

PROTRXion™

Quick Start Guide

inVENTUS™
POWER

S-48V60-TRX-HD



Designed & Manufactured by

inVENTUS™
POWER

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Applicable Models

Model	Part No. (CANopen)
S-48V60-TRX-HD (w/out heater)	59140-101

Document Information

Release Date	Revision	Scope of Change
2023-07-28	V2.8	Minor edits to Version 2 release

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Technical Support

If you have any technical questions regarding the PROTRXion™ battery, please contact our technical support team at:

Phone: +1.877.423.4242

E-mail: tech_support@inventuspower.com

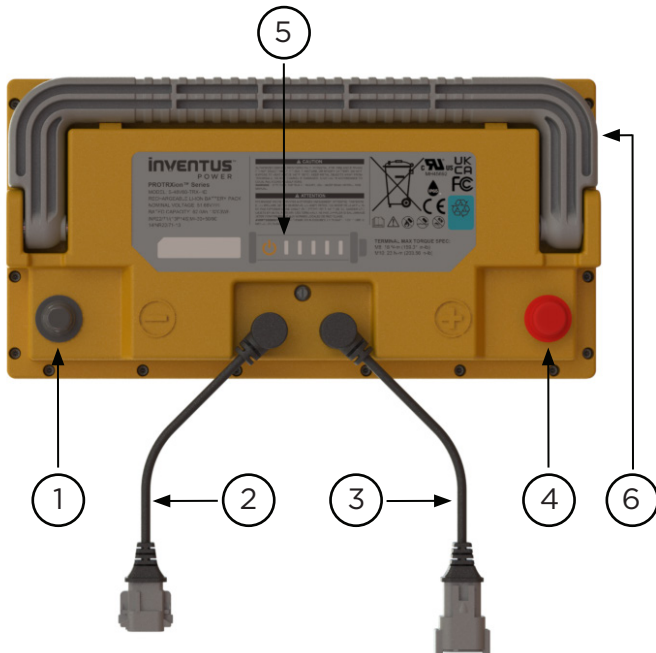
Please read the detailed User Manual first and refer to this guide as another quick resource.



Before installation or maintenance of your batteries, the following equipment is required:

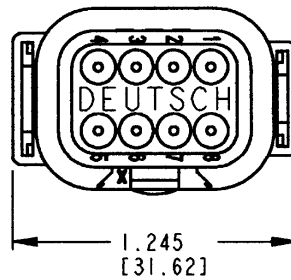
- Rubber gloves
- Safety goggles or other eye protection
- Insulated Torque Wrench / Philips Screwdriver
- Voltmeter

Mechanical Features

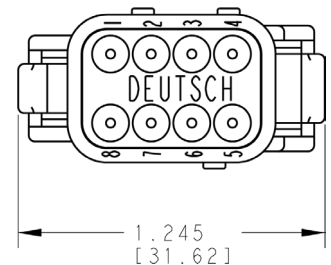


#	Description
1	Negative Terminal
2	Signal Connector Receptacle
3	Signal Connector Plug
4	Positive Terminal
5	Battery State of Charge Indicator
6	Retractable Pull Handle

If in doubt, please consult with **Inventus Power Technical Support** (tech_support@inventuspower.com) on further instructions on the signal cable connections to the host system.



Deutsch Plug Connector P/N: DTM04-08PA



Deutsch Receptacle Connector P/N: DTM06-08SA

Battery Terminal Torque Rating

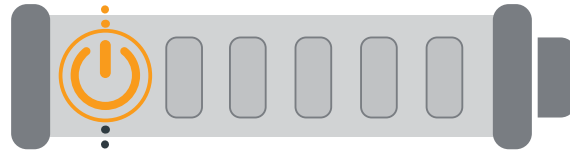
Model	Terminal Type	Wrench Size	Torque (Nm)
S-48V60-TRX-HD	ISO M8 x 1.25 x 20mm Bolt (Negative Terminal)	13mm	17 ± 1
	ISO M8 x 1.25 x 20mm Bolt (Positive Terminal)	13mm	17 ± 1

Wake-Up & Ship Mode

TO WAKE UP THE BATTERY

Press the SOC button
for 5 seconds

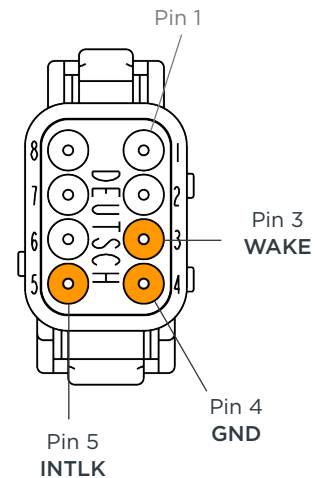
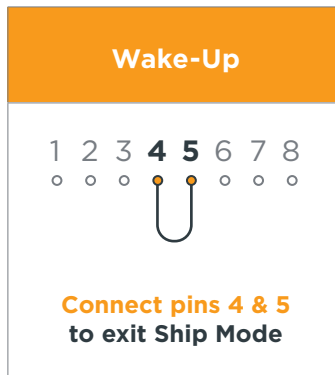
We recommend to place the battery in Ship Mode when it is not used to prevent self-consumption current drain and extend storage life.



TO PLACE IN SHIP MODE

Press the SOC button
for 5 seconds

Battery can also receive a wake up signal from the signal connector by shorting pin 4 (GND) to pin 5 (INTLK) to wake up battery from Ship Mode.



Power Cables

Power cables are not included with the battery unless a integration kit is purchased. Choose the appropriate power cable size based on the system load requirements. When connected in parallel configuration, it is preferable for all cables to be the same length and wire gauge. Refer to ampacity table in User Manual when selecting power cables.

Communication Cables

If your application requires communication, please connect a CAN cable from the battery signal connector to the respective system or chargers. Signal wires must be installed onto connector.

Item	Mfg Part No.	Where to Purchase
Plug Signal Connector	Deutsch DTM04-08PA	Digikey
Receptacle Signal Connector	Deutsch DTM06-08SA	Digikey

Many types of lead acid chargers are compatible with our PROTRXion™ batteries and safely charge in temperature ranges as shown in the table below. When choosing an intelligent charger, please discuss with Inventus Technical Support on suitable off-the-shelf charger solutions. Charger datasheets can be provided upon request.

Charge Voltage / Current

Model	S-48V60-TRX-HD
Charge Voltage	57.4 VDC
Charge Current	17A (0.28C)
Max Charge Current	38A (0.6C)
Charge Temperature (without heater)	0°C to 45°C (32°F to 113°F)

Pin Definition

Pin Definition (S-48V60-TRX-HD)

Pin #	Symbol	Description
1	SYS_VCANH	CAN High for communication to the vehicle/machine
2	SYS_VCANL	CAN Low for communication to the vehicle/machine
3	WAKE	Wake up input pin - active low to enable discharging
4	GND	Pack signal ground used to pull Wake and Charge Enable low
5	INTLK	Interlock (charge enable) input pin - active low to enable charging
6	BATT_VCANH	CAN High for module to module communications
7	BATT_VCANL	CAN Low for module to module communications
8	AUX	12V regulated aux power supply 5A continuous max -- connect auxiliary ground to battery negative terminal.

Note: CAN lines in the battery pack DO NOT have internal termination resistance. It is recommended to properly terminate the system and battery CAN Bus lines following the CAN Bus termination standards. For any technical questions about properly adding termination resistance, please contact technical support at tech_support@inventuspower.com.

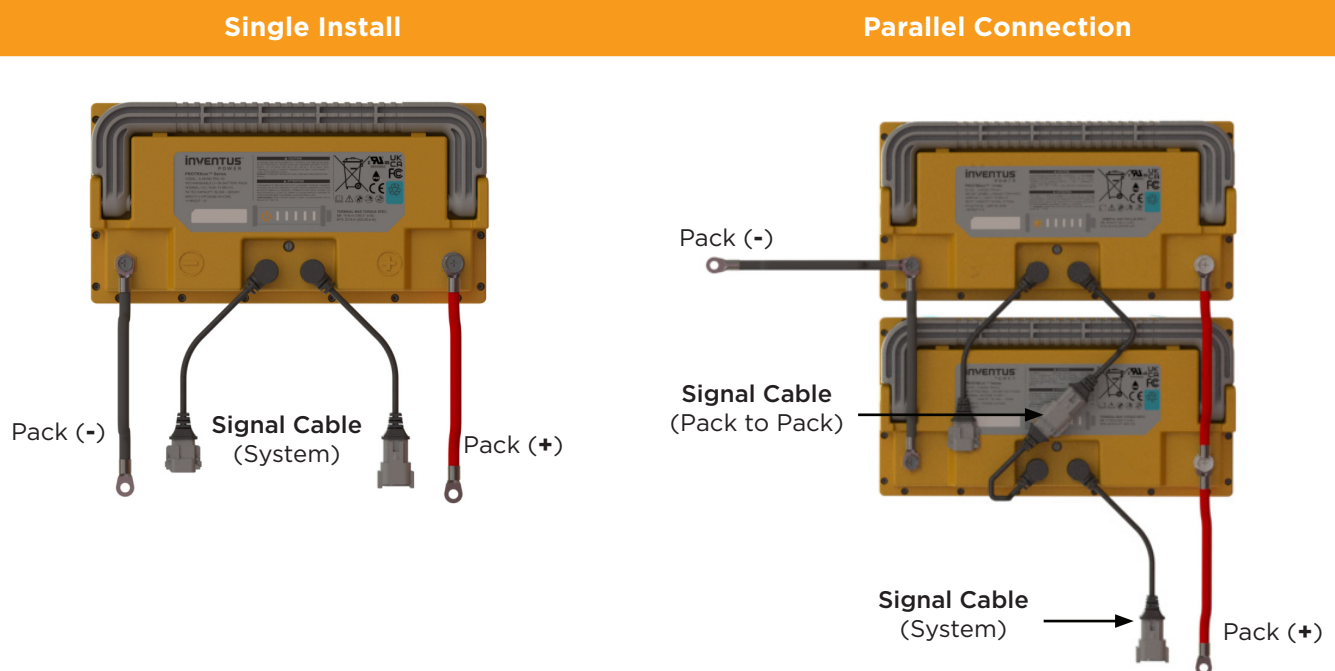
Connecting the Battery

1. Remove power to the vehicle/device prior to installation of the PROTRXion™ battery.
2. Remove all other batteries from the system prior to replacing them with PROTRXion™ batteries.
3. Ensure the PROTRXion™ battery is in Ship Mode to remove power for safe install.
4. Remove the protective battery terminal covers from the terminals. Retain these covers in the event that you need to remove or move the battery at some future time.
5. Attach the negative cable from the device to the negative terminal on the battery.
6. Attach the positive cable from the device to the positive terminal on the battery.
7. Attach the signal communications cable (Deutsch DTM Series Connector) if needed.
8. If the battery charger is integrated with the device drawing power from the PROTRXion™ battery, then please follow manufacturers recommended sequence for each battery connection.
9. It is recommended to fully charge and fully discharge the battery system upon initial connection to properly calibrate the SOC.

Please contact Inventus Technical Support if the system requires more than 6 batteries.

Parallel connections

The PROformance batteries can be connected in parallel to increase your energy requirements. You may connect up to 6 batteries for the S-48V60-TRX-HD. These batteries cannot be connected in series. Refer to wiring diagram below.



Battery Modes

Sleep Mode (Terminals ON)	Charge Mode	Discharge Mode
<p>Disable pin 3 & 5, wait 5 min to enter Sleep Mode</p>	<p>Charge Current $\geq 500\text{mA}$ to enter Charge Mode</p>	<p>Discharge Current $> 500\text{mA}$ to enter Discharge Mode</p>

Mode Name	WAKE	INTLK	Action	Mode Description
Sleep (Terminals ON)	Off (Open)	Off (Open)	Disable pins 3 & 5 and wait 5 minutes to enter Sleep Mode	Sleep, Terminals ON, MOSFETs closed
Charge	N/A	N/A	Charge current $\geq 500\text{mA}$ to enter charge mode	Charge allowed*, MOSFETs closed
Discharge	N/A	N/A	Discharge current $> 500\text{mA}$ to enter discharge mode	Discharge allowed**, MOSFETs closed
Ship	N/A	N/A	Press the SOC button and hold for 20 sec to place in Ship Mode	Low power mode, MOSFETs open
Shutdown	N/A	N/A	Apply charge voltage to exit Shutdown	Lowest power mode, MOSFETs open

LED Indicator Status	SOC
	80 - 100%
	60 - 79%
	40 - 59%
	20 - 39%
	10 - 19%
	<10%