

Conext™ Core XC-NA Series Grid Tie Photovoltaic Inverter

Operation Manual

990-5145B

August 2016



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Information About Your System

As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number _____

Product Number _____

Purchased From _____

Purchase Date _____

Important Safety Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

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

WARNING

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

CAUTION

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

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Audience

This manual is intended for anyone who will operate the Conext Core XC-NA Series Inverter. Operators must be familiar with all the safety regulations pertaining to operating high-voltage equipment as dictated by local code. Operators must also have a complete understanding of this equipment's features and functions.

Installation must be performed by **qualified personnel**. Qualified personnel have training, knowledge, and experience in:

- Installing electrical equipment and PV input systems (up to 1000 V).
- Applying all applicable installation codes.
- Analyzing and reducing the hazards involved in performing electrical work.
- Selecting and using Personal Protective Equipment (PPE).

Configuration, servicing, and maintenance must be performed by **authorized service personnel** only. Authorized service personnel meet the requirements for a qualified installer, plus they have received specific training from the manufacturer on servicing the Conext Core XC-NA Series Inverter. Do not open doors or covers or attempt any servicing, maintenance, or other corrective actions unless you meet the requirements for authorized service personnel.

This manual does not contain information regarding servicing or de-energization for servicing. Authorized service personnel should refer to the Conext Core XC-NA Series *Service Bulletin for Lock-Out and Tag-Out Procedures* (document number 993-0479) and the Conext Core XC-NA Series *Commissioning and Configuration Manual* (document number CM-XC-012).

About

Scope

This manual provides safety guidelines and information about operating, troubleshooting, and maintaining the Conext Core XC-NA Series Inverter . Installation instructions are available in the *Conext Core XC-NA Series Grid Tie Photovoltaic Inverter Planning and Installation Manual (document number 990-5144)* and the *Conext Core XC-NA DC Fuse Recombiner and Conext Core XC-NA DC Fused Disconnect Recombiner Installation Instructions (document number 990-9793)*. Commissioning and Configuration instructions are available to authorized service personnel in the *Commissioning and Configuration Manual (document number CM-XC-012)*.

Abbreviations and Acronyms

AIC	Active In-feed Converter
ASIC	Application specific integrated circuit
CP	Constant power
EEPROM	Electrically erasable programmable read only memory
GFD	Ground Fault Detection
IGBT	Insulated gate bipolar transistor
LC	Line control
MTHA	ASIC time counter circuit within APP processor
OC	Overcurrent
OCP	Overcurrent protection
OTP	Over-temperature protection
PE	Protective earth (ground)
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
PV	Photovoltaic
PVO	Photovoltaic option
RISO	Resistance ISolation measurement
RTC	Real time clock
VAC	Volts (alternating current)
VDC	Volts (direct current)

Related Documents

You will need to have access to the following related documents:

- *Service Bulletin for Lock-Out and Tag-Out Procedures (document number 993-0479)*
- *Conext Core XC-NA Series Grid Tie Photovoltaic Inverter Planning and Installation Manual (document number 990-5144)*
- *Conext Core XC-NA Series Grid Tie Photovoltaic Inverter Commissioning and Configuration Procedure and Checklist (document number CM-XC-012)*
- *Related Products 7*

Related Information

You can find more information about Schneider Electric as well as its products and services at: www.schneider-electric.com

For specific information on Solar, visit the Schneider Electric Solar Business website at: <http://solar.schneider-electric.com/>

Product Safety Information

This manual contains important safety instructions for the Conext Core XC-NA Series Inverter that must be followed during installation procedures.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

Do not open any cabinet doors or covers unless you are either **qualified personnel** or **authorized service personnel** as defined in "Audience" on page 4.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- Read all instructions, cautionary markings, and all other appropriate sections of this manual before operating or troubleshooting the Conext Core XC-NA Series Inverter.
- To be installed only by qualified personnel and serviced only by authorized personnel equipped with appropriate personal protective equipment, and following safe electrical work practices.
- This inverter is energized from multiple sources: the PV array, the AC grid, and the external auxiliary AC source (if used¹). Before opening doors on the AC cabinet, power stage cabinet, or DC cabinet you must perform the following steps:
 - Consult the system diagram to identify all power sources.
 - De-energize, lock out, and tag out all power sources following the "*Installation Lock-out and Tag-out Procedure*" on page 1.
 - Wait at least five minutes for internal capacitors to discharge to safe voltages.
- Operation of the switches in or on the inverter does not remove all power from this inverter. Switch terminals remain live unless the PV, AC, and external auxiliary AC sources have been disconnected externally.
- Before servicing, test using a meter rated at least 600 VAC/CAT IV and 1000 VDC/CAT III, to ensure all circuits are de-energized.

Failure to follow these instructions will result in death or serious injury.

¹ The XC733-NA will always be configured to use an external auxiliary AC source.

 **WARNING**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE HAZARD OF EQUIPMENT DAMAGE

Obey the manual's instructions, as well as all physical, electrical, and environmental specifications shipped with the Conext Core XC-NA Series Inverter.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

 **WARNING**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- In all installations, the installer must provide external disconnecting means for the PV input, AC output, and external auxiliary AC source input wiring.
- The overcurrent protection devices within the Conext Core XC-NA Series Inverter are intended to provide adequate protection for Conext Core XC-NA Series Inverter circuitry only.
- The installer is responsible for determining whether additional external overcurrent protection is required for the AC output and external auxiliary AC source wiring, in accordance with the applicable installation codes.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

 **WARNING**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

Do not install or attempt to operate the Conext Core XC-NA Series Inverter if it has been dropped or has received more than cosmetic damage during transport or shipping. If the Conext Core XC-NA Series Inverter is damaged, or suspected to be damaged, contact customer service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED USE

The Conext Core XC-NA Series Inverter is not intended for use in connection with life support systems or other medical equipment or devices. The Conext Core XC-NA Series Inverter can only be used in grid-interconnected PV systems with PV modules. It is not suitable for any other application areas.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

HAZARD OF CRUSH INJURY AND EQUIPMENT

- Use caution and follow the instructions in this manual for correct lifting, moving, and mounting of the Conext Core XC-NA Series Inverter.
- The Conext Core XC-NA Series Inverter can topple over if tipped. You must securely attach the Conext Core XC-NA Series Inverter to the mounting surface after positioning.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚡ ⚠ WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- Do not defeat or change the settings of the heater thermostat and dew point controller located inside the Conext Core XC-NA Series Inverter as these heaters are installed to help prevent condensation inside the Conext Core XC-NA Series Inverter.
- Do not change the settings on the AC circuit breaker.
- Do not defeat any of the door interlocks. They are an integral part of the Conext Core XC-NA Series Inverter protection system.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

HAZARD OF BURNS AND EQUIPMENT DAMAGE

Components become hot during normal operation. Surfaces inside of the Conext Core XC-NA Series Inverter may continue to be hot after the five minute duration required to discharge the internal capacitors. After opening the cabinet doors, follow all posted warnings and use caution before touching conductive surfaces.

Failure to follow these instructions can result in injury or equipment damage.

⚠ CAUTION

HAZARD OF OVERHEATING AND EQUIPMENT DAMAGE

- Keep the supply air and exhaust air areas unobstructed.
- Follow the installation, ventilation, and clearance instructions.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Conext Core XC-NA Series Inverter electronics can be destroyed by electrostatic charge. Wear electrostatic protection gear, and use anti-static tools and procedures when installing the Conext Core XC-NA Series Inverter.

Failure to follow these instructions can result in equipment damage.

NOTICE

DUST OR MOISTURE INGRESS

- The service area around the Conext Core XC-NA Series Inverter must be dry and free of debris during installation, commissioning, servicing or preventive maintenance.
- If the service area is not dry and free of debris, the installation, commissioning, servicing or preventive maintenance must be postponed until the environmental conditions have cleared.
- Do not open cabinet doors and covers or remove screens and filters when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinets.
- Close the doors when you are not working in the cabinets.

Failure to follow these instructions can result in equipment damage and can compromise the environmental protection of the Conext Core XC-NA Series.

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1 Introduction

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Operator Interface Controls

Figure 1 Conext Core XC-NA Series main external components



1	Exhausts
2	Front panel user interface behind cover
3	ENABLE STATE/DISABLE STATE switch behind cover
4	Inverter ON/OFF switch
5	AC circuit breaker behind cover
6	AC cabinet
7	Power stage cabinet
8	DC cabinet
9	PV Disconnect Switch behind cover
10	Ground fault status indicator

*Air intakes at the rear of the Conext Core XC-NA Series.

** Conext Core XC-NA Series Inverter shown with covers open; covers are closed during normal operation.

All Conext Core XC-NA Series Inverters' covers must be closed and cabinet doors must be closed and locked during normal operation. For specific maintenance operations, Conext Core XC-NA Series Inverters have a feature that will allow the DC cabinet door to be opened without interrupting the Conext Core XC-NA Series Inverter's operation (opening any other doors will interrupt Conext Core XC-NA Series Inverter's operation). This feature is only intended to allow visual inspection of components or monitoring devices located inside the DC compartment while the inverter is running. The door must be closed again immediately after inspection.

NOTICE

DUST OR MOISTURE INGRESS

- Do not open cabinet doors and covers or remove screens and filters when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinets.
- Close the doors when you are not working in the cabinets.

Failure to follow these instructions can result in equipment damage and can compromise the environmental protection of the Conext Core XC-NA Series.

ENABLE STATE/DISABLE STATE Switch

The Conext Core XC-NA Series Inverter has an ENABLE STATE/DISABLE STATE switch behind a cover located on the door of the AC cabinet, see *Figure 2 on page 19*. The cover has provisions for a lock to prevent unauthorized access, although this is not a lock-out and tag-out location. Use a 4 mm hex key to unlock the latch and open the cover in order to access the ENABLE STATE/DISABLE STATE switch.

Under normal conditions, the ENABLE STATE/DISABLE STATE switch is in the ENABLE STATE position. The main AC circuit breaker and PV disconnect switch will not close unless the switch is in the ENABLE STATE position. The Conext Core XC-NA Series will not operate unless the switch is in the ENABLE STATE position.

To change any grid parameter, the switch must be turned to the DISABLE STATE position. Turning the switch to the DISABLE STATE position initiates an immediate controlled shutdown of the Conext Core XC-NA Series and opens both the main AC circuit breaker and PV disconnect switch within the inverter.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

Turning the switch to the DISABLE STATE position does not de-energize the Conext Core XC-NA Series; it only stops power production. Externally disconnect the PV, AC, and external auxiliary AC sources to de-energize the Conext Core XC-NA Series.

Failure to follow these instructions will result in death or serious injury.

 DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE**

- Turning the inverter ON/OFF switch to the ON position energizes auxiliary and control circuits.
- The upper section of the AC cabinet must be accessed only if wearing PPE appropriate for the hazards presented by the AC auxiliary circuit.
- The DC cabinet must be accessed only if wearing PPE appropriate for the hazards presented by both the DC input circuit and AC auxiliary circuit.

Failure to follow these instructions will result in death or serious injury.

Inverter ON/OFF Switch

The Conext Core XC-NA Series has an inverter ON/OFF switch located on the AC cabinet door, see *Figure 2*.

The inverter ON/OFF switch is also the auxiliary power switch. Under normal conditions, the inverter ON/OFF switch is in the ON position, providing the auxiliary power necessary for power production and for maintenance functions such as viewing and extracting data from the front panel user interface or performing software updates. The main AC circuit breaker and PV disconnect switch cannot be closed unless the switch is in the ON position. The Conext Core XC-NA Series will not restart unless the switch is in the ON position.

To initiate a power cycle, the switch must be turned to the OFF position and then back to the ON position. Turning the switch to the OFF position initiates an immediate controlled shutdown of the Conext Core XC-NA Series and opens both the main AC circuit breaker and PV disconnect switch within the Conext Core XC-NA Series.

 DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE**

Turning the switch to the OFF position does not de-energize the Conext Core XC-NA Series; it only stops power production. Externally disconnect the PV, AC, and external auxiliary AC sources to de-energize the Conext Core XC-NA Series.

Failure to follow these instructions will result in death or serious injury.

Figure 2 ENABLE STATE/DISABLE state switch and inverter ON/OFF switch



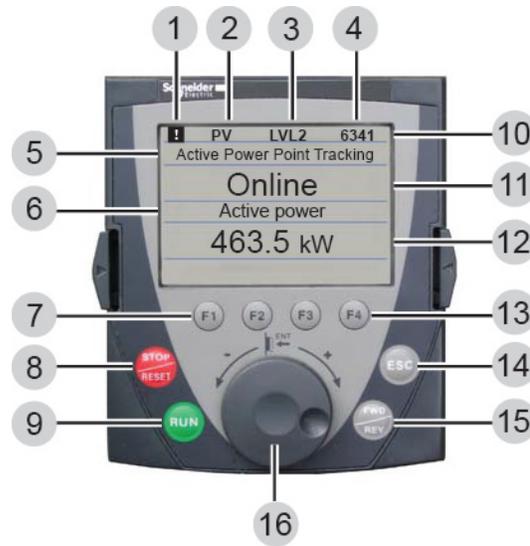
Front Panel User Interface

The front panel user interface on the Conext Core XC-NA Series has a display and keypad with scroll wheel for local monitoring and configuration (see *Figure 3 on page 20*). The front panel user interface is behind a cover located on the door of the AC cabinet. The cover has a window to allow you to easily see the display and read status information.

In order for the front panel user interface to function correctly, and to help protect the Conext Core XC-NA Series from the external environment, the cover must remain closed during normal operation.

Extensive status information and Offline state or Service state events are reported to the front panel user interface. Use a 4 mm hex key to unlock the latch and open the cover in order to make changes via the front panel user interface. The cover has provisions for a lock to prevent unauthorized access. Use the scroll wheel to navigate through menu or value options, and press the center of the scroll wheel to select the menu or value. The keypad has four “F” function keys, RUN (remote enable) and STOP/RESET (remote disable) keys, and an ESC escape key.

Figure 3 Front panel user interface



1	Periodic servicing reminder
2	Inverter operating mode
3	Access level
4	Event ID
5	Inverter activity or state description
6	Display parameter—use scroll wheel to change
7	F1 return to default parameter display
8	Disable via software command
9	Enable via software command
10	Inverter status line
11	Inverter state
12	Parameter value
13	F2, F3, and F4 function keys (context-specific)
14	Exit current menu
15	Unused
16	Scroll wheel

Local Ground Fault Status Indicator

The ground fault status indicator light will only be functional if the optional insulation monitoring device is installed in the inverter. The indicator light, located in the middle of the DC cabinet door, illuminates red if the insulation monitoring device detects a ground fault. The indicator light may also illuminate in the event of a loss of power in the insulation monitoring device.

 **DANGER****HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE**

- Measure voltage before proceeding. In the case of a ground fault, normally grounded conductors may be ungrounded and energized, or normally ungrounded conductors may be grounded. Normally grounded DC conductors will become intermittently ungrounded with indication by the ground fault status indicator when the Conext Core XC-NA Series measures the PV isolation.
- Do not defeat or modify the GFDI circuit in any way.
- Do not operate the Conext Core XC-NA Series without a functioning GFDI circuit.

Failure to follow these instructions will result in death or serious injury.

Available Options

When an option is ordered, it will be factory-installed before shipping.

Power level: 540 kVA, 630 kVA, 680 kVA, or 733 kVA

Language: English, French, or Spanish

Cold temperature operation: Operation to -35°C (-31°F) with cold weather option (the standard Conext Core XC-NA Series Inverter operates to -20°C (-4°F))

Communication: Gateway Modbus to TCP/IP

Array grounding: Positive, negative, or ungrounded (floating)

Local vs. Remote Monitoring

The Conext Core XC-NA Series provides information to users about the system's current state and recent events, as described in *Table 1*.

Table 1 Communication features

Information Type	Description	Communication Method
System status	The system states are: <ul style="list-style-type: none"> ■ Disable ■ Online ■ Offline ■ Service 	<ul style="list-style-type: none"> ■ Front panel user interface ■ Optional remote monitoring system
Offline state event	The time and details are stored in non-volatile memory.	<ul style="list-style-type: none"> ■ Front panel user interface: event ID and a brief text description ■ Optional remote monitoring system: event ID and an extensive text description
Service state event	The time and details are stored in non-volatile memory.	<ul style="list-style-type: none"> ■ Front panel user interface: event ID and a brief text description ■ Optional remote monitoring system: event ID and an extensive text description
Data logging		<ul style="list-style-type: none"> ■ Optional remote monitoring system

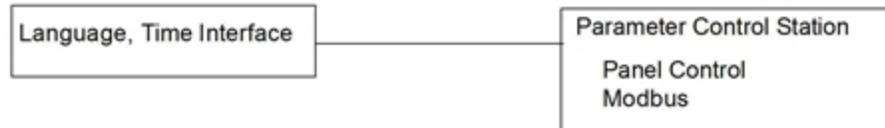
Setting the Communication Method

The Parameter Control menu on the front panel user interface sets whether the Conext Core XC-NA Series is controlled locally on the front panel user interface or remotely.

To change the communication method:

1. Check that you are at the home screen. If not, press Esc multiple times or F4 to return to the home screen.
2. Press the center of the scroll wheel.
3. Scroll to Language, Time, Interface, and then press the center of the scroll wheel.
4. Scroll to Parameter Control Station, and then press the center of the scroll wheel.
5. Scroll to highlight either Panel Control or Modbus, and then press the center of the scroll wheel to apply the change.
 - a. Select Panel Control to use the front panel user interface for communication.
 - b. Select Modbus to communicate through an optional remote monitoring interface.

Figure 4 Setting parameter control



6. Press F4 to return to the home screen.

When the parameter control is set to Modbus, you can still access the Parameter Control Station menu on the front panel interface to change back to panel control.

AC Circuit Breaker and PV Disconnect Switch

 **DANGER**

MULTIPLE SOURCES WITH HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- Operation of the switches in or on the Conext Core XC-NA Series does not remove all power from the Conext Core XC-NA Series. Switch terminals remain live unless the PV, AC, and external auxiliary AC source have been disconnected externally.
- All service and maintenance must be performed by authorized service personnel only by following the instructions in *Service Bulletin for Lock-Out and Tag-Out Procedures* (document number 993-0479).

Failure to follow these instructions will result in death or serious injury.

The main AC circuit breaker is located behind a cover on the AC cabinet door and the PV disconnect switch is located behind a cover on the DC cabinet door as shown in *Figure 5 on page 24*. These covers help to protect the circuit breaker and PV disconnect from the external environment. Twist the knob to open the covers.

 **WARNING**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- Do not change the settings on the AC breaker.
- Although the covers are hinged at the top and they fall closed, you must manually twist the knob to latch the covers closed after use.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Additional external AC and PV disconnecting means, capable of being locked out and tagged out, must be provided as part of the installation to help facilitate safe installation of the Conext Core XC-NA Series and for certain service operations.

The main AC circuit breaker and PV disconnect switch are each load-break rated disconnects. During an Offline state or Service state event—or if the Conext Core

XC-NA Series is shut off for any reason—the AC circuit breaker and PV disconnect switch automatically open. Each is capable of breaking its full load current.

Figure 5 AC circuit breaker and PV disconnect switch



1	AC cabinet
2	DC cabinet
3	AC circuit breaker
4	PV disconnect switch

2 Operation

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Description of System Operation

The Conext Core XC-NA Series is a fully automated grid-interactive photovoltaic inverter. The control unit within the inverter governs and monitors system startup and shutdown, power conditioning and flow, and system events. Manual intervention is necessary only when a Service state event occurs (see *Service State*).

Operating Modes

The Conext Core XC-NA Series has the following operating modes:

- PV mode: Standard operating mode
- PVCQ mode: Constant reactive power mode, used when 24-hour reactive power compensation is required
- CP mode: Constant power mode, used only for testing

Operating States

The Conext Core XC-NA Series has the following main operating states:

- *Initialization (transitional state at power-up)*
- Disable
- Enable
 - Offline
 - *Reconnecting (transitional state during offline to online transition)*
 - Online
 - Grid Online (This state only occurs when the Conext Core XC-NA Series is running in PVCQ mode)
- Service

The operating states for a Conext Core XC-NA Series in PV mode are illustrated in *Figure 6 on page 27*. The operating states for a Conext Core XC-NA Series in PVCQ mode are illustrated in *Figure 7 on page 28*. A state machine within the control unit software governs the transitions between operating states.

Initialization

When the inverter is turned on (powered up), it will perform a self diagnostic test (initialization). Once initialization is complete, the inverter will be fully operational and will be in the Disabled state. Transitions between the Disable state and the Enable state is described later in this manual.

Figure 6 Conext Core XC-NA Series operational states in PV mode

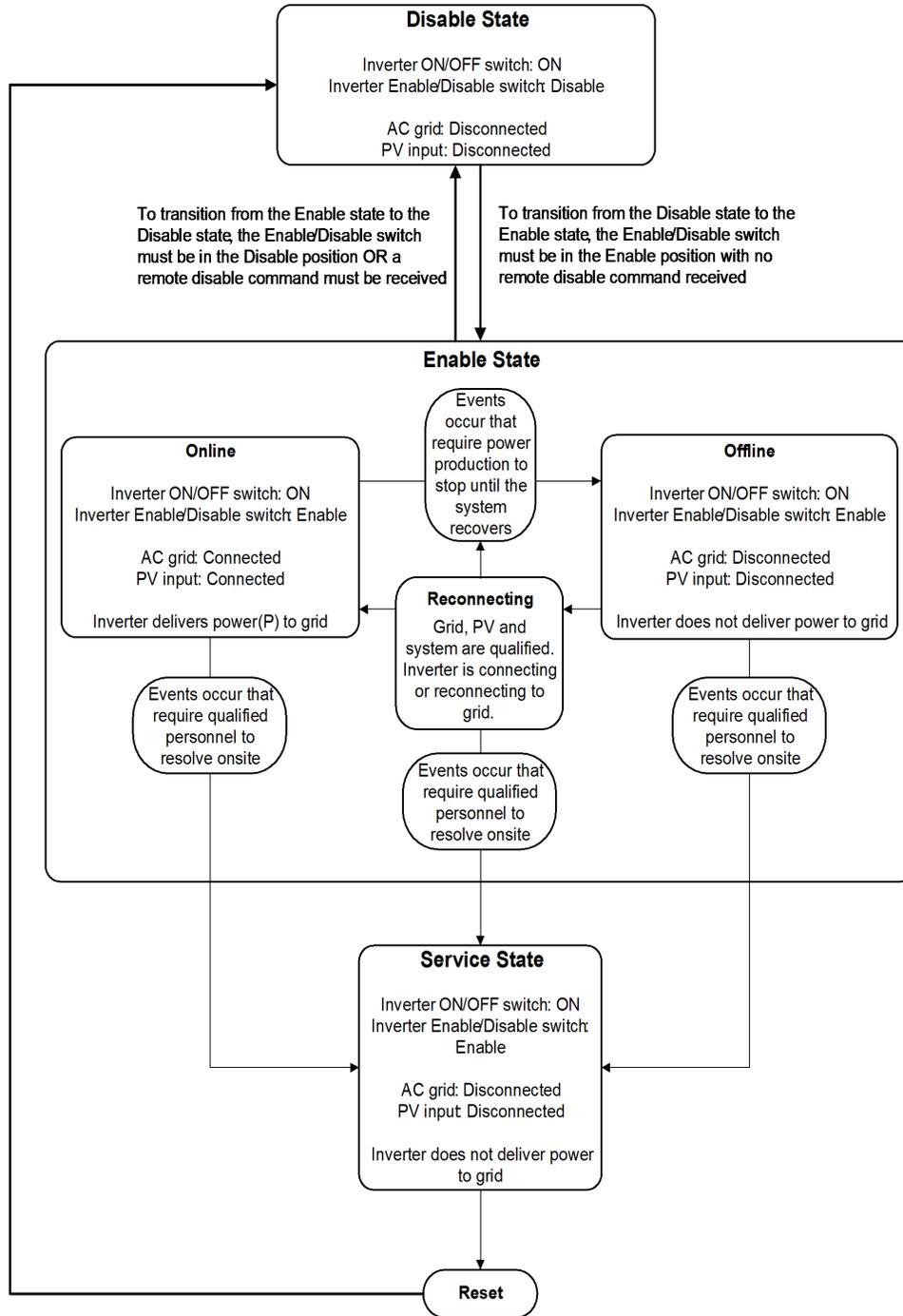
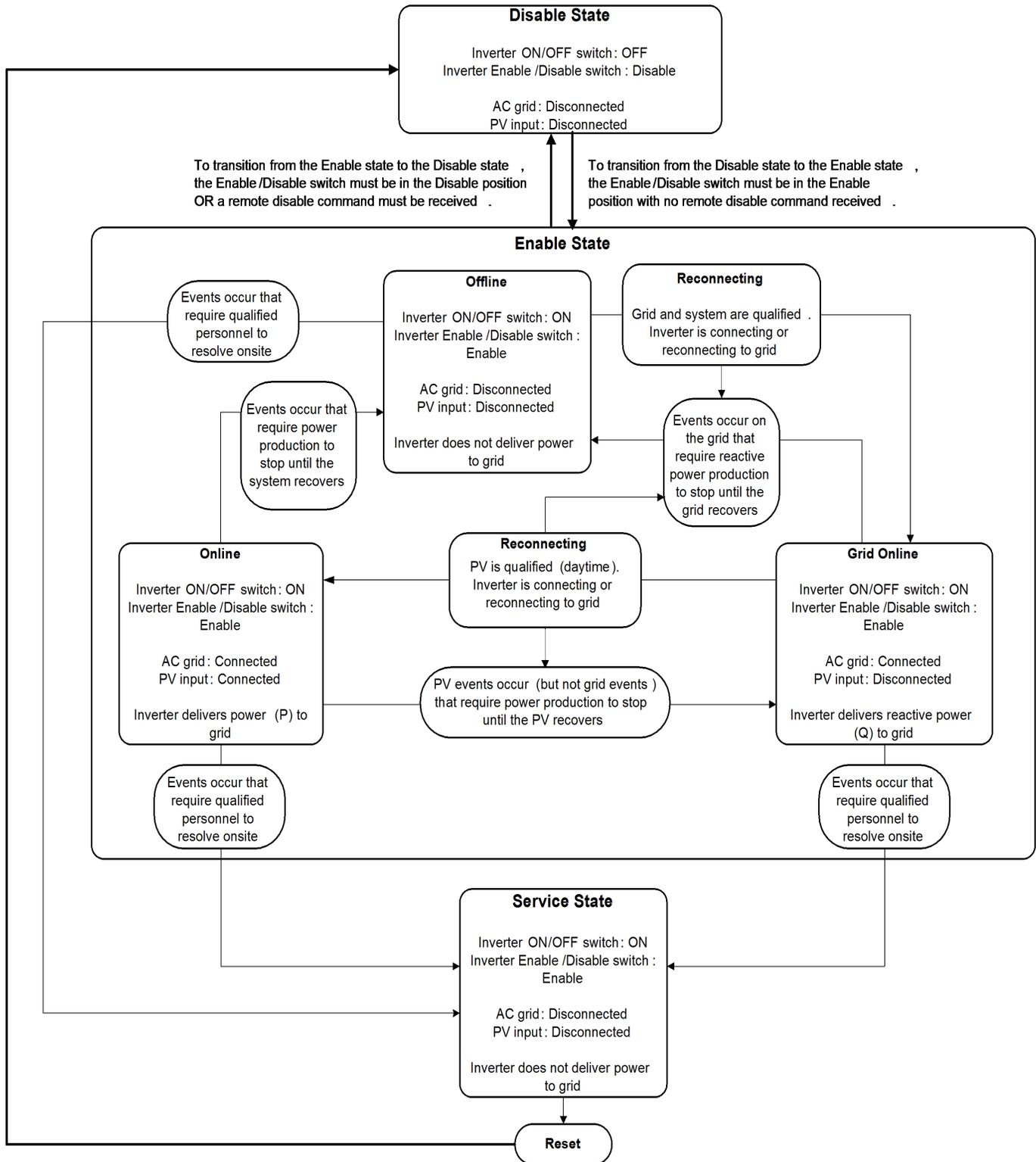


Figure 7 Conext Core XC-NA Series operational states in PVCQ mode



Disable

In the Disable state, the Conext Core XC-NA Series is dormant and does not attempt to connect to the grid. The Conext Core XC-NA Series must be in the Disable state to receive commands and changes to the configuration parameters. To exit the Disable state, both the ENABLE STATE/DISABLE STATE switch and any optional remote monitoring system command must be set to ENABLE.

When the Conext Core XC-NA Series is in the Enable state, it transitions to the Disable state only when the ENABLE STATE/DISABLE STATE switch is set to DISABLE or the DISABLE command is sent from any optional remote monitoring system connection.

Enable

The Enable state is the standard operating state of the Conext Core XC-NA Series. In this state, the Conext Core XC-NA Series maximum power tracker operates the array at maximum power based on the available irradiance. The following conditions must be met for the Enable state:

- The inverter ON/OFF switch, the ENABLE STATE/DISABLE STATE switch, and the optional remote monitoring system ENABLE/DISABLE command are in the ON or ENABLE position.
- Automatic reconnect has occurred and the AC circuit breaker and PV disconnect switch are both in the ON or closed position.
- Service state events are not present.
- The Conext Core XC-NA Series is in PV mode or PVCQ mode. It cannot be enabled when in CP test mode (*Operating Modes on page 26*).

Within the Enable state the Conext Core XC-NA Series can either be Offline, Reconnecting, Online, or Grid Online (PVCQ mode only).

Offline

The PV input is not within the normal operating ranges or a grid disturbance or PV disturbance has been detected. Examples of an Offline state event are disconnection due to variations in grid voltage or frequency, or the loss of PV power at nighttime. During an Offline state event, the Conext Core XC-NA Series stops processing power and stays in the Offline state until the grid or PV array returns to its normal operating range.

All Offline state event conditions that the Conext Core XC-NA Series detects are reported to the front panel user interface and any optional remote monitoring interface and are recorded in the event log. The front panel user interface displays the state and fault code. For a description of the Offline state event codes, see *Offline State and Service State Event Code Descriptions on page 55*.

Reconnecting

The reconnecting state is a transitional state during the offline to online transition. This state will be initiated when the grid or PV array is within its normal operating range. The inverter will exit the reconnect stage after the "Grid Reconnect Delay" period has expired.

The AC circuit breaker will close followed by closing of the PV disconnect switch. The inverter will then be in the online state.

Online

All monitored parameters are within normal operating range and the Conext Core XC-NA Series is processing power as intended. In addition to the conditions for the Enable state, the following conditions must be met for the Online state:

- The utility AC voltage and frequency is stable.
- The PV voltage is present.
- The service state or offline state events are not present.

Grid Online (PVCQ mode only)

The grid is within its normal operating range but the PV array is not within its normal operating range. The Conext Core XC-NA Series is delivering constant reactive power to the grid.

Set the Conext Core XC-NA Series to operate in PVCQ mode when 24-hour reactive power compensation (Var) is required. This can be done by setting "CQ Mode" to "ON" in the Inverter Operating Modes menu.

Service State

Whenever a Conext Core XC-NA Series encounters a Service state event condition, it immediately stops processing power and executes an orderly shutdown that includes opening both the main AC circuit breaker and the PV disconnect switch. Examples of a Service state event are a fault signal received from the processor or the number of overcurrent events and switching frequency events exceeding the OCP Max Daily Count.

The Conext Core XC-NA Series remains in the Service state until an authorized service technician remedies the cause and then returns the Conext Core XC-NA Series to normal operation.

Service state events appear on the front panel user interface and if programmed to do so, they also appear on any optional remote monitoring interface (Renconnect or a PC with a Modbus connection). These events are recorded in the event log. The front panel user interface displays the state and event ID code. For a description of the Service state event codes, see *Offline State and Service State Event Code Descriptions on page 55*.

Operational Features

Operational features of the inverter include heaters, dew point controllers, cold start functionality, and anti-islanding.

Heaters

The Conext Core XC-NA Series inverters are equipped with heaters to keep the internal components at operating temperature and free of condensation, even when the inverter is not producing power. The heater thermostats are set to 5 °C (41 °F). The dew point controller and thermostat settings must not be changed.

Dew Point Control

The inverters have a dew point controller that monitors the humidity of the internal environment. The dew point controller has the ability to turn on the heaters independently of the heater's thermostat. The feature called "Dew Point Control" is active when the ambient temperature is too high to trigger the heaters, but they are triggered instead by the dew point controller due to high humidity. Dew point control tends to occur when the sun first comes up and the inverter is attempting to transition from offline to online. The inverter receives two signals; one saying that the heaters are on, and one saying that the temperature is above the heater's thermostat setting. Based on these signals, the inverter will remain offline for the "Dew Point Reconnection Delay" time (default is 15 minutes) before transitioning to online which allows time for the humidity to decrease. The GKP displays the relevant event code and Dew Point Control message during the offline period.

Cold Start

At temperatures between the "Cold Offline Threshold" (default is -15 °C/5 °F) and the "Cold Start Reset Threshold" (default is -5 °C/23 °F) the inverter needs to be slowly ramped up to full power to help prevent damage to the components. This slow ramp time will take a maximum of 20 minutes. During the ramp time the GKP displays the "Cold Start" event condition. As soon as the "Cold Start Reset Threshold" is reached, the inverter will immediately ramp to full power.

Dust Filter Detection

The Conext Core XC-NA Series uses thermal switches to detect when the filters in either the AC or DC cabinets are not functioning, and uses a temperature sensor to detect when the AIC filter in the power stage cabinet is not functioning. If the thermal switches or the temperature sensor are triggered, the filters should be checked for damage or to see if they are clogged.

The AC and DC cabinet thermal switches open at temperatures greater than 68.3 °C (154.9 °F) and close when the temperature drops below 54.4 °C (129.9 °F). When either switch is open, the front panel user interface displays the following message: **Cabinet Air Filters**.

The AIC powerboard temperature sensor is triggered at the temperature set by the **AIC Filter Derate Th.** parameter (default is 75 °C (167 °F)). When the AIC temperature

sensor is triggered, the front panel user interface displays the following message: **AIC Filter De-rating**.

If either the AC thermal switch opens, the DC thermal switch opens, or the AIC temperature sensor is triggered, the inverter will start derating apparent power at the rate set by the **Thermal De-rating Rate** (default is 0.5% of nominal apparent power per minute). The inverter will continue to derate down to a minimum of 50% of nominal apparent power (unless otherwise defined by your specific installation) and will not derate lower. In addition, the fans will always run at full speed during derating to help cool the inverter. Even with derating, it is possible that any of the other over temperature parameters will be triggered, in which case the inverter will report the event code to the front panel user interface. Refer to Chapter 4 for additional information on event codes.

In order for derating to end, both AC and DC temperature switches must be closed and the AIC temperature sensor must no longer be triggered. The inverter will return to normal power at a rate of 36% of **User Apparent Power Limit** per minute.

Anti-islanding

Islanding occurs when a distributed generation source continues to energize a portion of the utility grid (the *island*) after the electrical utility has stopped providing power. Distributed generation sources such as the Conext Core XC-NA Series can detect an islanding condition and stop energizing the grid.

The Conext Core XC-NA Series inverter detects grid voltage or frequency instability when the load and generation demand is unbalanced and transitions to the offline state. At times, however, the load and generation demand in the islanded area are balanced, and the self resonance of the grid is at the same frequency as the nominal grid frequency. In this situation, the inverter would continue to supply the islanded area with power if it did not have a special feature known as *grid perturbation* or *active anti-islanding*.

In most medium voltage applications, the Conext Core XC-NA Series inverter is not required to perform grid perturbation because such plants are remotely controlled (dispatched) by the electrical utility. Without grid perturbation, more stable, continuous and accurate delivery of active and reactive power is possible.

Schneider Electric authorized personnel can turn the active anti-islanding function on or off during configuration of the Conext Core XC-NA Series, with the agreement of the local utility.

Operator Interface

The operator interface communicates critical operational information to and from the Conext Core XC-NA Series. This communication occurs between the operator and the front panel user interface or between the operator and any optional remote monitoring system. The front panel user interface is behind a cover located on the door of the AC cabinet. See the *Front Panel User Interface* on page 19 for more information. You can read the display through the window without opening the cover. Use a 4 mm hex key to unlock the latch and open the cover in order to make changes via the front panel user interface. The cover has provisions for a lock to prevent unauthorized access.

In order for the front panel user interface to function correctly, and to help protect the Conext Core XC-NA Series from the external environment, the cover must remain closed during normal operation.

NOTICE

HAZARD OF DUST OR MOISTURE INGRESS

- Do not open the cover when the environmental conditions indicate a possibility of dust or precipitation entering the cabinet.
- Avoid longer than necessary operation with the cover open.

Failure to follow these instructions can result in damage to equipment and can compromise the environmental protection of the Conext Core XC-NA Series.

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Repeated or extended low temperature exposure may reduce the lifetime of the front panel user interface.

Failure to follow these instructions can result in equipment damage.

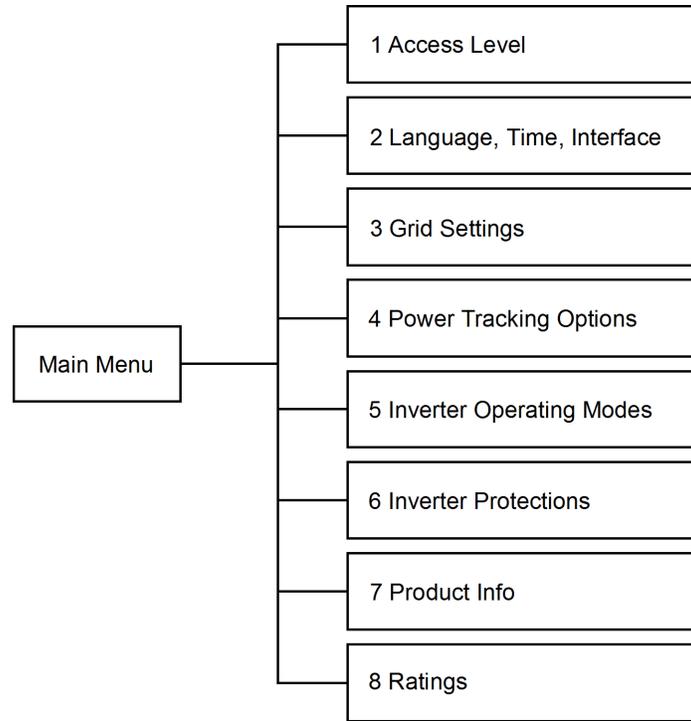
Front Panel User Interface

The Conext Core XC-NA Series user interface consists of a display and keypad with a scroll wheel on the front panel for local monitoring and configuration. Use the scroll wheel to navigate through menu or value options, and press the center of the scroll wheel to select the menu or value. See *Figure 3 on page 20*.

To access the main menu:

1. Make sure you are at the home screen.
2. Press the center of the scroll wheel.

Figure 8 Main menu



For details about these menu items, see *Overview on page 38*.

Operator Interface Structure

The operator interface—whether the front panel user interface or an optional remote monitoring interface—contains the following main types of information:

Conext Core XC-NA Series status

Operational information that the Conext Core XC-NA Series provides to you. The status information, which includes the Conext Core XC-NA Series operating mode and state and all operational values, can be viewed any time the Conext Core XC-NA Series has control power. For details about Conext Core XC-NA Series status information, see the Conext Core XC-NA Series Status below.

Configuration settings

Operational information that you provide to the Conext Core XC-NA Series. For details about configuration settings, see *Overview on page 38*.

Conext Core XC-NA Series Status

Key status information relating to Conext Core XC-NA Series mode and state appears on the main screen of the front panel user interface, as shown in *Figure 3 on page 20* and listed in *Table 2*.

Table 2 Conext Core XC-NA Series status information on main screen

Operational Parameter	Description
Periodic servicing reminder	The exclamation point (!) symbol is shown on the front panel user interface when a Service state alert is active or a recommended maintenance service call is required
Inverter operating mode	Shows the current Conext Core XC-NA Series operating mode: PV (standard operating mode) PVCQ (constant reactive power) CP (constant power - diagnostic only)
Current access level	Shows the current access level enabled for changing write menu parameters.
Event ID	See the <i>Offline State and Service State Event Code Descriptions on page 55</i> for a detailed list of Event ID codes. If there is more than one Service State event, only the most urgent Event ID code is shown. If there is more than one Offline State event, the Event ID for the first event to occur is shown.
Inverter activity or state description	A more detailed explanation of what the Conext Core XC-NA Series is actively doing, such as Active Power Point Tracking.
Inverter state	Shows the current Conext Core XC-NA Series state: Initialization Disable Enable Offline Online Grid Online (in Enable state,PVCQ mode only) Service

Operational Parameter	Description
Display parameter	<p>Shows the parameter that has been chosen for initial display.</p> <ul style="list-style-type: none"> Active Power (kW) Reactive Power (kVAr) Apparent Power (kVA) Grid Current Line 1 (A) Grid Current Line 2 (A) Grid Current Line 3 (A) Grid Current (A) Grid Voltage V12 (V) Grid Voltage V23 (V) Grid Voltage V31 (V) Grid Frequency (Hz) DC Voltage (V)¹ PV Voltage (V)¹ PV Current (A) PV Power (kW) MWh Energy Produced (MWh) Temperature PowerBoard (°C) Temperature Heatsink 1 (°C) Temperature Heatsink 2 (°C) Temperature Heatsink 3 (°C) Countdown <p>Use the scroll wheel to view other display parameters, when you reach the end of the menu, the display returns to the beginning of the menu.</p> <p>To change the display parameter, follow the instructions in <i>Changing the Display Parameter on page 39</i>.</p>
Parameter value	Shows the value of the parameter currently being viewed.

¹ The PV voltage = The voltage measured from PV input. DC voltage = The voltage of DC bus within the Conext Core XC-NA Series.

3 Configuration

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- Changing System Setup 38**
 - Setting the Date and Time 38
 - Setting the Language 39
 - Changing the Display Parameter 39
 - Changing Parameter Control 40
 - Changing Logging Settings 40
 - Clearing the Service State Alert 41
- Changing Grid, Power Tracking, and Protection Settings 42**
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Overview

You can change many of the configuration settings on the Conext Core XC-NA Series to meet your specific requirements. This chapter describes the configurable settings and explains how to change them.

Changing System Setup

The front panel user interface is used to change the date and time, language, display parameter, parameter control, and data logging settings and to clear a service state alert.

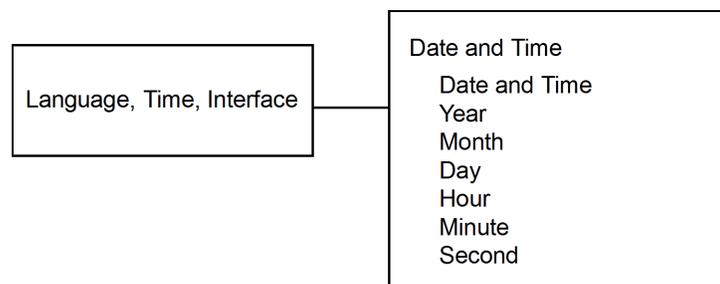
Setting the Date and Time

Follow the procedure below to change the date and time using the front panel user interface.

To change the date and time:

1. Ensure you are at the home screen.
2. Press the center of the scroll wheel.
3. Scroll to Language, Time, Interface, and then press the center of the scroll wheel.
4. Scroll to Date and Time, and then press the center of the scroll wheel.
5. Scroll to Year, and then press the center of the scroll wheel. Enter the data:
 - a. The display defaults to a single digit. Since the year has several numbers, press F2 (<<) three times to add three more numbers. Each number can be incremented independently. The number with the black background is the number that is currently selected.
 - b. Starting from the far left number, scroll to select the correct number (from 0 to 9), and then press F3 (>>) to move to the number to the right.
 - c. Repeat until all numbers are correct, and then press the center of the scroll wheel to apply the code.
6. Press Esc on the keypad to return to the Date and Time menu.
7. Repeat steps 5 and 6 to add information for Month, Day, Hour, Minute, Second.
8. Press F4 to return to the home screen.

Figure 9 Setting the date and time



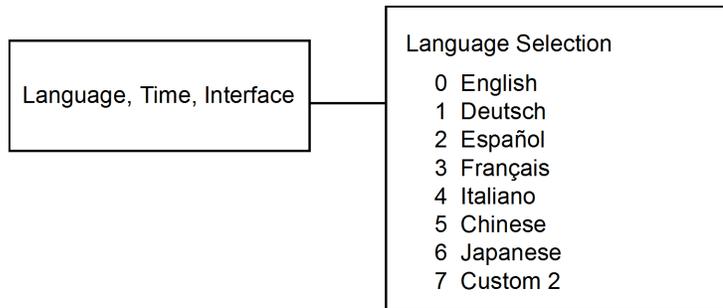
Setting the Language

Follow the procedure below to change the language that the Conext Core XC-NA Series displays, using the front panel user interface.

To change the language:

1. Ensure you are at the home screen.
2. Press the center of the scroll wheel.
3. Scroll to Language, Time, Interface, and then press the center of the scroll wheel.
4. Scroll to Language Selection, and then press the center of the scroll wheel.
5. Scroll to the language that you want to select, and then press the center of the scroll wheel.
6. Press F4 to return to the home screen.

Figure 10 Setting the language



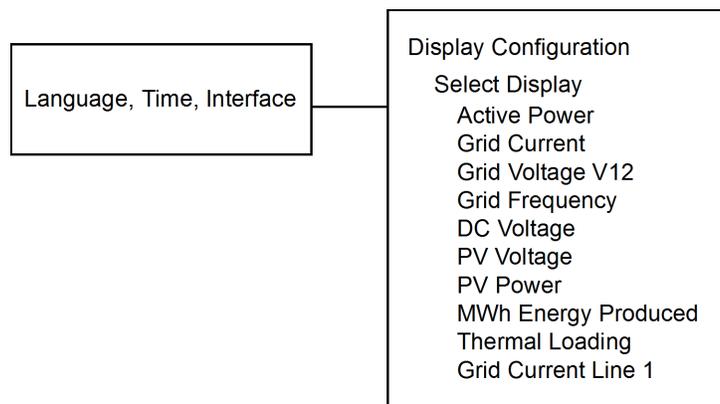
Changing the Display Parameter

The Conext Core XC-NA Series defaults to showing the active power on the front panel user interface. You can change this displayed parameter.

To change the display parameter:

1. Make sure you are at the home screen.
2. Press the center of the scroll wheel.
3. Scroll to Language, Time, Interface, and then press the center of the scroll wheel.

Figure 11 Setting default view



4. Scroll to Display Configuration, and then press the center of the scroll wheel.
5. Scroll to Select Display, and then press the center of the scroll wheel.
6. Scroll to select the parameter that you want to display as the default on the front panel user interface, and then press the center of the scroll wheel to apply the change.
7. Press F4 to return to the home screen.

Changing Parameter Control

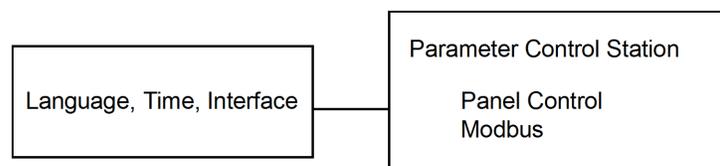
The Parameter Control menu on the front panel user interface sets whether the Conext Core XC-NA Series is controlled remotely by Modbus communication or locally using the front panel user interface (Panel Control in the menu). Even if the parameter control is set to Modbus, you can change it to Panel Control from the front panel user interface. Parameter Control is the only menu that can be modified from the front panel user interface while the Conext Core XC-NA Series is under Modbus control.

Use the Modbus setting for all optional remote monitoring interfaces.

To change the Parameter Control Station:

1. Ensure you are at the home screen.
2. Press the center of the scroll wheel.
3. Scroll to Language, Time, Interface, and then press the center of the scroll wheel.
4. Scroll to Parameter Control Station, and then press the center of the scroll wheel.
5. Scroll to highlight either Panel Control or Modbus, and then press the center of the scroll wheel to apply the change.
6. Press F4 to return to the home screen.

Figure 12 Setting parameter control



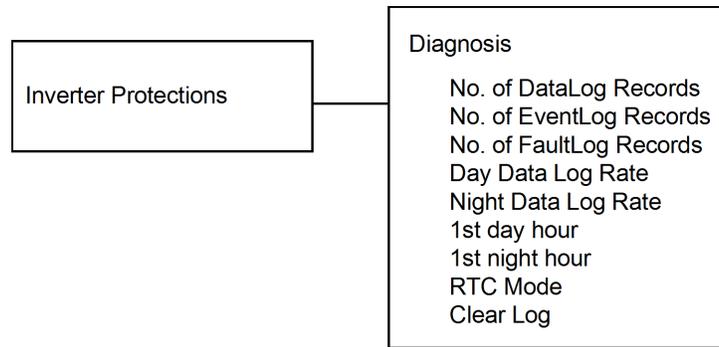
Changing Logging Settings

Before you change any data logging settings, you must change the RTC Mode from RTC Log to RTC Config. After you make the changes, you change it back to RTC Log to continue normal logging behavior.

To change logging settings:

1. Ensure you are at the home screen.
2. Press the center of the scroll wheel.
3. Scroll to Inverter Protections, and then press the center of the scroll wheel.

Figure 13 Inverter Protections menu



4. Scroll to Diagnosis, and then press the center of the scroll wheel.
5. Scroll to RTC Mode (real time clock mode), and then press the center of the scroll wheel.
6. Scroll to Config Mode, and then press the center of the scroll wheel.
7. Press Esc on the keypad to return to the RTC Mode menu, and then press Esc again to return to the Diagnosis menu.
8. Make any changes to Day Data Log Rate, Night Data Log Rate, 1st day hour, or 1st night hour (see *To change settings: on page 42* for instructions on how to change the parameters and for detailed information on the parameters).
9. After the parameters have been changed, press Esc on the keypad to return to the Diagnosis menu.
10. Scroll to RTC Mode, and then press the center of the scroll wheel.
11. Scroll to Log Mode, and then press the center of the scroll wheel.
The XC Series is unable to log information while in Config Mode.
12. Press F4 to return to the home screen.

Clearing the Service State Alert

You can clear the Service state alert, although, if the reason for the alert still exists, the Service state alert will reactivate.

To clear the Service state alert:

1. Power cycle the inverter.
2. Turn the ENABLE/DISABLE switch to DISABLE.
3. On the front panel user interface, ensure you are at the home screen.
4. Press the center of the scroll wheel.
5. Scroll to Access Level, and then press the center of the scroll wheel.
6. Scroll to Clear Service Mode, and then press the center of the scroll wheel.
Enter 1234:
 - a. The display defaults to a single digit. Press F2 (<<) to add three more numbers, one number per press. Each number can be incremented independently. The number with the black background is the number that is

- currently selected.
 - b. Starting from the far left number, scroll to select the correct number (from 0 to 9), and then press F3 (>>) to move to the number to the right.
 - c. Repeat until all numbers are correct, and then press the center of the scroll wheel to apply the code.
7. Press the center of the scroll wheel again to confirm.
 8. Press F4 to return to the home screen.

Figure 14 Clearing Service State



Changing Grid, Power Tracking, and Protection Settings

The tables in this section describe all the configurable grid, power tracking, and Conext Core XC-NA Series protection parameters and provide the default values that are shipped from the factory.

Certain settings are password protected and can be changed only by authorized service personnel. For example, a password is required to configure many parameters relating to utility protection.

 WARNING
<p>HAZARD OF ELECTRIC SHOCK AND FIRE</p> <ul style="list-style-type: none"> ■ Password-protected settings must be adjusted only by authorized service personnel (as defined in <i>Audience on page 1</i>) who are aware of the impact of changing the settings, including the impact on system safety. ■ Utility protection parameter settings must be changed only with the agreement of the local authority. <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

To change settings:

1. Ensure you are at the home screen.
2. Press the center of the scroll wheel.
3. Scroll to the menu name, and then press the center of the scroll wheel.

4. To modify the value slightly, use the scroll wheel to increase or decrease the value slowly.
5. To modify the value significantly, increment each number independently: The number with the black background is the number that is currently selected. Press F2 (<<) or F3 (>>) to move left and right and use the scroll wheel to increase or decrease the selected number.
6. Press the center of the scroll wheel to apply the value change.

Region-Specific Grid Settings

The tables in this section list the grid settings that you can view using the front panel user interface. The grid thresholds and delays are determined by the standards of the utility region and are defined as follows:

Thresholds

The value that the parameter must be at for the alert to be triggered (*disconnect* threshold) or the value that the parameter must be at for the alert to be cleared (*reconnect* threshold).

Delays

The length of time the parameter must be at the threshold before the alert is triggered (*disconnect* delay) or the length of time the parameter must be at the threshold before the alert is cleared (*reconnect* delay).

The “very high voltage”, “very high frequency”, “very low voltage”, and “very low frequency” parameters enable you to set a short delay period to quickly disable the Conext Core XC-NA Series when measurement values are out of range.

Utility Regions

Table 3 lists the available utility regions. The Conext Core XC-NA Series is configured with the utility region’s default settings at the factory. Changes must be made by authorized personnel with a password.

Note: The only region that applies to the XC733-NA inverter is the IEEE 1547 (60Hz) region.

Table 3 Utility Regions

Parameter	Description	Units
Utility Region	A set of parameter values that are specific to a region. If you change the Utility Region setting, all Utility Region parameters, including parameters affected by Utility Region settings that were custom configured, revert to the default.	0 = NONE 8 = IEEE 1547 (60Hz) 9 = USA MV-DG 255 = Custom

Table 4 Region-specific Utility Settings

Parameter	Password Required?	Utility Region		
		USA MV-DG ¹	IEEE1547 (60 Hz)	Firmware Version
System L to L Voltage	Y	Not determined by utility region. Factory defaults are 300 V, 350 V, 380 V, and 407 V		
Disconn vHV Threshold (%)	Y	140	120	All
		Level at which disconnection occurs due to AC very high voltage (as a percentage of nominal).		
Disconn vHV Delay (s)	N	3.00	0.16	All
		Length of time that the inverter must be at or above "Disconn very HV Threshold" before it disconnects.		
Disconn HV Threshold (%)	Y	120	110	All
		Level at which disconnection occurs due to AC high voltage (as a percentage of nominal).		
Disconn HV Delay (s)	N	0.10	1.00	All
		Length of time that the inverter must be at or above "Disconn HV Threshold" before it disconnects.		
Disconn LV Threshold (%)	Y	80	88	All
		Level at which disconnection occurs due to AC low voltage (as a percentage of nominal).		
Disconn LV Delay (s)	N	3.00	2.00	All
		Length of time that the inverter must be at or below "Disconn LV Threshold" before it disconnects.		
Disconn vLV Threshold (%)	Y	25	50	All
		Level at which disconnection occurs due to AC very low voltage (as a percentage of nominal).		
Disconn vLV Delay (s)	N	1.00	0.16	All
		Length of time that the inverter must be at or below "Disconn vLV Threshold" before it disconnects.		
Disconn vHF Threshold (Hz)	Y	70.0	65.0	All
		Value at which disconnection occurs due to AC very high frequency.		
Disconn vHF Delay (s)	N	3.00	3.00	All
		Length of time that the inverter must be at or above "Disconn vHF Threshold" before it disconnect.		
Disconn HF Threshold (Hz)	Y	62.2	60.5	All
		Value at which disconnection occurs due to AC high frequency.		
Disconn HF Delay (s)	N	0.16	0.16	All
		Length of time that the inverter must be at or above "Disconn HF Threshold" before it disconnects.		
Disconn LF Threshold (Hz)	Y	59.0	59.3	3.02 and above
		Value at which disconnection occurs due to AC low frequency.		
Disconn LF Delay (s)	N	300.0	0.16	3.02 and above
		Length of time that the inverter must be at or below "Disconn LF Threshold" before it disconnects.		
Disconn vLF Threshold (Hz)	Y	56.5	57.0	All
		Value at which disconnection occurs due to AC very low frequency.		

Parameter	Password Required?	Utility Region		
		USA MV-DG ¹	IEEE1547 (60 Hz)	Firmware Version
Disconn vLF Delay (s)	N	0.16	0.16	All
		Length of time that the inverter must be at or below "Disconn vLF Threshold" before it disconnects.		
Voltage Envelope Threshold (%)	Y	135	135	All
		Amount that the instantaneous voltage must exceed the normal peak value of the AC output system voltage before disconnection occurs.		
Voltage Envelope Delay	Y	3 data samples (all utility regions)		All
		Length of time that the inverter must be at "Voltage Envelope Threshold" before it disconnects.		
Reconn HV Threshold (%)	N	110	106	All
		Level at which the AC high voltage condition is cleared (as a percentage of nominal) and the reconnection delay begins.		
Reconn LV Threshold (%)	N	90	88	All
		Level at which the AC low voltage condition is cleared (as a percentage of nominal) and the reconnection delay begins.		
Reconn HF Threshold (Hz)	N	61.5	60.5	All
		Value at which the AC high frequency condition is cleared and the reconnection delay begins.		
Reconn LF Threshold (Hz)	N	59.0	59.3	All
		Value at which the AC low frequency condition is cleared and the reconnection delay begins.		
Reconnection Delay (s)	N	20.00	300.00	All
		Length of time that the inverter must have all grid-related parameters within normal operating conditions before allowing transition to the online state.		
Power Reference Selection	N	Modbus (all utility regions)		All
		The type of power reference input: Modbus or analog.		
User Reactive Power Ref.	N	Not determined by utility region. Factory default is 0 kVAr.		All
		Max "User Reactive Power Reference" is limited by the value of "Configured Reactive Power Limit" (positive for capacitive reactive power, negative for inductive reactive power).		
User Active Power Limit	N	Not determined by utility region. Factory defaults are 540.0 kW, 630.0 kW, 680.0 kW, and 733 kW.		All
		Max "User Active Power Limit" is limited by the value of "Configured Active Power Limit".		
User Apparent Power Limit	N	Not determined by utility region. Factory defaults are 540.0 kVA, 630.0 kVA, 680.0 kVA, and 733 kVA.		All
		Max "User Apparent Power Limit" is limited by the value of "Configured Apparent Power Limit".		
User Phase Angle Ref.	N	Not determined by utility region. Factory default is 0 degrees.		All
		Phase angle for Var Command (positive for capacitive reactive power, negative for inductive reactive power).		
User Phase Current Limit	N	Not determined by utility region. Factory default is 100%.		All
		User phase current limit.		

Parameter	Password Required?	Utility Region		
		USA MV-DG ¹	IEEE1547 (60 Hz)	Firmware Version
Voltage Support Function	N	ON (all utility regions)		All
		Action to take to support voltage. 0 = OFF 1 = ON Provides support by adding capacitive current for low voltage events and inductive current for high voltage event.		
Voltage Support Factor	N	0	0	All
		VAC support factor.		
V-Support Low Threshold (%)	N	80	88	All
		VAC support threshold, as a percentage of system line-to-line voltage. When system voltage is less than V-Support Low Threshold, reactive power compensation is capacitive.		
V-Support High Threshold (%)	N	110	110	All
		VAC support threshold, as a percentage of system line-to-line voltage. When system voltage is greater than V-Support High Threshold, reactive power compensation is inductive.		
Q-Reg Filter Factor	Y	Not determined by utility region. Factory default is 0.010.		
		Low-pass filter factor for reactive power auto-regulation.		
Asymmetry V Factor	Y	2.00	2.00	All
		Asymmetry Voltage Factor – percentage of Vn to determine whether asymmetric voltage ride through or not (for extreme cases).		
Asymmetry I Limit Factor	Y	0.40	0.40	All
		Asymmetry Current Limit Factor—percentage of In to limit reactive current during asymmetric voltage ride through.		
P(f) Control, Function	N	ON	OFF	All
		Enables active power control as a function of power frequency (P(f)) control.		
P(f) Control, Reset Time (s)	N	600.00	120.00	All
		Length of time that the system will take to resume normal power when active power control ends. The actual time may be less than the value set in this parameter because the ramp step assumes that the device starts at 0% power.		
P(f) Control, Corner Freq. (Hz)	N	60.2	60.2	All
		Frequency in Hz, at which active power control starts reducing power.		
P(f) Control, Slope (%Hz)	N	40	40	All
		Slope at which active power control reduces power.		

Parameter	Password Required?	Utility Region		
		USA MV-DG ¹	IEEE1547 (60 Hz)	Firmware Version
P(f) Control, Reset Freq. High (Hz)	N	60.05	60.05	All
		Frequency below which active power control can resume normal power.		
P(f) Control, Reset Freq. Low (Hz)	N	60.05	60.05	All
		Frequency above which active power control can resume normal power.		
P(f) Control, Reset Delay (s)	N	0	0	All
		Length of time that the inverter must be at or below "P(f) Control, Reset Freq. High" or at or above "P(f) Control, Reset Freq. Low" before active power control can resume normal power.		
Power Ref. Ramp Time (ms)	N	50	50	All
		Time it takes to get from 0% to maximum power or from maximum power back down to 0%.		
Reconn Power Ramp Time (s)	N	0	0	All
		Length of time that the active power limit is increased from "Min. Power Limit" to 100% of the active power limit following a grid error event. If you set this parameter to greater than 0 while the system is ramping up, the new value is not applied.		
Min. Power Limit (%)	Y	5	10	All
		Initial active power limit following a grid error event.		
Anti-Islanding Function	Y	OFF	ON	All
		Sets whether or not the active anti-islanding protection is enabled for the inverter.		
Anti-Islanding Type	Y	All Type 0		3.0 and later
		Anti-Islanding perturb type.		
Anti-Islanding Pert Duration	Y	Not determined by utility region. Factory default is 0.15 s.		All
		Anti-Islanding perturb duration.		
Anti-Islanding Pert Occurrence	Y	Not determined by utility region. Factory default is firmware version dependant. To determine the default value, contact Schneider Electric.		All
		Anti-Islanding perturb occurrence.		
Anti-Islanding Pert Factor	Y	Not determined by utility region. Factory default is 6%.		
		The amplitude of perturb reactive power = (Pout * Anti-Islanding perturb factor).		
Power Ramp Rate (%/minute)	N	6000.0		1.11 and later
		The power ramp rate per minute. This value is used to smooth positive power output when the inverter is online. This power slew rate will be desensitized if the value is maximum, 6000.0.		
Min. Power Ramp Step (kW)	Y	2.0		1.11 and later
		Minimum power ramp step for power positive slew rate.		
Vac-Regulation	N	OFF (all utility regions)		1.11 and later
		Vac-Regulation is to enable or disable (=0) the voltage regulation function.		
Reconnect Start Delay (s)	N	10	10	1.11 and later
		The initial delay for system reconnection.		

Parameter	Password Required?	Utility Region		
		USA MV-DG ¹	IEEE1547 (60 Hz)	Firmware Version
Reconnect Power Ramp Type	N	Grid error		1.11 and later
		Type or flag to indicate how reconnect power ramp behaves. 0 = Grid Error, means ramp will only trigger by grid errors; 1 = Global, means ramp happens all the time when inverter transits from offline to online.		
OVSPD, Voltage Threshold (%)	N	140	140	1.11 and later
		Voltage above which power ramp down starts.		
OVSPD, Power Limit (%)	N	100	100	1.11 and later
		Power limit at which power ramp down stops.		
OVSPD, Ramp Down Rate (s)	N	10.0	10.0	1.11 and later
		Ramp down rate for active power.		
OVSPD, Ramp Up Rate (s)	N	10.0	10.0	1.11 and later
		Ramp up rate for Active power.		
GFD Max. Daily Count	Y	1	1	All
		GFD max daily count.		

¹ The USA MV-DG default setting is compliant with NERC PRC-024-1 Draft 1 A(Feb 17, 2009), WECC Off-Nominal Frequency (April 2005), and FRCC Regional Generator Performance During Frequency and Voltage Excursions (Version 5).

User Limits and References for Grid Settings

The user limits and references listed in the *Table 5* enable a customer to change the system’s limits and references for grid settings.

Table 5 Default user limits and references

Parameter	Description	Default Value
On the Grid Settings Tab, Under Grid Support Options		
User Reactive Power Reference	Desired reactive power: positive for capacitive reactive power and negative for inductive reactive power. Maximum “User Reactive Power Ref” is limited by the value of “Configured Reactive Power Limit”.	0 kVAr
User Active Power Limit (PV Mode)	User’s desired maximum active power output from the inverter.	540.0 kW 630.0 kW 680.0 kW 733.0 kW

Parameter	Description	Default Value
User Apparent Power Limit	User's desired maximum apparent power output from the inverter. Maximum "User Apparent Power Limit" is limited by the value of "Configured Apparent Power Limit".	540.0 kVA 630.0 kVA 680.0 kVA 733.0 kVA
User Phase Angle Reference	Desired phase angle for reactive power compensation. The inverter responds to this setting only if "User Reactive Power Ref" is set to 0.	0 degrees
User Phase Current Limit	Desired maximum current output (per phase) from the device.	100 %
Max. Daily Online Cycling ¹	Maximum number of Online/Offline cycles.	50

Power Tracking Settings

The tables in this section list the power tracking settings that you can view using the front panel user interface.

PV Gen Qualification

The PV Gen Qualification settings listed in *Table 6* are the parameters for changing the inverter PV status from online to offline and vice versa.

Table 6 Default PV Gen Qualification settings

Parameter	Description	Default Value
PV OC Start Voltage	The PV voltage at which inverter can start to produce power (wake-up voltage).	400 VDC
PV Reconn Delay	Length of time that the inverter must have all PV parameters within normal operating condition before going online.	1200 seconds
PV noP Disconn Threshold	Power threshold at which the inverter goes offline due to inadequate power from the PV array (normally a nighttime event).	1 %
PV noP Disconn Delay	Time delay before inverter goes offline due to inadequate power from the PV array.	3000 seconds
PVnoPDisconnDelay Factor	Multiplier to extend the "PV noP Disconn Delay" when "User PV Voltage Reference" is not zero.	4
Max DC Operating Voltage ²	Voltage at which, or above which, the inverter can defer reconnection when power ramping is required because of a grid error.	850 VDC

¹ Changes must be made by authorized personnel with a password.

² Changes must be made by authorized personnel with a password.

Parameter	Description	Default Value
PV OC Recovery Delay	Length of time before the inverter stops power ramping and produces full power. This value must be higher than "Reconnect Power Ramp Time".	15 minutes

Low Power Tracking

The Low Power Tracking settings are the parameters for the low power (LP) threshold and delay, as listed in *Table 7*. All users can change these settings.

Table 7 Default Low Power Tracking settings

Parameter	Description	Default Value
LP PV Voltage Reference	PV voltage reference at low power production.	400 VDC
LP Threshold	Minimum power required before MPPT can be calculated.	5 %
LP Transition Delay	Time delay before inverter moves to low power mode.	300 seconds

MPPT Settings

The MPPT settings listed in *Table 8* are the parameters for tracking maximum power point.

Table 8 Default MPPT settings

Parameter	Description	Default Value
MPPT Type	MPPT method that the inverter will use. Type 0: Standard perturb and observe (P&O) routine. Type 1: P&O routine with prediction of the power change trend.	Type1
Min Tracking Volt	Lower limit of AC voltage at which power point tracking occurs.	400 VDC
Max Tracking Volt	Upper limit of AC voltage at which power point tracking occurs.	800 VDC
Perturb Voltage Step	Size of an MPPT voltage perturbation step (power tracker step).	1 VDC
MPPT Occurrence Factor	Sets the frequency of MPPT voltage perturbation steps ("MPPT Occurrence Factor" X "MPPT Sample Interval").	5
MPPT Offset Factor	Defines the hysteresis level for determining tracking direction.	2500
MPPT Offset Max.	Defines the maximum MPPT hysteresis, where: MPPT hysteresis = PV power/"MPPT Offset Factor."	1000 W
MPPT Offset Min.	Defines the minimum MPPT hysteresis, where: MPPT hysteresis = PV power/"MPPT Offset Factor."	50 W
MPPT Sample Interval	Sampling interval for PV power readback.	500 ms
MPPT Reset Factor	Defines the level used to reset the PV voltage reference during power point shifting, where: Reset increment = "MPPT Reset Factor" x "Perturb Voltage Step."	0.01

Fast Sweep

The Fast Sweep settings listed in *Table 9* are the parameters for periodic sweeps of the PV array voltage using the Schneider Electric Fast Sweep™ technology.

Table 9 Default Fast Sweep settings

Parameter	Description	Default Value
Sweep Enable	Enables or disables periodic sweeps of the PV voltage to detect if multiple maxima exist.	Disabled
Sweep Occurrence	Time between periodic PV voltage sweeps.	3600 seconds
Sweep Duration	Duration of each PV voltage sweep.	5 seconds
Sweep Start Volt	Voltage at which an MPPT sweep starts.	variable ³
Sweep Range Volt	Voltage at which an MPPT sweep range starts or stops. If SweepRangeVoltage=0, the sweep range is defined by "Sweep Start Volt" and "Sweep Stop Volt." Otherwise, the sweep starts at presentPVvoltage - Sweep Range Voltage and the sweep stops at presentPVvoltage + Sweep Range Voltage	0 VDC
Sweep Stop Volt	Voltage at which an MPPT sweep stops.	800 VDC

User PV Voltage Reference

The User PV voltage reference setting listed in *Table 10* is the parameter that allows users to set their own PV voltage reference.

Table 10 Default User PV Voltage Reference settings

Parameter	Description	Default Value
User PV Voltage Ref.	Desired PV voltage reference. If you set this reference to zero, or if the PV voltage is zero, the inverter will use the MPPT settings instead.	0 VDC

Diagnosis

Refer to *Changing Logging Settings on page 40* as additional steps are required to modify the parameters in the Diagnosis Menu.

³ The default is the low point of the MPP (maximum power point) range for each model, see "Electrical Specifications" on page 85

Table 11 Diagnostic parameters

Parameter	Description	Default Value
Day Data Log Rate ⁴	Rate at which the data logger stores data during the day (maximum 60 minutes)	5 minutes
1st Day Hour ⁴	The hour at which daytime starts (24-hour clock).	6 hours
Night Data Log Rate ⁴	Rate at which the data logger stores data at night.	60 minutes
1st Night Hour ⁴	The hour at which nighttime starts (24-hour clock).	21 hours
RTC Mode	Sets whether the Conext Core XC-NA Series is logging data (Log Mode) or writing data (Config Mode).	Log Mode
Clear Log	<p>Clears the data log.</p> <p>1 = 000 Do nothing</p> <p>2 = 106 Clear Data Log</p> <p>3 = 206 Clear Event Log</p> <p>4 = 306 Clear Fault Log</p>	1

Temperature Settings

The table in this section lists the temperature settings that can be changed by authorized personnel with a password.

Table 12 Default temperature settings

Parameter	Description	Default Value
Heater Disconnect Delay	Length of time before the “Heater Response” alert is triggered.	4.0 seconds
Cold Offline Threshold	Cold Offline Threshold is used when the inverter is offline to trigger the error event 2805 (too cold) which keeps the inverter offline.	-15 °C
Cold Online Threshold	Cold Online Threshold is used when the inverter is online to trigger the same error event which will transition the inverter from online to offline.	-20 °C
Cold Start Reset Threshold	Internal temperature at or above which the Conext Core XC-NA Series immediately exits the Cold Start algorithm and resumes normal operation.	-5 °C
Cold Start Time	Maximum length of time the Cold Start algorithm remains active if the Conext Core XC-NA Series does not reach a temperature above the Cold Start Reset Threshold. The Conext Core XC-NA Series will commence normal operation after this time.	20 minutes
Dew Point Temp	Internal temperature at or above which the Conext Core XC-NA Series triggers Dew Point Control if the Conext Core XC-NA Series is attempting to transition from offline to online and the heaters are running. This threshold is identifying that the heaters are being activated by the dew point controller and not the thermostat.	10 °C

⁴Changes must be made by authorized personnel with a password.

Parameter	Description	Default Value
Dew Point Reconn. Delay	Length of time before the Conext Core XC-NA Series automatically exits Dew Point Control, regardless of the result of a Dew Point Temperature query.	15 minutes
Thermal Derating Rate	Rate at which the Conext Core XC-NA Series derates power during the Cabinet Air Filters event or AIC Filter De-rating event.	0.5% / minute

5 Troubleshooting

What's in This Chapter?

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 DANGER

MULTIPLE SOURCES WITH HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- All service and maintenance must be performed by authorized service personnel only, as defined in *Audience on page 1*, following the lock-out and tag-out procedure in *Service Bulletin for Lock-Out and Tag-Out Procedures (document number 993-0479)*.
- Any event resulting in a transition to Service state must be corrected by authorized service personnel. You must call for service

Failure to follow these instructions will result in death or serious injury.

Offline State and Service State Event Code Descriptions

Table 13 provides a description of all the event conditions that might occur on the Conext Core XC-NA Series. If the Conext Core XC-NA Series is in Service state you must call for service.

For more information about Offline state and Service state events, see *Operating States on page 26*.

Table 13 Event codes

Event Code	Event Condition Name	State	Event Condition Description	Required Action
0000	No Alarm	N/A	N/A	N/A
0006	PV Power Interrupted	Service	The PV disconnect has transitioned from closed to open while the Conext Core XC-NA Series was in Online mode.	Call for service.
0007	AC Power Interrupted	Service	The AC circuit breaker has transitioned from closed to open while the Conext Core XC-NA Series was in Online mode.	Call for service.
0010 see 2010	AC Switch Response	Service	The number of AC Switch Response events (code 2010) has exceeded the AC Switch Response max Daily Count.	Call for service.
0015 see 2015	DC Switch Response	Service	The number of DC Switch Response events (code 2015) has exceeded the DC Switch Response max Daily Count.	Call for service.
0020 see 6020	AC Caps, AC MOV	Service	The AC capacitor fuses have signaled a trip.	Call for service.
0026 see 2026	ASIC Reset	Service	The number of ASIC Reset events (code 2026) has exceeded the ASIC Max Daily Count.	Call for service.
0027	MTHA (time counter)	Service	The MTHA time counter has signaled an error.	Call for service.
0031	Current Sensor	Service	The AC current sensor has signaled a failure.	Call for service.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
0032 see 2032	Thermal Sensor S/C	Service	The number of short-circuits detected by the thermal sensor (code 2032) has exceeded the maximum daily limit.	Call for service.
0033 see 2033	Thermal Sensor O/C	Service	The number of open-circuits detected by the thermal sensor (code 2033) has exceeded the maximum daily limit.	Call for service.
0040 see 2040	PV Voltage Sensor	Service	The number of PV Voltage Sensor events (code 2040) has exceeded the PV V Sns. max Daily Count.	Call for service.
0041 see 2041	PV Current Sensor	Service	The number of PV Current Sensor events (code 2041) has exceeded the PV I Sns. max Daily Count.	Call for service.
0045 see 2045	Heater Response	Service	The number of Heater Response events (code 2045) has exceeded the maximum daily limit.	Call for service.
0050 see 2050	Phase Imbalance	Service	The number of Single Phase Transient events (code 2050) has exceeded the Single Phase Transient max Daily count. There has been a loss in at least one phase. The sensor might be signalling a fault.	Call for service.
0070	LC EEPROM	Service	The LC EEPROM is corrupted.	Call for service.
0071	Calibration EEPROM Zone	Service	The calibration EEPROM is corrupted.	Call for service.
0072	APP Flash	Service	The APP Flash is corrupted.	Call for service.
0073	APP EEPROM	Service	The APP EEPROM is corrupted.	Call for service.
0076	Power Supply fault	Service	Fault signal received from the power supply.	Call for service.
0078	24 V Aux Power	Service	Fault signal received from the 24 V auxiliary power supply.	Call for service.
0079	CPU	Service	Fault signal received from the processor; this could be related to RAM, Flash, Task, or Stack.	Call for service.
0088	Daily CB cycling service	Service	The Conext Core XC-NA Series has exceeded the value for Max. Daily Online Cycling.	Call for service.
0201	Internal SW	Service	Unexpected logic path detected in the software.	Call for service.
0202	Incompatible Configuration	Service	An incompatible card has been installed.	Call for service.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
0203	Invalid FGA Number	Service	Configured FGA number in EEPROM is not recognized by system: PV Systems: XCxxx or XCxxx-NA (f/w version 3.03 and later)	Call for service.
0260	Unidentified LC	Service	Unidentified LC detected.	Call for service.
0261	Incompatible Option Card	Service	An incompatible option card has been installed.	Call for service.
0262	Incompatible Power Rating	Service	The power configuration is mismatched to the hardware.	Call for service.
0263	Incompatible LC	Service	The line control card firmware is mismatched.	Call for service.
0611 see 2611	Precharging Timeout	Service	The number of precharging system events (code 2611) has exceeded the Charging Max Daily Count. Charging Max Daily Count resets automatically at midnight or with a manual Conext Core XC-NA Series reset.	Call for service.
0617	GFDI CB Response	Service	The GFDI circuit breaker is not responding to commands.	Call for service.
0618	PV Surge Arrestor (PV MOV)	Service	Fault signal received from the PV surge arrestor.	Call for service.
0619	Ground CB Open or Tripped	Service	The ground (GFDI) circuit has tripped. PV array grounding type = grounded: The ground (GFDI) circuit breaker is open or tripped.	For firmware v3.02 or newer, cycle power. For older firmware versions, call for service.
0620 see 2620	AC Over Current	Service	The number of overcurrent events (code 2620) and switching frequency events (code 2621) has exceeded the OCP Max Daily Count.	Call for service.
0623 see 2623	Ground Fault	Service	PV array grounding type = floating: The number of detected ground fault events (code "2623" on page 68) has exceeded the GFD Max Daily Count. PV array grounding type = grounded with RISO on: The duration of the detected ground fault has exceeded the RISO Service Delay.	For firmware v3.02 or newer. Cycle power. For older firmware versions, call for service.
0630 see 2630	IGBT Response	Service	The number of IGBT Transient events (code 2630) has exceeded the IGBT Max Daily Count. IGBT Max Daily Count resets automatically at midnight or with a manual Conext Core XC-NA Series reset.	Call for service.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
0804	Door Interlock	Service	A cabinet door interlock is compromised or the filter cartridge from the rear air intake or AIC is missing.	Call for service.
2010 see 0010	AC Switch Response	Offline	The AC circuit breaker is in the wrong position or is signalling an error. Once the AC circuit breaker is in the correct position or no longer signalling an error the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0010.
2015 see 0015	DC Switch Response	Offline	The PV disconnect is in the wrong position or is signalling an error. Once the PV disconnect is in the correct position or no longer signalling an error the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0015.
2026 see 0026	ASIC Reset	Offline	The ASIC is invalid or is signalling an error. Once the ASIC is validated or no longer signalling an error the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0026.
2032 see 0032	Thermal Sensor S/C	Offline	The thermal sensor is signalling a short-circuit. Once the thermal sensor is no longer signalling a short-circuit the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0032.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2033 see 0033	Thermal Sensor O/C	Offline	The thermal sensor is signalling an open-circuit. Once the thermal sensor is no longer signalling an open-circuit the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0033.
2038	Anlg. P Lim. Out of Range	Offline	The active power reference input is below the AI2 Low Disconnect Threshold or above the AI2 High Disconnect Threshold for longer than the Analog Input Disconnect Delay. Once the analog power reference input rises above the AI2 Low Reconnect Threshold or falls below the AI2 High Reconnect Threshold for longer than the Analog Input Reconnect Delay, the Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2039	Anlg. Q Ref. Out of Range	Offline	The reactive power reference input is below the AI4 Low Disconnect Threshold or above the AI4 High Disconnect Threshold for longer than the Analog Input Disconnect Delay. Once the reactive power reference input rises above the AI4 Low Reconnect Threshold or falls below the AI4 High Reconnect Threshold for longer than the Analog Input Reconnect Delay, the Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2040 see 0040	PV Voltage Sensor Transient	Offline	The difference in measured values between the PV and DC voltage sensors is above the PV V Sns. Disconnect Threshold. Once the difference in measured values between the PV and DC voltage sensors falls below the PV V Sns. Reconnect Threshold, the Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Internal Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0040.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2041 see 0041	PV Current Sensor Transient	Offline	<p>The difference in measured values from the PV current sensors is above the PV I Sns. Disconnect Threshold. Once the difference in measured values from the PV current sensors falls below the PV I Sns. Reconnect Threshold, the Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Internal Reconnection Delay period.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0041.</p>
2045 see 0045	Heater Response	Offline	<p>The Conext Core XC-NA Series Cold Offline Threshold, Cold Online Threshold, or Dew Point Temperature has triggered the heaters to turn on but the heaters do not turn on when commanded. The Conext Core XC-NA Series transitions to offline. When the heater turns on or the Conext Core XC-NA Series automatically clears this event, the inverter resumes normal operation after the Grid Reconnection Delay period.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0045.</p>
2050 see 0050	Single Phase Transient	Offline	<p>The difference between the phase currents is above the Current Imbalance Threshold for longer than the Current Imbalance Delay period. Once the difference between the phase currents falls below the Current Imbalance Threshold for longer than the Current Imbalance Delay period, the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.</p> <p>There has been a loss in at least one phase. The sensor might be signalling a fault.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0050.</p>

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2077	PVO Aux Power	Offline	<p>One of the PVO internal DC auxiliary power supplies is outside of its normal output voltage range for longer than the threshold delay. Once all of the PVO auxiliary power supplies are inside of the threshold for longer than the threshold delay, the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Internal Reconnection Delay period.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation.</p>
2080 see 6080	Thermal Condition (HS)	Offline	<p>The IGBT heatsink temperature is above the IGBT hardware-set over-temperature threshold. Once the IGBT heatsink temperature has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.</p>	<p>Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris.</p> <p>If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.</p> <p>Conext Core XC-NA Series will automatically resume operation.</p>
2081 see 6081	Thermal Condition (IGBT)	Offline	<p>The IGBT junction temperature is above the IGBT hardware-set over-temperature threshold. Once the IGBT junction temperature has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.</p>	<p>Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris.</p> <p>If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.</p> <p>Conext Core XC-NA Series will automatically resume operation.</p>

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2082 see 6082	Thermal Condition (2)	Offline	The APP control card temperature is above the hardware-set over-temperature threshold for longer than the Unit OTP Disconnect Delay period. Once the APP control card temperature has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	<p>Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris.</p> <p>If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.</p> <p>Conext Core XC-NA Series will automatically resume operation.</p>
2090 see 6090	IGBT Over Temp. Protection	Offline	The temperature of the IGBT heatsink is above the APP hardware-set over-temperature threshold for longer than the IGBT Heatsink Temperature Disconnect Threshold Delay period. Once the temperature of the IGBT heatsink has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	<p>Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris.</p> <p>If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.</p> <p>Conext Core XC-NA Series will automatically resume operation.</p>
2091	Ventilation Sys. Protection	Offline	The temperature of the power board is above the Power Board Temperature Disconnect Threshold for longer than the Power Board Temperature Disconnect Threshold Delay period. Once the temperature of the power board falls below the Power Board Temperature Reconnect Threshold for longer than the Power Board Temperature Reconnect Threshold Delay period, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	<p>Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris.</p> <p>If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.</p> <p>Conext Core XC-NA Series will automatically resume operation.</p>

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2095	ISL Comm.	Offline	An error was detected with the ISL communication. Once the ISL communication is verified, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2096	IO12 Comm.	Offline	An error was detected with the IO communication. Once the IO communication is verified, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2097	Option Card Comm.	Offline	An error was detected with the option card communication. Once the option card communication is verified, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2098	PVO-APP Comm.	Offline	An error was detected with the PVO to APP communication. Once the PVO to APP communication is verified, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2099	PVO-LC Comm.	Offline	An error was detected with the PVO to LC communication. Once the PVO to LC communication is verified, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2100	Line Control is not Ready	Offline	The Conext Core XC-NA Series detects that the line control is not running or not ready for pre-charging. Once the line control sends an active signal, the Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2401	AC Freq Low	Offline	The utility grid frequency is below the Disconnect Low or Very Low Frequency Threshold for longer than the Disconnect Low or Very Low Frequency Delay period. For the Conext Core XC-NA Series to clear this event, utility grid voltage and frequency must both be within range for longer than the respective delay periods. The Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2402	AC Freq High	Offline	The utility grid frequency is above the Disconnect High Frequency Threshold or the Disconnect Very High Frequency Threshold for longer than the Disconnect High Frequency Delay or Disconnect Very High Frequency Delay period. For the Conext Core XC-NA Series to clear this event, utility grid voltage and frequency must both be within range for longer than the respective delay periods. The Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2406	AC Voltage Low	Offline	The utility grid voltage is below the Disconnect Low Voltage Threshold or Disconnect Very Low Voltage Threshold for longer than the Disconnect Very Low Voltage Delay or Disconnect Low Voltage Delay period. For the Conext Core XC-NA Series to clear this event, utility grid voltage and frequency must both be within range for longer than the respective delay periods. The Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2407	AC Voltage High	Offline	The utility grid voltage is above the Disconnect High Voltage Threshold or Disconnect Very High Voltage Threshold for longer than the Disconnect High Voltage Delay or Disconnect Very High Voltage Delay period. For the Conext Core XC-NA Series to clear this event, utility grid voltage and frequency must both be within range for longer than the respective delay periods. The Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2410	Voltage Envelope High	Offline	The instantaneous amplitude of any phase of the grid is above the Voltage Envelope Threshold for longer than the Voltage Envelope Delay. Once the utility grid voltage has recovered to within the acceptable operating range, the Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2601	Hardware DC Over Voltage	Offline	The DC voltage is above the IGBT hardware-set over-voltage threshold. Once the DC voltage has recovered within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2602	Undervoltage DC	Offline	The DC voltage is below the IGBT hardware-set under-voltage threshold. Once the DC voltage has recovered within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2606	PV Voltage High	Offline	<p>The Conext Core XC-NA Series is in PV mode and has detected a DC input voltage above the PV High Voltage Disconnect Threshold for greater than the PV High Voltage Disconnect Delay period. Once the DC voltage has recovered to within the acceptable operating range, the Conext Core XC-NA Series qualifies the input, automatically clears this event after the PV High Voltage Reconnect Delay, and resumes normal operation after the Grid Reconnection Delay period.</p> <p>The PV system could be mis-wired or there might have been a lightning strike on or near the PV system wiring.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation.</p>
2607	CP Input Voltage High	Offline	<p>The Conext Core XC-NA Series is in CP mode and has detected a DC input voltage above the CP High Voltage Disconnect Threshold for greater than the CP High Voltage Disconnect Delay period. Once the DC voltage has recovered to within the acceptable operating range, the Conext Core XC-NA Series qualifies the input, automatically clears this event after the CP High Voltage Reconnect Delay, and resumes normal operation after the Grid Reconnection Delay period.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation.</p>
2608	CP Input Voltage Low	Offline	<p>The Conext Core XC-NA Series is in CP mode and has detected a DC input voltage below the CP Low Voltage Disconnect Threshold for greater than the CP Low Voltage Disconnect Delay period. Once the DC voltage has recovered to within the acceptable operating range, the Conext Core XC-NA Series qualifies the input, automatically clears this event after the CP Low Voltage Reconnect Delay, and resumes normal operation after the Grid Reconnection Delay period.</p>	<p>No action needed. Conext Core XC-NA Series will automatically resume operation.</p>

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2609	DC Over Voltage	Offline	The DC voltage is above the hardware-set Max DC Voltage threshold. Once the DC voltage has recovered within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2611 see 0263	Precharging Timeout	Offline	The precharging sequence during the Disable to Enable transition takes longer than expected (the DC voltage remains below the DC Under Voltage Threshold during charging). Once the Disable to Enable transition time has recovered to within the acceptable operating range, the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0263.
2612	Voltage Ramp Timeout	Offline	The charging ramp time is above the Charging Ramp Disconnection Delay. The Conext Core XC-NA Series transitions to Offline and shows Int Error Recon Delay on the front panel user interface. The Conext Core XC-NA Series automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2620 see 0620	Overcurrent	Offline	The short circuit current is above the IGBT hardware-set overcurrent threshold. Once the short circuit current has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0620.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2621	Switching Freq.	Offline	The control frequency is above the hardware-set control frequency threshold. Once the control frequency has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2622	PV Neg Current	Offline	The PV current is below the PV current trigger threshold. Once the PV current has recovered to within the acceptable operating range, the Conext Core XC-NA Series waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2623 see 0623	Ground Fault	Offline	The array isolation monitor or the ground fault detector interrupter signals the presence of a ground fault. The Conext Core XC-NA Series waits for the GFD Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2630 see 0630	IGBT Transient	Offline	The de-sat (desaturation) condition is above the IGBT hardware-set de-sat condition threshold. Once the de-sat condition has recovered to within the acceptable operating range, the Conext Core XC-NA Series resets the hardware latch, waits for the Int Error Recon Delay period to pass, and then automatically clears this event and resumes normal operation after the Grid Reconnection Delay period.	No action needed. Conext Core XC-NA Series will automatically resume operation or escalate to code 0630.
2803	Utility Region is "NONE"	Offline	The utility region is set to None. This is the factory default; utility region must be set during commissioning. Once the utility region is set to a valid region, the Conext Core XC-NA Series qualifies the grid, automatically clears this event, and resumes normal operation after the Grid Reconnection Delay period.	Call for service.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
2804	System is locked	Offline	The Conext Core XC-NA Series is locked. This is the factory default; Conext Core XC-NA Series must be unlocked with a password during commissioning. Once the password is entered to unlock the Conext Core XC-NA Series, the Conext Core XC-NA Series automatically clears this event, qualifies the grid, and resumes normal operation.	An authorized service person must enter the password to unlock the Conext Core XC-NA Series. Once unlocked, the Conext Core XC-NA Series will automatically resume operation.
2805	Too Cold	Offline	The internal temperature of the Conext Core XC-NA Series is below the Cold Offline Threshold (if the Conext Core XC-NA Series is offline) or Cold Online Threshold (if the Conext Core XC-NA Series is online). The Conext Core XC-NA Series will raise this event and transition to offline. Once the internal temperature of the Conext Core XC-NA Series has recovered to within the acceptable operating range, the Conext Core XC-NA Series automatically clears this event and resumes normal operation.	No action needed. Conext Core XC-NA Series will automatically resume operation.
2806	Dew Point Control	Offline	<p>The internal temperature of the Conext Core XC-NA Series is above the Dew Point Temperature setting, the heater is on (due to a high humidity reading from the dew point controller), and the Conext Core XC-NA Series is offline.</p> <ul style="list-style-type: none"> ■ When the temperature drops below the Dew Point Temperature setting or the heater turns off, the Conext Core XC-NA Series automatically clears this event and resumes normal operation immediately. <p>OR</p> <ul style="list-style-type: none"> ■ After the Dew Point Recon. Delay period, the Conext Core XC-NA Series automatically clears this event and resumes normal operation regardless of the Dew Point condition. 	No action needed. Conext Core XC-NA Series will automatically resume operation.
4006	AC/DC Fan Rotation	Online	One of the fans in either the AC or DC cabinet has dropped below the AC/DC Fan Threshold. The Conext Core XC-NA Series begins power limiting at 10% of nominal active power.	Call for service.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
4007	AIC Fan Rotation	Online	One of the AIC fans in the power stage cabinet has reported a fan block signal for longer than the Fan Block Delay period. Fan blocked by debris, or fan failure detected. The Conext Core XC-NA Series begins power limiting at 10% of nominal active power.	Call for service.
4036	RTC Service Mode	Online	The RTC has signalled a fault.	Call for service.
4037	RTC Battery Low	Online	The RTC battery is low.	Call for service.
4042	DC Switch Alert	Online	The DC switch is approaching its lifetime number of opening and closing cycles.	Call for service.
4043	AC Switch Alert	Online	The AC switch is approaching its lifetime number of opening and closing cycles.	Call for service.
4044	Operational Info. Eeprom	Online	The operational EEPROM zone has lost data.	Call for service.
4045	Heater Response	Offline	The heater does not start when expected.	Call for service.
4046	Cabinet Air Filters	Online	The AC or DC cabinet internal temperature is too high; the air filter may be blocked. The Conext Core XC-NA Series begins power derating at the Thermal Derating Rate.	Clean or replace the cabinet air filters (see <i>Air Intake Filter Check and Replacement Procedure</i>), if the event reoccurs, call for service.
4048	AIC Filter Derating	Online	The temperature of the power board has exceeded the AIC Filter Derating Threshold. The Conext Core XC-NA Series begins power derating at the Thermal Derating Rate.	Replace the AIC filter (see <i>Active In-feed Converter Filter Check and Replacement Procedure</i>), if the event reoccurs, call for service.
4610	DC Capacitor Alert	Online	The DC capacitors might be approaching their published lifetime (accumulative surge timer threshold reached).	Call for service.
6000	Initialization, please wait	Initializing	Logged event only.	No action needed.
6001	IM400-Wait/Grid-Reconn. Delay	Offline	Logged event only.	No action needed.
6020 see 0020	AC Caps, AC MOV	Online	The AC capacitor fuses have signaled a trip.	No action needed.
6074	Config 0	Online	The default configuration table 0 is inconsistent.	No action needed.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
6075	Config 1	Online	The default configuration table 1 is inconsistent.	No action needed.
6080 see 2080	Thermal Power Shifting (HS)	Online	The IGBT temperature is above the IGBT hardware-set over-temperature threshold and the Conext Core XC-NA Series is now derating.	Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris. If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.
6081 see 2081	Thermal Power Shifting (IGBT)	Online	The IGBT temperature is above the IGBT hardware-set over-temperature threshold and the Conext Core XC-NA Series is now derating.	Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris. If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.
6082 see 2082	Thermal Condition (2)	Online	The APP control card temperature is above the hardware-set over-temperature threshold and the Conext Core XC-NA Series is now derating.	Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris. If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
6090 see 2090	IGBT Over Temp.	Online	The IGBT temperature is above the IGBT hardware-set over-temperature shift threshold and is now derating.	Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris. If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.
6092	Switch SW2	Online	The remote hardware enable signal is active.	No action needed.
6094	Cold Start	Offline	The temperature of power board and average of heat sinks is higher than the Cold Offline Threshold (when the Conext Core XC-NA Series is offline) and lower than the Cold Start Reset Threshold. The Conext Core XC-NA Series will begin Cold Start procedure by transitioning the Conext Core XC-NA Series to online state. Once the temperature is higher than the Cold Start Reset Threshold or the Cold Start lasts for the period of the Cold Start Time, the Conext Core XC-NA Series will automatically stop Cold Start procedure and resume the normal online operation.	No action needed.
6421	Line Freq Based Power Control	Online	Logged event only.	No action needed.
6430	Reconnecting	Online	Logged event only.	No action needed.
6626	no PV Power	Online	Logged event only.	No action needed.
6627	PV OC Voltage Low	Online	Logged event only.	No action needed.
6640	Active Power Point Tracking	Online	Logged event only.	No action needed.
6641	Low Power Tracking Mode	Online	Logged event only.	No action needed.
6642	Power Point Shifting	Online	Logged event only.	No action needed.
6643	User PV Voltage Control	Online	Logged event only.	No action needed.
6644	Current Limit Active	Online	Logged event only.	No action needed.
6645	Power Limit Active	Online	Logged event only.	No action needed.

Event Code	Event Condition Name	State	Event Condition Description	Required Action
6801	Disable via Software Command	Disable	The system was commanded via the front panel user interface or via an optional remote monitoring interface to transition to the Disable state. This event is not indicative of a failure or malfunction, but primarily indicates that the Conext Core XC-NA Series was shut down.	No action needed.
6802	Disable via Local Switch	Disable	The local ENABLE STATE/DISABLE STATE switch is open.	No action needed.
6803	Disable via External Switch	Disable	The remote ENABLE STATE/DISABLE STATE switch is open.	No action needed.
6804	Performing RISO measurement	Offline	Logged event only.	No action needed.
6814	System is Shutting Down...	Online	This is a temporary Event ID that signals the Conext Core XC-NA Series is in a controlled shutdown.	No action needed.

Front Panel User Interface Troubleshooting

The front panel user interface is behind a cover located on the door of the AC cabinet. The cover has a window to allow you to easily see the display and read status information. The cover and the heaters behind the cabinet door, help to keep the front panel user interface warm. If you have the cover open for an extended period of time in cold weather—below 0 °C (32 °F), even though the heater is active, the front panel user interface may stop responding. Should this happen, (for example, while changing settings) close the cover and allow the internal heaters to warm the front panel user interface until it responds.

<i>NOTICE</i>
<p>EQUIPMENT DAMAGE</p> <ul style="list-style-type: none"> ■ Do not open the cover when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinet. ■ Repeated or extended low temperature exposure may reduce the lifetime of the front panel user interface. <p>Failure to follow these instructions can result in equipment damage and can compromise the environmental protection of the inverter.</p>

Ground Fault Status Indicator Troubleshooting

This troubleshooting only applies to inverters where the GFD option is included.

There is an indicator light located in the middle of the DC cabinet door that illuminates red in the event of a detected ground fault or during isolation measurements of grounded

installations. The indicator may also illuminate in the event of a loss of power in the isolation monitor. Troubleshoot the ground fault accordingly.

  **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- Measure voltage before proceeding. Always assume that the ground fault status indicator is illuminated due to a ground fault. Normally grounded conductors may be ungrounded and energized, or normally ungrounded conductors may be grounded, when a ground fault is present. Normally grounded DC conductors will become intermittently ungrounded with indication by the ground fault status indicator when the Conext Core XC-NA Series measures the PV array isolation.
- Do not defeat or modify the GFD circuit in any way.
- Do not operate the Conext Core XC-NA Series without a functioning GFD circuit.

Failure to follow these instructions will result in death or serious injury.

6 Preventive Maintenance

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Returning the Inverter to Operation	83

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

All service and preventive maintenance not described in this chapter must be performed by authorized service personnel only, as defined in the *Audience on page 1*, following the lock-out and tag-out procedure in *Service Bulletin for Lock-Out and Tag-Out Procedures (document number 993-0479)*.

Failure to follow these instructions will result in death or serious injury.

NOTICE

EQUIPMENT DAMAGE

- The service area around the Conext Core XC-NA Series must be dry and free of debris during installation, commissioning, servicing or preventive maintenance.
- If installation, commissioning, servicing or preventive maintenance must be performed when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinet (such as rain, snow, or heavy wind) or if the temperature is below freezing, the customer must provide a service shelter at their own expense.
- If the service shelter is not provided, the installation, commissioning, servicing or preventive maintenance will be postponed until the environmental conditions have cleared.
- Do not open cabinet doors and covers or remove screens and filters when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinets.
- Close the doors when you are not working in the cabinets.

Failure to follow these instructions can result in damage to equipment and can compromise the environmental protection of the Conext Core XC-NA Series.

Maintenance Requirements

Preventive maintenance is required to help provide safe operation and good performance.

Maintenance in Response to Periodic Servicing Reminder Events

If at any time the periodic servicing reminder activates (a “!” in the top, left corner of the front panel user interface and a corresponding event code sent by the monitoring system), then the specific maintenance that the reminder relates to must be performed promptly.

Longer Maintenance Intervals

Preventive maintenance over time intervals longer than a month is required. This maintenance must always be performed by authorized service personnel. Preventive Maintenance contracts can be arranged with the manufacturer. Contact your local Schneider Electric Front Office to book an appointment with authorized service personnel to perform preventive maintenance tasks on a contract basis or to perform maintenance upon request. For major maintenance events dealing with heavy equipment, it is the

customer's responsibility to have a fork-lift and licensed fork-lift operator available on site.

Maintenance on a Monthly Interval (or more often if required)

The only maintenance that can be performed by a customer is the *External Cleaning Procedure*, *Exhaust Screen Cleaning Procedure*, *Air Intake Filter Check and Replacement Procedure*, and *Active In-feed Converter Filter Check and Replacement Procedure*. All other maintenance must be performed by authorized service personnel, as defined in the *Audience on page 1*. Customers should follow the monthly interval at a minimum; however, the environmental degree of pollution at the installation could mean that cleaning of dirt and debris needs to be performed more frequently.

External Cleaning Procedure

Accumulation of dirt and debris around and in exhaust locations, the AIC filter in the power stage cabinet, and rear air intake filters will decrease the ability of the Conext Core XC-NA Series to move air which could cause the Conext Core XC-NA Series to enter Service state based upon an over-temperature event. Less cooling will lead to decreased Conext Core XC-NA Series lifetime. Vacuuming of dirt or debris can be done by operators; it does not require authorized service personnel.

WARNING

HAZARD OF AMPUTATION

- Shut down the inverter before attempting to inspect or clean the external cooling fans. See *Air Intake Filter Check and Replacement Procedure on page 81*.
- Enclosure doors must remain closed at all times, even during debris-clearing.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

To clean the exterior of the Conext Core XC-NA Series:

1. Visually inspect the exhaust locations and rear air intake filters for accumulation of dirt and debris.
2. If there is any dirt or debris blocking the air intake or exhaust, clear the debris using a vacuum cleaner or similar tool.

Exhaust Screen Cleaning Procedure

The exhaust locations on the front and back of the Conext Core XC-NA Series have eight total screens that need to remain free of obstruction.

DANGER

HAZARD OF ELECTRIC SHOCK AND AMPUTATION

Remove and clean only the outer screen. Do not remove the second, inner screen.

Failure to follow these instructions will result in death or serious injury.

NOTICE

EQUIPMENT DAMAGE

- Do not remove the exhaust screens when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinet.
- Reinstall the exhaust screens as soon as they are clean.
- Do not twist or bend screens as you remove them. They must retain their shape to be effective when they are reinstalled.
- Do not use harsh cleaners, brushes, pressure washers, or clean dry air (CDA) that is pressurized over 70 kPa (10 psi).

Failure to follow these instructions can result in damage to equipment and can compromise the environmental protection of the Conext Core XC-NA Series.

To clean the exhaust screens:

1. Use a Phillips screwdriver to remove the two screws on either side of each exhaust screen, as shown in *Figure 15*.
2. Keep the screws.
3. Gently clean the screen using warm soapy water.
4. Fully rinse the screen clear of soap.
5. Reinstall the exhaust screen, with the drain holes pointing down, using the screws removed in step 1.

Figure 15 Exhaust screen removal



Air Intake Screen Cleaning Procedure

There are four air intakes located at the rear of the inverter. One each for the AC and DC cabinet, and two for the power stage cabinet.

NOTICE

EQUIPMENT DAMAGE

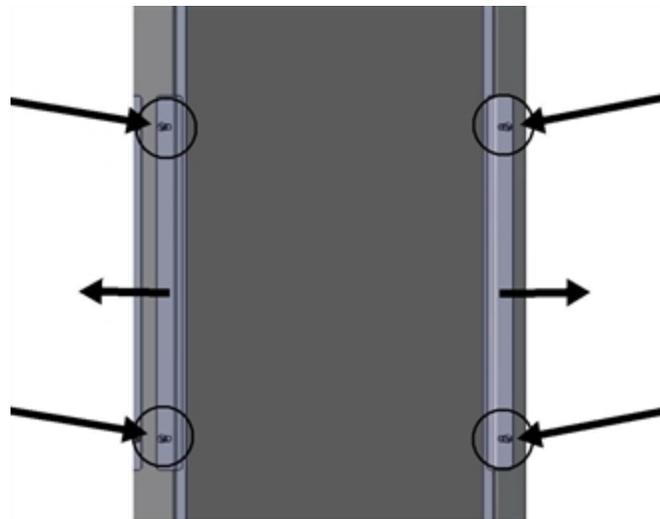
- Do not remove the air intake screens when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinet.
- Reinstall the air intake screens as soon as they are clean.
- Do not twist or bend screens as you remove them. They must retain their shape to be effective when they are reinstalled.
- Do not use harsh cleaners, brushes, pressure washers, or clean dry air (CDA) that is pressurized over 70 kPa (10 psi).

Failure to follow these instructions can result in damage to equipment and can compromise the environmental protection of the Conext Core XC-NA Series.

To clean the air intake screens:

1. Use a Phillips screwdriver to loosen the four screws on the brackets retaining the screen, as shown in *Figure 16*.
2. Slide the brackets to either side and remove the screen by pulling it towards you.
3. Gently clean the screen using warm soapy water.
4. Fully rinse the screen clear of soap.
5. Reinstall the air intake screen, ensuring that the honeycomb is on the inside and the bug screen is on the outside.
6. Slide the brackets back over the screen and tighten the screws until snug.

Figure 16 Air intake locations



Air Intake Filter Check and Replacement Procedure

The air intakes located on the rear panels of the AC and DC cabinets have a filter that must be checked and replaced as needed. Removing the air intake filter initiates an immediate controlled shutdown of the Conext Core XC-NA Series. It is strongly recommended that you initiate a shutdown with the switches as described in this procedure. You will need to restart the Conext Core XC-NA Series after you replace the air filter.

NOTICE

EQUIPMENT DAMAGE

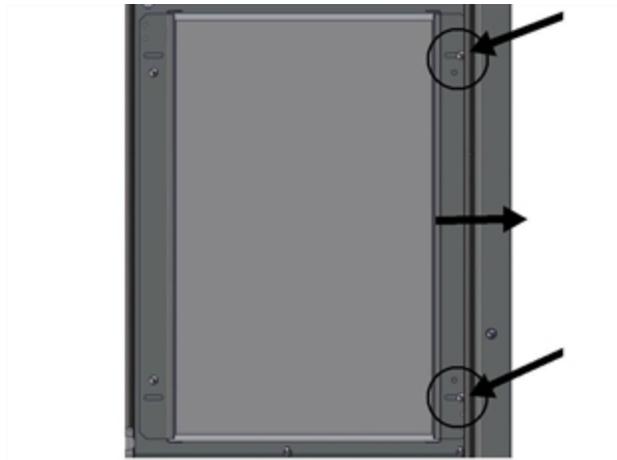
- Do not remove the air intake filters when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinet.
- Reinstall the air intake screens as soon as the air filters are replaced.
- Do not twist or bend screens as you remove them. They must retain their shape to be effective when they are reinstalled.
- Filters are not washable and must be replaced.

Failure to follow these instructions can result in damage to equipment and can compromise the environmental protection of the Conext Core XC-NA Series.

To remove and replace the filters:

1. Shut down the Conext Core XC-NA Series by turning the ENABLE state/DISABLE state switch to DISABLE state and the inverter ON/OFF switch to OFF.
2. Remove the air intake screens on the AC and DC cabinets only, as described in *To clean the air intake screens: on page 80*.
3. Use a Phillips screwdriver to loosen the two screws on the bracket on the right-hand side of the filter, as shown in *Figure 17*.
4. Slide the right-hand bracket to the right and remove the filter by pulling it towards you.
5. Tip the air filter horizontally and shake it to remove any loose dust and debris. Inspect the filter for damage and embedded debris, and replace it if needed. Filters are not washable.
Note: Filters are a specialized part. If you must replace the filter, contact your local Schneider Electric Front Office.
6. Reinstall the air filters and verify that the interlock switches are operating correctly by performing the following steps:
 - a. Slide the air filter towards the interlock switch until you feel the filter click into place.
 - b. Slide the bracket back against the air filter, and tighten the screws securely.
7. Reinstall the air intake screens on the AC and DC cabinets, as described in *To clean the air intake screens: on page 80*.

Figure 17 AC and DC cabinet air filter removal



Active In-feed Converter Filter Check and Replacement Procedure

The active in-feed converter (AIC) filter is located in the left-hand section of the power stage cabinet. Barriers are installed in the power stage cabinet for protection while replacing the AIC filter.

NOTICE

EQUIPMENT DAMAGE

- Do not open the power stage cabinet doors when the environmental conditions indicate a possibility of dust, rain, or strong wind entering the cabinet.
- Close the power stage cabinet doors as soon as you have replaced the AIC filter.

Failure to follow these instructions can result in equipment damage.

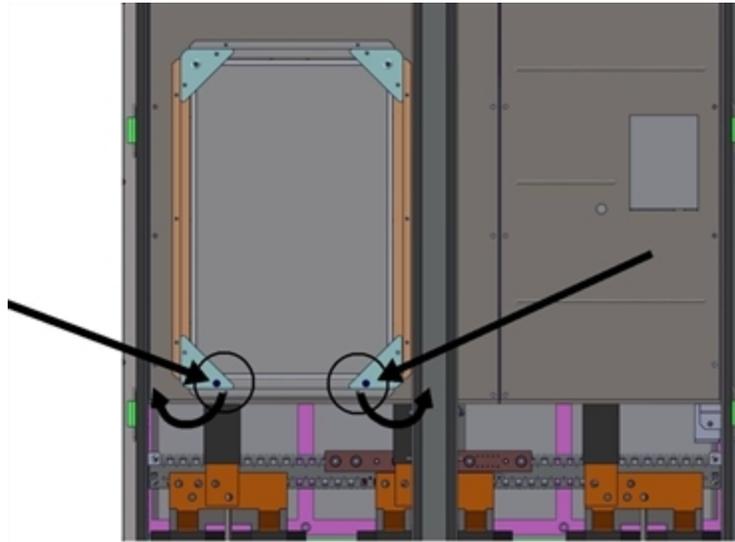
To remove and replace the AIC filter:

1. Shut down the Conext Core XC-NA Series by turning the ENABLE state/DISABLE state switch to DISABLE state and the inverter ON/OFF switch to OFF.
2. Open the left-hand power stage cabinet door.
3. Locate the AIC filter in the center of the left cabinet, as shown in *Figure 18*.
4. Loosen the captive thumb screws holding the bottom metal triangles in place.
5. Pivot the metal triangle and slide the filter out the bottom.
6. Tip the air intake filter horizontally and shake it to remove any loose dust and debris. Inspect the filter for damage and embedded debris, and replace it if needed. Filters are not washable.

Note: Filters are a specialized part. If you must replace the filter, contact your local Schneider Electric Front Office.
7. Reinstall the air filter by sliding it upwards against the top frame, and then pushing the bottom in against the interlock switch until you feel it click into place.

8. Replace the filter with a new one by sliding it up from the bottom, making sure that the top is behind the upper metal triangles.
9. Pivot the metal triangle back in to place and tighten the captive thumb screws until snug.
10. Close the power stage cabinet door as soon as the work is complete.

Figure 18 AIC filter location



Returning the Inverter to Operation

This section describes how to return the inverter to normal operation.

To return the inverter to operation:

1. Turn the inverter ON/OFF switch (QS2) to the ON position.
2. Check the inverter state on the home screen of the front panel user interface. The inverter state should be Offline (not producing power). If the inverter state is Service, troubleshoot accordingly.
3. Turn the ENABLE STATE/DISABLE STATE switch (S11) to the ENABLE STATE position.
4. Look at the ground fault status indicator on the front of the DC cabinet door. If it is illuminated, troubleshoot accordingly before continuing.
5. Check the inverter state on the home screen of the front panel user interface. If the inverter state is Service, troubleshoot accordingly.
6. Verify that the inverter is operating normally and is not in the Service state.

7 Specifications

What's in This Chapter?

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 <b style="font-size: 1.2em;">WARNING
<p>HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE HAZARD OF EQUIPMENT DAMAGE</p> <p>Unsafe conditions and damage to the Conext Core XC-NA Series can result if the instructions and electrical, physical, and environmental installation specifications in this manual are not obeyed.</p> <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

System Specifications

The Conext Core XC-NA Series has only been designed for use with photovoltaic power storage systems that operate within the following specifications.

Electrical Specifications

Table 14 Electrical specifications

Specification	XC540-NA	XC630-NA	XC680-NA	XC733-NA
Number of output phases	3	3	3	3
Nominal phase-to-phase AC voltage (VAC)	300 V _{rms}	350 V _{rms}	380 V _{rms}	407 V _{rms}
Overvoltage category (AC Mains)	III	III	III	III
Maximum AC output current	1040 A _{rms}	1040 A _{rms}	1040 A _{rms}	1040 A _{rms}
Nominal AC frequency (f)	60 Hz			
Power factor settable range (Ppf dispatch)	0.7 to 1.0 (leading and lagging)			
Power factor range (PQ dispatch)	0 to 1 (leading and lagging)			
AC output current distortion	< 3% THD (total harmonic distortion) at rated power			
Output power (S)	540 kVA	630 kVA	680 kVA	733 kVA
Real power (at PF = 1)	540 kW	630 kW	680 kW	733 kW
Reactive power range (Q)	± 540 kVAr	± 630 kVAr	± 680 kVAr	± 733 kVAr
Suggested PV array peak power ¹	621 kW	725 kW	782 kW	834 kW
Maximum open circuit PV voltage	1000 VDC	1000 VDC	1000 VDC	1000 VDC
Maximum PV operating current	1280 A	1280 A	1280 A	1280 A
Maximum array short circuit current at STC (standard test conditions)	1600 A	1600 A	1600 A	1600 A

¹ Higher PV array peak power may be possible, refer to the Conext Core XC and XC-NA Series: DC to AC Over-paneling Application Note (part number: AP-XC-056)

Specification	XC540-NA	XC630-NA	XC680-NA	XC733-NA
Maximum array short circuit current under any condition	2000 A	2000 A	2000 A	2000 A
MPP (maximum power point) range ²	440 to 800 V	510 to 800 V	550 to 800 V	591 to 800 V
Static MPPT accuracy	> 99.9% 5% to 100% of nominal power Entire MPP (maximum power point) range PV generator Fill Factor from 60-80%			
PV operating voltage range	440 ³ to 885 V	510 ³ to 885 V	550 ³ to 885 V	591 ³ to 885 V
External auxiliary AC source voltage	3-phase: 208 or 240 V _{rms}			
External auxiliary supply power required	3000 VA	3000 VA	3000 VA	3000 VA
CEC method	≥97%	97.5%	97.5%	98%
Peak efficiency	≥98.2%	≥98.5%	≥98.6%	98.7%

Physical and Environmental Specifications

Table 15 shows the physical and environmental specifications for the Conext Core XC-NA Series.

Table 15 Physical and environmental specifications

Specification	Conext Core XC-NA Series
Dimensions	2407 mm W x 2273 mm H x 854 mm D (see Figure 19 on page 91) 94¾ in. W x 89½ in. H x 33¾ in. D
Net weight	1940 kg (4277 lbs)
Gross shipping weight (approximate)	2190 kg (4828 lb)
Altitude	1000 m with no deratings ⁴
Maximum altitude	2000 m with possible derating

² Valid for power factor = 1 (Q = 0). For more information, see Application Note on Power Point Tracking for Conext Core XC and XC-NA Series Inverters (document number AP-XC-007-EN).

³ Higher PV array peak power may be possible, refer to the Conext Core XC and XC-NA Series: DC to AC Over-paneling Application Note (part number: AP-XC-056).

⁴ Depending on ambient temperature at altitude, the output power must be derated above 1000 m. See Application Note: Conext Core XC-NA Series Grid Tie Photovoltaic Inverter: Altitude Derating Application Note (document number AP-XC-016-EN).

Specification	Conext Core XC-NA Series
Operating temperature and humidity	-20°C to +50 °C (-4°F to 122 °F) Optional -35°C to +50 °C (-31°F to 122 °F) Relative humidity: 0 to 100% condensing
Storage temperature and humidity	-20°C to +55 °C (-4°F to 131 °F) Relative humidity: 0 to 100% condensing
Storage air pressure	700 to 1060 mbar
Maximum storage time ⁵	<ul style="list-style-type: none"> ■ The inverter must be commissioned within 24 months from the date of the Schneider Electric commercial invoice. ■ After commissioning, the inverter may not be shut down or de-energized for a period longer than 24 months.
Degree of protection (outdoor installation)	Enclosure type 3R, suitable for use in class 4S2 according to IEC 60721-3-4
Degree of protection (indoor installation)	Type 1
DC overvoltage protection	Type II surge arrestor
Clearance (ventilation and serviceability)	Top: 300 mm (11¾ in.) Front: 977 mm (38½ in.) plus local safety standards for door clearance Rear: 914 mm (36 in.) plus local safety standards for air intakes

⁵ When de-energized and stored for more than 24 months, the performance of electrolytic capacitors used in the inverter degrades. Restoration of the capacitors by a method known as Reforming is then required prior to use. Failure to do so may result in damage to the capacitors and void your warranty. For more information on Reforming, see *Capacitor Leakage Test for Conext Core XC Series Grid Tie Photovoltaic Inverters* (document number SD-XC-032).

Regulatory Specifications

Regulatory specifications for the Conext Core XC-NA Series are CSA-certified⁶ to UL1741 and C22.2 No. 107.1.

Over Voltage, Under Voltage, Frequency, and Tolerances

Table 16 provides over/under voltage and over/under frequency information.

Table 16 Over/under voltage and over/under frequency

Condition		Trip time (seconds)
Voltage (V)	Frequency (Hz)	
V < 50% Vnom (50% default) Adjustable 0–100%	Rated (60 Hz)	0.16 s (default) (Adjustable 0 – 65.535 s)
50% Vnom ≤ V < 88% Vnom (88% default) Adjustable 60–100%	Rated (60 Hz)	2.0 s (default) (Adjustable 0 – 65.535 s)
110% Vnom < V < 120% Vnom (110% default) Adjustable 100–140% for XC540, 630, and 680 kVA Adjustable 100 -120% for XC733 kVA	Rated (60 Hz)	1.0 s (default) (Adjustable 0 – 65.535 s)
V ≥ 120% Vnom (120% default) Adjustable 100–140% for XC540, 630, and 680 kVA Adjustable 100 -120% for XC733 kVA	Rated (60 Hz)	0.16 s (default) (Adjustable 0 – 65.535 s)
Rated Vnom	65.0 Hz (default) (Adjustable Set points 50.0 – 80.0)	3 s (default) (Adjustable 0 – 65.535 s)
Rated Vnom	>60.5 Hz 60.5 Hz (default) (Adjustable Set points 50.0 – 70.0)	0.16 s (default) (Adjustable 0 – 65.535 s)
Rated Vnom	<59.8 Hz 59.3 Hz (default) (Adjustable Set points 40.0 – 60.0)	0.16 s (default) (Adjustable 0 – 65.535 s)
Rated Vnom	<57.0 Hz 57.0 Hz (default) (Adjustable Set points 40.0 – 60.0)	0.16 s (default) (Adjustable 0 – 65.535 s)

⁶ Certified only when the Conext Core XC-NA Series is installed in conjunction with the DC Recombiner Mating Kit.

The following table provides tolerance information.

Table 17 Voltage and frequency tolerances

Trip parameter type	Tolerance
Voltage	± 2%
Frequency	± 0.1 Hz
Time	± 0.1%, but not less than ± 90 ms

Bolt Sizes and Torque Requirements

Table 18 provides acceptable bolt sizes and torque values for AC terminal connections.

Table 18 AC terminal bolt size and torque values

AC Terminal Connections	Number of Terminals	Max # Conductors per Terminal	Bolt (Hardware) Size	Torque Requirements ⁷
Grounding (PE)	10	2	M10	26 Nm (19 lb-ft)
AC output/grid (XT1)	3 (~ L1, ~ L2, ~ L3)	15	M12	61.4 Nm (45.3 lb-ft)
External auxiliary AC source (XT4)	3 (~ L1, ~ L2, ~ L3)	1	Maximum size: 5 mm ² (10 AWG) stranded conductor.	N/A spring clamps

Table 19 provides acceptable bolt sizes and torque values for PV terminal connections.

Table 19 PV terminal bolt sizes and torque values

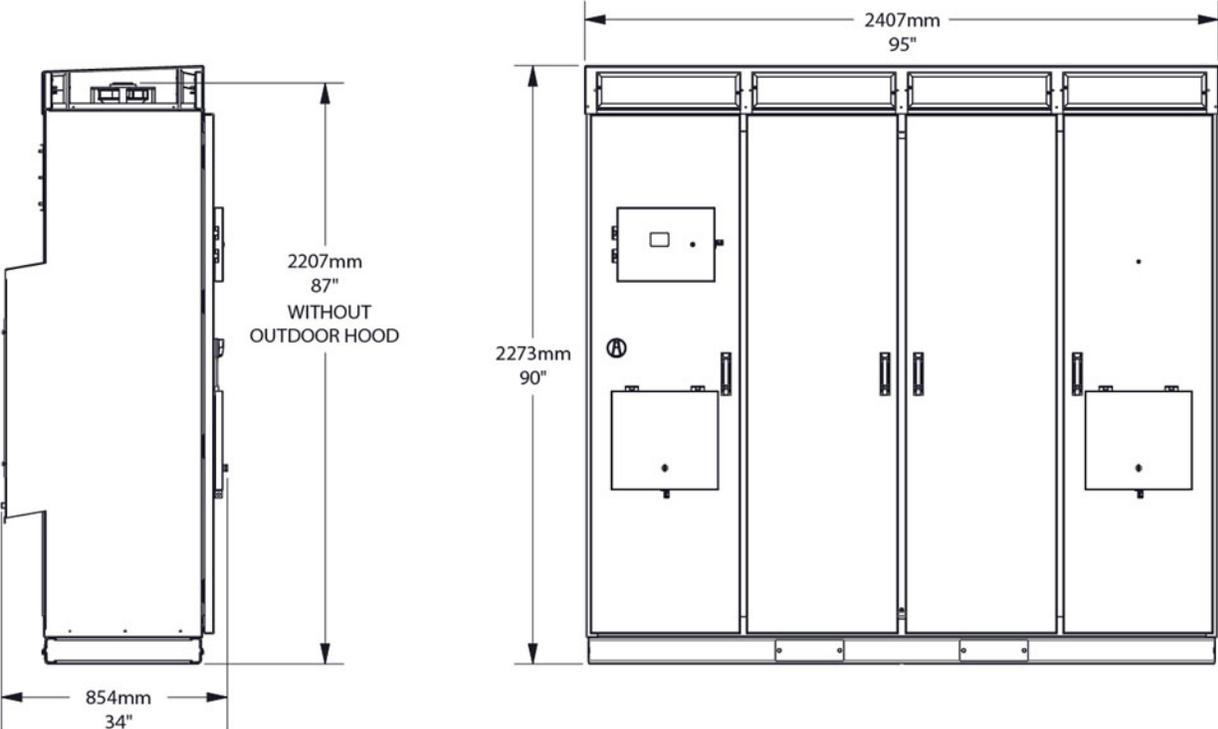
DC Terminal Connections	Number of Terminals	Max # Conductors per Terminal	Bolt (Hardware) Size	Torque Requirements ¹
Mating Kit rigid busbars to PV+ and PV- terminals on rear wall of DC cabinet ²	2 (PV+, PV-, 3 bolts each)	1	M12	61.4 Nm (45.3 lb-ft)
Mating Kit flexible busbars to Mating Kit rigid busbars ²	2 (PV+, PV-, 2 bolts each)	1	M12	61.4 Nm (45.3 lb-ft)

⁷ Draw a single permanent line across the fastener and the mounting surface immediately after the connector is torqued to the correct value.

DC Terminal Connections	Number of Terminals	Max # Conductors per Terminal	Bolt (Hardware) Size	Torque Requirements¹
DC Recombiner ground busbar to equipment ground busbar in DC cabinet ²	1	1	M10	26 Nm (19 lb-ft)

Dimensions

Figure 19 Conext Core XC-NA Series dimensions



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As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

For other country details please contact your local Schneider Electric Sales Representative or visit the Schneider Electric Solar Business website at: <http://solar.schneider-electric.com/>

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