



xStorage Home User manual

For 4.2 kWh, 6 kWh and 10 kWh systems capacity

This document is intended for end users.



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1. Introduction

Thank you for purchasing the xStorage Home system

Before you start

This manual contains important instructions that must be followed during the installation, operation and maintenance of the xStorage Home system. All instructions must be read before installing and operating the equipment. This manual should be retained for future reference. Please note that the xStorage Home system must only be installed by Eaton certified personnel, i.e. an Eaton technical support representative or an Eaton certified installer. There are no user serviceable parts inside the xStorage Home system. Failure to observe the above will void the warranty provided and Eaton cannot be held legally accountable.

This product is intended for residential application only. The contents of this manual are the copyright of the publisher and may not be reproduced (even in extracts) without the prior written approval of Eaton Corporation. While every care has been taken to ensure the accuracy of the information contained in this manual, Eaton assumes no liability for any error or omission. Eaton reserves the right to modify the designs of its products. The unauthorized copying and lending of this manual is prohibited.

Technical disclaimer

In line with our goal to continuously improve the products and the customer service we provide, all specifications contained in this document are subject to change with due notice. All drawings, descriptions or illustrations contained in this document serve to provide a clear overview and/or technical explanation of the present product and its various components and accessories.

Legal entity

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2. Good to know

To download the latest technical documentation, such as, the safety documentation and other relevant updates, visit our website www.eaton.com/xstorage. Please note that in order to improve our customer experience we are constantly updating and enhancing the relevant technical and marketing materials.

2.1 System overview

The following images in Figure 1 and Figure 2 provide an external overview of the xStorage Home system.



Figure 1: xStorage Home 3D casing model

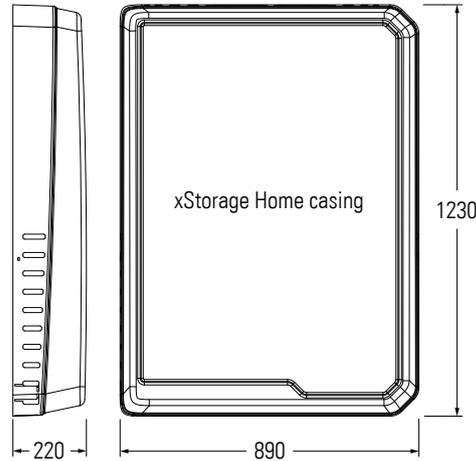


Figure 2: xStorage Home casing dimensions

2.2 System product list

This user manual applies to the listed product system, which is a single-phase system with a total of nine power-charging and energy-capacity combinations:

Table 1 xStorage Home system combinations overview

xStorage Home systems			
Charging power	Battery capacity	Product Description	Part Number
3.6 kW	4.2 kWh	XST 1Ph 3.6 kW 4.2 kWh Blue	XSTH1P0361UBUEV2
4.6 kW	4.2 kWh	XST 1Ph 4.6 kW 4.2 kWh Blue	XSTH1P0461UBUEV2
6.0 kW	4.2 kWh	XST 1Ph 6.0 kW 4.2 kWh Blue	XSTH1P0601UBUEV2
3.6 kW	6.0 kWh	XST 1Ph 3.6 kW 6 kWh Blue	XSTH1P0362NBUEV2
4.6 kW	6.0 kWh	XST 1Ph 4.6 kW 6 kWh Blue	XSTH1P0462NBUEV2
6.0 kW	6.0 kWh	XST 1Ph 6.0 kW 6 kWh Blue	XSTH1P0602NBUEV2
3.6 kW	10.08 kWh	XST 1Ph 3.6 kW 10.08 kWh Blue	XSTH1P0364NBUEV2
4.6 kW	10.08 kWh	XST 1Ph 4.6 kW 10.08 kWh Blue	XSTH1P0464NBUEV2
6.0 kW	10.08 kWh	XST 1Ph 6.0 kW 10.08 kWh Blue	XSTH1P0604NBUEV2

2.3 On line product registration

Please note that the xStorage Home guarantee is only valid for xStorage Home systems that have been registered by the Eaton certified installer online or via the Eaton certified installer portal, the date of the online product registration being the start date of the guarantee period. The user must therefore ensure that an Eaton certified installer has properly registered the product.

2.4 Before the installation

This manual must be read and understood prior to installing the xStorage Home system. Failure to do so may result in damage due to misuse or incorrect installation of the product, which would also violate the terms of guarantee. This could also lead to unnecessary hazards, potentially exposing the installer and/or residential user to electrical shocks, injuries or death.

3. Symbols and glossary overview

The following pages provide a comprehensive overview of all symbols used in this manual, on the xStorage Home system and its accessories to alert you to important information that must be understood and applied at all times when handling the xStorage Home system.

3.1 Safety related notices

DANGER	DANGER indicates a hazard with a high level of risk which, if not avoided, will result in serious injury or death.
WARNING	WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in serious injury or death, or damage to you or your equipment.
CAUTION	CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury, or damage to you or your equipment.

3.2 Hazard symbols

GENERAL WARNING SIGN	
ELECTRICAL HAZARD	
EXPLOSION AND FIRE HAZARD	
CORROSIVE HAZARD	
BATTERY HAZARD	
ELECTRICAL HAZARD ENERGY STORAGE TIMED DISCHARGE	
HOT SURFACE	

3.3 Prohibited action symbols

Prohibited action symbols are used to indicate an action that should not be taken:

GENERAL SYMBOL FOR PROHIBITED ACTION	
LIMITED OR RESTRICTED ACCESS	
NO SMOKING	

3.4 Mandatory action symbols

Mandatory action symbols are used to indicate an action that must be taken:

GENERAL SYMBOL FOR MANDATORY ACTION	
READ MANUAL	
DISCONNECT FROM POWER SOURCE	
PROTECTION ACTION	
MEDICAL ACTION	

3.5 Product labels

The following are examples of symbols used on the xStorage Home system or accessories to alert installer and end user to important information:

RISK OF ELECTRICAL SHOCK	
CAUTION - REFER TO INSTALLATION OR USER MANUAL: Refer to your manual for additional information, such as important operating and maintenance instructions.	
This symbol indicates that the battery pack of the xStorage Home system must not be discarded with domestic waste. This product involves sealed, Lithium-ion batteries which must be properly discarded. For more information, contact your local recycling or hazardous waste facility.	
This symbol indicates that waste electrical or electronic equipment (WEEE) as well as the Lithium-ion battery pack of the xStorage Home system may not be disposed of together with unseparated household waste. By separating waste electrical and electronic equipment and batteries, you will help reduce the volume of waste sent for incineration or land-fills and minimize any potential negative impact on human health and environment. For proper disposal, contact your local recycling or hazardous waste facility.	
ELECTRICAL HAZARD ENERGY STORAGE TIMED DISCHARGE	  5min
HOT SURFACE	
READ MANUAL	
CAUTION FOR LITHIUM-ION BATTERY TRANSPORTATION	 WARNING multiple supply
MULTIPLE SUPPLIERS	CAUTION!    LITHIUM ION BATTERY
Do not open the metal casings	

3.6 Conventions used in this document

This manual adopts the following type conventions and the following acronyms to refer to Eaton xStorage Home systems or its parts:

- Screen type represents information that appears on the screen or LCD display (used to indicate screen content inside the text).
- ALL CAPITALS highlights critical points that require careful attention.

All abbreviations used in this document are listed in the Table 2 Glossary.

Table 2 Glossary

AC/DC	Alternating Current/Direct Current	FW	Firmware	PV	Photovoltaic
ADSL	Asymmetric Digital Subscriber Line	IP	Internet Protocol	RCD	Residual Current Device
API	Application Program Interface	IPV4	Internet Protocol Version 4	SOC	State Of Charge
BMS	Battery Management System	LAN	Local Area Network	SSID	Service Set Identifier
C/D	Charge/Discharge	MAC	Maximize Auto-Consumption	SSL	Secure Sockets Layer
DDNS	Dynamic Domain Name System	NTP	Network Time Protocol	SW	Soft Ware
DG	Dangerous Goods	OV	Over Voltage	TB	Terminal Block
DHCP	Dynamic Host Configuration Protocol	PE	Protective Earth	UI	User Interface
DNS	Domain Name System	PS	Peak Shaving	URL	Uniform Resource Locator

4. Safety instructions

SAVE THESE INSTRUCTIONS.

These safety guidelines contain essential information that must be followed during the installation of the xStorage Home system in accordance with the procedures outlined in the installation manual provided to the Eaton certified installer. Instructions must be carefully read and understood before operating the equipment and be saved for future reference. The xStorage Home system is a product for residential application only and installation must be done in a dry, indoor environment within a temperature range of 0 °C to 30 °C that is free of conductive contaminants.

Note: THE XSTORAGE HOME SYSTEM CAN ONLY BE INSTALLED BY EATON CERTIFIED PERSONNEL I.E. AN EATON CERTIFIED INSTALLER.

4.1 Product life usage

Please note that safety instructions are organized and mapped around:

- the use phases of the xStorage Home system (see Table 3);
- the users associated with each of these use phases;
- all potential dangerous actions a user might take.

These safety instructions are supplemented by a detailed explanation of potential hazards that may arise if a dangerous action is undertaken.

Preventive measures must be taken at all times in order to avoid potential hazards and to prevent any injury and product damage.

Table 3 xStorage Home life usage

USE PHASE	USER	ACTION
LOGISTICS	Forwarder	Loading, storing, delivery
INSTALLATION	Eaton certified installer	Unpacking, mounting, installation, commissioning
OPERATING PHASE	Residential user	Nominal operation via the User Interface (UI), malfunction notification, misuse
SERVICE AND MAINTENANCE	Eaton certified service provider	Standard check-up, replacement of the battery pack, the hybrid inverter or the electrical units, software upgrade
DEINSTALLATION	Eaton certified installer	Dismantling the installed xStorage Home system
PRODUCT DISPOSAL	Eaton certified installer	Recycling the xStorage Home system

4.2 Logistics

The following safety measures must be observed during the logistics phase.

 <p style="text-align: center; font-weight: bold; margin: 0;">WARNING</p> <ul style="list-style-type: none"> Do not attempt to lift any of the packaged or unpackaged units on your own without the assistance of a second person or the use of an adequate machine lifter. Failure to do so may result in severe injury. Do not stack the product pallets on top of one another. One pallet contains three rows of products, i.e. three packages on top of each other, distributed in two columns side by side. If the total number of packages per pallet exceeds this number, the products may be damaged or fall, which may result in irreversible product damage and potentially the injury or death of the handler. When loading, lifting, storing and delivering products, uncontrolled movements should be avoided, as these could harm both the product and the handler. The battery pack and the hybrid inverter must be transported in their original packaging, in an upright position with the terminals at the top. Compliant, non-flammable material must be used to protect the battery pack from impact damage. Never lift the battery pack or the hybrid inverter by the terminals. During delivery, the products must be carefully stacked to prevent any damage during transport due to excessive vehicle movements, which should therefore be avoided wherever possible. 	 <p style="text-align: center; font-weight: bold; margin: 0;">CAUTION</p> <ul style="list-style-type: none"> The packaged units (the battery pack and the hybrid inverter) are both heavy; safety shoes shall therefore be worn and a forklift could be used for all handling operations. All handling operations such as loading, lifting, moving packed units through the warehouse, delivery and unloading will require AT LEAST two persons working together. Always store packaged units in a dry and humidity-controlled environment with a storage temperature range between -10 °C and 40 °C, and at a safe distance from any running liquids. Never let a foreign body penetrate inside the packaging, i.e. neither inside the packaging of the battery pack nor inside the packaging of the hybrid inverter. If a packaged item should be dropped, this must be reported immediately to the responsible personnel who will then carry out a product quality check to ascertain that the fall or its impact did not cause any damage to the product. Packaged products must not be stored outside, as harsh weather conditions may cause severe product damage.
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4.3 Installation

The following safety measures must be observed during the product installation phase. The installation must be performed by Eaton authorized service personnel, i.e. an Eaton certified installer. THERE ARE NO USER SERVICEABLE PARTS inside the xStorage Home System. The following section applies only to Eaton certified installers.



DANGER

- The product installation guidelines, i.e. the instructions for mounting, connecting and operating the equipment described in this manual, must be followed at all times in the given order.
- The xStorage Home system must be installed in a temperature and humidity controlled, indoor environment that is free of conductive contaminants, in accordance with the recommendations set out in this manual. The xStorage Home system must NOT be installed in an airtight room, in the presence of flammable gases, or in an environment that does not meet the outlined specifications, such as outdoors. The system is not intended for outdoor use. Excessive amounts of dust in the operating environment of the xStorage Home system may cause damage or lead to malfunction.
- The permitted ambient temperature range is [0 °C, 30 °C] and must not exceed 30 °C for 10 consecutive days. Do not install and operate the xStorage Home system where water or excessive humidity (95 % maximum) are present.
- Prior to starting any installation or service work, all AC and DC power sources must be disconnected. In addition, the system grounding/PE continuity must also be ensured.
- Do not open or mutilate the battery pack or the hybrid inverter in any way.
- If either the battery pack or the hybrid inverter should be accidentally dropped, immediately move back beyond the five metres safety perimeter and make sure to have foam fire extinguishers at hand, as the impact may cause the battery pack cells to ignite. Next, inform your Eaton technical support representative of the incident. In case of fire, immediately alert the fire brigade and maintain safe distance from the hazard area to avoid exposure to potentially toxic fumes or smoke. Instruct all people in the immediate vicinity not to enter the hazard area.
- In case of spillage incidents, i.e. battery pack leakage, move away at least five metres from the leak point and inform the fire brigade as well as your Eaton technical support representative. Keep away from the hazard area. Disposal of the battery must be handled by certified personnel.
- In the event of electrolyte contamination (i.e. exposure to uncovered battery components such as the electrolyte, powder, etc.), immediately rinse the skin and eyes with running water and remove any contaminated clothing.
- The affected individual should then seek medical assistance.



DISREGARD OF THE DANGERS OUTLINED IN THIS MANUAL MAY RESULT IN SEVERE PRODUCT DAMAGE, ELECTRICAL SHOCK AND POTENTIALLY THE DEATH OF THE INSTALLER.



WARNING

- Prior to energizing the installed xStorage Home system, determine if the hybrid inverter and/or the battery pack are inadvertently grounded. Should the system be inadvertently grounded, remove the source from the ground. Contact with any part of a grounded battery pack or hybrid inverter may result in an electrical shock. The likelihood of a shock can be reduced if all grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).
- To comply with warranty and safety requirements, a minimum clearance distance of at least 15 cm should be maintained around all sides of the xStorage Home casing.
- Prior to energizing the installed xStorage Home system make sure to connect, physically, all elements as it is instructed in the manual and to close the hybrid inverter with the xStorage Home casing in order to prevent potential contact with the operating system once it has been energized.
- If the xStorage Home system application includes a connection to a Photovoltaic (PV) solar power system and/or the grid, make sure to deenergize the PV connection, and/or the battery connection, and/or the grid terminals prior to carrying out any work. Please note that the xStorage Home system can be powered either by a PV solar system, by the electricity grid, or by its own energy sources (batteries), making it essential to deenergize each connecting terminal. Always make sure to protect the xStorage Home unit against the ingress of solid foreign objects.
- Make sure never to block the natural air flow around the system, and not to place any objects on top of or near the sides of the xStorage Home system after installation.
- Never expose the system to direct sunlight or a source of heat.
- If the xStorage Home system is to be stored prior to installation, this must be done in a dry place away from any exposure to sunlight or rain.
- When installing the hybrid inverter, please note that both AC and DC sources are terminated within this device. To prevent the risk of an electrical shock during installation, please ensure that all AC and DC terminals are disconnected from the power source.
- Make sure to secure the Ground line to the Grid's Ground, and to double check that the Line and Neutral are not confused with Ground.
- The hybrid inverter is designed to feed AC power directly into the public utility power grid only. Do not connect the AC output feed of the hybrid inverter to a private AC equipment. If the equipment is used in a manner not specified by the manufacturer, the functioning of the integrated protective features may be impaired.
- Do not attempt to alter the battery pack wiring or connectors, especially those to the hybrid inverter. Any attempt to alter the wiring may cause injury.



CAUTION

- The packed units (the battery pack and the hybrid inverter) are both heavy: wear safety shoes and preferentially use a vacuum lifter for handling operations.
- All handling operations will require at least two people (for unpacking, lifting and mounting the system on an indoor wall).
- Carefully unpack both units (the battery pack and the hybrid inverter) while paying special attention to the sharp edges on the housing and cooling fins. Excessive movements should also be avoided, as these may lead to product damage and/or severe injury.
- When unpacking, all accessories listed in the manual must be identified. Should the identification of all accessories not be possible, the installation must be aborted due to the missing components. Do not try to replace any on your own.
- Handling precautions must be taken, i.e. rubber gloves and safety boots must be worn and adequate installation tools must be used.
- Do not place tools, metal parts or any other objects on top of the unpackaged or mounted battery pack or hybrid inverter. Allocate a minimum wall surface area of 1,530 mm x 1,190 mm that is free from electrical wiring, pipework or any other obstructions, either on the wall surface or embedded within it.
- Suitable eye protection should be worn when working with or near the Lithium-ion batteries.



4.4 Operating phase

These are the safety measures that must be observed during the system use and the product's operating life cycle. These measures are intended for the residential users of the xStorage Home system. Upon installing the xStorage Home system, the installer should go through these safety measures with the end user.

THERE ARE NO USER SERVICEABLE PARTS INSIDE THE XSTORAGE HOME SYSTEM.



DANGER

- Once installed and energized, the xStorage Home system contains components that carry **HIGH HAZARDOUS CURRENTS AND VOLTAGES**. Residential users **MUST NOT REMOVE THE COVER and MUST NOT OPEN IT** at any time. All repairs and service work should be performed by **EATON AUTHORIZED SERVICE PERSONNEL ONLY**. There are **NO USER SERVICEABLE PARTS** inside the xStorage Home system.
- Do not try to remove the screws from the hybrid inverter and the battery pack at any time. Failure to comply may cause electrical hazards that may prove fatal for both the residential user and/or the system.
- Never block the natural air flow around the installed system, and do not place any objects on top of or near the sides of the system after installation. Allow for a minimum distance of 15 cm between the xStorage Home system and any surrounding objects. Otherwise, the system may overheat, which may lead to malfunctions and electrical hazards that may potentially cause fire and/or an electrolyte contamination event.
- While designed to meet the requirements of international safety standards, the hybrid inverter and the battery pack may become hot while in operating mode. Do not touch the heat sink or peripheral surfaces of the hybrid inverter during or shortly after its operation.



WARNING

- The xStorage Home system may only be operated through the system's official UI application, and in the manner instructed by the Eaton certified installer, to ensure that the system is in the nominal operation mode. Any failure to comply may lead to product misuse, damage, or malfunction and potentially to personal injury.
- Please note that a deep cycle charge and discharge may damage the battery cells inside the battery pack and can be dangerous if not performed correctly. The battery must be cycled in accordance with the manufacturer's instructions. If the battery has been over discharged it must be returned to the distributor for disposal. The battery must not be charged and discharged outside of the voltage levels detailed in this manual. If the battery pack is misused (typically over/ under charged), harmful gases may be released.
- Before charging the battery from the grid, check with your Eaton certified installer that this option is available. Otherwise, you may incur the risk of product damage, personal hazard and product misuse.

4.5 Service and maintenance

Only Eaton authorized personnel are allowed to open the xStorage Home system and to carry out replacement and maintenance work on the hybrid inverter and the battery pack. THERE ARE NO USER SERVICEABLE PARTS inside the xStorage Home system. In case of system failure always contact your Eaton technical support representative responsible for the xStorage Home system maintenance i.e. the Eaton certified installer.



- To prevent the risk of electrical shock during service and maintenance work, please ensure that all AC and DC terminals are disconnected from their power sources prior to removing the casing of the xStorage Home system. Please note that the xStorage Home system can be powered by a PV solar system, by the grid or by its own energy sources (batteries), and that both AC/DC sources are terminated within the hybrid inverter, while DC sources are terminated within the battery pack. The output terminals may therefore still be energized even after the xStorage Home system has been disconnected from an AC or a DC source. After disconnecting all sources of supply, wait for five minutes before removing the cover.
- Make sure to secure the Ground line to the ground according to local regulations.
- When replacing the battery pack be aware that HIGH VOLTAGES, CORROSIVE, TOXIC and EXPLOSIVE substances are present in it. Given the set-up of the battery string, the output terminal may carry high voltages even when the AC supply is not connected to the xStorage Home system. The battery pack terminals should therefore not be touched before it has been definitely ascertained that they are deenergized. The shutdown instructions should be carefully followed.
- When replacing the hybrid inverter, please note that both AC and DC sources are terminated within this device. To prevent the risk of electrical shock during service and maintenance, please ensure that all AC and DC terminals are disconnected from the power source and deenergized.
- When servicing/replacing any other electrical items listed in the xStorage Home accessory list, please make sure that they are also disconnected from any AC/DC source and deenergized.
- The hybrid inverter is connected to more than one source of supply, i.e. the grid and a PV solar system. Make sure to disconnect all the power sources prior to servicing and maintenance, especially the DC switch and the breaker between the hybrid inverter and the PV panel, which starts to supply high DC voltage when exposed to sunlight. Avoid touching any live parts. Prior to reconnecting the hybrid inverter to the utility, please ensure that an earthing connection is present to prevent potential high-leakage currents.

4.6 Deinstallation

Only Eaton authorized personnel are allowed to open the xStorage Home system, carry out its deinstallation and the disconnection of all power sources, remove any electric units, and demount the hybrid inverter and/or the battery pack. There are NO USER SERVICEABLE PARTS inside the xStorage Home system.



- Prior to starting the dismantling process, the battery pack must be fully discharged to prevent potential electrical shocks.
- To further prevent the risk of electrical shock during the deinstallation phase, please ensure that all AC/DC terminals are disconnected from all power sources (PV and grid) prior to removing the casing of the xStorage Home system.
- Please note that the xStorage Home system can be powered by a PV solar system, by the grid or by its own energy sources (batteries), and that both AC/DC sources are terminated within the hybrid inverter, while DC sources are terminated within the battery pack. The output terminals may therefore still be energized even after the xStorage Home system has been disconnected from an AC or a DC source. Allow five minutes to pass before moving forward with the deinstallation.
- When demounting the battery pack from the wall, please take every precaution to prevent the product from falling and to avoid any potential electrical and chemical hazard, as the battery pack may contain residual HIGH VOLTAGES as well as CORROSIVE, TOXIC or EXPLOSIVE substances.
- The battery pack terminals should not be touched before it has been definitely ascertained that they are deenergized.



- Please note that both the xStorage Home hybrid inverter and the battery pack are heavy. Safety shoes should therefore be worn and all handling operations during the deinstallation, such as the demounting, repacking or moving of units from the original installation site to the transportation vehicle, as well as the loading and unloading of units at the waste disposal facility, etc., will require AT LEAST two persons working together. While dismantling the product, special attention should be paid to the sharp edges on the housing and cooling fins.
- Suitable eye protection should be worn when working with or near Lithium-ion batteries.



4.7 Product disposal

At the end of the xStorage Home system's product life cycle, only Eaton authorized personnel are allowed to carry out a full system disposal (including the hybrid inverter, the battery pack, the casing and the supporting electrical elements), in line with the applicable local regulations for waste disposal. Contact the local recycling or hazardous waste facility for information regarding the proper disposal of the used equipment.



CAUTION

- The product is made up of recyclable materials. Dismantling and destruction must take place in compliance with all local regulations concerning waste. At the end of its service life, the product must be transported to a dedicated processing facility for electrical and electronic waste.
- The battery pack must be disposed of in accordance with local disposal requirements. Do not attempt to dispose of any elements of the xStorage Home system by burning them, as the battery pack may explode when exposed to fire.
- The product contains Lithium-ion battery cells that must be processed in accordance with applicable local regulations concerning this type of batteries. The battery pack may be removed to comply with regulations and in view of correct disposal.
- Do not attempt to open or mutilate any elements of the xStorage Home system prior to its disposal. Released electrolyte from the battery pack is harmful to the skin and eyes. It may be toxic.
- Do not discard the xStorage Home system or any of its elements in the domestic waste. This product contains sealed, Lithium-ion battery cells and must be disposed of properly. For more information, contact your local recycling/ reuse or hazardous waste facility.
- Do not discard waste electrical or electronic equipment (WEEE) in the domestic waste. For proper disposal, contact your local recycling/reuse or hazardous waste facility.

5. Wiring



WARNING!

This section is shared with you for your information in order to give you an overview of the wiring and system set-up process. Please **DO NOT TOUCH THE INVERTER, THE BATTERY PACK AND THE CABLES**. **DO NOT WIRE AND SET-UP** the system yourself. Failure to comply may cause electrical hazards, severe product damage, electrical shock and potentially death. Your Eaton certified installer is the only person authorized to do so.

Follow the illustrated step by step instructions to ensure the proper wiring of the xStorage Home system.

5.1 Hybrid inverter connections

The xStorage Home hybrid inverter has two sides that can be connected either to power, input/output loads or to communications network. These connection points are referenced and explained in Figure 3, Figure 4 and Table 4.

Figure 3: Hybrid inverter power and communication network - Available connections

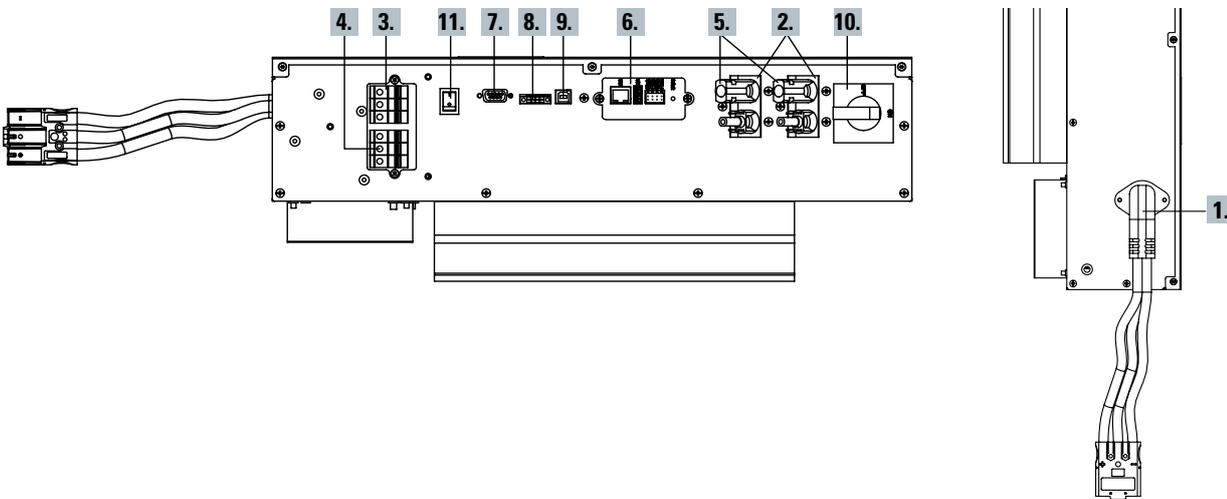


Figure 4: 3D view of hybrid inverter connection points

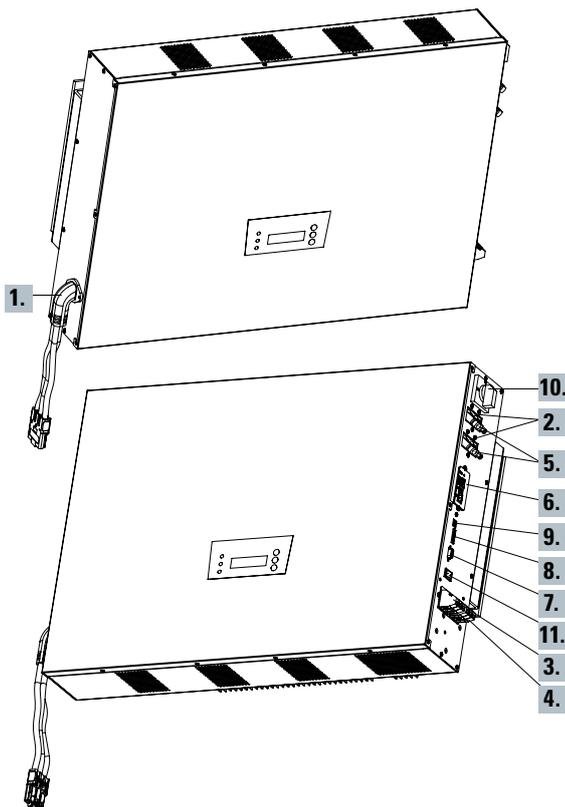


Table 4 Hybrid inverter connection points

Hybrid inverter	INVERTER POWER RANGE		
	3.6 kW	4.6 kW	6 kW
Connection reference	Description		
1	DC-input (BAT): Terminals for battery pack connection		
2	DC-input (PV): Cable cross section must be calculated according to I _{sc}		
3	AC load output: The terminal supports the AC power wires connection. L (Phase), N (Neutral), GND (PE): Ø 4/6mm ²		
4	AC grid-input: The terminal supports the AC power wires connection. L (Phase), N (Neutral), GND (PE): Ø 6/10 mm ²		
5	Ground (PE) screw: Accessory includes GND wire (Ø 10 mm ²) to connect battery pack chassis for safety purpose		
6	Communication slot: Ethernet card already assembled; LAN, USB and RS-485 port		
7	CAN-BUS BAT COMM: Accessory includes RS232 cable to communicate with BMS board		
8	Optional EPO port		
9	USB		
10	DC switch disconnector		
11	Soft start switch for the installation		

5.2 Battery pack wiring connections

The battery pack contains two main connection terminals, as referenced and explained in Figure 5, Figure 6 and Table 8.

Figure 5: Battery pack power and communication network - Available connections

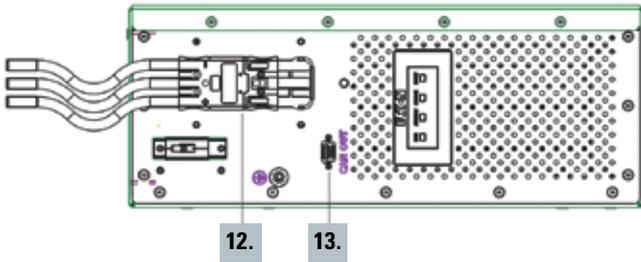


Figure 6: 3D view of battery pack connections for reference



Table 5 Battery pack connection points

Battery pack	NOMINAL CAPACITY		
	4.2 kWh	6 kWh	10.08 kWh
Connection reference	Description		
12	DC-input (BAT): Terminals for battery pack connection		
13	CAN-BUS BAT COMM: Accessory includes RS232 cable		

6. System start up



WARNING!

This section is shared with you for your information in order to give you an overview of the wiring and system set-up process. Please **DO NOT TOUCH THE INVERTER, THE BATTERY PACK AND THE CABLES**. **DO NOT WIRE AND SET-UP** the system yourself. Failure to comply may cause electrical hazards, severe product damage, electrical shock and potentially death. Your Eaton certified installer is the only person authorized to do so.

6.1 Start up sequence

To start the xStorage Home system:

1. Verify that all components have been properly connected as instructed in Section 5;
2. Verify and eventually put the soft start switch of the inverter in position "I" (figure 3 reference 11);
3. Activate the circuit breakers for AC input power and AC output power in the designated power distribution box;
4. Activate the battery pack switch (Figure 7);
5. Activate the hybrid inverter DC switch (Figure 8);
6. Configure the power meter;
7. If no fault trips, the start-up sequence has been successfully completed.
8. At this point, perform the FW upgrade if it needed.

Figure 7: 3D overview of the xStorage Home battery pack



Figure 8: 3D overview of xStorage Home hybrid inverter



6.2 Hybrid Inverter – Front control display

The front control panel of the hybrid inverter consists of an LCD display, three status indication LEDs, and three keys as depicted below in Figure 9 and Figure 10. The functional description is provided in Table 6.

Figure 9: View of the xStorage Home hybrid inverter and its display



Figure 10: Overview of the display elements of the xStorage Home hybrid inverter

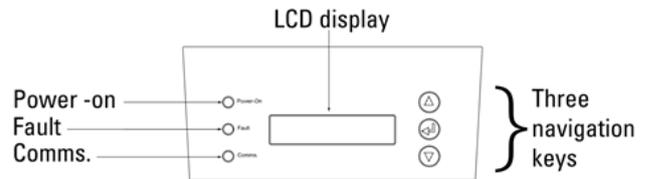


Table 6: Functional overview of the xStorage Home display elements

Hybrid inverter control panel elements		
LED	Power-on	Lights up when the inverter starts up
	Fault	Lights up if a fault is detected
	Comms	Lights up if the communications port is active and communications with the battery pack are up
Navigation keys		Scroll up the menu or move the cursor upward
		Set or confirm the setting
		Scroll down the menu or move the cursor downward
LCD display	16 characters x 2 lines; monochrome	Displays the operational status and parameter settings

The three LEDs are designed to indicate:

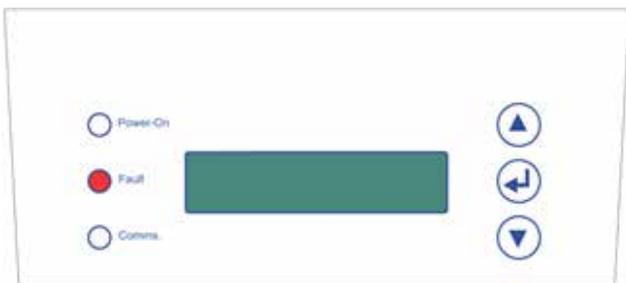
- Power-on: LED Green (Figure 11) → The hybrid inverter is connected to the grid, and it supplies or consumes power;

Figure 11: Power-on: Green on



- Fault: LED Red (Figure 12) → A fault has been detected, and the inverter has tripped and is no longer connected to the grid. Further details on possible faults and their remedial actions can be found in Section 15 “Troubleshooting”;

Figure 12: Fault: Red on



- Communications: LED Green (Figure 13) → Communications via USB port or RS-485 card are in progress.

Figure 13: Comms: Green on

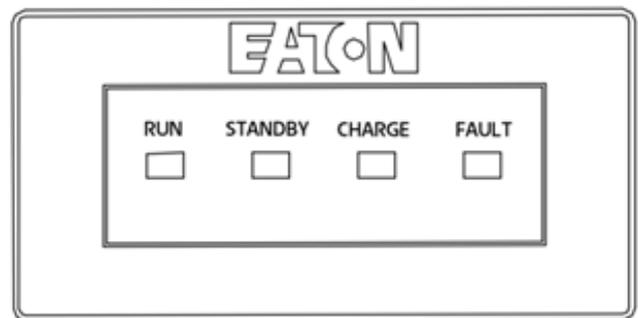


6.3 Battery pack LD indications

Battery pack has a total of four LD indication lights (Figure 14):

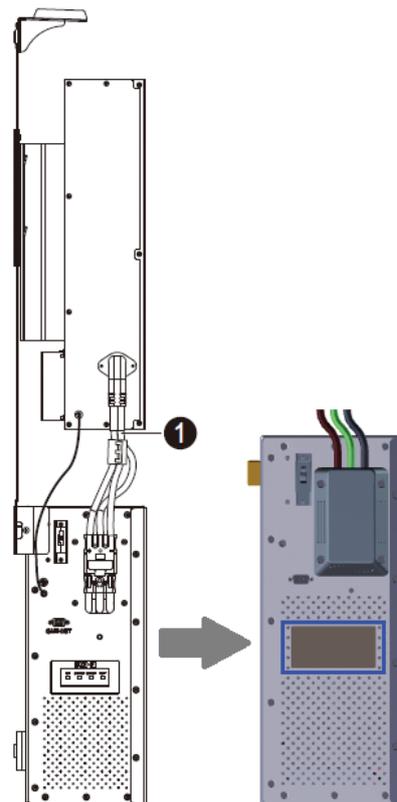
- **RUN** – Illuminated in normal battery pack operational mode;
- **STANDBY** – Illuminated when starting up the xStorage Home system for the first time or during restart;
- **CHARGE** – Illuminated during charging mode;
- **FAULT** – Illuminated to indicate system malfunction.

Figure 14: Battery pack LED indication lights



The location of the battery pack LED display is indicated here:

Figure 15: Battery pack display location



If the “FAULT” LED indication lights up together with one of the other lights, the following is the case:

- **STANDBY & FAULT** – a battery pack failure has occurred, and you should contact your Eaton technical support representative;
- **RUN & FAULT** – the battery pack is fully charged and its battery management system sends messages to the hybrid inverter to stop charging.

7. Configuring the communications interface

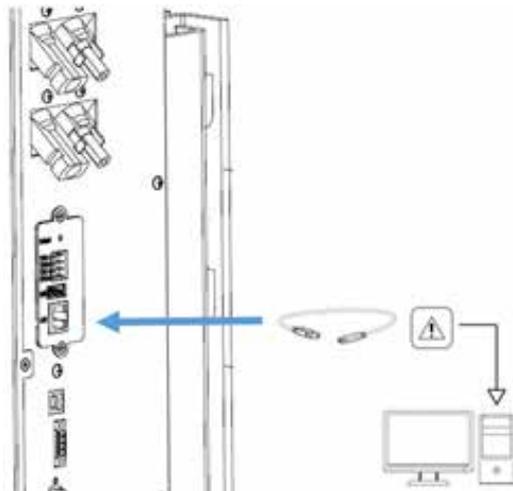


WARNING!

This section is shared with you for your information in order to give you an overview of the wiring and system set-up process. Please **DO NOT TOUCH THE INVERTER, THE BATTERY PACK AND THE CABLES. DO NOT WIRE AND SET-UP** the system yourself. Failure to comply may cause electrical hazards, severe product damage, electrical shock and potentially death. Your Eaton certified installer is the only person authorized to do so.

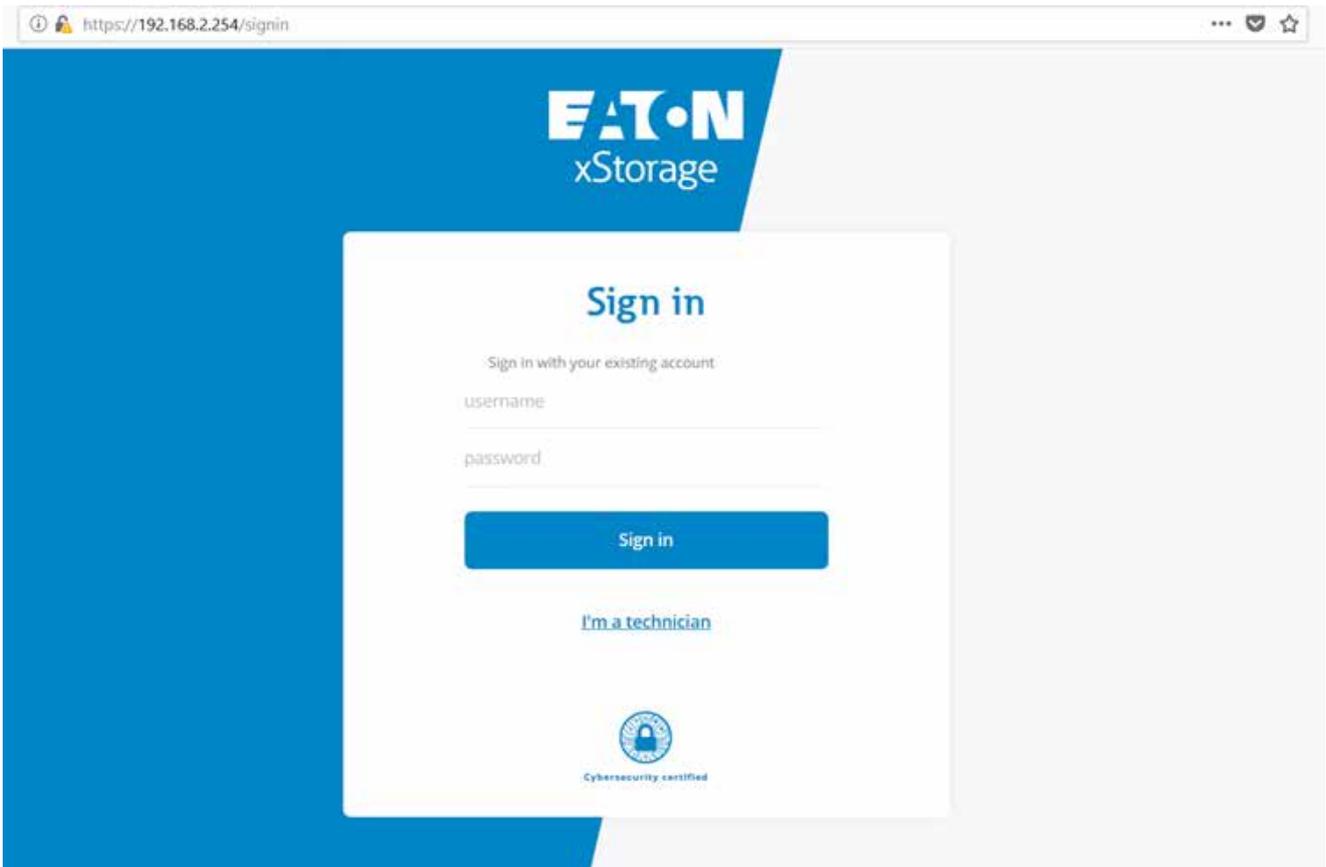
Once the Eaton certified installer has successfully carried out the xStorage Home system “system start-up” procedure, the network and functional configuration phase of the installation process can begin, using the step-by-step process illustrated below.

Setting the Ethernet card for the first time	
STEPS	Instructions
1.	Use a network cable to connect the hybrid inverter Ethernet card with your PC.



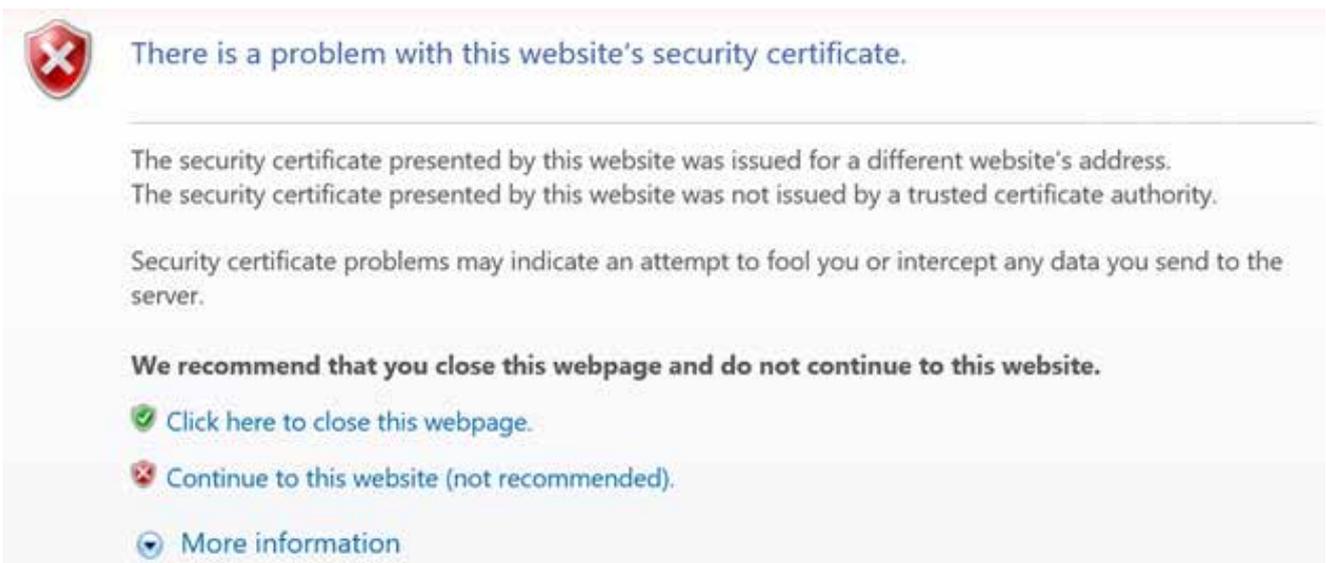
STEPS	Instructions
2.	<p>The default Ethernet card IP address of the hybrid inverter is 192.168.2.254. Set the PC's IP address to be in the same domain as the hybrid inverter's Ethernet card, by assigning it the following information in the TCP/IP setting:</p> <ul style="list-style-type: none"> • IP Address: 192.168.2.X (X=any number between 2-253) • Subnet mask: 255.255.255.0 • Default gateway: 192.168.2.1
3.	To enter the settings page for the hybrid inverter's Ethernet card, open the web browser on the PC and enter the default IP address of the Ethernet card as follows: https://192.168.2.254 .
4.	Enter the following login information (See Figure 16): Username: user Password: user

Figure 16: Login page of the local user interface



Note: After the detailed network configuration, a browser message may be displayed indicating that the connection being established might not be private, and that there might be an issue with the security certificate of the UI website that is being accessed (see Figure 17). This message can be disregarded, as the connection will not cause any technical harm to the PC.

Figure 17: Possible browser message when trying to establish a connection with the xStorage Home UI



Please refer to the xStorage Home user interface manual and cybersecurity recommendations document for further details. The document is available for download on www.eaton.com/xstorage.

8. Maintenance

For the best preventive maintenance, keep the area around the installed xStorage Home system, notably the protective cover of the casing, clean and dust free. This will allow for natural air flow, which will ensure that the system is properly cooled. Please note that ANY TYPE of maintenance may only be performed by an Eaton certified installer. The end user should only access the xStorage Home system via the UI. There are no user serviceable parts inside the xStorage Home system. For any type of preventive maintenance, an Eaton certified installer should be contacted. This may include periodical torque and temperature control checks.

8.1 Charge and Discharge recommendations

To ensure optimal product lifespan, the xStorage Home system should only be used as advised in the warranty conditions.

8.2 Battery pack replacement and upgrading

As per the xStorage Home product guarantee, the battery replacement is free of charge during the guarantee period, provided that the battery failure occurs suddenly and is not the result of equipment misuse.

Once the guarantee has expired, the battery should continue to function properly, but in the case of failure it will have to be replaced at the end user's expense. Any battery replacement needs to be carried out by an Eaton certified installer.

8.3 xStorage Home casing – Cleaning recommendations

The casing doesn't require a specific cleaning process. Gently wipe it with a soft dry cloth.

8.4 xStorage Home – Switch off process

For safety reasons the end users should be aware of the way to switch off the xStorage Home system. The end users must not TOUCH THE INVERTER AND THE BATTERY PACK CABLES. Follow the steps below to switch off the xStorage Home system:

- Switch off the xStorage Home system from the UI.
- Remove the cover.
- Disconnect the PV using the DC switch and/or the breaker.
- Disconnect the battery from the inverter using the breaker or the contactor.
- Disconnect the external AC circuit breaker.

9. Product disposal

When the xStorage Home system reaches the end of its service life, please contact an Eaton certified installer for disposal instructions.



This symbol indicates that waste electrical or electronic equipment (WEEE) as well as the Lithium-ion battery pack of the xStorage Home system may not be disposed of together with unseparated household waste. By separating waste electrical and electronic equipment and batteries, you will help reduce the volume of waste sent for incineration or land-fills and minimize any potential negative impact on human health and environment. For proper disposal, contact your local recycling or hazardous waste facility.



Li-ion

Please note that Lithium-ion batteries must be disposed of in an environmentally responsible manner and in accordance with local regulations. These batteries contain toxic chemical elements and pose a danger to the environment, as they may cause heavy contamination and water pollution if discarded in an irresponsible manner.

10. Contact support information

Should any technical problems arise during the operation of the xStorage Home system, contact your Eaton certified installer for technical support and assistance. The following information should be provided when contacting the Eaton technical support representative:

- Product Model;
- Fault messages displayed on the UI notification panel.

1.1. Troubleshooting



WARNING!

This section is shared with you for your information in order to give you an overview of the wiring and system set-up process. Please **DO NOT TOUCH THE INVERTER, THE BATTERY PACK AND THE CABLES. DO NOT WIRE AND SET-UP** the system yourself. Failure to comply may cause electrical hazards, severe product damage, electrical shock and potentially death. Your Eaton certified installer is the only person authorized to do so. Please **DO NOT CLOSE THE BREAKER ON THE BATTERY PACK IF IT IS OPEN**. Contact your Eaton technical support representative for assistance.

The following tables set out the preliminary guidelines for troubleshooting of the xStorage Home system and provides an overview of the fault messages that may appear on the hybrid inverter LCD display or the UI interface (i.e., the panel notifications). Two levels of failure can be identified:

- System failure (Table 7);
- Hybrid Inverter failure (Table 8).

In the event of **System failure**, the end user should refer to the troubleshooting guide in order to ascertain the type of failure and to determine whether the PV or the grid connection is offline.

In the event of **Hybrid Inverter failure**, the end user should immediately notify an Eaton certified installer, wait for his/her arrival and leave any debugging procedure to him/her. Bit codes are listed for the purpose of failure identification only.

Table 7: System troubleshooting

LEVEL OF FAILURE	BIT CODE	ERROR MESSAGE	DESCRIPTION & DIAGNOSIS	ACTION
SYSTEM FAILURE	Bit 29	Grid Fac Fail	Grid frequency is out of grid code range.	The AC grid is affected by one of the following conditions: over or under frequency. In this case, please contact an Eaton certified installer and make sure the AC grid is operating normally.
	Bit 18	Zpv PE Fail	The isolation resistance of the PV panel is out of tolerable range before connecting to the grid.	The insulation to Ground for the PV DC input is poor and may result in a leakage current. Please contact an Eaton certified installer. If not, the system installation should be improved.
	Bit 26	Over Load	The critical load level is exceeded.	The number of connected critical loads should be decreased. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 17	Grid Vac Fail	Grid voltage is out of grid code range.	The AC grid is affected by one of the following conditions: over or under voltage. In this case, please contact an Eaton certified installer and make sure the AC grid is operating normally.
	Bit 15	Vpv Max Fail	The PV input voltage exceeds the maximum tolerable value.	The DC voltage fed from PV arrays is too high. Please make sure the PV arrays used meet the specification. If the problem persists please contact the Eaton technical support representative.
	Bit 10	RCMU Curr Fail	Residual current is too high.	The leakage current at the AC output is too high. Please make sure that the AC cables are properly connected to the terminals and that there is no other connection between the cables and ground. If the fault cannot be remedied by re-connecting the AC cables, please contact the Eaton technical support representative.
	Bit 9	No Utility	Grid voltage is lost.	The AC grid is not available. Please check that the AC cables are properly connected to the terminals. If an AC grid is present and the fault persists, please contact the Eaton technical support representative.
	Bit 8	No Battery	Battery communication or connection is lost.	Please check the battery communication or connection. If the battery communication or connection issue persists, please contact the Eaton technical support representative. Do not close the breaker on the battery if it is open.
	Bit 4	PV Over Power	PV DC power exceeds the maximum limit.	The DC Power fed from PV arrays is too high. Please make sure the PV arrays used meet the specification. If the problem persists please contact the Eaton technical support representative.

Table 8: Hybrid inverter troubleshooting

LEVEL OF FAILURE	BIT CODE	ERROR MESSAGE	DESCRIPTION & DIAGNOSIS	ACTION
	Bit 31	Master-Slave Fail	Communication between microcontrollers is failed.	Communication problem is detected within the Inverter. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 30	EEPROM Fail	EEPROM cannot be read or written.	Memory error is detected. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 28	Battery High Fail	Battery voltage is too high.	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 27	Battery Low Fail	Battery voltage is too low.	The internal bus voltage is abnormal. If the fault persists after restarting the Inverter, please contact Eaton technical support representative.
	Bit 25	Relay Fail	Relay is Fail.	The relay inside the inverter is malfunctioned. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 24	Over Power	The power on grid terminal is exceeded.	If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 23	ENS Vac Fail	Different value between Master and Slave for grid voltage	Communication problem is detected within the inverter. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 22	ENS Fac Fail	Different value between Master and Slave for grid frequency	Communication problem is detected within the Inverter. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 21	ENS Iac Fail	Different value between Master and Slave for grid current	Communication problem is detected within the Inverter. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 20	ENS GFCI Fail	Different value between Master and Slave for GFCI current	Communication problem is detected within the Inverter. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 19	Offset Iac Fail	The DC injection check for grid Current is fail.	The Inverter detects high DC component in the AC output current. Disconnect the AC grid and wait for one minute. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 14	Test Fail	Auto Test failed.	Only for Italy grid code requirement. If the fault cannot be cleared after restarting the Inverter, please contact the Eaton technical support representative.
	Bit 13	Temperature Fail	The temperature is over the maximum tolerable value.	The ambient temperature of the inverter is too high. If necessary improve the ventilation of the inverter. If the error messages shows when the ambient temperature is below 40°C, please contact the Eaton technical support representative.
	Bit 12	M-S Version Fail	Master and Slave firmware version is mismatch.	If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 11	Bus Fail	DC bus fault	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.

Table 8: Hybrid inverter troubleshooting (Continued)

LEVEL OF FAILURE	BIT CODE	ERROR MESSAGE	DESCRIPTION & DIAGNOSIS	ACTION
	Bit 7	Device Fault	Inverter device abnormal or output short circuit	If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 6	Bus High Fail	DC Bus voltage is too high.	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 5	Bus Low Fail	DC Bus voltage is too low.	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 2	Ref 2.5V Fault	The 2.5 V reference inside are abnormal.	The reference voltage of microprocessor is found abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 1	DC Sensor Fault	The DC output sensor is abnormal.	If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 0	RCMU Device Fail	The RCMU detection circuit is abnormal.	Internal module is found abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 8	BMS Fault	General BMS fault detected	If the fault persists after restarting the Inverter, please contact the Eaton technical support representative.
	Bit 2	Inverter Curr Fail	Inverter current is over the tolerable value.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.

Should the entire system need to be turned off for troubleshooting or maintenance:

- Please make sure to turn off the circuit breaker of the AC grid input power in the designated power distribution box.
- Please note that after this step, the system will still be powered up if the “battery on” mode is active.
- The casing should therefore be removed and the battery pack should be deactivated by turning off its power switch. This will turn off the system completely.

12. Guarantee

Download the current guarantee conditions from the webpage www.eaton.com/xstorage.

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