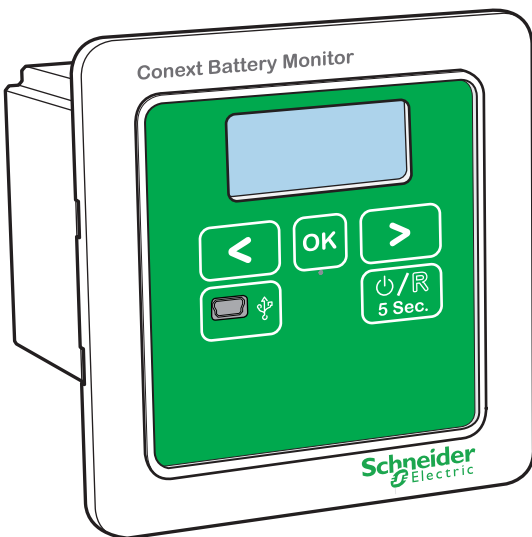


Conext™ Battery Monitor Quick Start Guide

865-1080-01

<http://solar.schneider-electric.com>



A Introduction

The Conext Battery Monitor is a meter for 24 V & 48 V batteries designed for use in off-grid power systems as a wall/panel/DIN-rail mount device. It features a local display to selectively show the voltage, current, consumed amp-hours, remaining capacity, and remaining hours.

The Battery Monitor connects with other Xanbus devices such as Inverters, Solar Charge Controllers, Automatic Gen Start & System Control Panel via Xanbus ports to provide accurate information about the state of the connected battery. The Battery Monitor is wired to the battery through two ports, an analog signal port and BTS (Battery Temperature Sensor).

Important Safety Information

This Guide is intended for any qualified personnel who need to operate, configure, and troubleshoot the Conext Battery Monitor. Certain configuration tasks should only be performed by qualified personnel in consultation with your local utility and/or an authorized dealer. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. Servicing of batteries must only be performed or supervised by qualified personnel with knowledge of batteries and their required precautions.

Qualified personnel have training, knowledge, and experience in:

- Installing electrical equipment
- Applying applicable installation codes
- Analyzing and reducing the hazards involved in performing electrical work
- Installing and configuring batteries
- Selecting and using Personal Protective Equipment (PPE)

No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

1. Before using this product, read all instructions and cautionary markings on the unit, the batteries, and all appropriate sections of this manual.
2. Use of accessories not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
3. The manufacturer recommends that all wiring be done by a certified technician or electrician to ensure adherence to the local and national electrical codes applicable in your jurisdiction.
4. To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the equipment with damaged or substandard wiring.
5. Do not operate the equipment if it has been damaged in any way.
6. This unit does not have any user-serviceable parts. Do not disassemble the combiner box except where noted for connecting wiring and cabling. See your warranty for instructions on obtaining service. Attempting to service the unit yourself may result in a risk of electrical shock or fire. Internal capacitors remain charged after all power is disconnected.
7. To reduce the risk of electrical shock, disconnect both AC and DC power from the equipment before attempting any maintenance or cleaning or working on any components connected to the equipment. Putting the unit in Standby mode will not reduce this risk.
8. The equipment must be provided with an equipment-grounding conductor connected to the AC input ground.
9. Do not expose this unit to rain, snow, or liquids of any type. This product is designed for indoor use only. Damp environments will significantly shorten the life of this product and corrosion caused by dampness will not be covered by the product warranty.
10. To reduce the chance of short-circuits, always use insulated tools when installing or working with this equipment.
11. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with electrical equipment.

Read and Save These Instructions - Do Not Discard

This guide contains important safety instructions for the Conext Battery Monitor that must be followed during installation procedures. Read and keep this Quick Start Guide for future reference.

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 bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

Note: The Conext Battery Monitor is not compatible with Lithium-Ion batteries.

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.

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Remove watches, rings, or other metal objects.
 - This equipment must only be installed and serviced by qualified electrical personnel.
 - Keep sparks and flames away from the batteries.
 - Use tools with insulated handles.
 - Wear protective glasses, gloves and boots.
 - Do not lay tools or other metal parts on top of batteries.
 - Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
 - Never operate energized with covers removed.
 - Energized from multiple sources. Before removing covers identify all sources, de-energize, lock-out, and tag-out and wait 2 minutes for circuits to discharge.
 - Always use a properly rated voltage sensing device to confirm all circuits are de-energized.
- Failure to follow these instructions will result in death or serious injury.

HAZARD OF ELECTRIC SHOCK AND FIRE

- Connect only to Safety Extra Low Voltage (SELV) circuits and power sources.
 - All wiring must be done by qualified personnel to ensure compliance with all applicable installation codes and regulations.
 - For Indoor Use Only.
 - Do not disassemble. No user serviceable parts inside.
- Failure to follow these instructions will result in death or serious injury.

WARNING

OVERHEATING OF DC TERMINALS AND CABLES
Overheating of the DC terminals or DC cables to dangerous temperatures may occur due to improper installation.

- Do not put anything between the cable lug and the terminal surface.
- Do not over-tighten connections; observe all recommended torque values.
- Do not apply any type of anti-oxidant paste until after the cable connection is tightened.
- Do not under size cables; install cables sized in accordance with national electrical code requirements.
- DC cables must have crimped copper compression lugs or crimped and soldered copper compression lugs; soldered connections alone are not acceptable. Lugs must be rated for use with fine-stranded cable.
- Do not use coarse-stranded cable; the lack of flexibility may pull DC terminal connections loose.

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

POTENTIAL FIRE HAZARD

To reduce the risk of electrical fire, replace fuse with SAME size, type, and rating ONLY.

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

HAZARD OF ELECTRIC SHOCK

For monitoring lead-acid batteries with a nominal voltage up to 48VDC, maximum terminal voltage is 64VDC.

Failure to follow these instructions can result in injury.

OVERHEATING OF SHUNT

The shunt is rated 500A, 50mV. Do not exceed these values.

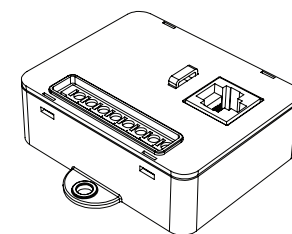
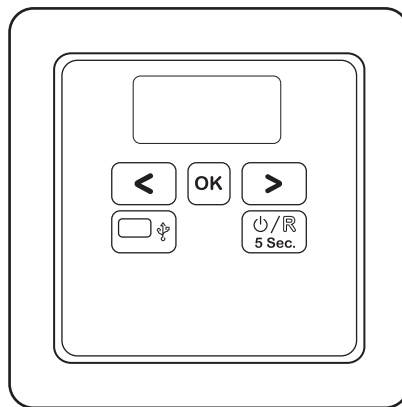
Failure to follow these instructions can result in injury.

CAUTION

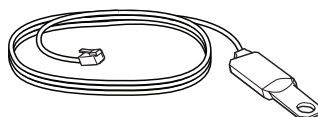
DAMAGE TO BATTERY MONITOR

- The shunt must be installed in the negative line. Installing the shunt in the positive line may result in damage to the Battery Monitor.
 - Install Battery Monitor in a dry, indoor location away from direct sunlight.
- Failure to follow these instructions can result in damage to equipment.

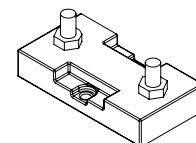
B Inside the Box



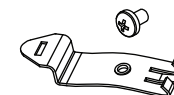
Pre-scaler board
Not shown: battery sense cable
(9.8 ft. / 3m)



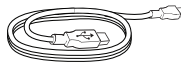
Battery Temperature Sensor (BTS)



Battery shunt (500A/50mV)



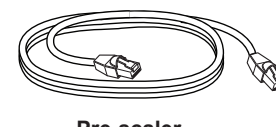
DIN rail clip



USB 2.0 A to Mini-B Cable



Network terminator



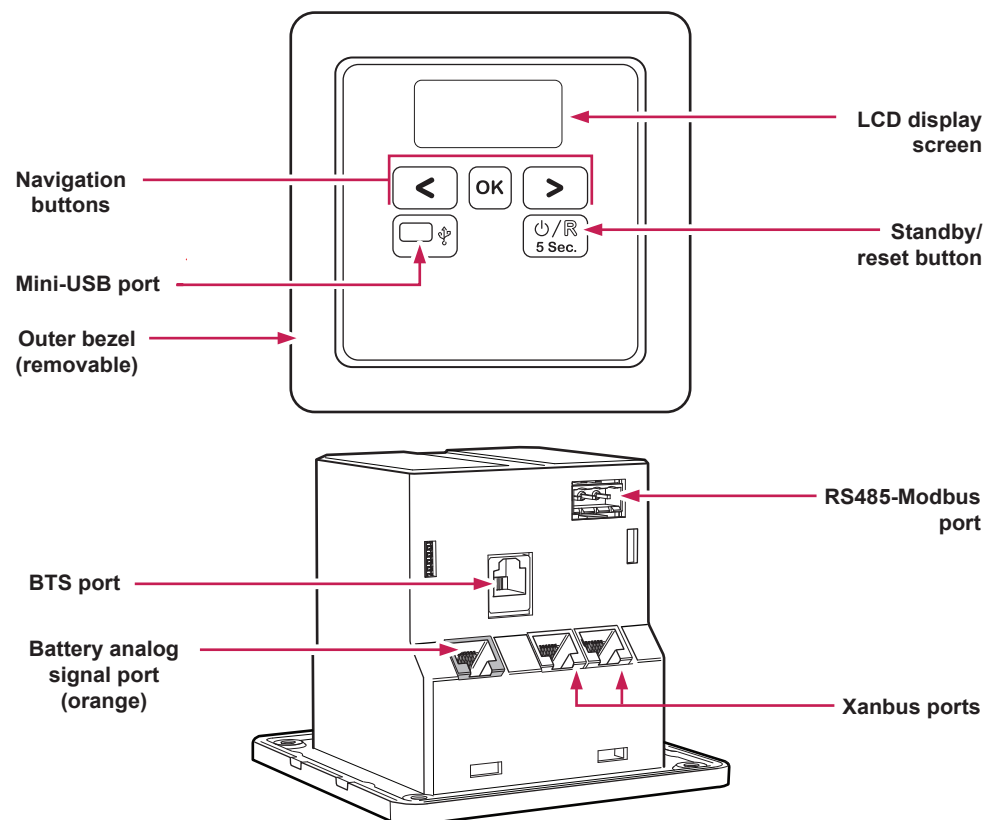
Pre-scaler cable (orange)
(15 ft. / 4.5m)



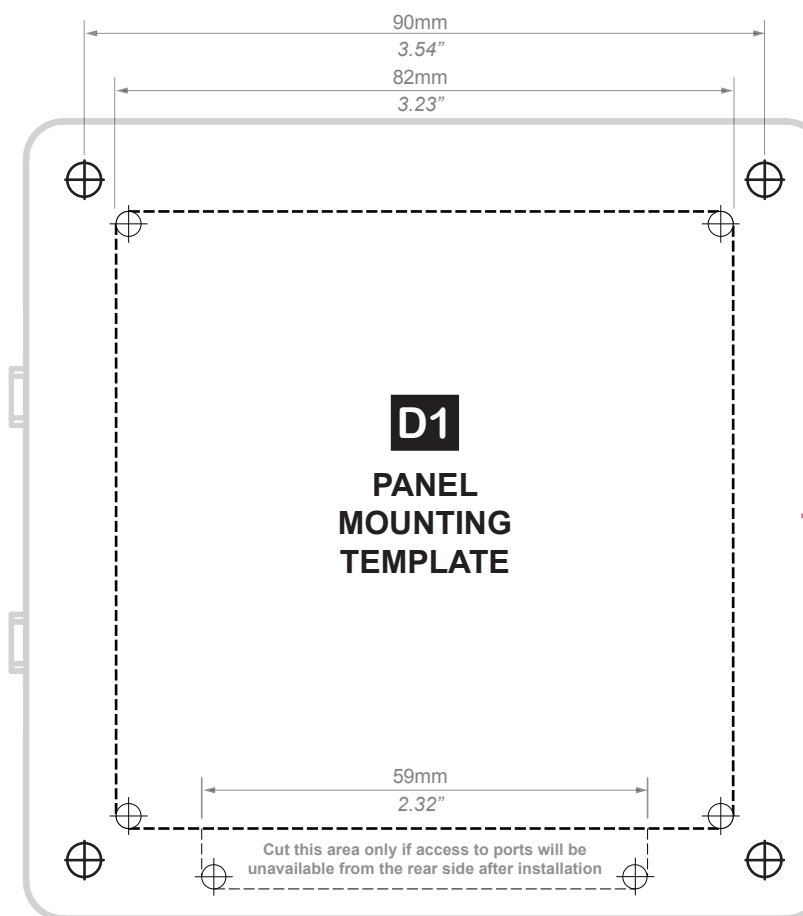
Modbus connector

Not shown: mounting hardware

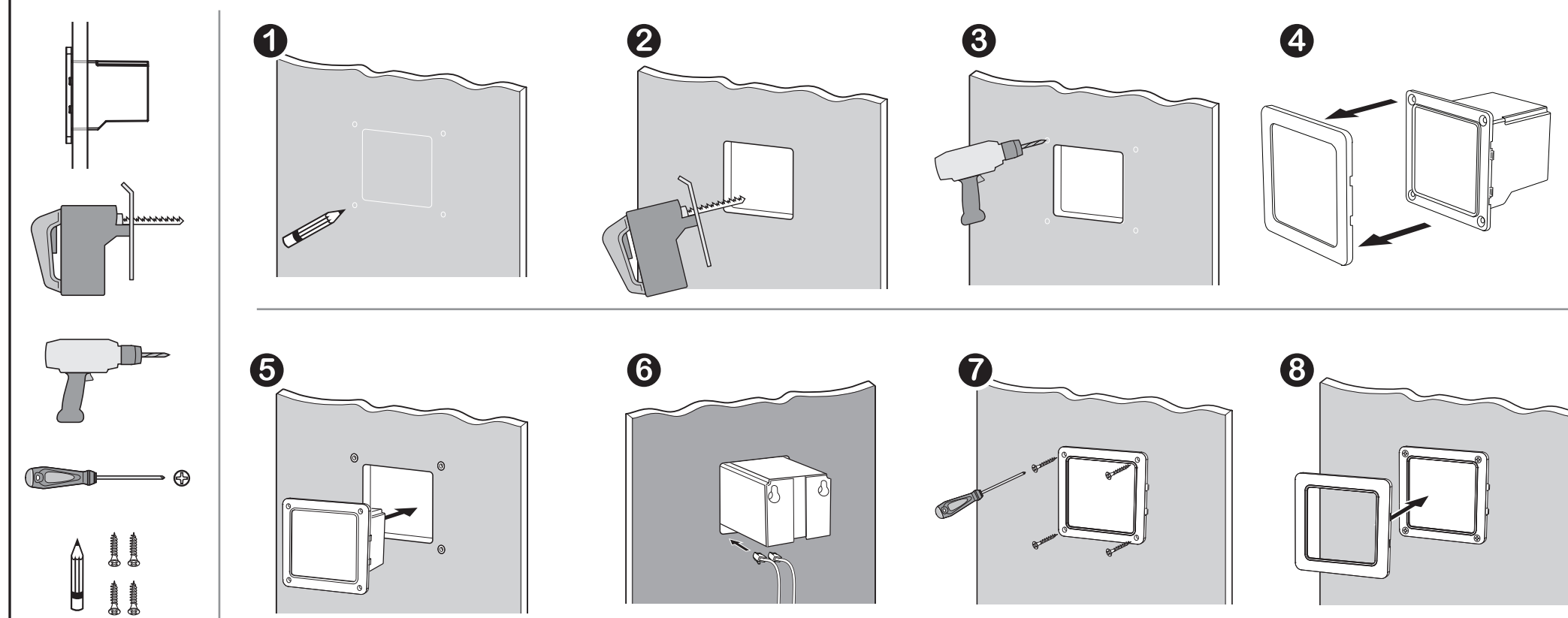
C Features



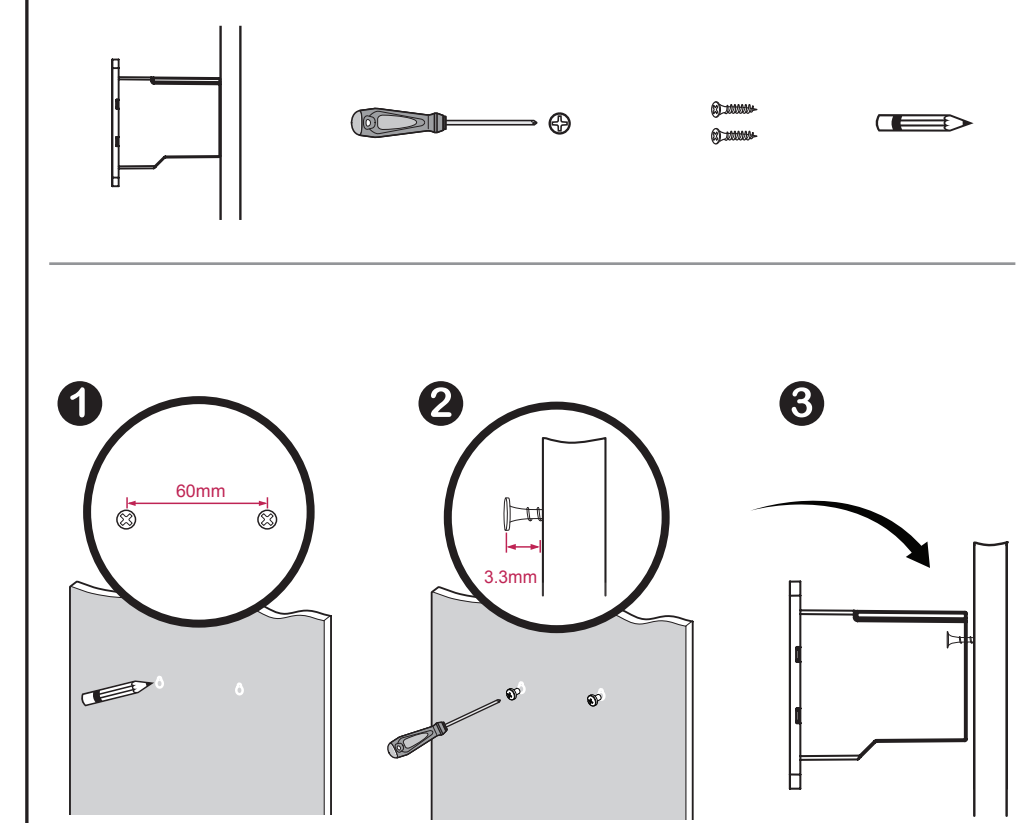
D Mounting Templates



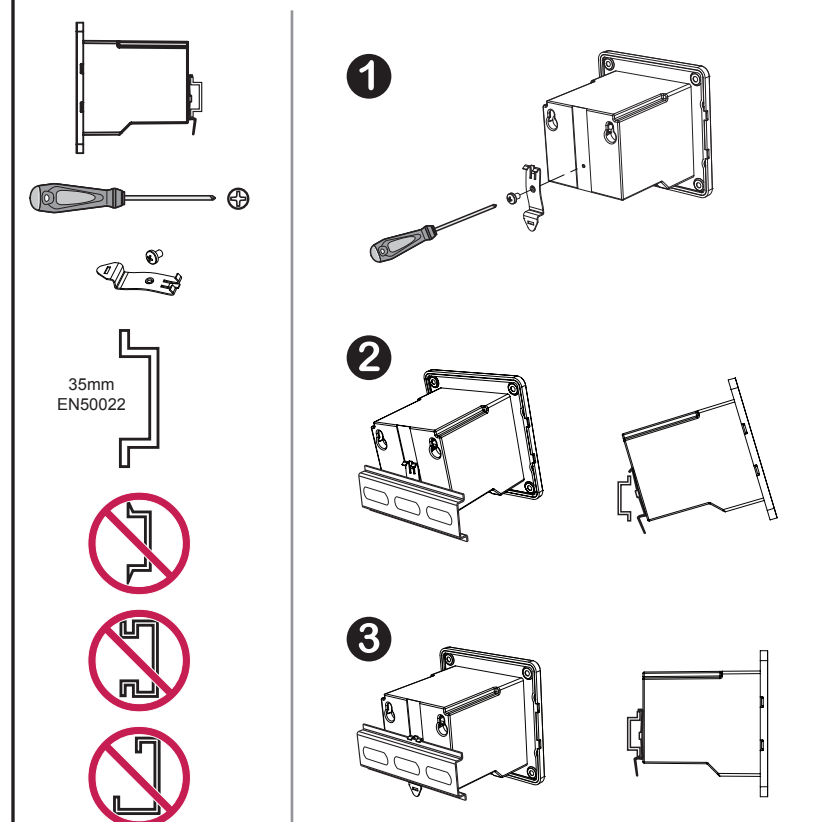
D1 Panel Mounting



D2 Wall Mounting

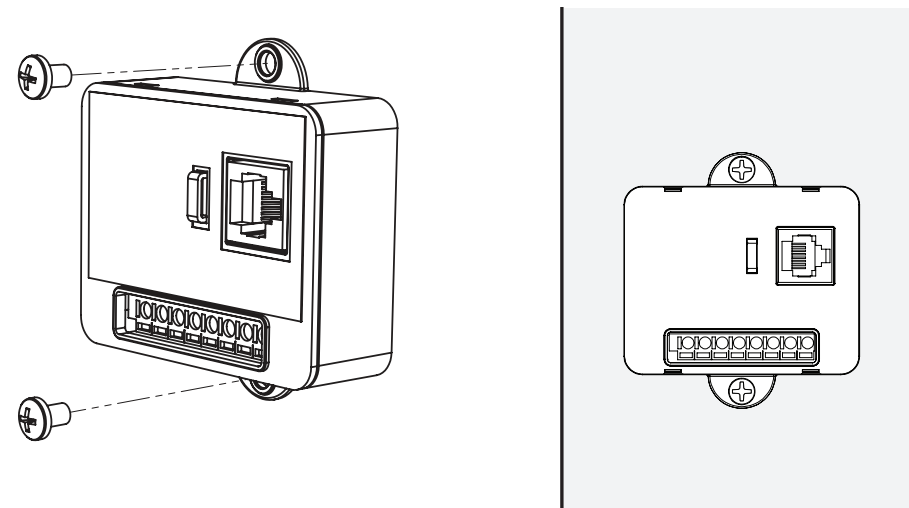


D3 DIN Rail Mounting



E1 Pre-Scaler Board Mounting

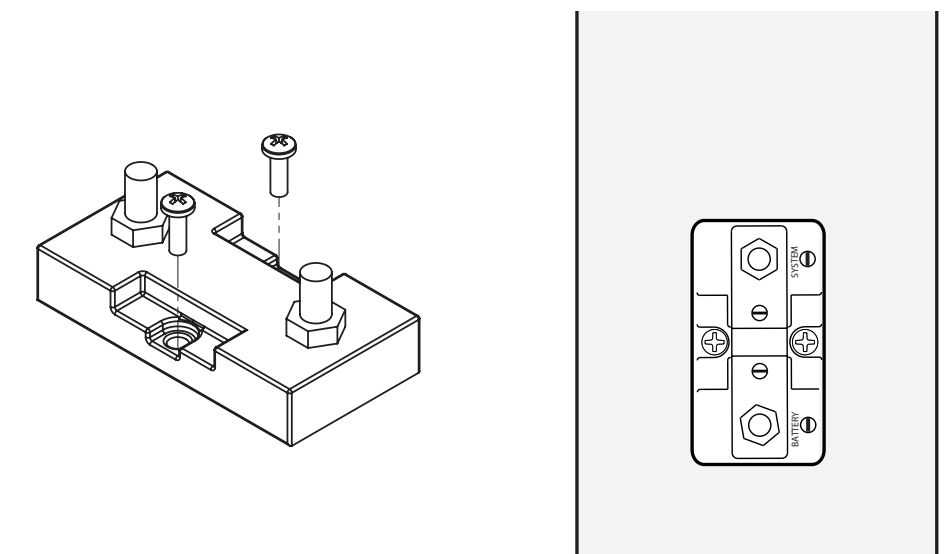
Install the Pre-Scaler board onto a wall with two screws (not included), as shown below. Choose a location that is near the battery and easily accessible.



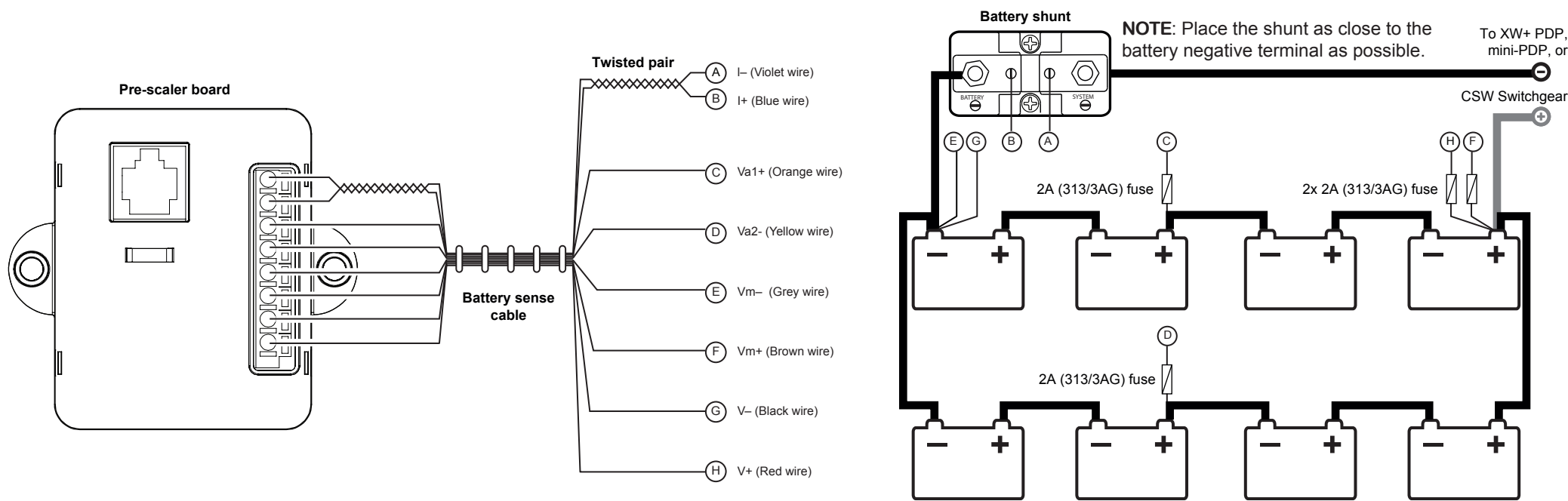
E2 Battery Shunt Mounting

Install the battery shunt as close as possible to your battery location near the negative terminal, using the screws included with the shunt; if possible, install the shunt inside your battery enclosure.

NOTE: Ensure that terminals are covered after installation and wiring steps are completed. Use the two screws provided to secure the shunt to your chosen location, as shown below. The maximum allowable distance between the Battery Monitor and the shunt is 30m.

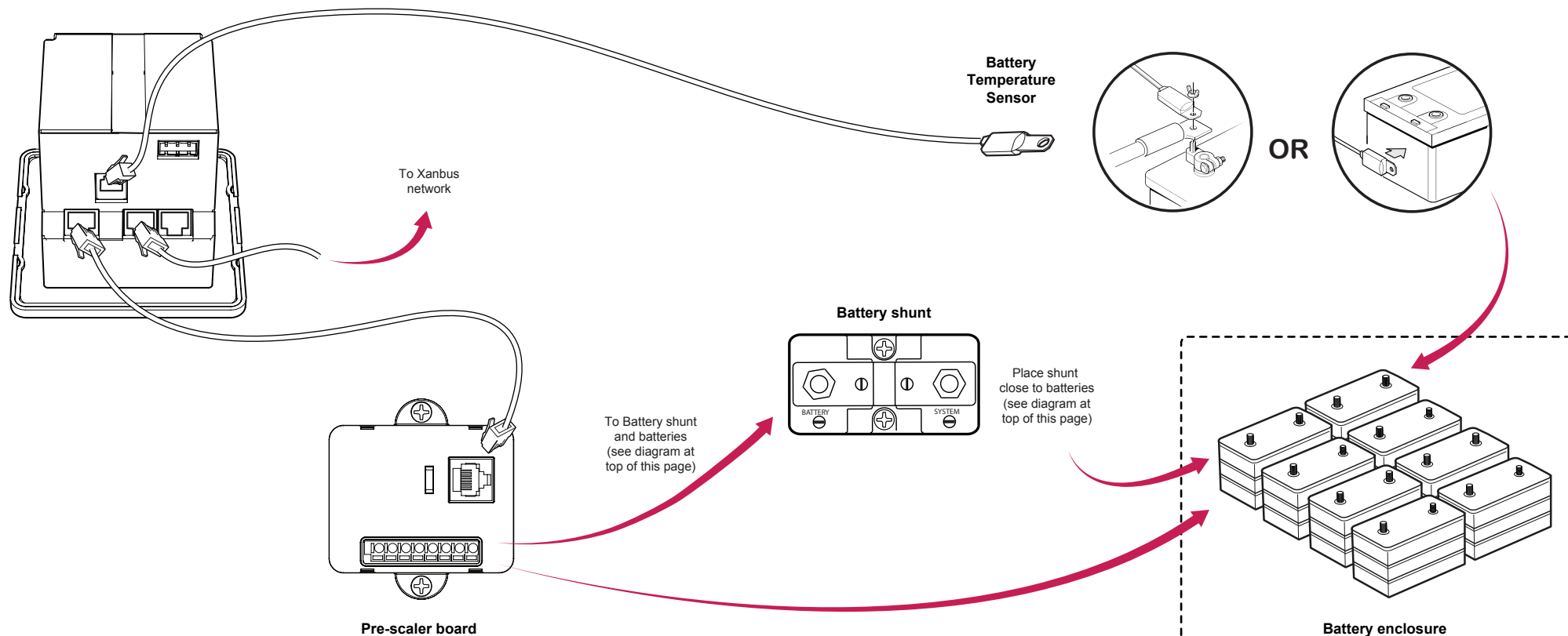


F Cable Connections



To wire the Battery Monitor:

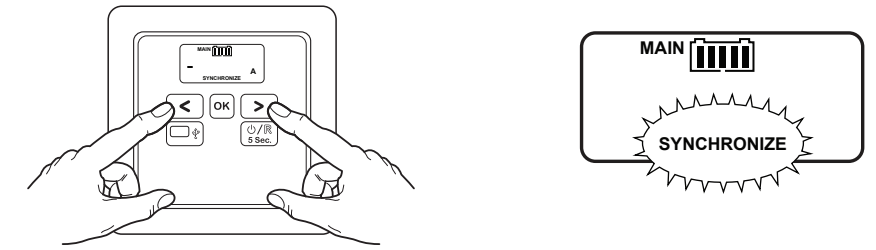
- 1 Connect the battery sense cable wires to the battery terminals, as shown above.
- 2 Wire the battery shunt to the battery, as shown above.
- 3 Install 2A (313/3AG) fuses as close to the battery terminals as possible, as shown above.
- 4 Connect the Battery Temperature Sensor to the battery bank, as shown below.
- 5 Connect Xanbus cables to your Xanbus network and Pre-scaler cable (orange) to the pre-scaler board, as shown below.



G Synchronize

SYNCHRONIZE

Hold the **<** and **>** buttons until **SYNCHRONIZE** flashes on the display screen.



NOTE: Before synchronizing the Battery Monitor to a state of charge of 100%, charge the batteries completely and allow the batteries to remain in float state for two hours or longer after first installation.

H Menu Navigation

NAVIGATION BUTTONS

Use the navigation buttons on the Conext Battery Monitor to scroll through menu screens, check battery status and change configuration settings.



MAIN MENU

Enter the Main menu by holding **OK** for three seconds, until **SEt** appears on the display screen. From the Main menu, you can navigate to different menus, including the Function menu (see Function Menu, below).



For information about other menus, see the *Conext Battery Monitor Owner's Guide* available at <https://solar.schneider-electric.com/product/conext-battery-monitor>.

FUNCTION MENU

From the Main menu, enter the Function menu by pressing **>** twice, until **FUnc** appears on the display screen.

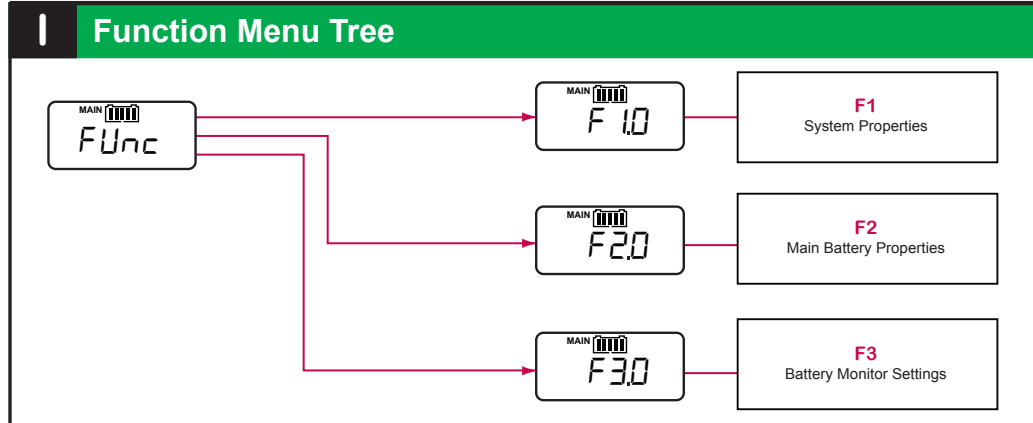


Use **<** and **>** buttons to browse through the different Functions. Press **OK** to view the selected Function value.

Use **<** and **>** to change the value. Press **OK** again to return to the Function menu.

DISPLAY MODE

Access the Display Mode from any menu item by pressing **OK** for three seconds. This will save any Function value changes to internal memory. When no navigation buttons are pressed for 90 seconds while operating in the Function menu, the Battery Monitor will automatically return to the Display Mode without saving any Function value changes.



J Essential Settings

Function	Default	Min	Max	Description
F1.0 Float voltage	52.8V	16V	64V	Battery charger's float voltage, which is the last stage of the charging process.
F1.3 Discharge floor	50%	0%	99%	Reference point at which the battery needs to be recharged. When SOC < this value the Charge battery indicator starts flashing, the time remaining shows 0:00 & SOC bar is empty.
F2.0 Battery Capacity	200Ah	20Ah	9990Ah	Battery's capacity in Amp-hours (Ah)
F2.1 Nominal Discharge Rate	20h	1h	20h	The discharge rate (in hours) at which the battery manufacturer rates your battery's capacity.
F2.2 Nominal Temperature	20°C	0°C	40°C	The temperature at which the battery manufacturer rates the battery's capacity.
F3.1 Shunt Amp Rating	500A	10A	9000A	Amp rating of connected shunt
F3.2 Shunt millivolt Rating	50mV	50mV	60mV	Battery monitor supports only 50mV and 60mV shunts
F3.3 Backlight mode	30s	OFF/5s	300s/ON	Period of backlight activation in seconds after key-press
F3.4 Temperature unit	°C	°C	°F	Select display between °C/°F
F3.5 Setup lock	OFF		ON	When set to "ON", all Push buttons on physical unit is locked

K Advanced Settings

Function	Default	Min	Max	Description
F1.5 Time remaining averaging filter	1	0	2	Represents effect of reducing battery capacity at higher discharge rates.
F2.3 Temperature coefficient	0.50% cap/°C	0.01	1.00%cap/°C	Percentage that battery's capacity changes with temperature.
F2.4 Peukert's exponent	1.25	1.00	1.50	Represents effect of reducing battery capacity at higher discharge rates. Set to 1 for Lithium-based batteries.
F2.5 Self-discharge rate	3.0% /month	OFF /	25.0% /month	Rate at which the battery loses capacity by itself, when it is not used. Set to OFF for Lithium-based batteries.
F2.6 Charge Efficiency Factor	Au	50%	Au	Ratio between the energy removed from a battery during discharge & the energy used during charging to restore original capacity.

L Modbus Settings

Modbus settings on your Battery Monitor are not configurable via the Function menu. These settings can be configured with a Conext System Control Panel, ComBox or Conext Configuration Tool:

Modbus Setting	Default	Min	Max
RS485 Address	200	1	255
RS485 Baud Rate	19200	9600	115200
RS485 Parity	Even	Odd	None
RS485 Stop Bits	1	1	2
Modbus Byte Order	LSB First	LSB	MSB

M Configuration using the Conext System Control Panel

The Conext System Control Panel (SCP) provides remote configuration and monitoring capability for the Battery Monitor and all other Xanbus-enabled devices in the network.

Conext SCP Battery Monitor menu

Conext BM 00 : Meters

Battery	57.4V	31.7A
State of Charge		75%
AH Removed		-150Ah
Time Remaining		03:56 h:m
Battery Temp		28°C
Mid Points	23.7V	23.8V
Mode		[Standby]
Synchronize Now		(control button)

Conext BM 00 : Basic

Capacity	[450Ah]
Discharge Rate	[20h]
Nominal Temp	[25°C]
Shunt Amps	[500A]
Shunt mV	[50mV]
Self Disch	[3.0%]
Discharge Floor	[50%]
Float Volt	[52.8V]
Float Amps	[2%]
Auto Sync Time	[240]
Temp Unit	[Celsius]
Back Light Timer	[30]

Conext BM 00 : Adv

Peukert Expo	[1.25V]
Charge Eff	[Auto]
Temp Coeff	[0.5%]
Sync Sensitivity	[3]
Time Rem Filter	[Faster]
Multi Unit Config	
Restore Defaults	

Conext BM 00: RS485 Sett

Address	[001]
Baud Rate	[119200]
Parity	[Even]
Stop Bits	[One]
Byte Order	[LSB]

Conext BM 00 : Multi

Dev Name	[BM1]
Dev Number	[00]
DC Conn	[HouseBatt1]

- ### N Compatible Products by Schneider Electric
- Conext XW+ 5548 NA / Conext XW+ 6848 NA
 - Conext XW +7048 E / Conext XW + 8548 E
 - Conext SW 2524 230 / Conext SW 4024 230
 - Conext SW 2524 120 / Conext SW 4024 230
 - Conext MPPT 60 150
 - Conext MPPT 80 600
 - Conext SCP
 - Conext AGS
 - Conext ComBox

Exclusion for Documentation
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O Technical Specifications

Parameter	Conext Battery Monitor
Electrical Specifications	
Supply Voltage	18 to 66 VDC
Supply Current*	80 mA @ VIN=48 VDC, 150 mA @ VIN=24 VDC
Power Consumption	<4W
Input Voltage Range (main batt.)	0 to 70VDC
Input Voltage Range (aux. batt.)	2 to 70VDC
Input Current Range	-9999 to +9999A
Battery Capacity Range	20 to 9990Ah
Operating Temperature Range	-20 to +50°C
* (Backlight off, logging disabled)	
Resolution	
Voltage	0 to 70 (+0.01 V)
Current	0 to 200A / 200 to 9999A (+0.1A / +1A)
Amp-Hours	0 to 200AH / 200 to 9990Ah (+0.1Ah / +1Ah)
State-of-charge	0 to 100% (+0.1%)
Time Remaining	0 to 24hrs / 24..240hrs (+ 1 minute / + 1hr)
Temperature ()	-20 to +50°C (+ 0.5°C)
Accuracy	
Voltage Measurement	+/- 0.3%
Current Measurement	+/- 0.4%
Connections	
Battery Voltage, Shunt/Temp Sensor	RJ45 / RJ12 (cables included)
USB 2.0 – Device	Connector: USB min-B, Protocols: MSD (data extraction)
Features	
Network	Protocol: Xanbus / Connectors: RJ45
USB 2.0	Protocol: MSD (data extraction) Connector: USB min-B
ModBus	Isolated RS-485, 2-wire serial
Data Logging	10 data points every 10 minutes for 10 years
Display	Backlit LCD
Front-panel interface	3 menu buttons, 1 power button
Battery string-imbalance detection	Two-point sensing
Temperature Sensor (included)	762cm
Warranty	2 to 5 years (depending on country)
Mechanical Specifications	
Dimensions	8.5 x 8.5 x 9.0cm
Weight	0.2kg
IP Rating/Mounting location	IP 20, NEMA 1, Indoor Only
Storage Temperature Range	-30 to +60°C
Part number	865-1080-01
Battery Interface Kit with Shunt (Included)	
Connection to Battery	300cm cable with ring-terminals
Connection to Battery Monitor	500cm CAT5 cable RJ45
Shunt	500A / 50mv
Shunt Dimensions	8.7 x 4.5 x 3.5 cm
Shunt Weight	0.15 kg
Regulatory Standards	
Markings	CE
EMC	Directive 2004/108/EC, IEC/EN61000-6-3, IEC/EN61000-6-1, FCC Part 15 Class B, Industry Canada ICES-003 Class B