operation, page 28)
⑦	Up-Button (10.3. Menü-Bedienung, Seite 28)	⑧	Down-Button (10.3. Menu Operation, page 28)
⑨	OK-Button (10.3. Menu Operation, page 28)	⑩	TEST-Button
⑪	Maintenance Seal (next service)		

6.4. Display

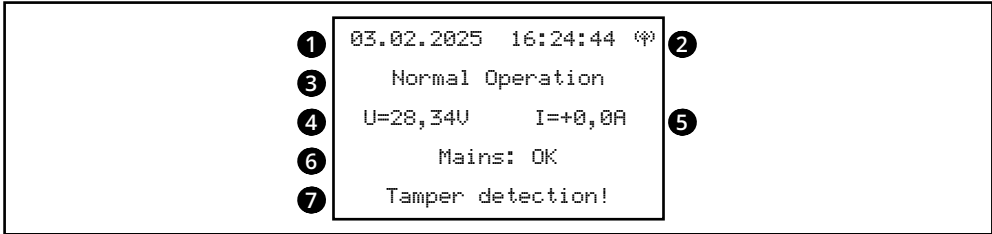


Fig. 4: Display

Pos.	Description	Pos.	Description
❶	Date, Time	❷	Bluetooth-Status Ⓡ Bluetooth active Ⓡ Bluetooth inactive
❸	Operating status (14.2. Operating States, page 33)	❹	Battery voltage
❺	Battery current	❻	Mains supply status
❼	Fault message / system name (14.3. Faults, page 34)		

Date and time ❶ can be set (10.4. Menu structure, page 28). These are referred to as Reference used for inspection book entries.

When the Bluetooth connection is turned on, the Bluetooth icon ❷ is displayed.

The battery voltage ❹ corresponds to the currently measured voltage of the battery. The nominal voltage of a fully charged battery is over 28 V. This voltage does not correspond to the voltage that is emitted from the device to the luminaires.

The battery current ❺ shows the current currently measured in the intermediate circuit. A plus sign indicates a current charging process. A minus sign indicates a discharge of the battery. This is not the current emitted to the luminaires.

6.5. Functionality

6.5.1. Power Failure Detection

As soon as the DualSmart registers a failure of the connected mains voltage, it switches all connected circuits to 230 V DC. Selective switching of the luminaires in the event of a mains failure can be programmed by assigning bus-capable phase monitors.
If a certain phase monitor has been assigned to a luminaire, the luminaire will switch on when a mains failure is detected by the corresponding phase monitor, or in the event of a mains failure on the DualSmart device itself. Unassigned bus-capable phase monitors do not lead to switching of the selectively programmed luminaires.

6.5.2. Electrical source for safety services

A LiFePO4 battery provides the DC voltage for the operation of the emergency lighting in the event of a failure of the general 230 V AC network. The DualSmart monitors the condition of the battery and gently charges it if necessary.

6.5.3. System status

The current status of the system is shown via the display and the status LEDs, or can be viewed via The mobile app and optional remote displays (group controllers, RCM) can be viewed.

6.5.4. Switching types

CG-S luminaires allow for individual configuration of different operating modes per luminaire within the same circuit. STAR technology enables mixed operation without the use of an additional data line.

- Non maintained light switches on in the event of a power failure or during the functional and duration test.
- Maintained light
- Switched maintained light switches depending on the assignment, e.g. system inputs, bus module inputs or timers.

6.5.5. Functiontest and durationtest

The device performs automatic tests of the connected lights and the battery at a programmable interval. If a fault is detected during the test, it is shown on the display and also noted in the DualSmart's logbook.

6.6. Components

All internal electronic components follow a modular structure.

6.6.1. Mainboard

The terminal block for connecting external components is located on the mainboard (see Section 7: Mounting and Installation, page 17).

6.6.2. CU (Control Unit)

The CU with non-volatile program memory monitors and controls the emergency lighting system. Any faults that occur are reported via the display. The internal memory ensures the archiving of the device configuration as well as the prescribed logbook information for at least 4 years.

6.6.3. Charger

The charging module converts the 230 V AC input voltage into the battery voltage and controls the charging process of the battery.

6.6.4. CSD (Control Switch Device)

Each circuit card (CSD) supplies two end circuits and up to four CSDs can be installed. The maximum rated current per circuit is 0.625 A. There are two outlet fuses (1 AT / 250 V) per circuit, measuring 5 mm x 20 mm. After replacing a CSD, the function „search circuits“ needs to be performed. Menu → Circuit setup → Search circuits

6.6.5. DC/DC Converter

The DC/DC converter converts the battery voltage to the output voltage.

Up to two DC/DC converters can be installed, each providing 270W of output power.

6.7. Bluetooth and USB-C Interface for Data Transfer

The USB-C interface allows you to do the following:

- Download the DualSmart logbook
- Download the DualSmart configuration file
- Programming option to completely disable the interface for tamper protection

The USB interface and the Bluetooth interface are deactivated by default for cybersecurity reasons and must be manually enabled before use. After activation, the USB interface remains active for 2 minutes to allow data transfer. To activate the USB interface, proceed as follows:

1. Insert the USB stick
2. Navigate to: Menu (press OK) → Basic Setup → Enable USB
3. Wait for the USB stick to initialize; this may take up to 20 seconds.

Bluetooth can be enabled either permanently, manually, or for a defined time period after activation. To activate the Bluetooth interface, proceed as follows:

1. Navigate to: Menu (press OK) → Basic setup → Bluetooth Settings
2. Select the activation method (time range from 10 minutes up to 8 hours, permanently on, or manual on/off)
3. If using the time range or manual on/off, activate Bluetooth as follows:
Menu (press OK) → Bluetooth → Enable Bluetooth

The behavior of the Bluetooth interface after a system restart depends on the selected activation method:

- **Permanently on:** Bluetooth is automatically re-enabled after a restart.
- **Manual on/off:** Bluetooth remains disabled after a restart.
- **Configured time range (10 minutes – 8 hours):** Bluetooth remains disabled after a restart.

6.8. Batteries

The LiFePO4 battery is available in five different sizes. The table below indicates the permissible capacities for each enclosure type.

LiFePO4 Battery	STS-Enclosure	ESF30-Enclosure	MET-Enclosure	HYG-Enclosure
09 Ah	x	-	x	x
12 Ah	x	x	x	x
20 Ah	x	x	x	x
48 Ah	-	x	x	x
64 Ah	-	x	x	x

 NOTE

The rated voltage of the battery ranges from 20.0 V to 28.8 V DC.

If the discharge cut-off voltage of 20.5 V is undershot, the system automatically generates a deep discharge protection message.
This message indicates a critical voltage level and serves to protect the battery from harmful deep discharge. The “Deep Discharge Protection” message must be acknowledged via the device menu or the app.

Once acknowledged, the battery must be immediately checked for functionality and subjected to a capacity test.

Only use batteries approved and supplied by the manufacturer, as only these have been validated for compatibility and safety. The battery block contains electronics equipped with software specifically configured for use with the DualSmart system.

The use of non-approved batteries can result in a non-functional emergency lighting system.

The following instructions must be provided and clearly displayed near the battery installation:

- Name of the installer,
- Date of commissioning,
- Safety recommendations, information regarding disposal and recycling

7. Assembly and installation

⚠ Danger

Danger to life due to electric shock in case of physical contact with live parts.

Follow these 5 essential safety rules when working on components that may be electrically energized.

- Disconnecting the electrical system from the power supply ((See more in chapter “7.7 Disconnecting from the power sources”, on page 27)
- Protect against re-energizing.
- Verify that there is no voltage.
- Carry out earthing and short circuiting.
- Barrier off adjacent live parts from contact.

7.1. Mounting the enclosure

The mounting may differ depending on the type of enclosure. When using a DualSmart HYG variant, it is necessary to drill the cable entries on site into the stainless steel enclosure. Due to the high hygiene requirements, there are no pre-embossed cable entries. Always use accessories delivered with the cabinet.

⚠ Notes

Risk of damage to the DualSmart due to internal dust accumulation.

- Avoid getting dust into the device, especially when drilling!

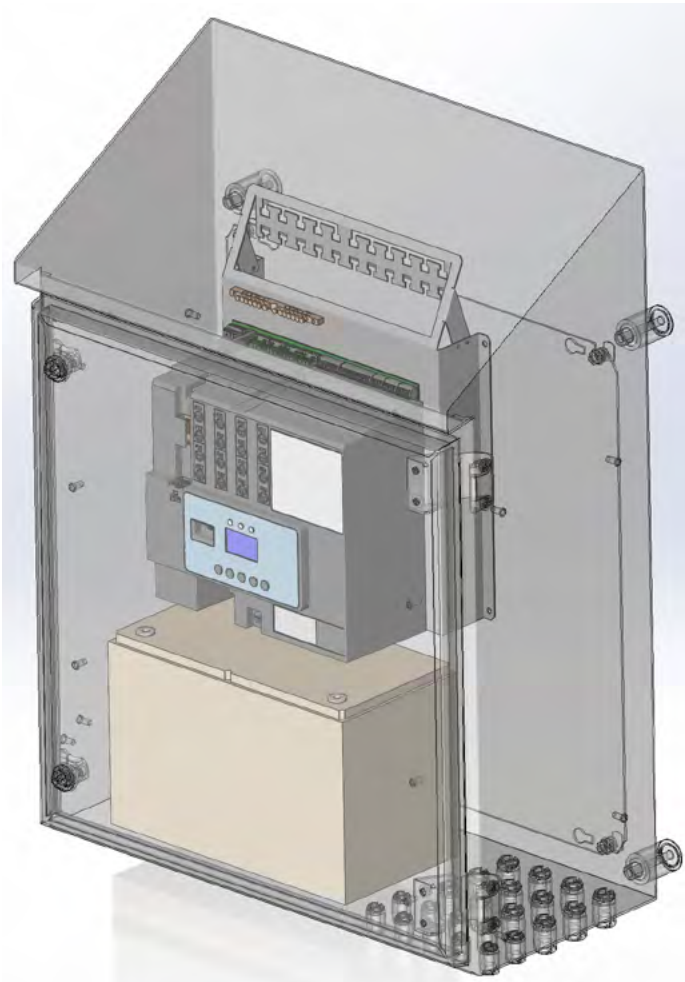
Risk of incorrect installation.

- To avoid incorrect installation, suitable fastening material must be used.
Flat-head screws or washers are recommended.
 - When punching out the pre-marked cable entries, align the striking tool centrally on the designated knockout point. Begin with the smallest required entry.
 - Cable entries can also be created using a step drill.
- 1 Check the installation location for suitability in terms of accessibility and availability of all necessary cables.
 - 2 Check the fastening base for sufficient load-bearing capacity and select appropriate fastening material.
 - 3 Use the drilling template on the packaging of the DualSmart STS housing to mark and drill the mounting holes. For the installation of the enclosure variants “MET”, “HYG” and “ESF30” measure the fastening points and draw them on the fastening base before drilling.
 - 4 Mount the housing to the mounting base using the appropriate mounting material.
 - 5 Check that the system is firmly in place at the mounting base.

7.2. Additional Information – Hygiene Enclosure

Please make sure to carefully read and follow the additional information included with the mounting accessories. Using incorrect components or failing to comply with the specified guidelines can significantly increase hygiene risks – particularly due to exposed threads, dead spaces, and gaps.

- Use the included wall spacers.
- Use the included cable glands (HD M16 or HD M20).
- Cable entry must be made exclusively from below, as shown in the example image. A pre-installed cable duct is available inside the enclosure for internal cable routing.
- If gaps occur – for example, due to uneven mounting surfaces – they must be properly sealed to avoid hygiene risks.



7.3. Additional Information ESF30 Enclosure

Please make sure to carefully follow the additional instructions included with the mounting accessories. By scanning the QR code located inside the ESF30 enclosure, you can access further information as well as cabinet-specific installation and operating instructions:

1. Use the enclosed mounting accessories.
2. After cable insertion, fill any remaining gaps with mineral wool.
3. Only strip the cable after it has been properly strain-relieved at the designated point (see Fig. 12).
4. After stripping, route the individual conductors in a gentle bend to the terminal point, maintaining a length of approximately 22 cm, and connect them professionally at the designated terminals.

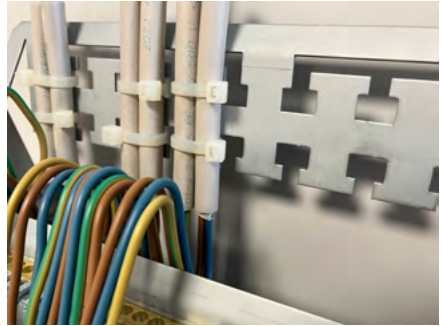
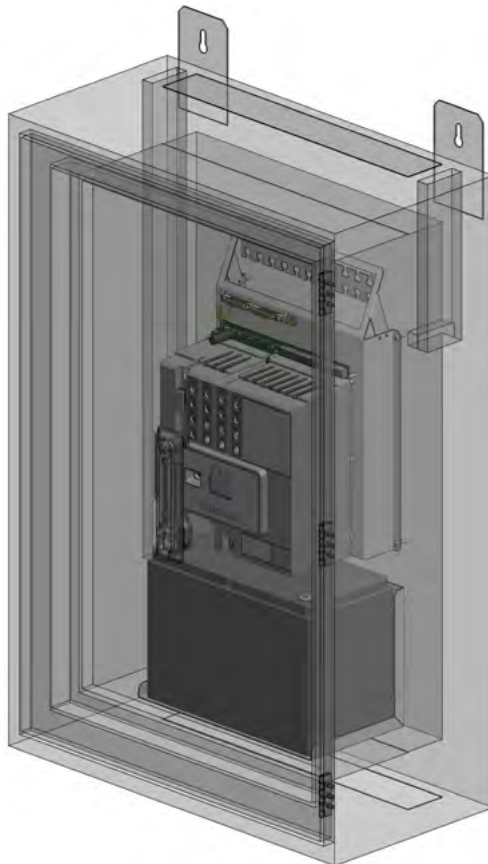


Fig. 12: Strain Relief



7.4. Overview of terminal blocks

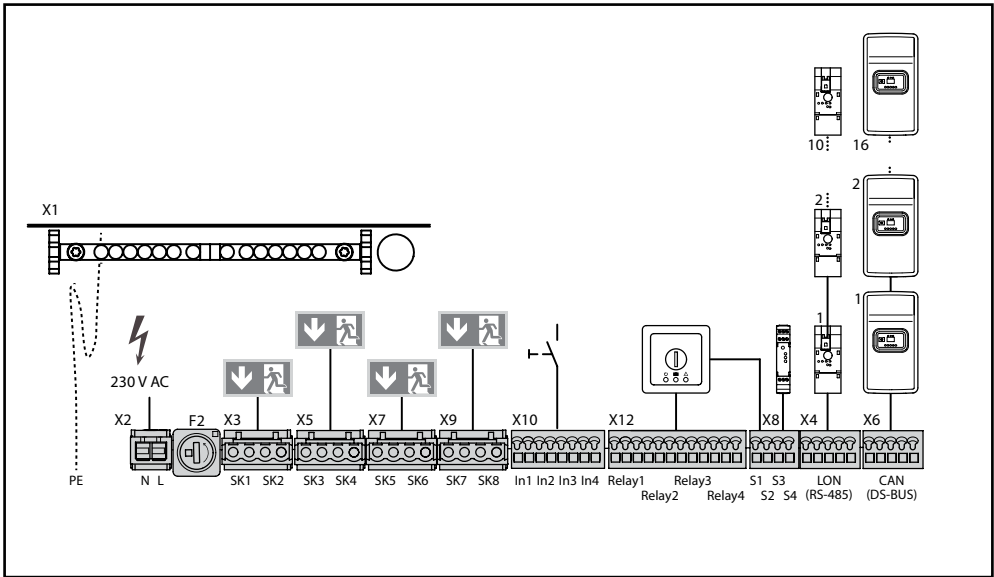


Fig. 5: Terminal block overview

Pos.	Description
X1	PE – Terminals connection (preassembled and prewired).
X2	Mains connection 230 V AC (see section 7.4: Connection to the power sources, page 23)
F2	Mains input fuse (8 AT / 250 V AC)
X3	Circuits 1 and 2 (see section 7.3.1: Connection of the emergency lamps, page 19)
X5	Circuits 3 and 4 (see section 7.3.1: Connection of the emergency luminaires, page 19)
X7	Circuits 5 and 6 (see section 7.3.1: Connection of the emergency lamps, page 19)
X9	Circuits 7 and 8 (see section 7.3.1: Connection of the emergency lamps, page 19)
X10	Digital inputs
X12	Potential-free relay contacts
X8	• S1/S2 (7.3.2. Connection of a remote indication (RCM) with blocking function, page 19) • S3/S4 (7.3.3. Connection of a conventional phase monitor loop, page 20)
X4	LON (RS-485) for connecting bus phase monitors (e.g. I-Bus modules)
X6	CAN (DS-Bus) for connecting other DualSmart devices and a group controller

7.5. Connecting system components

⚠ DANGER!

Danger to life due to electric shock!

- Use the device only as intended
- System components may only be connected by trained specialists.
- Only operate system components in an undamaged condition.

7.5.1. Connection of the emergency lights

Depending on the circuit allocation, connect the luminaires to terminals X3, X5, X7 and X9 (7.2. Overview of Terminal Strips, page 18).

Ensure a continuous earth connection to the earthing terminal block (6.2. Device design, page 13)

7.5.2. Connection of a remote indication with blocking function

This can be an RCM-A remote indication, for example.

- 1 Connect the blocking loop to the terminal block X8, connection terminals S1/S2.
- 2 Connect the remote display LEDs to the X12 terminal block.
- 3 To transfer a block command to other systems, use the PUB/SUB function (9.2. PUB/SUB function of connected DualSmart devices, page 26)

7.5.3. Connection of a phase monitor loop

NOTE

Only connect permissible devices with test button according to EN50171.

- 1 Connect the phase monitor loop to the terminal block X8, terminals S3/S4.
- 2 Remove the 1 kΩ resistor from the terminal block of the DualSmart and integrate it in series at the farthest phase monitor.

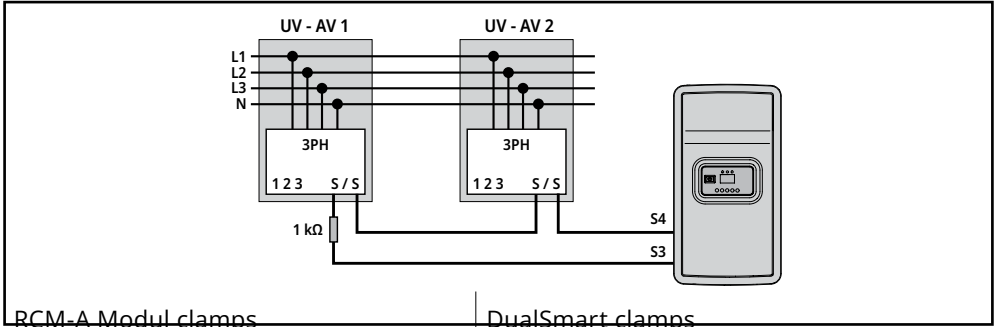
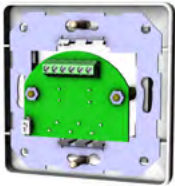


Fig. 6. Installation example phase monitor loop 12 (LED red)

RCM-A Modul clamps	DualSmart clamps
22 (LED green)	Relay 1 (NC)
32 (LED yellow)	Relay 2 (NC)
S1	Relay 3 (NC)
S2	S1
+24 V	S2
	+24 V



Bridge between -24 V and terminals "CM" of Relay 1, 2 and 3

7.5.4. Connection of bus phase monitors via RS-485 bus (LON)

An RS-485 bus (LON) is used for data communication with external bus modules. The RS-485 bus is connected to the terminal block X4, terminals -, +, SH, B, A. Up to 10 bus phase monitors can be connected. A parallel connection of data lines is not permitted and does not extend the bus line length. However, for supplying power to the modules, conductors within a single cable may be connected in parallel.

- Bus topology: Linear, double terminated ($120\ \Omega$). No stub lines allowed
- Maximum cable length: 1200 m
- Cable Type (Minimum Requirement): IY(ST)Y 4x2x0.8mm (Twisted Pair, Shielded)
- If the DualSmart is at the beginning or end of the linear bus topology, the left DIP switch must be in the upper position. The internal $120\ \Omega$ resistor for terminating the RS-485 bus (LON) is located under the safety cover (7.3.6. DIP Switch Setting, page 22).

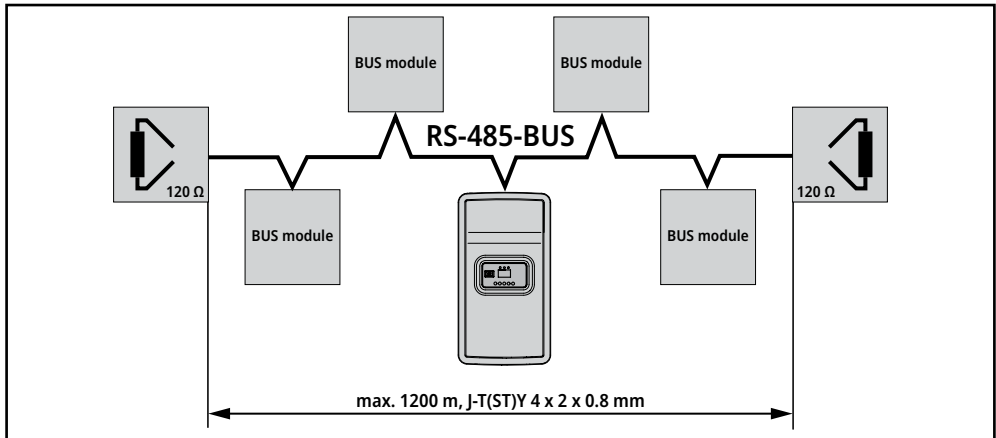


Fig. 7: RS-485 bus installation example

7.5.5. Connection of other DualSmart devices via DS bus

For data communication with other DualSmart devices the DS-Bus (CAN) is utilized. The DS bus is connected to the terminal block X6, terminals -, SH, L, H. Up to 16 DualSmart devices can be connected to each other.

! NOTE

The voltage +24 V DC must not be connected through.

- Bus topology: Linear, double terminated ($120\ \Omega$), no branch lines allowed
- Maximum cable length: 900m
- Cable Type (Minimum Requirement): IY(ST)Y 4 x 2 x 0.8 mm (Twisted Pair, Shielded)
- If the DualSmart is at the beginning or end of the linear bus topology, the right DIP switch must be in the upper position. The internal $120\ \Omega$ resistor for terminating the DS bus (CAN) is located under the safety cover (7.3.6. DIP switch setting, page 22).

7.5.6. DIP switch setting

⚠ DANGER!

Risk of electric shock due to capacitor voltage even shortly after disconnection from the power supply!

- Open the safety cover only 70 seconds after disconnecting the DualSmart from the power supply to ensure that the capacitors have discharged.

If the DualSmart is located at the beginning or end of a bus topology, the corresponding DIP switch must be switched to the upper position. The DIP switches are located under the safety cover.

To terminate the RS-485 bus (LON), the left DIP switch must be in the up position.

To terminate the DS-Bus (CAN) the right DIP switch must be in the up position.

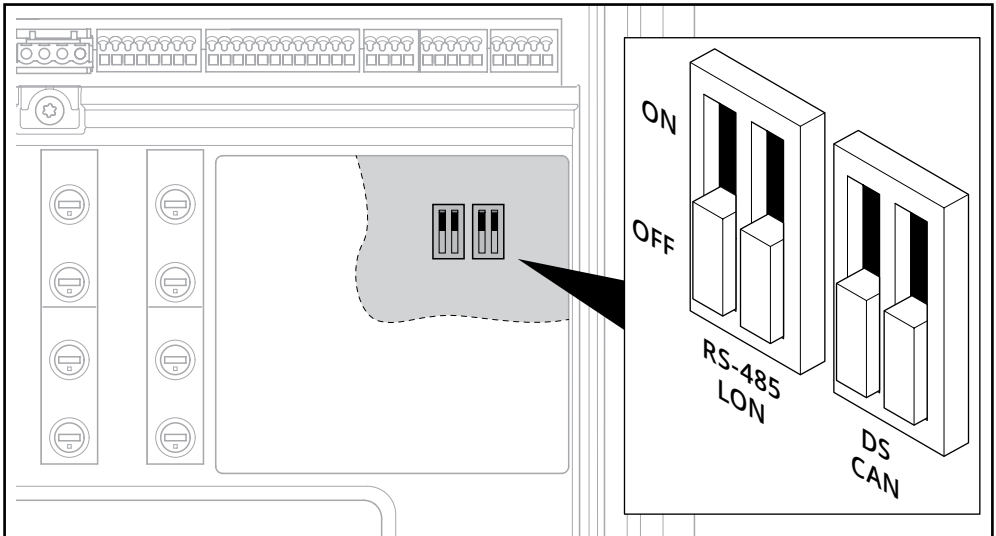


Fig. 8: DIP switch (factory default)

7.5.7. Connecting a group controller

The DS bus (CAN) is used for data communication with the optional group controller. A DualSmart may only be monitored by one group controller at a time. The connection of several group controllers in a bus line is not permitted.

The DS bus is connected to the terminal block X6, terminals -, +, SH, L, H. Information on topology, cable length, and termination is the same as in (See more in chapter "7.5.5 Connection of other DualSmart devices via DS bus", on page 25).

ⓘ NOTE

When a group controller is connected, the group controller is powered exclusively by a DualSmart device. **Do not connect the 24 V output voltage of several DualSmart devices in parallel!**

7.6. Connecting to the power supply

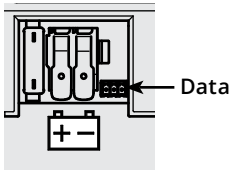
⚠ DANGER!

Risk of electric shock

- Connect DualSmart only in the order specified
- Observe general safety rules for working with electrical voltage

Connect the device to the power sources in the following order:

- 1 Except for the battery, connect all external system components and circuits to the device
- 2 Connect the terminal on the DualSmart marked with "+" to the positive terminal of the battery.
- 3 Connect the terminal on the DualSmart marked with "-" to the negative terminal of the battery.
- 4 Connect the battery's data communication cable to the designated terminal



- 5 Connect the DualSmart to the X2 connection terminal block ((See more in chapter "7.4 Overview of terminal blocks", on page 22)). Connect the PE conductor directly to the ground terminal block ((See more in chapter "6.2 Device design", on page 13)

7.7. Disconnecting from the power sources

⚠ DANGER!

Risk of electric shock

- Block the DualSmart via the App or menu
- The system must be disconnected from mains and battery to ensure the system is voltage-free.
- Observe general safety rules for working with electrical voltage.

7.7.1. Disconnect DualSmart from the battery

Disconnect the battery in the following order:

- 1 Block the DualSmart via the menu in the corresponding menu to prevent switching to battery voltage ((See more in chapter "10.4 Menu structure", on page 34)).
- 2 Measure and ensure, that there is no DC current in the battery circuit.
- 3 Disconnect the terminal on the DualSmart marked with "-" from the negative terminal of the battery.
- 4 Disconnect the terminal on the DualSmart marked with "+" from the positive terminal of the battery.

7.7.2. Disconnect DualSmart from the 230 V AC mains supply

Disconnect the device in the following order:

- 1 Disconnect the DualSmart from the battery ((See more in chapter "7.7.1 Disconnect DualSmart from the battery", on page 27).
- 2 Disconnect the 230 V AC voltage at terminal block X2. ((See more in chapter "7.4 Overview of terminal blocks", on page 22)

8. Inputs / Outputs

8.1. Digital inputs

The DualSmart has 4 freely programmable digital inputs. These digital inputs switch as soon as they are controlled by a 24 V DC signal on the X10 terminal block (7.2. Overview of terminal blocks, page 18).

Each digital input can be assigned one of the following functions

Function / displayed text	Signal	Explanation
No function		Default Setting
External switch	Level-triggered control (e.g. switch) 24 V DC = ON, 0 V = OFF	Acts as a switch and switches lights with "S" function
External switch inverted	Level-triggered control (e.g. switch) 24 V DC = OFF, 0 V = ON	
Manual reset	Edge-triggered control (e.g. pushbutton) LOW – HIGH	Switches back to normal operation if manual reset is active
Reset deep discharge		To reset/acknowledge a deep discharge message
Start functiontest		Starts a functiontest
Start durationtest		Starts a durationtest
Cancel test		Cancel an active test
Maintained OFF		All lights/ configured as "maintained light" will be turned off
Non maintained ON		All luminaires configured as "non maintained light" will be turned on
Fan monitoring	Level-triggered control (e.g. switch) 24 V DC = OK, 0 V = Failure	A charging fault is triggered via the potential-free signaling contacts of the DualSmart and the VisionGuard as long as 0 V is present.
External ISO monitor	Level-triggered control (e.g. switch) 24 V DC = OK, 0 V = Failure	Displays fault message on control unit as long as 0 V is present
External battery monitor		
External monitor		

Function / displayed text	Signal	Explanation
All luminaire ON	Level-triggered control (e.g. switch) 24 V DC = ON	Turns on all connecte luminaires
AE-Scenario active		Displays „scenario active“ (e.g. from an external AE-CU system)
AE-Failure		Displays „AE failure“ (e.g. from an external AE-CU system)

8.2. Potential-free relay outputs

The DualSmart has 4 freely programmable potential-free relay contacts, which are preconfigured for use in combination with a remote display. In the table below, the symbol 'X' marks the default configuration. Alternatively, they can also be used to forward the system status to an external building management system. (Max. 24 V DC, 0,5A) Connection: X12 (7.2. Overview of Terminal Blocks, page 18)

Designation	Relay 1	Relay 2	Relay 3	Relay 4
Mains operation				
Mains failure	X			
Mains failure DB	X			
Charging failure	X			
Circuit failure	X			
Luminaire failure	X			X
Ready for operation		X		
Deep discharge prot.	X			
ISO failure	X			
Device failure	X			
Function test		X		
Duration test		X		
Safety source active			X	

9. Configuration

In order for the system to be able to check the functionality of all connected luminaires, they must first be searched by using the “Luminaire Search” function or manually added to the individual circuits. After the search has been triggered, the luminaires report back to the DualSmart device according to their addresses set via the rotary coding switches. The configuration is stored in a non-volatile memory and is not lost when the 230 V AC mains voltage and battery power is switched off. The configuration can be carried out via the control buttons on the device, via the mobile app via Bluetooth connection or by importing a configuration file from the PC programming software. The status of connected luminaires can be displayed via the menu (See more in chapter “10.4 Menu structure”, on page 34)).



Fig. 9: Luminaire Overview (Example)

Symbol	Significance	Symbol	Significance
	Light off		Luminaire failure
	Light on		Luminaire address assigned twice
	No luminaire connected		

9.1. Mobile-App

The basic functions can be configured directly on the device, while some advanced functions can only be set via the app.

In order to use the mobile app, the following steps are necessary:

- 1 Download the mobile app using the QR code below.
- 2 Register
- 3 Login
- 4 Search the system via Bluetooth. Make sure that the Bluetooth interface of the DualSmart has been activated.
- 5 Connect to the system and follow the instructions



Fig. 10: QR-Codes for App-Download

9.2. PUB/SUB function of connected DualSmart devices

If several DualSmart devices have been connected to each other via the DS bus, digital inputs, bus modules and phase monitors can be used across systems with the PUB/SUB function. This feature can be configured via the mobile app and PC programming software.

Example using a bus module:

If “PUB” is activated for a bus module connected to System A in the programming, the module information is automatically published via the DS bus and thus made available to other systems.

If a bus module is added in the configuration of system B and configured to “SUB”, it will subscribe to the switching states of the module of system A. System B can thus use inputs from the bus module connected to System A for programming

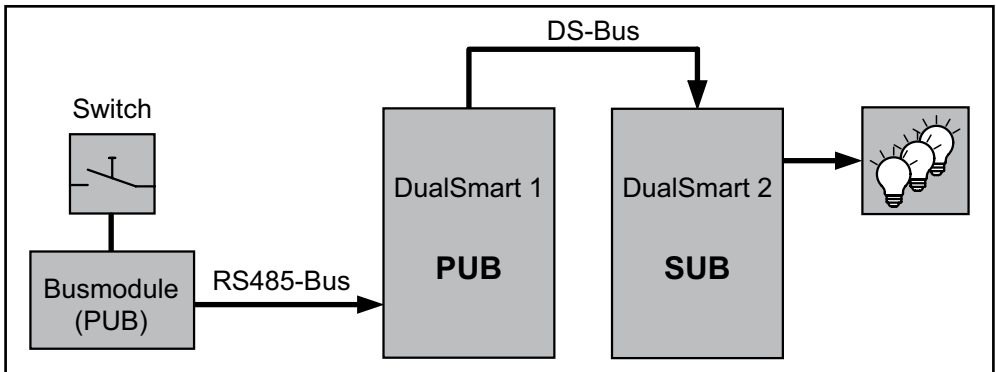


Fig. 11: PUB/SUB-Scheme

10. Control

The status LEDs of the DualSmart must be checked daily for correct operation. For housing variants that obscure the status LEDs, a group controller or remote display (RCM) must be connected. In the event of malfunctions, operational readiness must be restored immediately. The housing of the DualSmart may only be opened by an authorized electrician.

10.1. User rights

Some functions of the DualSmart are reserved exclusively for qualified specialists, therefore, the operation is separated into 2 levels. The two levels have the following operating rights:

	Function	User	Administrator
Display	System state	x	x
	Logbook	x	x
	Luminaire status	x	x
	Current system configuration	-	x
	Circuit information	-	x
Commands	Start/Stop function test	-	x
	Start/Stop Betriebsdauertest	-	x
	Block / Release	-	x
	All luminaire ON	-	x
	Non-Maintained luminaires ON	-	x
	Maintained luminaires OFF	-	x
Configuration	Duration of functiontest and durationtest	-	x
	Bluetooth interface configuration	-	X
	Luminaire search	-	x
	Luminaire configuration	-	x
	I-Bus modules	-	x
	PUB/SUB function	-	Only mobile app
	Battery parameter	-	x
	BMS parameters for VisionGuard	-	Only mobile app
	BMS parameters for Modbus	-	x
	Upload configuration files	-	x
	Download configuration files	Only mobile app	x

10.2. Password Management

10.2.1. Assign device PIN

To prevent unauthorized access, each DualSmart device must be protected with a PIN.

When the DualSmart is started for the first time and no PIN has been set, a prompt to create a PIN will automatically appear.

This prompt cannot be bypassed.

PIN requirement: 6 to 20 digits

10.2.2. Reset of the Device-PIN

To reset the PIN if lost, do the following:

- 1 Switch off the DualSmart
- 2 Switch on the DualSmart
- 3 Press and hold the up, down button, and OK button during the power-on process.

⇒ The PIN is now deleted and can be reassigned.

10.2.3. Bluetooth device password

Bluetooth access via the mobile app is password protected. An initial password is set. If a new password has not yet been assigned, the individual initial password can be viewed via the menu "Basic Settings" -> "Bluetooth Settings". When connecting via the mobile app for the first time, a prompt appears to change the initial password.

After the initial assignment, the Bluetooth device password can only be changed by the user account used for the login.

In the event of losing the Bluetooth device password, the device must be reset to factory settings.

Procedure: Menu → Basic setup → Factory reset.

⚠ WARNING!

When resetting, the system loses its current configuration. Reprogramming or restoring a backup configuration is required.

Alternatively, the password can be reset by an EATON service technician

10.3. Menu operation

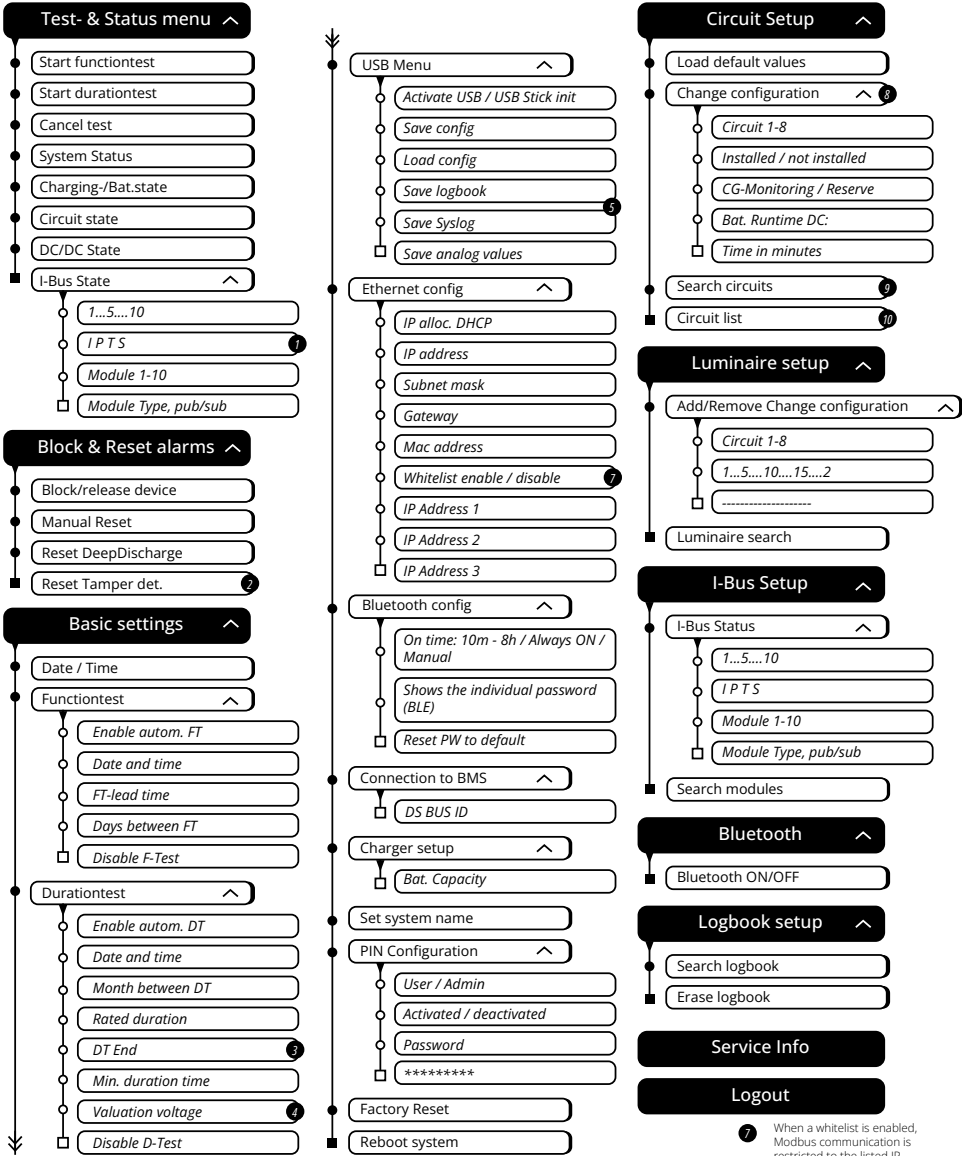
Only commissioning personnel, trained maintenance personnel and EATON CEAG service personnel are permitted to operate the menu.

Use the **up and down buttons** to navigate between menu items on the same level.

Press the **OK button** to open the selected menu item.

Press the **ESC button** to return to the higher-level menu.

10.4. Menu structure



- 1 I = Module in "I-mode" for querying switches
P = Module in "3PM/5I- mode" for phase monitoring and switch queries
T = TLS module
S = Address occupied by a subscribed module
- 2 The system's tamper detection is activated when either the safety cover is opened or the power supply (AC and DC) is completely interrupted and subsequently restored.
- 3 **Condition for ending the duration test (DT)**
Rated duration- The DT ends as soon as the configured rated duration time has elapsed
Min. duration time- The DT ends as soon as the configured min. duration time has been reached
Deep discharge protection- The DT ends upon reaching the discharge cut-off voltage - regardless of the configured rated or min. duration time.
- 4 If the "min. duration time" is used as the criterion for ending the DT, an evaluation voltage can additionally be configured. If the battery voltage drops below the evaluation voltage, a capacity error is triggered.
- 5 **Save Syslog-** Creates a detailed ".log" file on the connected USB stick. This file contains timestamped entries for system faults, configuration changes, and triggered sabotage/tamper detections.
Save Analog Values- Creates a ".csv" file that records the analog values of the DC operation as well as the subsequent battery charging process until full charge is reached.
- 6 Defines the time in seconds after which the Modbus connection is automatically terminated if no communication occurs.
Setting range: 0 to 65.535 seconds ($\approx$ 18.2 hours)
Note: If set to 0, the connection will not be automatically terminated
- 8 **Resets circuits to default settings:**
 - Luminaires are set to continuous light / Maintained light
 - Circuits monitoring mode will be set to "CG Monitoring"
 - Selective battery runtime in DC is set to permanent (default)
- 9 After replacing a CSD in the DualSmart, this function must be executed once.
- 10 Displays the installed circuits

11. Maintenance

11.1. General

For functional and safety reasons, regular maintenance activities at prescribed intervals are necessary to ensure safe system operation and are required in accordance with DIN EN 50172. The DualSmart system creates a test log in accordance with EN 50172 and documents proper operation, fault messages, and automatic system tests. Battery maintenance must be carried out in accordance with the manufacturer's documentation.

Maintenance of the connected emergency luminaires should be performed according to the operating instructions of the respective luminaires. The operator is responsible for complying with maintenance intervals.

Inspection and maintenance of a battery system must be performed in accordance with the manufacturer's specifications.

If a capacity test is conducted, the test methods specified in IEC 62620:2014, section 6.3, should be applied. To ensure the safe operation of a stationary battery, regular inspection is required.

Any signs of deterioration must be documented and addressed—especially in cases of electrolyte leakage or insulation faults. Deteriorating lithium-ion batteries may be identified by a slightly swollen housing. A swollen housing typically indicates a safety-critical condition, which may be caused by internal gas pressure, loss of vacuum (only in pouch cells), or the deposition of metallic lithium (plating, dendrites, etc.). Continued operation (especially charging) may result in failures such as electrolyte leakage, venting of electrolyte gases, or thermal runaway. In such cases, the battery must be taken out of service—regardless of whether manufacturer instructions exist.

Battery inspection can be integrated into the regular maintenance routine. Regular inspection and monitoring of batteries in operation must be carried out in accordance with the recommendations provided in the manufacturer's documentation.

Recurring tests following the EN50171:2021

The recurring tests shall be performed in accordance with the local/national regulations. If no local/national regulations exist, then the following test intervals are recommended:

These tests shall only be performed by experts for safety power supply systems. The weekly tests can be performed by the user (responsible person), if it is without risk for themselves or by an automatic test.

11.2. Daily maintenance activities

DualSmart must be ready for operation at all times. The status LEDs of the DualSmart or the connected remote display must be checked daily. In the event of malfunctions, operational readiness must be restored immediately.

11.3. Weekly maintenance activities

A functional check of all emergency luminaires. Typically, this is automatically carried out by the DualSmart as per configured function test. A manual function test can be carried out all the time via the menu or the mobile app. The results will be documented in the digital log book. When switching to DC mode, the system is also checked for insulation faults including the final circuits.

11.4. Semi-Annual maintenance activities

Simulation of mains failure e.g. using the test button at phase monitoring modules in sub distribution boards

11.5. Annual maintenance activities

The following tests must be carried out annually in accordance with DIN EN 50171. These activities may only be carried out by qualified specialists, such as EATON CEAG customer service.

- Verify emergency lighting functionality by simulating a power outage over the specified duration time. Capacity test for the rated autonomy with the full site load. For this test the battery shall be charged in accordance with the manufacturer's specifications and shall, subsequent to a float charging period of 24 h, be subjected to a discharge test. During discharge, the central safety power supply system shall be loaded with the full site load and the rated autonomy time shall be reached ensuring that at the end of discharge the battery voltage is not less than the specified minimum voltage. The function and voltage of the battery block shall be tested and documented.
- Checking the presence and functionality of all backlit safety signs and safety lights during testing.
- Inspection of the condition of all illuminated safety signs and emergency luminaires for dirt and damage.
- If applicable, testing the function of the monitoring equipment of a central power supply. (S3/S4)
- If applicable, testing the function of connected RCM remote modules
- Inspection to verify that all electrical connections are secure and that the correct components have been installed, including appropriate fuse types and ratings.
- Checking the recognisability and effectiveness of exit sign luminaires, e.g. due to obstructions that impair visibility.
- Documentation of inspection, test results and repairs.

The maintenance seal documents the time of the next maintenance.

11.6. Three-year maintenance activities

- Measurement of protection against an electric shock at Mains input according to EN62368-1

11.7. Five-year maintenance activities

Control of compliance with the lighting requirements by measurement according to DIN EN 1838.

11.8. Spare parts

Only use original spare parts from the manufacturer!

⚠ WARNING!

Incorrect or faulty replacement parts may lead to damage, malfunction, or complete failure of the device. The use of non-approved replacement parts voids all warranty, service, compensation, and liability claims.

When ordering spare parts, enter the following data:

- Order number
- Type
- In the case of batteries, the nominal capacity and battery type

In the event of complaints, you will need an RMA number from us. Further information on this under www.eaton.de/ceag

11.9. Cleaning

If necessary, clean the housing with a soft, damp, but not wet, microfiber cloth and warm soapy water. Do not use aggressive chemical cleaning agents that can attack the housing

12. Disposal

⚠ WARNING!

Disposal of packaging materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations. If necessary, hire a recycling company.

- Observe handling instructions on the packaging!

Dispose of the packaging of the DualSmart in accordance with local disposal regulations.

EATON CEAG is certified according to the recycling certificate of Interzero Circular Solutions Germany GmbH. The packaging materials of EATON CEAG products can be handed in free of charge to Interzero collection points for recycling in accordance with the regulations with the contract number 85405.

Batteries and electronic components contain substances that lead to health and environmental damage if not disposed of properly. Be sure to follow the documentation on the battery as well as the national guidelines and regulations for the disposal of old batteries and electronic components

13. Technical specification

Number of circuits: 2 to 8

Number of DC/DC converters: 1 to 2

Ambient temperature during operation: 0 °C to +35 °C

Sound pressure level during mains operation: 0 dB

Degree of protection STS enclosure: IP31 (Cable entry from above) / IP20 (Cable entry from the rear)

Degree of protection MET enclosure: IP65

Degree of protection ESF enclosure: IP42

Degree of protection HYG enclosure: IP66

Input

Rated voltage: 1 ~ 220 bis 240 V AC

Rated frequency: 50/60 Hz

Max rated current: 7,5 A AC

Input fuse: 8 A slow-blow (T), 300V, 6,3 x 32 mm

Battery

Fuse: 50 A slow-blow (T), 58V DC, MAXI Blade Fuse, 29,2 x 34,3 mm

Rated voltage: 20,0 bis 28,8 V DC

Battery: Lithium Batterie LiFePO4 25,6 V, max. 60 A für 4s

Output

Rated voltage AC: 220 to 240 V AC

Rated voltage DC: 222 to 229 V DC (Load-dependent)

Max. rated power per circuit: 150 VA/140 W

Rated current per circuit: 0,625 A

Circuit fuse: 1 A slow-blow (T), 250 V, 5 x 20 mm

Max. rated power 24 V auxiliary voltage: 2x 14,4 W (LON- and DS-Bus)

Output	1 DC/DC converters	2 DC/DC converters
Max. A of the system	2,4 A AC/1,2 A DC	4,8 A AC/2,4 A DC
Max. Rated Power VA/W	575 VA/270 W	1150 330 W (STS limited due 20 Ah battery) 1150 VA/540 W (MET, HYG und ESF)

Terminals

The following specifications apply to flexible conductors when used with insulated ferrules

Battery terminal: 0.75 to 16 mm² solid, 0.75 to 16 mm² flexible

Power supply terminals: 0.25 to 2.5 mm² solid, 0.25 to 2.5 mm² flexible

End circuit terminal: 0.25 to 2.5 mm² solid, 0.25 to 2.5 mm² flexible

Ground terminals: 4.0 to 10.0 mm² solid, 4.0 to 10.0 mm² flexible

Bus, relay, input and output terminals: 0.2 to 1.5 mm² solid, 0.25 to 1 mm² flexible

14. Signal scheme

14.1. LEDs

LED	Description	Explanation
	Ready	Operational readiness of the System
	Power source for safety purposes active	Supply from the safety source (e.g. battery operation in case of mains failure or FT/DT)
	Failure	Failure that can be further analysed via the menu or the app

14.2. Operating states

Display message	Description	Measures
- none -	Device ready for operation	No action required
Blocked S1/S2	All end circuits are blocked via the S1/ S2 contacts (e.g. RCM module). The battery is charging, but there will be no switching in the event of a mains failure.	• Check why/by whom the system was blocked (maintenance work, etc.) • Check wether and when a release can be granted. • Release via contacts S1/S2 to restore operational readiness The release must be initiated by the same source that also performed the blocking!

Display message	Description	Measures
Blocked (menu)	All end circuits are blocked via the menu. The battery is charging, but there will be no switching in the event of a mains failure.	• Check why/by whom the system was blocked (maintenance work, etc.) • Check whether and when a release can be granted. • Release via the menu (10.4. Menüstruktur, Seite 28) The release must be initiated by the same source that also performed the blocking!
Blocked (DS-Bus)	All end circuits are blocked via a connected device on the DS-Bus. The battery is charging, but there will be no switching in the event of a mains failure.	• Check why/by whom the system was blocked (maintenance work, etc.) • Check whether and when a release can be granted. • Release the system (DualSmart or group controllers connected via DS bus). The release must be initiated by the same source that also performed the blocking!
Blockiert (App)	All end circuits are blocked via the app. The battery is charging, but there will be no switching in the event of a mains failure.	• Check why/by whom the system was blocked (maintenance work, etc.) • Check whether and when a release can be granted • Release the system via the app The release must be initiated by the same source that also performed the blocking!
Battery operation	The system is operating on battery power. The mains supply to the device has failed	• The mains failure must be resolved by authorized personnel
Function test	The system is operating on battery power. A functional test has been started (e.g. test button; Menu; connected DualSmart system; BMS; VisionGuard; Mobile App).	• Wait for the end of the test (Duration of the function test: approx. 5 minutes).
Duration test	The system is operating on battery power. A duration test has been started (source: test button; Menu; connected DualSmart system; BMS; VisionGuard or Mobile App).	• Wait for the end of the test (Duration of the test: Depending on the configured operating time 1h; 1,5h; 2h; 3h or 8h).

14.3. Faults

Display message	Description	Measures
Mains failure S3/S4	The system detected a power failure in a sub-distribution board of the general supply via the S3/S4 current loop.	The mains failure must be resolved by authorized personnel
Mains failure SubDB.	The mains failure must be resolved by authorized personnel.	The mains failure must be resolved by authorized personnel
Charging/Bat. failure	The battery charge is faulty. Possible causes: - Defective battery - Defective charger - Battery fuse blown - Defective temp. sensor - Wrong charging parameters	- Perform a function test. - If the error persists, the failure must be resolved by authorized personnel
Circuit failure	Circuit failure detected. Possible cause: - Fuse blown, - Defective IGBT	- Check detailed failure message in the menu / app - Inspect the fuse - The failure must be resolved by authorized personnel
Luminaire failure ■■-■■■■■-■■■■	Luminaire failure detected. Possible cause: - Defective luminaire - Defective luminaire electronic - Wrong luminaire address	- The failure must be resolved by authorized personnel. - Check luminaire - Check addressing - Replacement of defective luminaires / drivers including re-addressing.
Cloud Comm.-failure	Communication to the BSMS cloud not possible	Check network connection of the DualSmart system
I-Bus Comm.- failure	No response from connected bus modules	- Check the RS485 wiring to the bus modules - Check the RS485 bus termination ((See more in chapter "7.5.4 Connection of bus phase monitors via RS-485 bus (LON)", on page 25)

15. Eaton CCOE (Cybersecurity Recommendations)

15.1. Guidelines

The DualSmart has been designed so that cybersecurity is an essential requirement. That's why this product offers several features to eliminate cybersecurity risks. These cybersecurity recommendations provide information that helps users deploy and maintain the product in a way that minimizes cybersecurity risks. These cybersecurity recommendations are not intended to provide a comprehensive guide to cybersecurity, but rather to complement customers' existing cybersecurity programs.

Eaton is committed to minimizing cybersecurity risk in its products and employing cybersecurity best practices in its products and solutions to make them more secure, reliable, and competitive for customers.

15.2. References

15.2.1. Category Wealth Management

Managing software and hardware resources in your environment is a prerequisite for effective cybersecurity management. Eaton recommends that you conduct an asset inventory that uniquely identifies each key component. To facilitate this, The DualSmart supports the following identification data:

- Manufacturer, type, serial number, and f/w version number.
- Publisher, name, version, and version date.

Bitte lesen Sie die entsprechenden Seiten des Handbuchs, um Informationen zu erhalten, wie Sie diese Parameter ermitteln können.

15.2.2. Category Risk Assessment

Eaton recommends that a risk assessment be conducted to identify and assess reasonably foreseeable internal and external risks to the confidentiality, availability, and integrity of the system, device, and environment. This task should be carried out in accordance with the applicable technical and regulatory frameworks such as IEC 62443. The risk assessment should be repeated regularly.

15.2.3. Physical Security Category

An attacker with unauthorized physical access can cause serious disruptions to the functionality of the system. In addition, the industrial control protocols do not provide cryptographic protection, which makes communication between the Industrial Control System (ICS) and Supervisory Control and Data Acquisition (SCADA) particularly vulnerable to threats to their data security. Physical security is an important layer of defence in such cases. The DualSmart is designed to be used and operated in a physically secure location.

Below are some best practices that Eaton recommends to physically seal your system. secure:

- Secure the premises and equipment with access control mechanisms such as locks, access card readers, security guards, pedestrian gates, video surveillance, etc., if necessary.
- Restrict physical access to cabinets and/or enclosures. Monitor and log access at any time.

- Physical access to telecommunications lines and network cables should be restricted to protect against interception or sabotage attempts. It is a best practice to use metal ducts for network cable routing between equipment cabinets.
- The DualSmart supports the following physical access ports:
RJ-45 and USB (default = disabled). Access to these ports should be restricted.
- Do not connect removable media (e.g., USB devices, SD cards, etc.) for any operations (e.g., firmware upgrade, configuration changes, or changes to the boot application) unless the origin of the media is known and trusted.
- Before connecting a portable device via a USB port, scan the device for malware and viruses.

15.2.4. Category Access Management

Logical access to the system or device should be limited to legitimate users, who should be assigned only the privileges necessary to perform their task roles/functions.

Some of the following best practices may need to be implemented by incorporating them into the company's internal policies:

- Change the default credentials the first time you log in. The DualSmart should not be used in production environments with default credentials because default credentials are published.
- No account sharing – Each user should be assigned a unique account instead of sharing accounts and passwords. The product's security monitoring and logging features are set up based on each user with an individual account. If users can share credentials, security is compromised.
- Restrict administrative access rights - Attackers try to gain control over allowed credentials, especially those for particularly privileged accounts. Administrative access rights should only be granted to accounts that are specifically intended for administrative tasks and not for regular use.
- Leverage roles/access rights to provide users with tiered access according to business/operational needs. As a matter of principle, try to assign only a few access rights (assign the minimum permission level and access to the system resources required for the role).
- Perform regular account maintenance (remove unused accounts).
- Make sure the length, complexity, and expiration times of the passwords are set appropriately, especially for all manager accounts (e.g., at least 10 characters, mix of uppercase and lowercase letters and special characters, and expire every 90 days or otherwise in accordance with your company's policies).
- Force a session time-out after a period of inactivity.

15.2.5. Category Time Synchronization

Many processes in power grids and IT networks are highly dependent on precise time information.

- Make sure the system clock is synchronized with an authoritative time source

15.2.6. Category network security

DualSmart supports network communication with other devices in the area. This feature can pose risks if it has not been configured securely. The following are Eaton's recommended best practices for securing the network. For more information on the various network protection strategies, see Eaton's Cybersecurity Considerations for Electrical Distribution Systems[R1].

Eaton recommends segmenting networks into logical enclaves, which denies data traffic between segments except the one that is explicitly allowed, and restricts communication to host-to-host paths (e.g., by using router ACLs and firewall rules). This helps protect sensitive information and critical services, and creates additional barriers in the event of a network perimeter breach. A network of industrial control systems for utilities should be divided into at least a three-tier architecture (as recommended by NIST SP 800-82 [R3]) to improve security control.

Communications Protection: DualSmart offers the ability to encrypt network communications. Please make sure that the encryption options are enabled. You can ensure the product's communication capabilities by following the steps in the manual.

Eaton recommends releasing only those ports that are necessary for operation and protecting network communications with network protection systems such as firewalls and access control systems/intrusion prevention systems.

15.2.7. Category Protocol and Event Management.

- Eaton recommends logging all relevant system and application events, including all management and maintenance activities.
- Logs should be protected from tampering and other risks to their integrity (e.g. by restricting access and modification rights, transmitting logs to a security information and event management system, etc.)
- Ensure that the logs are kept for a reasonable and sufficient amount of time.
- Check the logs regularly. The frequency of the review should be reasonable, taking into account the sensitivity and criticality of the system and all the data it processes.

15.2.8. Category Safe Maintenance

Best Practices

Visit Eaton's cybersecurity website for information on vulnerabilities.

<https://www.eaton.com/de/de-de/company/news-insights/cybersecurity.html>

15.2.9. Category: Business Continuity / Cybersecurity Disaster Recovery

Plan for Business Continuity / Cybersecurity Disaster Recovery

Eaton recommends including DualSmart in the company's business continuity and emergency response models. Organizations should develop a business continuity plan and an emergency plan and regularly review and apply these plans where possible. As part of the plan, critical system data should be backed up and securely stored, including:

- Current configuration;
- Documentation of current authorizations / access controls, if not secured as part of the configuration;

15.2.10. Category Disclosure of confidential information.

Eaton recommends that confidential information (e.g., connectivity, log data, personal data) that may be stored by the Group Controller be adequately protected through the use of organizational security procedures.

15.2.11. Decommissioning or Reset

It is a best practice to clean data before disposing of a device with data. Guidelines for decommissioning are included in NIST SP 800-88. Eaton recommends that products with embedded flash memory be securely destroyed to ensure that data cannot be recovered.

Integrated flash memory in boards and devices: Eaton recommends the following procedures for disposing of motherboards, peripherals such as network adapters, or other adapters with non-volatile flash memory:

- Erase: If supported by the device, restore the state to the original factory settings.
- Shredding: Shred, crush, pulverize, or incinerate the device by burning it in a licensed incinerator.



български Общи инструкции за безопасност

- Уредите не са подходящи за частна употреба.
- Монтирането трябва да се извършва от квалифицирани техници, като се вземат под внимание националните разпоредби за безопасност и препоръките на производителя.
- Уредите трябва да се използват в съответствие с предназначението им, в подходящо и изправно състояние.
- Отстранете всички чужди тела от уредите, преди първото му използване.
- При работа с уредите, първо изключете напълно електрозахранването, уверете се, че не е възможно то да се включи отново и проверете дали уредът не е под напрежение. (Горното се отнася до електрическата мрежа, резервното захранване и евентуално контролно и външно напрежение.) Не изключвайте веригите, докато са под натоварване.
- Внимавайте за падащи части по време на транспортиране.
- Използвайте само оригинални резервни части за подмяна.

Česky Všeobecné bezpečnostní pokyny

- Zařízení nejsou určeny k soukromému využití.
- Veškerou instalaci musí provádět kvalifikovaný elektrikář seznámený s národními bezpečnostními předpisy.
- Zařízení se smí používat jen k zamýšlenému účelu a musí být v řádném a nepoškozeném stavu.
- Před prvním použitím ze zařízení odstraňte všechny cizí předměty.

16. General Safety Instructions

- Při práci na zařízení nejprve zcela odpojte napájení, zajistěte, aby nemohlo být znovu zapnuto, a zkontrolujte nepřítomnost napětí. (Výše uvedený pokyn se týká napájení z rozvodné sítě, záložního napájení a případně i přívodu ovládacího a externího napětí.) Neodpojujte okruh pod napětím.
- Při přenosu pamatujte na oddělitelné části.
- K výměně používejte výhradně originální náhradní díly.

Dansk Generelle sikkerhedsinstruktioner

- Apparaterne er ikke egnet til privat brug.
- En installation skal altid udføres af en kvalificeret elektriker og under hensyntagen til nationale sikkerheds- og ulykkesforebyggende regulativer.
- Apparaterne må kun anvendes i overensstemmelse med den påtænkte brug og i hel og ubeskadiget stand.
- Fjern alle fremmedlegemer fra apparaterne inden første anvendelse.
- Når der arbejdes med apparaterne, så sluk først for al strøm, fastslå at den ikke kan tændes igen og tjek, at de er uden spænding. (Ovennævnte er gældende for strømforsyning, nødstrøm og mulig kontrol og ekstern strøm.) Afbryd ikke kredsløbene under belastning.
- Pas på ledde under transport.
- Brug kun originale reservedele ved udskiftning.

Deutsch Allgemeine Sicherheitshinweise

- Die Geräte sind nicht für den privaten Gebrauch geeignet.
- Eine Installation darf nur durch qualifizierte Elektrofachkräfte unter Berücksichtigung der nationalen Sicherheits- und Unfallverhütungsvorschriften erfolgen.

- Die Geräte sind bestimmungsgemäß in unbeschädigtem und einwandfreiem Zustand zu betreiben.
- Alle Fremdkörper müssen vor der ersten Inbetriebnahme aus den Geräten entfernt werden.
- Bei Arbeiten an den Geräten sind diese zuerst komplett spannungsfrei zu schalten, gegen Wiedereinschalten zu sichern und die Spannungsfreiheit festzustellen. (Gilt für Netzspannung, Ersatzstromquelle und evtl. Steuer- / Fremdspannungen.) Stromkreise nicht unter Last trennen.
- Beim Transport mit herunter fallenden Teilen rechnen.
- Als Ersatz dürfen nur Originalteile verwendet werden.

Eesti Üldised ohutusjuhised

- Need seadmed ei ole mõeldud erakasutuseks.
- Paigaldustööd tuleb jätta kvalifitseeritud elektrikri hooleks ning tuleb teha vastavalt siseriiklikele ohutuseeskirjadele ja õnnetusjuhtumite vältimise reeglitele.
- Seadmeid tuleb kasutada nende ettenähtud eesmärgil korrasolevatena ja kahjustamata seisundis.
- Enne esmakordset kasutamist eemaldage seadmetest kõik võõrkehad.
- Seadmetega töötamisel lülitage kõigepealt kogu toide välja, tagage, et seda ei saa uuesti sisse lülitada ja kontrollige toitepinge puudumist. (Eeltoodu kehtib nii võrgupinge, varutoite kui ka võimaliku kontrollpinge ja välise pinge suhtes.) Ärge ühendage lahti koormuse all olevat vooluringi.
- Transportimisel võtke arvesse kukkuvatest osadest lahtuvat ohtu.
- Vahetamiseks kasutage ainult originaalvaruosi.

ελληνικά Γενικές οδηγίες για την ασφάλεια

- Οι συσκευές δεν είναι κατάλληλες για ιδιωτική χρήση.
- Η εγκατάστασή τους πρέπει να γίνεται από εξειδικευμένους ηλεκτρολόγους, λαμβάνοντας υπόψη τους εθνικούς κανονισμούς ασφαλείας και πρόληψης ατυχημάτων.
- Πρέπει να γίνεται μόνο η προβλεπόμενη χρήση των συσκευών, στην κατάλληλη κατάσταση τους και χωρίς να παρουσιάζουν βλάβη.
- Πριν από την πρώτη χρήση τους, απομακρύνετε όλα τα ξένα αντικείμενα από τις συσκευές.
- Όταν εργάζεστε με τις συσκευές, κλείνετε τον διακόπτη λειτουργίας, βεβαιώνετε ότι δεν μπορεί να ανοίξει ξανά και ελέγχετε εάν υπάρχει τάση σε αυτές (το ίδιο ισχύει και για τον γενικό διακόπτη ρεύματος, την εφεδρική πηγή ισχύος και την τυχόν τάση ελέγχου και εξωτερική τάση). Μην αποσυνδέσετε τα κυκλώματα υπό φορτίο.
- Έχετε υπόψη σας τα τμήματα που ενδέχεται να πέσουν κατά τη μεταφορά.
- Χρησιμοποιείτε μόνο γνήσια ανταλλακτικά για αντικατάσταση.

English General safety instructions

- The devices are not suitable for private use.
- An installation must be performed by qualified electricians taking into account the national safety and accident prevention regulations.
- The devices must be used in accordance with their intended use in a proper and undamaged condition.
- Remove all foreign objects from the devices before their first use.

- When working with the devices, first turn off the power completely, ensure that it cannot be turned back on, and check if they are free of voltage. (The above applies to mains power, backup power and possibly control and external voltage.) Do not disconnect the circuits under load.
- Be aware of falling parts during transport.
- Use only original spare parts for replacement.

Español Instrucciones generales de seguridad

- Los dispositivos no son adecuados para el uso privado.
- Solo puede instalarlos un electricista cualificado de acuerdo con la normativa de seguridad y prevención de accidentes.
- Los dispositivos deben utilizarse de acuerdo con su uso previsto, en buen estado y sin daños.
- Retire todos los objetos que no pertenezcan a los dispositivos antes del primer uso.
- Cuando se disponga a manipular los dispositivos, desconecte totalmente la corriente eléctrica, asegúrese de que no se pueden volver a conectar y compruebe que no tengan corriente. (Lo anterior se aplica a la red eléctrica, a los grupos electrógenos de emergencia, y posiblemente, también al control y a la corriente externa.) No desconecte los circuitos con una carga conectada.
- Tenga cuidado con los componentes que podrían caerse durante el transporte.
- Use solo piezas de repuesto originales para reemplazar las antiguas.

Français Consignes générales de sécurité

- Les dispositifs ne conviennent pas à un usage privé.
- L'installation doit être effectuée par des électriciens qualifiés, conformément aux réglementations nationales sur la sécurité et la prévention des accidents.

- Les dispositifs doivent être utilisés conformément à l'usage auquel ils sont destinés, être en bon état et ne pas être endommagés.
- Retirez tous les corps étrangers des dispositifs avant leur première utilisation.
- Lorsque vous travaillez sur les dispositifs, coupez tout d'abord complètement l'alimentation électrique, assurez-vous qu'elle ne peut pas être rétablie et vérifiez que la tension est nulle. (L'énoncé précédent s'applique à l'alimentation du secteur, l'alimentation de secours et peut s'appliquer à la tension de commande et à la tension externe.) Ne déconnectez pas les circuits en charge.
- Faites attention aux pièces pouvant tomber pendant le transport.
- N'utilisez que des pièces de rechange d'origine en cas de remplacement.

Hrvatski Opće sigurnosne upute

- Uredaji nisu prikladni za privatnu upotrebu.
- Instalaciju moraju provesti kvalificirani električari uzimajući u obzir nacionalne propise za sigurnost i sprečavanje nezgoda.
- Uredaji se moraju upotrebljavati u skladu sa svojim namjenom u ispravnom i neoštećenom stanju.
- Uklonite sve strane predmete iz uredaja prije prve upotrebe.
- Kada radite s uredajima, prvo u potpunosti isključite napajanje, osigurajte da se ne može uključiti i provjerite da nema napona. (Navedeno se odnosi na glavno napajanje, pomoćno napajanje i eventualno kontrolu vanjskog napona.) Nemojte isključivati strujne krugove pod opterećenjem.
- Pripazite na dijelove koji padaju tijekom transporta.
- Upotrebljavajte samo originalne rezervne dijelove za zamjenu.

Italiano Indicazioni generali sulla sicurezza

- Le unità non sono idonee all'uso privato.
- L'installazione deve essere effettuata da un elettricista specializzato prendendo in considerazione le norme nazionali in materia di sicurezza e prevenzione degli infortuni.
- Le unità devono essere utilizzate conformemente all'uso previsto in condizioni adeguate e senza danni.
- Rimuovere tutti i corpi estranei dalle unità prima di utilizzarle per la prima volta.
- Prima di ogni intervento sulle unità, disattivare completamente l'alimentazione elettrica, accertarsi che non possa essere riattivata e verificare che le unità siano prive di tensione. (Quanto sopra vale per la tensione di rete, l'alimentazione di riserva ed eventualmente per la tensione di controllo e la tensione esterna.) Non scollegare i circuiti sotto carico.
- Prestare attenzione alla possibile caduta di pezzi durante il trasporto.
- Utilizzare soltanto pezzi di ricambio originali.

Latviski Vispārējie drošības norādījumi

- Šīs ierīces nav paredzētas personīgai lietošanai.
- Uzstādīšana jāveic kvalificētiem elektriķiem, ievērojot nacionālos drošības un nelaimes gadījumu novēršanas noteikumus.
- Ierīces jālieto saskaņā ar tām paredzēto lietošanu pareizā un nebojātā stāvoklī.
- Pirms pirmās lietošanas reizes izņemiet no ierīces visus svešķermeņus.
- Rīkojoties ar ierīcēm, vispirms pilnībā izslēdziet barošanu, nodrošiniet, ka tās nevar atkal ieslēgt, un pārliecinieties, ka tās nav zem sprieguma. (Iepriekš minētais attiecas uz barošanu no tīkla, no rezervs barošanas avota, kā arī no iespējama vadības un ārēja sprieguma.) Neatvienojiet ķēdes, kam pievienota slodze.

- Transportējot uzmanieties no krītošām daļām.
- Nomaļņai izmantojiet tikai oriģinālās rezerves daļas.

Lietuviškas Bendrieji saugos nurodymai

- Įrenginiai neskirti privačiam naudojimui.
- Įrengti turi kvalifikuoti elektrikai, atsižvelgdami į šalies saugos ir nelaimingų atsitikimų prevencijos taisykles.
- Įrenginiai turi būti naudojami pagal numatytą paskirtį, tinkamos būklės ir nesugadinti.
- Prieš naudodami pirmą kartą, nuo įrenginio pašalinkite visus pašalinius daiktus.
- Dirbdami su įrenginiais pirmiausia visiškai išjunkite maitinimą, pasirūpinkite, kad jis negalėtų būti vėl įjungtas ir patikrinkite, ar neliko įtampos. (Minėti nurodymai taikomi pagrindiniam maitinimui, atsarginiam maitinimui ir galimai valdymo bei išorinei įtampai.) Neatjunkite grandinių, kuriomis teka elektros srovė.
- Veždami saugokite, kad neužkristų daiktai.
- Pakeitimui naudokite tik originalias atsargines dalis.

Magyar Általános biztonsági utasítások

- A készülékek nem megfelelőek magáncélok használatára.
- A felszerelést csak szakképzett villanyszerelő végezheti a biztonság és baleset-megelőzési helyi szabályozás betartásával.
- A készülékeket rendeltetésszerűen kell használni, és azoknak megfelelő és sértetlen állapotúnak kell lenniük.
- Az első használat előtt távolítsa el az összes idegen tárgyat a készülékekből.

- Ha a készülékekkel munkátokat végez, először szakszerűen meg teljesen azok áramellátását, biztosítsa bekapcsolás ellen, és ellenőrizze, hogy feszültségmentes állapotban vannak. (A fenti utasítás vonatkozik a tápfeszültségre, készenléti áramellátásra és a vezérlő és külső feszültségre, ha van ilyen.) Ne kapcsolja szét az áramköröket terhelés alatt.
- Figyeljen az esetleg leeső összetevőkre szállítás során.
- Csak eredeti cserealkatrészeket használjon.

Nederlands Algemene veiligheidsinstructies

- De componenten zijn alleen geschikt voor professioneel gebruik.
- Installatie moet worden uitgevoerd door gekwalificeerde elektromonteurs met inachtneming van de nationale regelgeving voor veiligheid en het voorkomen van ongevallen.
- De apparaten moeten worden gebruikt waarvoor deze bedoeld zijn, op juiste wijze en in onbeschadigde toestand.
- Verwijder alle vreemde voorwerpen van de apparaten voordat u deze in gebruik neemt.
- Tijdens werkzaamheden aan de componenten schakelt u eerst alle stroom geheel uit en zorgt u ervoor dat deze niet weer zo maar ingeschakeld kan worden, en controleert u of deze geheel vrij van spanning zijn. (Bovenstaande geldt voor de hoofdspanning, accuspanning en eventuele externe spanning.) Ontkoppel de stroomcircuits niet als deze in gebruik zijn.
- Let op vallende delen tijdens transport.
- Gebruik alleen originele onderdelen bij vervanging.

Norsk Generelle sikkerhets- instruksjoner

- Enhetene passer ikke for privat bruk.
- En installasjon må utføres av kvalifiserte teknikere som tar hensyn til nasjonale

sikkerhetsforskrifter og ulykkesforebyggende forskrifter.

- Enhetene skal brukes i samsvar med tiltenkt formål, i riktig og uskadet stand.
- Fjern alle fremmedlegemer fra enhetene før første gangs bruk.
- Ved arbeid med enhetene, skal strømmen først slås helt av, og det skal sikres at den ikke kan slås på igjen. Kontroller at de er spenningsfrie. (Det ovennevnte gjelder nettstrøm, ekstrastrøm og mulig kontroll- og ekstern spenning.) Ikke koble fra kretsene under ladning.
- Vær oppmerksom på fallende deler under transport.
- Bruk bare originale reservedeler til erstatning.

Polski Ogólne instrukcje bezpieczeństwa

- Urządzenia nie nadają się do użytku prywatnego.
- Montaż musi być przeprowadzony przez wykwalifikowanego elektryka z uwzględnieniem krajowych przepisów bezpieczeństwa pracy i zapobiegania wypadkom.
- Urządzenia należy używać wyłącznie zgodnie z ich zamierzonym przeznaczeniem, gdy są one w dobrym i nieszkodzonym stanie.
- Przed pierwszym użyciem należy usunąć z urządzeń wszystkie obce ciała.
- Podczas pracy przy urządzeniach należy najpierw całkowicie wyłączyć zasilanie, upewnić się, że nie można go włączyć ponownie oraz sprawdzić, czy nie ma napięcia. (powyższe instrukcje dotyczą zasilania sieciowego, zasilania awaryjnego oraz napięcia sterowniczego i zewnętrznego.) Nie wolno odłączać obwodów znajdujących się pod obciążeniem.
- Podczas transportu należy uważać na spadające elementy.
- W przypadku wymiany należy używać wyłącznie oryginalnych części zamiennych.

Português Instruções gerais de segurança

- Os dispositivos não são adequados para uso privado.
- A instalação deve ser efetuada por um electricista qualificado e em conformidade com os regulamentos nacionais de segurança e prevenção de acidentes.
- Os dispositivos devem ser utilizados em conformidade com o seu uso previsto e em boas condições, não apresentando danos.
- Remova todos os objetos estranhos dos dispositivos antes de utilizá-los pela primeira vez.
- Ao utilizar os dispositivos, primeiro desligue a electricidade completamente, certifique-se de que não pode ser ligada e verifique se não existe tensão. (O supramencionado aplica-se à rede elétrica, à energia de reserva e à possível tensão de controlo e externa.) Não desligue os circuitos sob carga.
- Tenha atenção à queda de peças durante o transporte.
- Em caso de substituição, utilize apenas peças sobressalentes originais.

Română Instrucțiuni generale de siguranță

- Aparatele nu sunt destinate pentru uz personal.
- Instalarea trebuie efectuată de către un electrician calificat în conformitate cu reglementările naționale de siguranță și prevenirea accidentelor.
- Aparatele trebuie utilizate conform destinației lor într-o stare corespunzătoare și nedeteriorată.
- Îndepărtați toate corpurile străine din aparat înainte de prima utilizare a acestuia.
- Dacă efectuați lucrări la aparate, întrerupeți mai întâi alimentarea cu curent, asigurați-le împotriva repornirii și verificați ca să nu fie sub tensiune. (Cele de mai sus se referă la alimentarea de la rețea, alimentarea de rezervă, tensiunea de reglare și curentul de scurgere.) Nu întrerupeți circuitele sub sarcină.

- Fiți atenți la obiecte care pot cădea în timpul transportului.
- Utilizați numai piese de schimb originale.

Русский Общие инструкции по безопасности

- Устройства не предназначены для бытового использования.
- Монтаж выполняется квалифицированными электриками с учетом государственных норм и правил ТБ и профилактики несчастных случаев.
- Светильники должны использоваться только по назначению, при этом их следует поддерживать в исправном состоянии и оберегать от повреждений.
- Перед началом эксплуатации устройств удалите с их поверхности все посторонние объекты.
- Перед началом выполнения любых работ со светильниками, необходимо полностью обесточить их, обеспечить невозможность несанкционированной подачи питания, а также проверить отсутствие напряжения в цепи. (Подразумевается магистраль питания, резервное питание и, по возможности, напряжение в цепи управления и внешней цепи.) Не разрывайте цепи, находящиеся под нагрузкой.
- Перемещайте аккумулятор с осторожностью, чтобы не уронить.
- При замене вышедших из строя деталей используйте только оригинальные запчасти.

Slovenčina Splošna varnostna navodila

- Zariadenia nie sú vhodné na súkromné použitie.
- Inštaláciu musí vykonávať kvalifikovaný elektrikár s prihliadnutím na vnútroštátne nariadenia o bezpečnosti a predchádzaní rizikám.
- Zariadenia sa musia používať v súlade s plánovaným používaním v riadnom a nepoškodenom stave.

- Pred prvým použitím odstráňte všetky cudzie predmety zo zariadení.
- Pri práci so zariadeniami najprv úplne vypnite napájanie, zaistite, aby sa znova nezapli a skontrolujte, či sú bez napätia. (Uvedené sa vzťahuje na sieťové napájanie, záložný zdroj a možnú kontrolu a externé napätie.) Obvody neodpájajte pod napätím.
- Počas prepravy dávajte pozor na padajúce predmety.
- Na výmenu používajte originálne náhradné diely.

Slovenščina Pokyny týkajúce sa všeobecnej bezpečnosti

- Naprave niso ustrezne za zasebno uporabo.
- Nameštitev morajo opraviti kvalifikirani električari, pri čemer morajo upoštevati nacionalne predpisy za varnost in preprečevanje nesreč.
- Napravo lahko uporabljate samo v skladu z njeno predvideno uporabo v ustreznem in nepoškodovanem stanju.
- Pred prvo uporabo naprave morate iz nje odstraniti vse tuje predmete.
- Ko delate na napravi, najprej povsem izkličite napajanje, se prepričajte, da se je ne da več vklopiti, in preverite, če res ni več priklapljen na napetost. (Zgornje se nanaša na glavno napajanje, rezervno napajanje in tudi krmilnik ter zunanje napajanje.) Ne izklopite vezij pod napetostjo.
- Med transportom pazite na padajoče predmete.
- Pri zamenjavi uporabljajte samo originalne rezervne dele.

Suomalainen Yleiset turvallisuusohjeet

- Laitteet eivät sovellu yksityiskäyttöön.
- Asennuksen saa suorittaa vain pätevät sähköasentajat ottaen huomioon kansalliset turvallisuus- ja tapaturmantorjuntamääräykset.

- Laitteita on käytettävä niiden tarkoitettuun käyttötarkoitukseen asianmukaisessa ja vahingoittumattomassa kunnossa.
- Poista kaikki vieraat esineet laitteista ennen niiden ensimäistä käyttökertaa.
- Kun työskentelet laitteiden kanssa, sammuta sähkö ensin kokonaan ja varmista ettei niiltä voi pistää takaisin päälle. Tarkista sitten ovatko ne jännittävapaat. (Edellä mainittu koskee verkkovirtaa, varavoimaa ja mahdollisesti ohjausjännitettä ja ulkoista jännitettä.) Älä irrota kuormitettuja virtapiirejä.
- Varo putoavia osia kuljetuksen aikana.
- Käytä vaihdossa vain alkuperäisiä varaosia.

Svenska Allmänna säkerhetsföreskrifter

- Dessa enheter lämpar sig inte för privat bruk.
- Installation skall utföras av behörig elektriker med hänsyn till de nationella säkerhets- och olycksfallsföreskrifterna.
- Enheterna måste användas i enlighet med dess avsedda bruk och i ett korrekt och oskadat skick.
- Ta bort alla främmande föremål från enheterna innan de används för första gången.
- Medan du arbetar med enheterna, stäng först av strömmen helt, se till att den inte kan slås på igen och kontrollera att den inte har spänning. (Ovanstående gäller elnät, reservström och eventuellt kontroll- och extern spänning.) Koppla inte ur kretsarna under laddning.
- Var uppmärksam på fallande delar under transport.
- Använd endast originalreservdelar vid utbyte.

Türkçe Genel güvenlik talimatları

- Aygıtlar özel kullanım için uygun değildir.
- Bir kurulum ulusal güvenlik ve kaza önleme yönetmelikleri dikkate alınarak vasıflı elektrikçiler tarafından yapılmalıdır.

- Aygıtlar, uygun ve zarar görmemiş bir koşula tasarlanan kullanımı doğrultusunda kullanılmalıdır.
- İlk kullanım öncesinde aygıtların tüm yabancı maddeleri giderin.
- Aygıtlarda çalışırken, ilk olarak gücü tamamen kapatın, tekrar açılmayacağından emin olun ve üzerinde gerilim olmadığını kontrol edin. (Yukarıdaki ana güç kaynağı, yedek güç kaynağı ve muhtemelen kontrol ve harici gerilim için uygulanır.) Yük altında devrelerin bağlantısını kesmeyin.
- Taşıma esnasında düşen parçalara dikkat edin.
- Değişim için sadece orijinal yedek parçaları kullanın.

عدم استعمال في حالات عدم الضمان

الاجهزة ليست مناسبة للاستخدام
الخاص

يجب أن يقوم كهربائي مؤهل بتركيب البطاريات مع الأخذ في الاعتبار قواعد السلامة الوطنية ومنع الحوادث. يتعين استخدام الأجهزة في حالتها السليمة غير التالفة ووفقاً لأغراض الاستخدام المخصصة لها. قم بإزالة جميع القطع الغريبة من الأجهزة قبل الاستخدام الأول لها. عند التعامل مع الأجهزة، أبداً بليقاف تشغيل الكهرباء بالكامل، وتأكد من عدم إمكانية إعادة تشغيلها، ثم تحقق مما إذا كانت خالية من الجهد. (ينطبق الوارد أعلاه على التيار الكهربائي، والطاقة الاحتياطية، والجهد الخارجي والذي يمكن التحكم فيه.) يحذر فصل الدوائر عند تعرضها للحمل الكهربائي. انتبه لقطع الغيار التي تسقط أثناء النقل. لا تستخدم إلا قطع الغيار الأصلية. لغرض الاستبدال

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Notes

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