

# ProCore™ Edge North America Installation, Operation, Service & Maintenance



Rev 04/27/23

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Changes or modifications to this product not completed by an authorized service provider could void the product warranty.

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No portion of these materials may be duplicated, used, or disclosed without prior written permission from WCSI.

A NOTE ABOUT CUSTOMER SUPPORT

Please write down the unit serial number in the Owner's Record below to ensure superior service, and have it available when contacting Webasto Customer Service. The serial number can be found on the nameplate rating label on the left side of the unit.

Owner's Record

Model: ProCore™ Edge

Serial Number (SN):  
.....

Purchase date:  
.....

Output power:  
.....

Customer Support:      IPCService@webasto.com  
                                 1-866-767-4242

Parts:                      WCSIParts@webasto.com

Continued on next page.

**In addition, please have the following information on hand before you call:**

1. Failed charger SKU number and serial number
2. Failed module SKU number and serial number
3. Customer name (for our reference)
4. Problem description, including any fault codes
5. Data download from the charger, including charge logs and fault logs
6. Ship-to contact name
7. Ship-to phone number (if possible, include a cell phone number for text messaging) and email address
8. Ship-to company address

***We also recommend taking pictures using your cell phone in case you need to send them to Webasto Customer Support via text message or email – we can use the images to help diagnose any problems.***

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## Warnings and Cautions



### DANGER

Only qualified service personnel should remove the DC output power cable panel and service the charger.



### DANGER

#### RISK OF ELECTRIC SHOCK

Electric shock can cause death or serious injury.

- Do not touch the uninsulated portion of the output power cable, battery connector or other live electrical parts, or uninsulated battery terminals.
- Disconnect the charger from the input power and battery before servicing.



### DANGER

#### DO NOT ATTEMPT TO CHARGE NON-RECHARGEABLE BATTERIES.

Fast chargers are designed to be used only for charging rechargeable batteries. Attempting to charge non-rechargeable batteries could lead to death or injury from exploding batteries.



### DANGER

#### BATTERIES CAN BE DANGEROUS.

Batteries generate explosive gases during normal charging and usage. Always follow charging instructions and those of the battery manufacturer to reduce the risk of battery explosion.



### WARNING

#### FLAMMABLE

- Keep batteries away from fire.
- Do not smoke, use an open flame, or cause sparks near a battery.



## WARNING

Connecting a high-voltage battery (80 V or higher) to a low-range charger (24 V – 48 V) may damage the charger.

Use voltage-keyed connectors on the chargers and batteries if your facility has mixed battery voltages.



## CAUTION

Use only copper wires.



## CAUTION

Every ProCore Edge is assembled and programmed for each customer's specific needs. Webasto recommends that you contact Webasto Technical Support before making any modifications and/or additions (such as modules) to your ProCore Edge.



## NOTE

**Three- and five-bay cabinets** have field wiring terminal blocks that can accept a input wire gauge range from 10 to 14 AWG (6–2.5 mm<sup>2</sup>).

- The minimum and maximum screw-tightening is 22.2 in-lb (2.5 Nm) and 26.4 in-lb (3 Nm) of torque, respectively.
- DC output power cables are provided with the charger.
- Anderson Euro, SB or SBX connectors are used.
- For more information, contact WCSI Customer Support at 1-866-767-4242.

**The 10-bay cabinet** has field wiring terminal blocks that can accept a input wire gauge range from #10 AWG to #4 AWG. Refer to the Torque Specifications Label on page 33 for the appropriate torque value for the screws for each wire size.



## Installation and Operation



### NOTE

Read and understand these manufacturer instructions and all safety practices.



### NOTE

This manual provides important information for installing the charger and should be carefully read.

This manual is based on information available at the time of publication. While efforts have been made for the information to be accurate, it does not cover all details of or variations in the hardware or software, nor provide for every possible contingency in connection with installation.

The features described may not be included in all systems.



### NOTE

This manual provides instructions for the installation and operation of the ProCore Edge Charging System, as well the maintenance and service of select components.

The procedures should only be performed by trained and qualified technicians to enhance safety and protect equipment integrity.

Please refer to the Table of Contents on pages 5-6 for the list of procedures included in this manual.



### NOTE

Always press the STOP button on the ProCore Edge battery display before disconnecting SB cables from a battery. Pressing the STOP button will prevent the possibility of electrical arcing.

## Acronyms, Abbreviations and Symbols

Acronym, Abbreviation or Symbol	Meaning
°C	Degrees Celsius
°F	Degrees Fahrenheit
A	Amp(s) / Ampere(s)
AC	Alternating Current
AWG	American Wire Gauge
BMID	Battery Monitor and Identifier
BMS	Battery Management System
CAN	Controller Area Network
CB	Circuit Breaker
CSA	Canadian Standards Association
D	Depth
DC	Direct Current
Di	Delta Current
Dt	Delta Temperature
EU	European Union
ft	Foot or Feet
h	Height
Hz	Hertz (frequency)
$I_{cc}$	Conditional Short Circuit Current
$I_{cp}$	Prospective Short Circuit Current
mr	Minimum Required
IEC	International Electromechanical Commission
in.	Inch(es)
IP	Ingress Protection (Rating)
kg	Kilogram(s)

Acronym, Abbreviation or Symbol	Meaning
kW	Kilowatt(s)
L	Length
lb.	Pound(s) by Weight
Max.	Maximum
Min.	Minimum
mm	Millimeter(s)
mm <sup>2</sup>	Square Millimeter(s)
NEMA	National Electrical Manufacturers Association
N-m	Newton-metre/meter
OK	All Correct
OCV	Open Circuit Voltage
ph.	Phase(s)
PSCCR	Prospective Short Circuit Current Rating
SB®	Storage Battery Connector
SBX®	Storage Battery Connector with Auxiliary Contacts
sic	"Thus it had been written"
SOC	State of Charge
SOOW	Cable type (Service), which features Oil-resistant insulation, an Oil-resistant jacket, and is Water resistant
UL	Underwriters Laboratories
V	Volt(s)
VAC	Volt(s) Alternating Current
VDC	Volt(s) Direct Current
W	Width
WCSI	Webasto Charging Systems, Inc.

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## Required Tools for 3-Bay and 5-Bay Cabinets

- Hex key 4 mm – filler screws on the charger top panel
- TORX TX30 – charger top panel for units shipped during 2021-2022
- TORX TX25 – charger top panel for units shipped 2023 and later
- Flathead screwdriver – terminal screws
- TORX TX25 – DC output power cable panel

## Technical Specifications for 3-Bay and 5-Bay Cabinets

Model	ProCore™ Edge 9		ProCore™ Edge 9		ProCore™ Edge 15		ProCore™ Edge 15	
Number of fitted modules	2	3	2	3	4	5	4	5
Max. output power rating¹	6 kW	9 kw	6.4 kW	9.6 kW	12 kW	15 kW	12.8 kW	16 kW
Module type	48 V		80 V		48 V		80 V	
Nominal input voltage	480 VAC ± 10% 3 ph. 50/60 Hz							
Cabinet size	3-BAY				5-BAY			
Max. input amps (3-phase 480-volt AC)	9 A	14 A	9 A	14 A	19 A	24 A	19 A	24 A
Max. CB size²	15 A	20 A	15 A	20 A	25 A	30 A	25 A	30 A
Min. fitted AC input wire size (AWG) per NEC	14	12	14	12	10	10	10	10
Max. output amperage: 24-volt battery @ 2.4 V/cell	128 A	192 A	—	—	256 A	320 A	—	—
Max. output amperage: 36-volt battery @ 2.4 V/cell	128 A	192 A	—	—	256 A	320 A	—	—
Max. output amperage: 48-volt battery @ 2.4 V/cell	104 A	156 A	80 A	120 A	208 A	260 A	160 A	200 A
Max. output amperage: 72-volt battery @ 2.4 V/cell	—	—	76 A	114 A	—	—	151 A	189 A
Max. output amperage: 80-volt battery @ 2.4 V/cell	—	—	69 A	104 A	—	—	139 A	173 A
Max. output amperage: 80-volt battery @ 2.4 V/cell	—	—	56 A	83 A	—	—	111 A	139 A

<sup>1</sup> The number of modules and module type determine the maximum output power rating.

<sup>2</sup> The circuit breaker ratings (maximum CB size) should be based on the charger maximum input ratings (input amps) for the number of fitted modules, as stated in this section.

Model	ProCore™ Edge 9		ProCore™ Edge 9		ProCore™ Edge 15		ProCore™ Edge 15	
Number of fitted modules	2	3	2	3	4	5	4	5
Max. output power rating¹	6 kW	9 kW	6.4 kW	9.6 kW	12 kW	15 kW	12.8 kW	16 kW
Module type	48V		80V		48V		80V	
Nominal input voltage	480 VAC ± 10% 3 ph. 50/60 Hz							
Cabinet size	3-Bay				5-Bay			
Min. DC output wire size (AWG)	1/0	1/0	1/0	1/0	3/0	3/0 or 4/0³	1/0	1/0
Protective class	I							
PSCCR max. (lcc)	3.6 kA							
PSCCR min. (lcp, mr)	320 A							
OCV	II							
Pollution degree	2							
Efficiency and power factor	Efficiency = 94% maximum Power factor = 0.95 maximum							
Output protection	Short circuit protection Reverse polarity protection							
Dimensions (H×W×D)	18.6" × 21" × 14.7" (473 mm × 534 mm × 374 mm)				24.8" × 21" × 14.7" (631 mm × 534 mm × 374 mm)			
Weight	51.8 lb. (23.5 kg) without module 9.2 lb. (+4.2 kg) per module				64.8 lb. (29.4 kg) without module 9.2 lb. (+4.2 kg) per module			
Installation	Wall and floor-stand mounting options							
Environment	Operating temperature: -4°F to 113°F (-20°C to +45°C) Storage temperature: -13°F to 149°F (-25°C to +65°C)							
Relative humidity	90%, non-condensing							
Enclosure	IP20, NEMA 1-only indoor use							
Operating altitude	Up to 3000 m (9843 ft)							
Certifications	CSA certified to UL1564, C22.2 107.2-01, and CEC							

## Required Tools for 10-Bay Cabinet

- Hex key 4 mm – filler screws on the charger top panel
- TORX TX25 – charger top panel
- Flathead screwdriver – terminal screws
- TORX TX25 – DC output power cable panel

## Technical Specifications for 10-Bay Cabinet

Number of fitted modules	6	7	8	9	10	6	7	8	9	10
Power Rating	18 kW	21 kW	24 kW	27 kW	30 kW	19.2 kW	22.4 kW	25.6 kW	28.8 kW	32 kW
Cabinet Size	10 Bay					10 Bay				
Module Type	24V- 48V					48V - 96 V				
Input voltage	480 VAC ±10% 3 ph 50/60 Hz									
Input amps (3-phase 480VAC)	25A	29A	33A	37A	41A	26A	30A	35A	39A	43A
Maximum CB size[1] (A)	35A	40A	45A	50A	60A	35A	40A	45A	50A	60A
Minimum AC input wire size (AWG)	10	8	6	6	4	10	8	6	6	4
Maximum output amperage 24V @ 2.4V / cell	384	448	512	576	640	–	–	–	–	–
Maximum output amperage 36V @ 2.4V / cell	384	448	512	576	640	–	–	–	–	–
Maximum output amperage 48V @ 2.4V / cell	312	364	416	468	520	240	280	320	360	400
Maximum output amperage 72V @ 2.4V / cell	–	–	–	–	–	222	259	296	333	370
Maximum output amperage 80V @ 2.4V / cell	–	–	–	–	–	200	235	268	302	334
Maximum output amperage 96 V @ 2.4 V/cell (Only lithium)	–	–	–	–	–	167	195	222	250	278
Minimum DC output wire size (AWG)	4/0 or 350 mcm	2/0 x 2 or 350 mcm	3/0 x 2	4/0 x 2	4/0 x 2	2/0	2/0	4/0	4/0	4/0

Number of fitted modules	6	7	8	9	10	6	7	8	9	10
Power Rating	18 kW	21 kW	24 kW	27 kW	30 kW	19.2 kW	22.4 kW	25.6 kW	28.8 kW	32 kW
Cabinet Size	10 Bay					10 Bay				
Module Type	24V- 48V					48V - 96 V				
AC Power System	TN, TT : Star (no Neutral connection)									
Protective Class	1									
PSCCR	640A min, 4KA max									
OCV	II									
Pollution Degree	2									
Dimensions H x W x D	40.47 in x 21.18 in x 14.76 (1028 mm x 538 mm x 375 mm)									
Weight	94.8 lb (43 Kg) Without module 9.2 lb (4.2 Kg) Per module									
Installation	Wall, stand, or floor mounting options									
Relative Humidity	90 %, non-condensing									
Enclosure	IP20; NEMA 1 - only indoor use									
Operating Altitude	Up to 3000 m (9843 ft.)									
Certifications	CSA certified to UL1564, C22.2 107.2-01, and CEC									
Field Repair	Module replacement									



## Positioning the Charger

The battery charger can be very heavy when fitted with modules. Take precautions to avoid injury when moving the charger.

Use appropriate material handling aids (e.g., a pallet truck) to move the charger into position. It is recommended to use a lifting hoist with straps or chains wherever possible, especially when the charger is raised above ground level.

M8 thread lifting eyebolts can be attached to four locations on the top panel of the charger to aid the process. Use a 4 mm hex key to remove the filler screws before attaching the lifting eyebolts.



### CAUTION

The battery charger can be very heavy when fitted with modules. Take precautions to avoid injury when moving the charger.

Use appropriate material handling aids (e.g., a pallet truck) to move the charger into position. It is recommended to use a lifting hoist with straps or chains wherever possible, especially when the charger is raised above ground level.

M8 thread lifting eyebolts can be attached to four locations on the top panel of the charger to aid the process. Use a 4 mm hex key to remove the filler screws before attaching the lifting eyebolts.



Fig. 1 – Attaching points for M8 lifting eyebolts, top panel view

## Choosing to Wall-Mount or Floor-Mount the Charger

Before you set up the ProCore Edge to be operational, you will want to choose whether to install the charger as a wall-mounted unit or a floor-mounted unit.

This will help you to decide your spacing needs and length of cables, etc.

### Wall Mount Installation for 3-Bay and 5-Bay Cabinets

Check with a professional installation professional to determine the proper mounting technique for your facility.

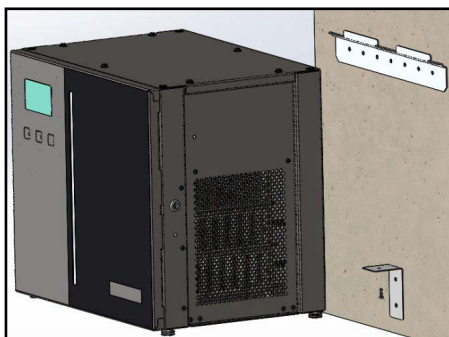


Fig. 2 – Charger, wall, wall mount hanger, bottom bracket and screw with an M6 Thread for units shipped during 2021-2022.

For units shipped in 2023 and later, use an M5 Thread.

1. Using the bolt hole locations for reference, secure the top bracket to the wall.

**NOTE:**

Wall anchor bolts are **not** included in the wall mounting kit.

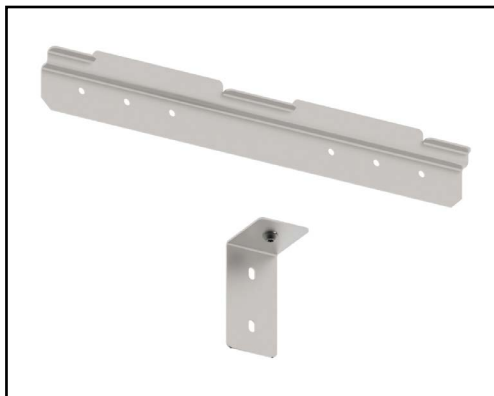


Fig. 3 – Bolt Hole Locations

2. There are two slots on the back of the charger for mounting it to the wall mount bracket – mount the charger onto that top bracket.
3. After mounting the charger on the wall bracket, secure the underside of the charger with the L bracket and torque the bolts.

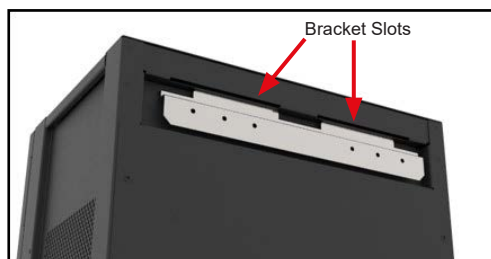


Fig. 4 – Bracket Slots

**M6:** 52.22 in-lbs (5.9 Nm)

**M5:** 35.4 in-lbs (4.0 Nm)

Then secure the L bracket to the wall.



Fig. 5 – L Bracket

## Floor Mount Installation for 3-Bay and 5-Bay Cabinets

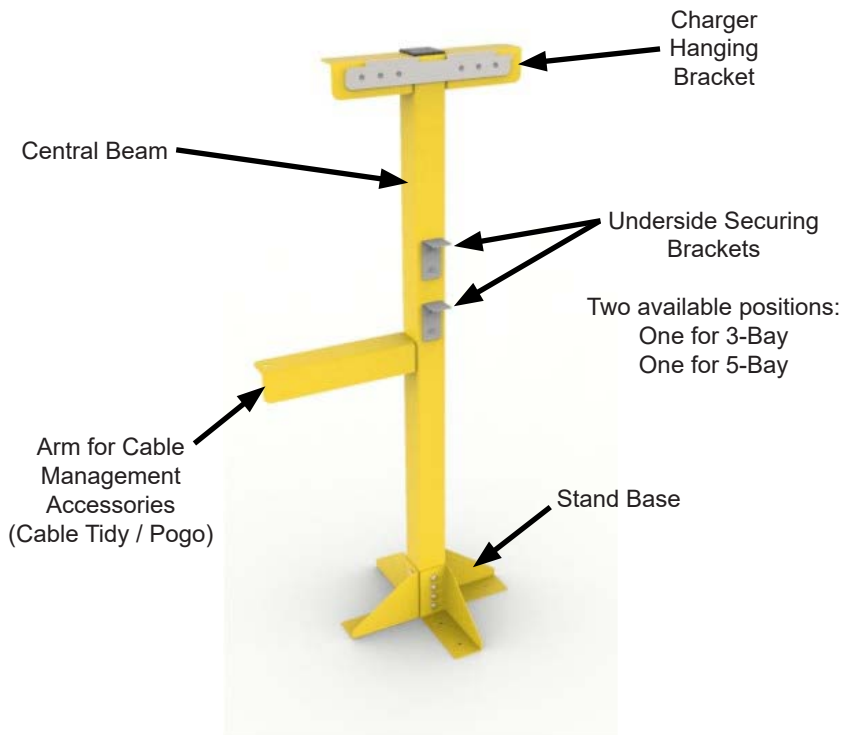


Fig. 6 – Floor Mount Stand

1. Secure the floor stand to the floor using the eight bolting points provided.

Webasto recommends using M10 (3/8 inch) bolt threads.

**NOTE:**

Anchor bolts are **not** included in the floor stand kit.

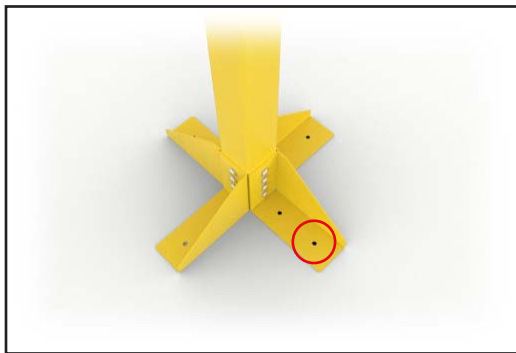


Fig. 7 – Eight floor stand anchor bolting points are provided.



Fig. 8 – Size Reference

2. There are two slots on the back of the charger for mounting it to the top bracket of the floor stand – mount the charger onto that top bracket.

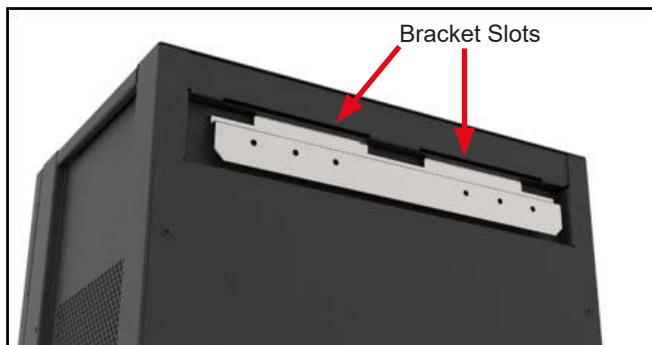


Fig. 9 – Bracket Slots



Fig. 10 – Backside of Floor Mounting Stand

3. After mounting the charger onto the top bracket, secure the underside of the charger with the L bracket. Then secure the L bracket onto the central beam of the floor stand.

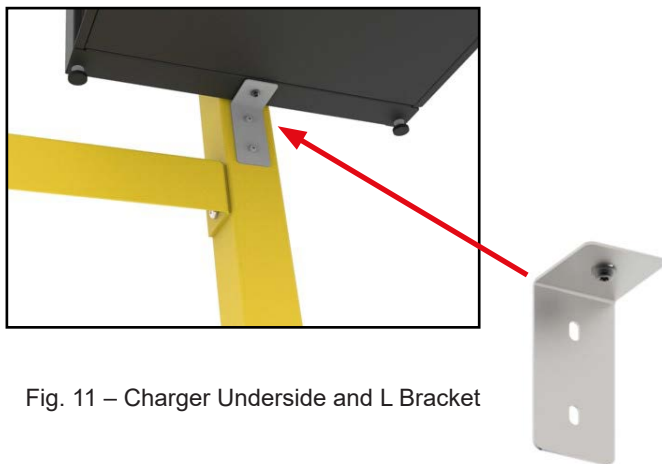


Fig. 11 – Charger Underside and L Bracket

## Wall-Mount Installation for 10-Bay Cabinet

Check with professional installation personnel to determine proper mounting techniques for all wall types. (Figures 12-14).

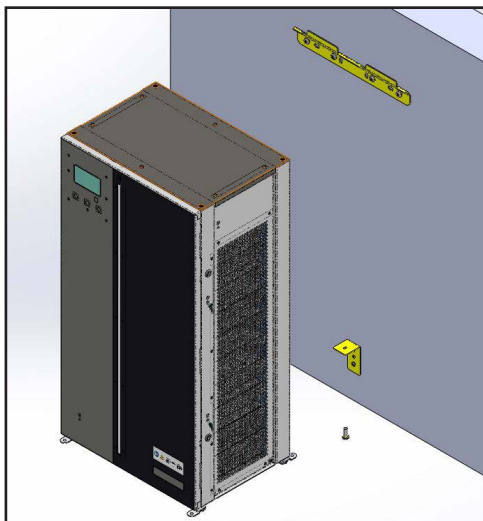


Fig. 12 – Charger, Wall, Wall-Mount Hanger, Bottom Bracket and Screw with an M5 thread

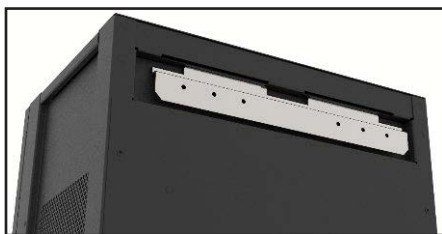


Fig. 13 – Charger on the Wall-Mount Hanger



Fig. 14 – Bottom Bracket Mounted to the Charger with 35.4 in-lbs (4.0 Nm) of torque



## Floor Stand Installation for 10-Bay Cabinet

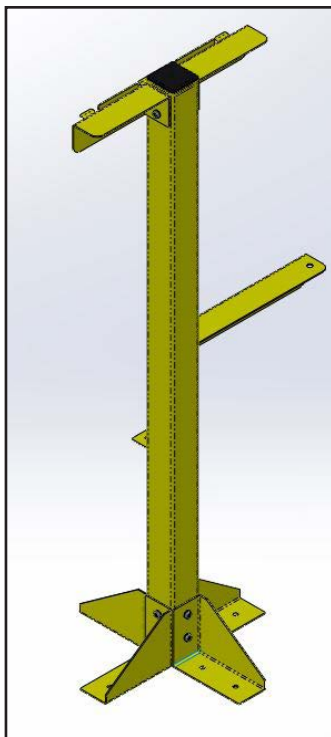


Fig. 15 – Floor Stand

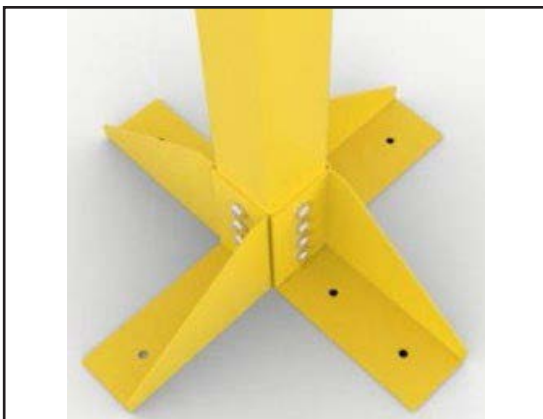


Fig. 16 – Pre-Drilled Holes for Bolting the Bast to the Floor



Fig. 17 – Optional Pogo Stick Attached to the Pogo Bracket

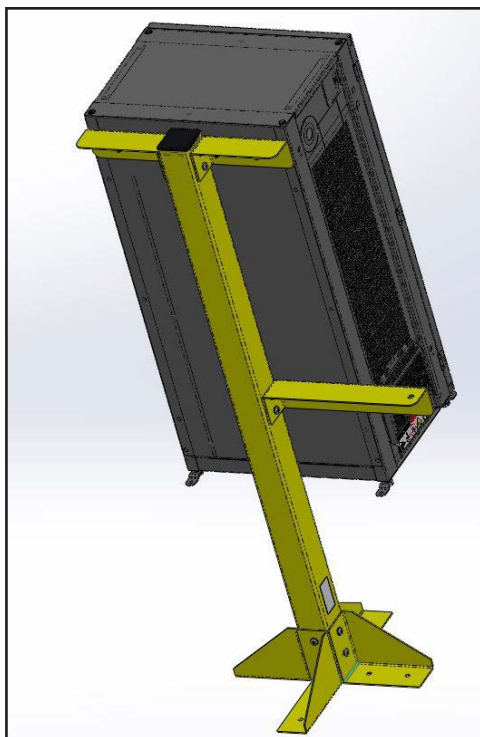


Fig. 18 – Charger Hung on the Floor Stand



Fig. 19 – Bottom Bracket Mounted to the Charger and Floor Stand  
with 35.4 in-lbs (4.0 Nm) of torque

## AC Power Connection

**DANGER****CONNECTION TO MAIN POWER**

Only qualified service personnel should remove the cover.

Only a qualified electrician is to make electrical connections!

- Make sure that the service AC input voltage is powered off before wiring the charger.

**DANGER**

- Ensure that the AC power cables to be used are disconnected from the AC power supply before continuing!
- Verify that there is no connection to the AC before opening the cabinet, which exposes AC wiring, and making terminal connections!
- Disconnect all power before servicing!

**WARNING****RISK OF FIRE****VAC Input****3-Phase 480V AC**

- Use the VAC input indicated above only on circuits with a branch circuit protection in accordance with the NEC NFPA 70 to reduce the risk of fire.

These circuits (maximum CB size) also are to be consistent with the supply current (input amps) indicated in the technical specifications for the respective number (2–5) and voltage (48V or 80V) of fitted modules and cabinet size (3 or 5 bays). See pages 13-16.

- Ensure that the minimum AC input wire size (AWG) indicated in the specifications meets NEC requirements.
- AC input voltage specifications are also listed on pages 13-16.

**On 3-bay and 5-bay cabinets:**

Remove the six screws on the top panel of the charger, then remove the panel.

M6 Screws (2021-2022)

M5 Screws (2023 and later)

**On 10-bay cabinets:**

Remove the six M5 screws on the top panel of the charger (Figure 20) with a TORX TX25, then remove the panel.

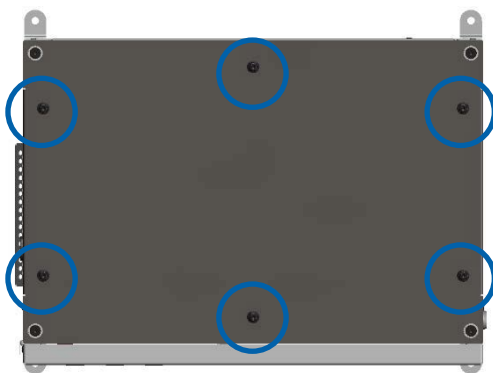


Fig. 20 – Top Panel View

Connect a NEC-approved AC shielded input cable (such as type SOOW) or conduit to the charger through the AC service entrance (Figures 21-23), which is the hole located near the top left corner of the charger.

**NOTE**

The USB connector is located in the top left corner of the charger.

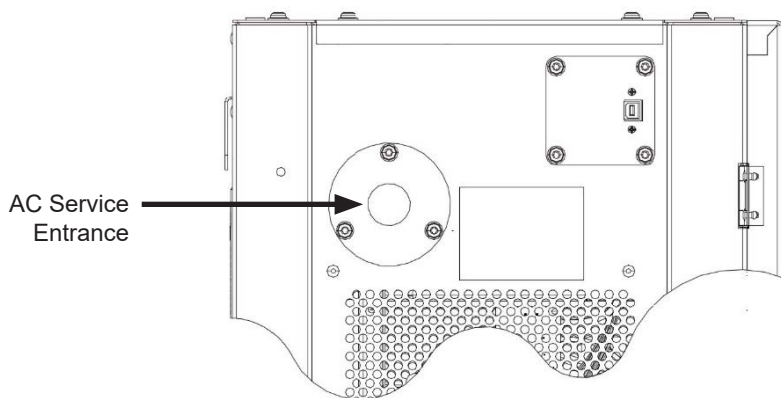


Fig. 21 – AC Service Entrance

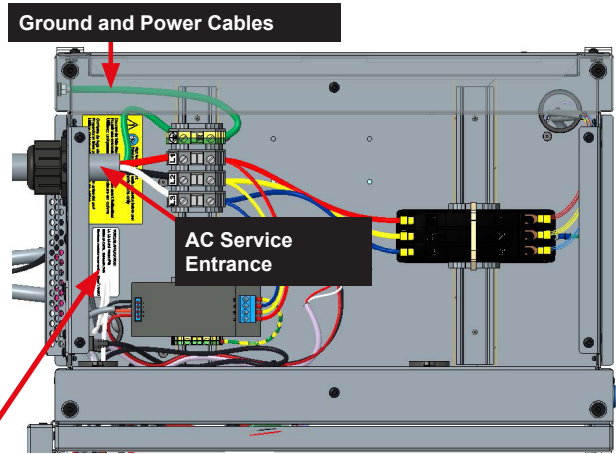


Fig. 22 – 3-Bay AC Service Entrance

TORQUE APPLICATION:  
L1, L2, L3 and Ground (PE)  
Min. 22 In-lb (2.5Nm), Max. 27 In-lb (3Nm)  
Maximum conductor cross section: 6AWG (16mm<sup>2</sup>)

Torque Specifications Label

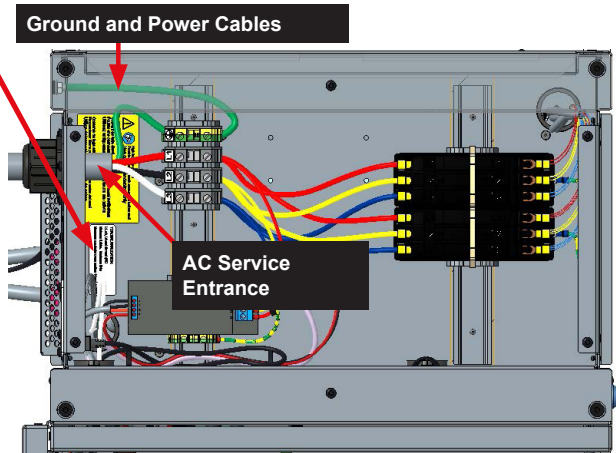
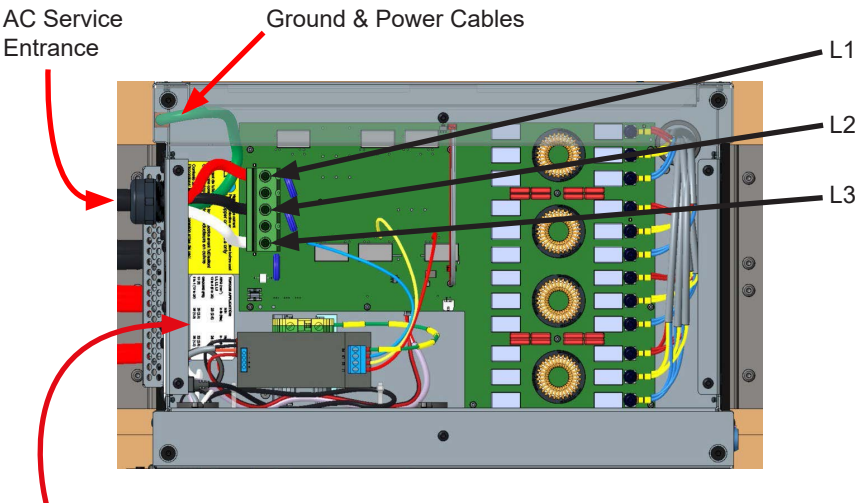


Fig. 23 – 5-Bay AC Service Entrance



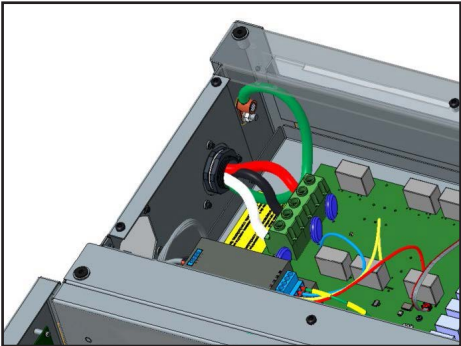
Fig. 24 – 10-Bay AC Service Entrance  
TOP VIEW



TORQUE APPLICATION:		
AWG (mm <sup>2</sup> )	MIN in-lb (Nm)	MAX in-lb (Nm)
<b>L1, L2, L3</b>		
10 to 4 (6 to 25)	23 (2.6)	26 (2.9)
<b>GROUND (PE)</b>		
10 (6)	20 (2.3)	22 (2.5)
8 to 4 (10 to 25)	35 (4.0)	38 (4.3)

Torque Specifications  
Label

Fig. 25 – AC Service Entrance  
THREE-QUARTER VIEW



Use the appropriate minimum wire size (gauge) or larger for the maximum kilowatt rating of the charger. See section 3 for the minimum fitted AC input wire size (AWG) per NEC.

The AC service entrance provides two-hole sizes.

1. Use the provided round panel to use the smaller hole size, or remove this panel to use the larger hole size.
2. Place an appropriate cable gland or conduit clamp in this AC service entrance to secure the cable or conduit.
3. Connect the three-phase AC input power cables.

Ensure that ground and power cables have been properly stripped of approximately 0.5 in. (12.7 mm) of insulation from the ends. Loosen the AC input terminal screws, with a flathead screwdriver, and insert the stripped ends of the ground and power cables.

4. Re-tighten the screws with a minimum to maximum of 23 in-lbs (2.6 Nm) to 26 in-lbs (2.9 Nm) of torque, respectively. AC line input positions are interchangeable because the three-phase input is not phase specific.
5. Ensure that the cable gland or conduit clamp has been properly tightened.

## DC Power Output

**DANGER**

Only qualified service personnel should remove the DC output power cable panel and service the charger.

**DANGER****RISK OF ELECTRIC SHOCK**

Electric shock can cause death or serious injury.

- Do not touch the uninsulated portion of the output power cable, battery connector or other live electrical parts, or uninsulated battery terminals.
- Disconnect the charger from the input power and battery before servicing.

**DANGER****DO NOT ATTEMPT TO CHARGE NON-RECHARGEABLE BATTERIES.**

Fast chargers are designed to be used only for charging rechargeable batteries. Attempting to charge non-rechargeable batteries could lead to death or injury from exploding batteries.

**DANGER**

**BATTERIES CAN BE DANGEROUS.**

Batteries generate explosive gases during normal charging and usage. Always follow charging instructions and those of the battery manufacturer to reduce the risk of battery explosion.

**WARNING**

**FLAMMABLE**

- Keep batteries away from fire.
- Do not smoke, use an open flame, or cause sparks near a battery.

**WARNING**

Connecting an 80V or higher battery to a 24V-48V charger may damage the charger.

Use voltage-keyed connectors on the chargers and batteries if your facility has mixed battery voltages.

**CAUTION**

User only copper wires.

**NOTE**

Three- and five-bay cabinets have field wiring terminal blocks that can accept a input wire gauge range from 10 to 14 AWG (6 - 2.5 mm<sup>2</sup>). The minimum and maximum screw-tightening is 22.2 in-lbs (2.5 Nm) and 26.4 in-lbs (3 Nm) of torque, respectively.

The 10-bay cabinet has field wiring terminal blocks that can accept a input wire gauge range from #10 AWG to #4 AWG. Refer to the Torque Specifications Label on page 33 for the appropriate torque value for the screws for each wire size.

- DC output power cables are provided with the charger.
- Anderson Euro, SB, or SBX connectors are used.
- Contact WCSI Customer Support at 1-866-767-4242 for more information.

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## Battery Connections for 3-Bay and 5-Bay Cabinets (Optional)

A 10-way screw terminal connector is provided behind the DC output power cable panel.

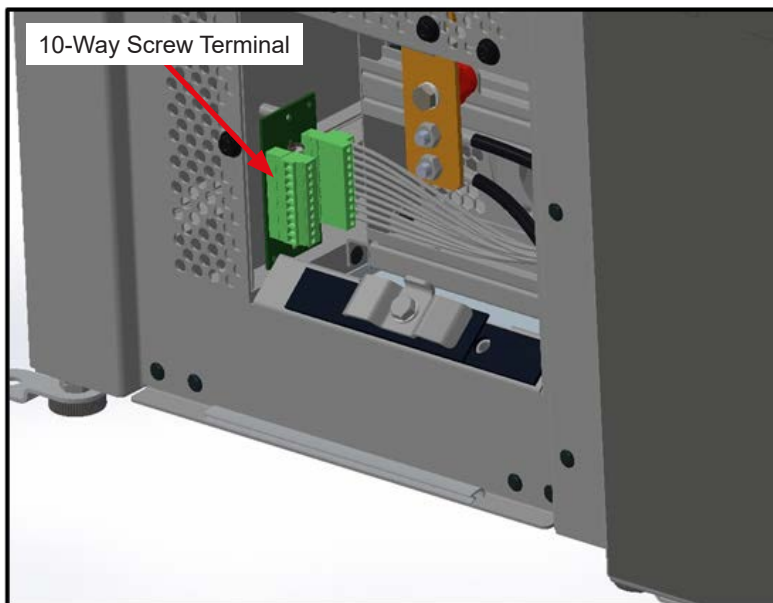


Fig. 26 – Ten-Way Screw Terminal Connector

This connector facilitates the connection of battery-related signals (battery communications).

Connect the battery communication wires – the “CAN” bus for battery BMS, “battery monitor,” and “pilot” (interlock) – to the screw terminal per Table 1, and tighten the terminal screws with 5.31 in-lb (0.6 Nm) of torque.



Fig. 27 – Battery Communication Wires Connected to the Screw Terminal



## Battery Connections for 10-Bay Cabinet (Optional)

A 12-way screw terminal connector is provided behind the DC output power cable panel

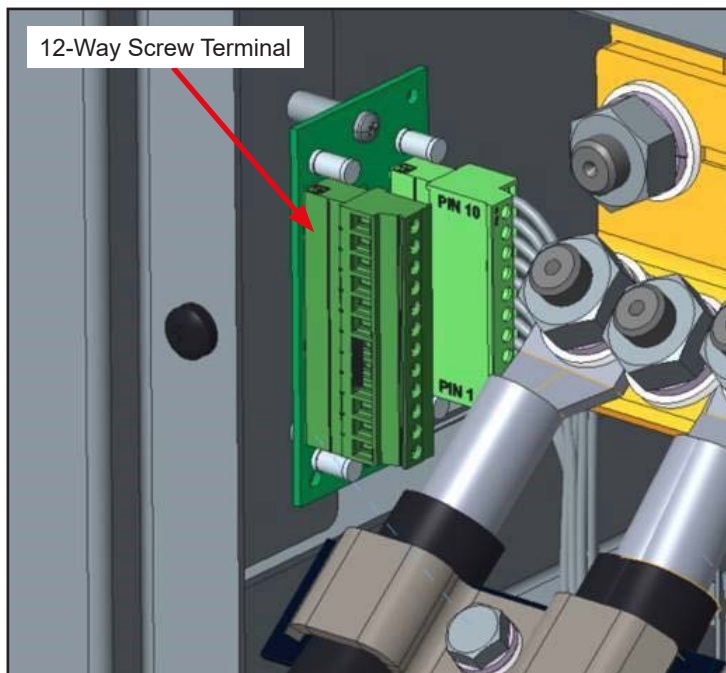


Fig. 28 – Twelve-Way Screw Terminal Connector

This connector facilitates the connection of battery-related signals (battery communications).

Connect the battery communication wires – the CAN bus for battery BMS, battery monitor, and pilot (interlock) – to the screw terminal per Table 1 and tighten the terminal screws with 5.31 in-lbs (0.6 Nm) of torque.

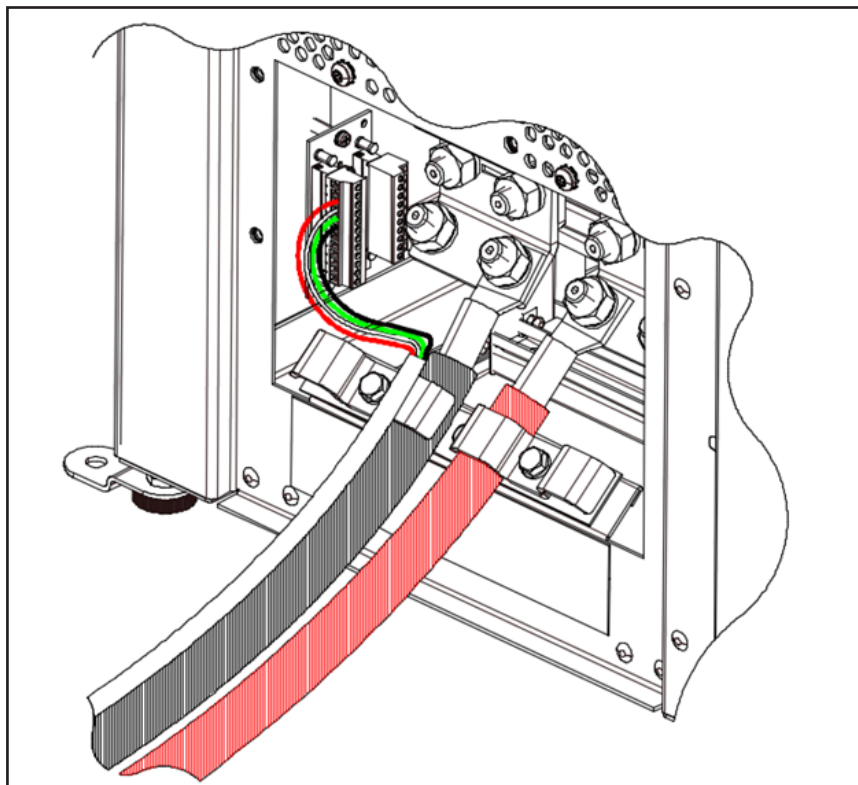


Fig. 29 – Battery Communication Wires Connected to the Screw Terminal

## Connection and Description for 3-Bay and 5-Bay Cabinets

The table below describes the bare-ended signal connections that can be connected to the charger via this connector.

Connection	Description
Pin 10	CAN1-L/DATA – RED
Pin 9	CAN1-H/DIR (Direction) – WHITE
Pin 8	PILOT – GREEN
Pin 7	PILOT RETURN – BLACK
Pin 6	SWA and SWB (DCT pins 6 and 5, respectively) are for an external pilot interlock connection. In order to charge, these pins must be shorted either by a normally closed pilot interlock connection or by a jumper. A jumper between these pins is factory installed to ensure the unit operates when it reaches a destination.
Pin 5	
Pin 4	Negative lead connecting and controlling the 24-VDC WATERING VALVE
Pin 3	Positive lead connecting the 24-VDC WATERING VALVE
Pin 2	Negative lead to the SPARE RELAY
Pin 1	Positive lead to the SPARE RELAY



### CAUTION

Use only copper wires.

## Connection and Description – 10-Bay Cabinets

The table below describes the bare-ended signal connections that can be connected to the charger via this connector.

Connection	Description
Pin 12	PILOT (GREEN) (BAT CON 2)
Pin 11	PILOT RETURN (BLACK) (BAT CON 2)
Pin 10	CANH/DATA (RED) (BAT CON1)
Pin 9	CANL/DIR (WHITE) (BAT CON2)
Pin 8	PILOT (GREEN) (BAT CON 1)
Pin 7	PILOT RETURN (BLACK) (BAT CON 1)
Pin 6	SWA and SWB (DCT pins 6 and 5, respectively) are for an external pilot interlock connection. These pins, in order to charge, must be shorted either by a normally closed external interlock or jumper. A jumper between these pins is factory installed to ensure that the unit operates when it reaches a destination.
Pin 5	
Pin 4	Negative lead connecting and controlling the 24VDC WATERING VALVE
Pin 3	Positive lead connecting the 24VDC WATERING VALVE
Pin 2	Negative lead to the SPARE RELAY
Pin 1	Positive lead to the SPARE RELAY

The connector can accept up to a 16 AWG wire.



### CAUTION

Use only copper wires.

## Optional Features

Optional Feature	Function
Watering Relay (24 VDC)	Allows control of a 24-VDC watering valve
Spare Relay	For future use
Pilot Interlock Connection	Stops the charger from charging

For more information, please contact your WCSI representative at 1-866-767-4242 on how to how to customize the Remote Battery Connections option.

## Charger Light Bar for 3-Bay, 5-Bay and 10-Bay Cabinets

Pattern	Meaning
<b>Flashing Red</b>	<p><b>Fault</b></p> <p>The charger has a problem. The fault code/description is shown on the display screen.</p>
<b>Walking White</b>	<p><b>Available</b></p> <p>The charger is power ON and is available to charge. The light will walk slowly upward. The light intensity is reduced, and the walk is half speed in Energy Saving mode.</p>
<b>Solid White</b>	<p><b>Connecting</b></p> <p>The light bar shows solid white during initial vehicle connection while the charger is collecting information.</p>
<b>Walking Blue</b>	<p><b>Offline</b></p> <p>The charger is not available to charge because the mobile application is configuring it or because the blockout window is active.</p>
<b>Cascading (Pulsing) Blue</b>	<p><b>Charging Lead Acid Batteries</b></p> <p>The charger is charging.</p> <p>The height of the cascading blue light on the light bar indicates the battery SOC level from 0% to 100%, scaling light by light.</p> <p>There are 22 lights on a 3-bay charger light bar, 32 lights on a 5-bay charger light bar, and 55 lights on a 10-bay charger light bar.</p> <p>For example, if the battery is 75% charged, the bottom 75% of the bar is cascading blue and the top 25% of the bar is dark (unilluminated).</p>

Pattern	Meaning
<b>Solid Blue</b>	Not Charging (Idle) But Connected The charger is not charging or has stopped charging and is idle, but it is connected to a vehicle. The height of the solid blue light on the light bar indicates the battery SOC level from 0% to 100%.
<b>Cascading (Pulsing) Orange</b>	Charging lithium-ion batteries The charger is charging. The height of the cascading orange light on the light bar indicates the battery SOC level from 0% to 100%, scaling light by light. There are 55 LEDs behind the strip of the charger light bar. For example, if the battery is 75% charged, the bottom 75% of the bar is cascading orange and the top 25% of the bar is dark (unilluminated).
<b>Solid Orange</b>	Paused (Lithium-Ion Charge) The lithium-ion BMS has paused the charging.
<b>Walking Yellow</b>	Charging is available, but there are module fault(s) which can reduce the charging rate.
<b>Cascading (Pulsing) Yellow</b>	Equalizing The charger is undergoing equalization of the charger batteries.
<b>Solid Yellow</b>	Watering The charger is watering the battery.
<b>Solid Green</b>	Completed The charging is 100% completed.

## Operating Instructions

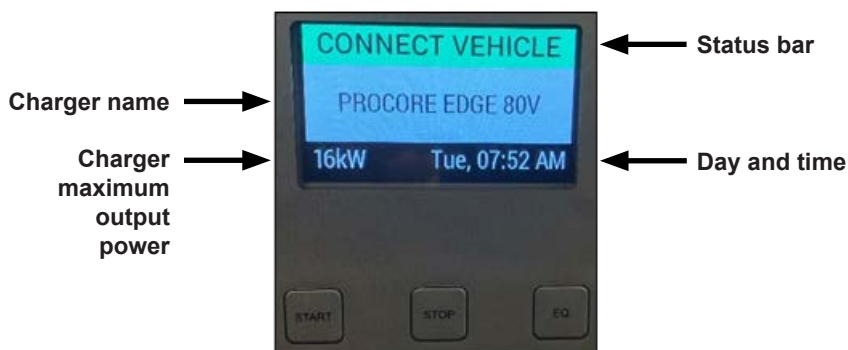


Fig. 30 – Status Bar

Table 5 – Operating Instructions Indicators and Descriptions

Indicator	Description
Status bar	Indicates whether a vehicle is connected to the charger.  “Connect Vehicle” indicates that there is no vehicle connected to the charger. The charger is idle.
Charger name	Displays the name broadcast to the ProCore™ Mobile Application (App), is sent to PosiLink and the cloud, and used in the charger logs.  You can change the charger name in the charge Setup window.



Indicator	Description
Charger Maximum output power	Displays the power rating for the charger  The value changes as modules are added or removed.
Day and time	The ProCore Mobile App automatically sets this indicator when connected to the charger.

Battery Display

The graphical battery display changes when the charger connects to the battery and shows the parameters of the battery’s state of charge (SOC).

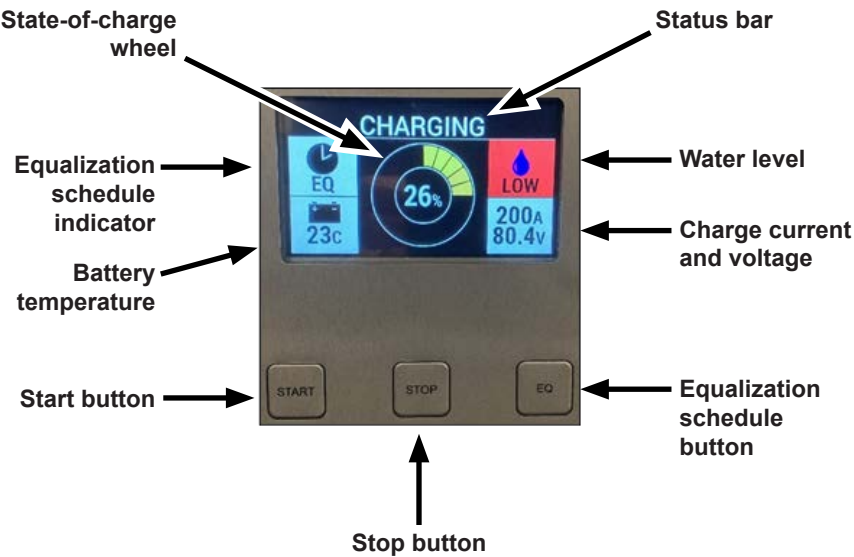



Fig. 31 – Graphical Battery Display

Indicator	Description										
State-of-charge wheel	<p>The charger estimates the battery charge percentage (or SOC) at the connection. The SOC wheel adds segments as the battery charges.</p> <p>The SOC displayed in the center of the wheel increases in value. As indicated below, the color of the wheel also indicates the SOC, allowing the battery charging state to be monitored at a distance.</p> <table border="1" data-bbox="330 500 792 659"> <thead> <tr> <th>Color</th><th>Charge Percentage</th></tr> </thead> <tbody> <tr> <td>Yellow</td><td>Less than 80%</td></tr> <tr> <td>Blue</td><td>80% or greater</td></tr> <tr> <td>Green</td><td>100% fully charged battery</td></tr> </tbody> </table>	Color	Charge Percentage	Yellow	Less than 80%	Blue	80% or greater	Green	100% fully charged battery		
Color	Charge Percentage										
Yellow	Less than 80%										
Blue	80% or greater										
Green	100% fully charged battery										
Equalization (EQ) schedule indicator	<table border="1" data-bbox="330 700 792 1013"> <thead> <tr> <th>Color</th><th>Meaning</th></tr> </thead> <tbody> <tr> <td>Light gray or no color</td><td>No EQ scheduled</td></tr> <tr> <td>Black</td><td>EQ scheduled</td></tr> <tr> <td>Flashing green</td><td>EQ charge in progress</td></tr> <tr> <td>Solid green</td><td>EQ charge completed for the current week</td></tr> </tbody> </table> <p><b>NOTE:</b> If there is no EQ icon visible, EQ is not available.</p>	Color	Meaning	Light gray or no color	No EQ scheduled	Black	EQ scheduled	Flashing green	EQ charge in progress	Solid green	EQ charge completed for the current week
Color	Meaning										
Light gray or no color	No EQ scheduled										
Black	EQ scheduled										
Flashing green	EQ charge in progress										
Solid green	EQ charge completed for the current week										

Indicator	Description
Battery temperature	<p>The temperature reading comes from a temperature sensor installed in the battery. If there is no sensor, then the display grays out.</p> <p>The display can be set to °F or °C, using the ProCore™ Mobile App Charger Setup/Display Options window.</p> <p>If the battery is overtemperature, then the charger faults and displays the battery temperature window as red.</p>
Status bar	<p>Indicates the charging status with the following displays:</p> <ul style="list-style-type: none"><li>• BMS Charging</li><li>• BMS Standby</li><li>• BMS Stopped Charging</li><li>• Charge Blocked (blockout window)</li><li>• Charge Completed</li><li>• Charge Stopped</li><li>• Charging</li><li>• Connect Vehicle</li><li>• Connecting...</li><li>• EQ Charging</li><li>• Fault – Additional information is displayed about the fault or warning.</li><li>• Full Charging</li><li>• Initializing (Phase)</li><li>• Offline – Charging is stopped to use the ProCore Mobile App to change the configuration.</li><li>• Recover Charge</li><li>• Watering</li></ul>

Indicator	Description	
Water level	<b>Drop/Background Color</b>	<b>Indication</b>
	Blue drop and white background	OK – the battery water level is OK.
	Blue drop and red background	LOW – the battery water level is low.
	Grey drop and white background	There is a BMID with a no water level sensor
	<div data-bbox="348 551 426 628">  </div> <p data-bbox="479 574 551 597"><b>NOTE</b></p> <p data-bbox="338 648 916 702">There is no drop if there is a CAN battery or if there is no BMID (voltage mode).</p>	
Charge current and voltage	The charger controls the charging current via Webasto proprietary charging algorithms.	

## Alternate Battery Display

You can switch the battery graphical display to an alternate tabular battery display showing additional parameters for the charging battery.

Press and hold the **Start** button for three seconds to change the graphical battery display to the alternate tabular battery display (Figure 5). Repeat this step to return the display to the graphical battery display.

CHARGING			
Battery ID	TESTBAT1	TRUCK001	Vehicle ID
Battery Cap	1000 Ah	58.6V/200A	Volts/Amps
Battery Cells	24	0hr 9min	Charge Dur
Battery Type	1	31 Ah	Charge Ah
Battery SOC	34%	1.9 kWh	Charge kWh
Battery Temp	24 C	v1.336	Charger SW
Water Status	LOW	Yes	EQ Scheduled

Fig. 32 – Alternate Tabular Battery Display



#### NOTE

ProCore™ Edge starts charging automatically when you connect a vehicle. Provided you are not utilizing SB cables, you can disconnect a vehicle safely from ProCore™ Edge even while charging. You do not need to start or stop the charge with the following buttons.

Table 6 – Buttons and Functions

Button	Function
Start	<p>If the charger is in the Charge Stopped state, then press the <b>Start</b> button momentarily to restart the charge.</p> <p>Press and hold the <b>Start</b> button for three seconds to switch from the graphical battery display to the alternate tabular battery display. Press and hold the <b>Start</b> button for three seconds again to switch back to the graphical battery display.</p>
Stop	<p>Press the <b>Stop</b> button to stop the charge.</p> <p>The charge displays “Charged Stopped” on the status bar.</p>
EQ	<p>Equalization (EQ) is an extended low-current charge performed once per week to maintain battery health. EQ normally is scheduled automatically by settings in the charger or BMID, and it is performed if scheduled after a regular charge to 100% SOC.</p> <p><b>NOTE:</b> Normally, the EQ button only responds during the EQ window period, but it can be configured to work at all times or not at all.</p> <p>The alternate tabular battery also displays the EQ Scheduled status.</p> <p>If the status bar at the top shows:</p> <p><b>Charging</b> – press the <b>EQ</b> button to schedule or unschedule an EQ charge.</p> <p><b>Charge Stopped</b> – the charger will charge the battery to full capacity, it will then start an EQ.</p> <p><b>Battery Undervoltage</b> – press and hold the <b>EQ</b> button to start a recovery charge, which is a low-current charge designed to raise safely the battery voltage. The battery should be able to accept a normal charge after the recovery charge is completed.</p>

## Faults and Warnings – Hardware Diagnostics

**NOTE:**

- A “fault” turns the charger **OFF**.
- A “warning” is a displayed message for the operator.

Display Message (Name)	Message type	Description	Action(s)
ADC Reference Low	Fault	The ADC reference power supply is under voltage. Readings cannot be trusted.	Replace the system controller.
BAT OVER VOLTAGE (Battery over voltage)	Fault	The battery voltage is too high (i.e., above the battery table maximum voltage limit) to charge.	Checked the battery parameters for accuracy.
		The BMID number of battery cells setting is incorrect.	Use the ProCore App BMID setup to set the correct number of battery cells.

(Continued)

Display Message (Name)	Message type	Description	Action(s)
BATT UNDER VOLTAGE  (Battery under voltage)	Fault	The battery voltage is too low to start the fast charge (the voltage is below the battery table minimum voltage limit).	Press and hold the <b>EQ Schedule</b> button to initiate a recovery charge and raise safely the battery voltage.
		The battery is drained to a voltage below a safe level for charging. Recovery charge is needed.	
		The battery voltage is too low (i.e., below the operational voltage limit) to use on this charger	Use a charger that supports the battery voltage.
		The BMID number of battery cells setting is incorrect.	Use the ProCore™ App BMID setup to set the correct number of battery cells.
Battery Communication Timeout	Fault	Communication with the battery was lost over the communication bus.	Check the communication wires.
Battery Connection Issue	Fault	Battery initialization failed during connection.	Check the battery communications wiring for damage.
Battery Data Invalid	Fault	The BMID configuration data read from the battery are not valid for the charge.	Use the ProCore App to recheck the battery parameters in the BMID.



Display Message (Name)	Message type	Description	Action(s)
<b>BATTERY TEMP</b>  (Battery over temperature  The battery temperature is too high.)	Fault	The batter temperature is too high (i.e., above the battery table maximum temperature) to charge.	Let the battery cool before charging.
		A faulty battery cannot accept a high-charge current.	Service the battery.
		An incorrect BMID setting is resulting in a faulty battery overheating.	Use the ProCore App to correct the BMID settings.
Battery Temperature Sensor Failure	Warning	The temperature sensor reading is out of the valid range.	Check the battery temperature sensor wiring for damage.
Battery Voltage Mismatch	Fault	The difference between the battery reported voltage and corrected local voltage exceeds 2 volts.	Check for output cable damage causing an excessive voltage drop.
Battery Voltage Reversed	Fault	Positive and negative terminals are reversed on the battery connection.	Fix the output cable connection polarity.
<b>BMID LOST COMM</b>  (BMID Communication is Lost)	Fault	There are damaged BMID communication (comm) wires in the charger output cable or in the vehicle.	Repair the wiring.

Display Message (Name)	Message type	Description	Action(s)
Charger Configuration Access	Fault	The charge could not read charge configuration settings.	Call Webasto service.
Current Control	Warning	One or more power modules are not delivering current.	Call Webasto service.
DC Line Open	Fault	The difference between the module reported voltage and local battery voltage exceeds 5 volts.	Check the battery voltage sensor wiring for damage.
Duplicate Module IDs	Fault	At least two modules have duplicate CAN IDs on the internal CAN bus.	Call Webasto service.
Factory Data Not Set	Fault	The charger factory configuration is missing.	Call Webasto service.
Fan Speed Low	Warning	The fan speed is very low.	Call Webasto service.
Fan Speed Too Low	Warning	The fan has stopped or is too low to charge.	Call Webasto service.
Module General Fault	Fault	The module faulted with no specific reason reported.	Call Webasto service.
Module High Temperature	Warning	The module temperature is very high	Check for obstructed air flow.

Display Message (Name)	Message type	Description	Action(s)
Module Memory Issue	Fault	The module had a memory related error.	Call Webasto service.
Module OCP Tripped	Fault	There was an error in the over-current protection module.	Check that the battery voltage is within range for the charger.
MODULE OVER TEMP  (Module / Charger Over Temperature)	Fault	The air intake is blocked.	Check for obstructed air flow.
		The system board temperature sensor is above 80° C.	Remove the blockage.
		The module temperature is too high to charge.	
		The module failed.	Replace the power module.
Module OVP Tripped	Fault	There was an error in the over-voltage protection module.	Check that the battery voltage is within range for the charger.
MODULE TYPE ERR  (Module Installation Type)	Fault	The power module type does not match the factory configuration (cabinet voltage) settings, or incompatible modules were installed together.	Install the correct power module.  Call Webasto service.
No Battery Configuration	Fault	The parameters have not been configured for the voltage mode charge.	Configure the voltage mode settings on the charger, using the ProCore mobile app.
No Modules	Fault	No power modules are installed.	Call Webasto service.
		No CAN or BMID messages received when connected.	Check the comm wiring.

Display Message (Name)	Message type	Description	Action(s)
OCP Fault  (There is a Module Over-current)	Fault	The module failed.	Replace the power module.
OVP Fault  (There is a Module Over-voltage)	Fault	The battery became disconnected without opening the pilot.	Wait for the fault to clear.
Power Stage Initialization Error	Fault	There was a CAN bus problem during power stage initialization.	Call Webasto service.

## Initial Software Setup

### Purpose:

The purpose of this procedure is to describe how main application software is installed onto the ProCore Edge charger system board, either by the manufacturer or in the field.

NOTE: This procedure describes the method of loading the firmware using a PC-connected via USB port. Firmware can also be loaded using a smart phone connected via Bluetooth. For the smart phone procedure see PLMS part no. 25129-11 for iOS devices.

### Scope:

This procedure relies on ProCore Edge Bootloader SW version 1.027 or later.

### Components and Descriptions:

Component	Description
ProCore Edge Charger	Industrial opportunity charger
LCD Screen	The graphical interface located on the front of the ProCore Edge charger
System Board	The PCB located inside the charger which controls the LCD screen, stack lights, and power output
USB	Universal Serial Bus – a USB connector is located on the side the unit
PilotTerm	Windows™ application that communicates with the charger via the USB port
AVB File	Loadable binary application file – this refers to the -11 main application loaded using PilotTerm, which has an extension of .avb

## Required Equipment:

- USB cable type AB
- PC utilizing one of the following Microsoft Windows operating systems:  
**64-bit — Windows 7, 10**  
**32-bit — Windows 7, 8, 10**
- PilotTerm 1.008 or later installed on the PC (PLMS Part No. 22718-11)  
The latest version as of this writing is 1.012.
- The **-11 AVB** file to be loaded to the charger stored somewhere on the PC (see this part number).



Fig. 33 – USB Cable AB

## Procedure:

1. Turn ON the charger.
2. Attach the B-type end of the USB cable to the USB port on the charger. Firmware is updated using the USB connector located in the top left corner of the charger.

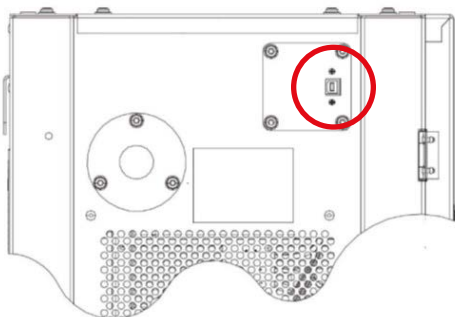


Fig. 34 – USB Connector

3. Attach the A-type end of the USB cable to a USB port on the PC running Windows.
4. Run PilotTerm on the PC.

5. In the Settings tab, select the COM port that is connected to the USB cable. Then select **Connect COM Port**.

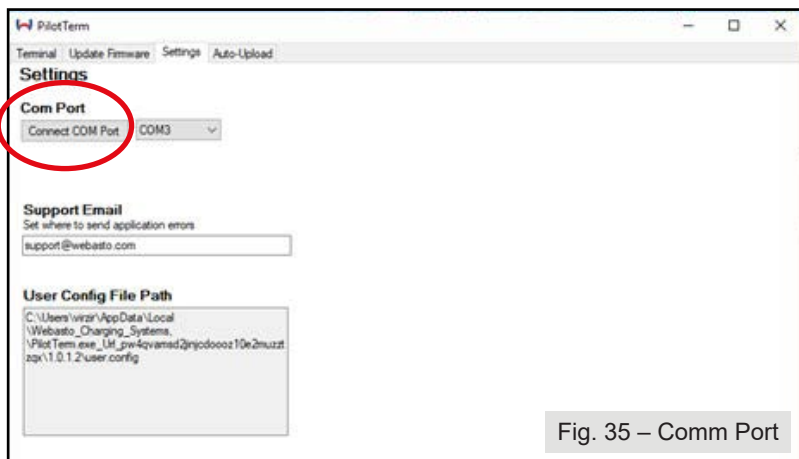


Fig. 35 – Comm Port

6. In the Update Firmware tab, use the **Browse** button to select the location of the AVB file you want to upload.

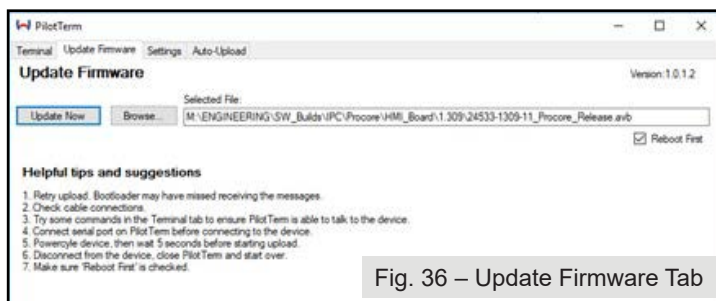


Fig. 36 – Update Firmware Tab

7. Select the **Update Now** button – you will see a progress bar at the bottom. The message “Upload successful” will appear at the bottom left when the upload is completed.
8. If you see the message “Upload Failed,” power cycle the charger and select the **Update Now** button again immediately after.

9. Select the **Terminal** tab, then enter **ver** in **Send Data** and select **Send**. The terminal window will display the following information (the version and CRC may vary):

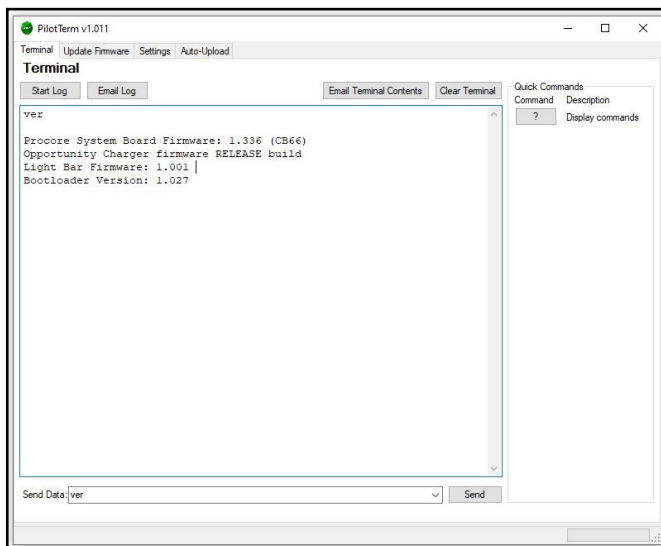


Fig. 37 – Terminal Tab

Confirm the firmware version matches the one that was just loaded, and confirm the Run Mode is Release (for production unit).

10. The loaded application should begin after the firmware load is complete. You may unplug the USB cable after this point.



# Service / Maintenance

## Preventative Maintenance Schedule

The table below describes the preventative maintenance activities for the first three years of the system.

**Verify the following activities after five years:**

- Monthly – Fan air flow at the module intake
- Yearly – Power connection torque along the high-current path
- Air Filter Replacement – Not yet available

ProCore™ Edge Component Description	Maintenance Verification / Action	Schedule				
		Daily, by User	Monthly	Trimonthly	Yearly	Triennially
Output Cables	Examine cables and replace any cable that exhibits signs of damage (splits, cracks, tears, exposed conductors, etc., or excessive wear, and discoloration.	*		*		
Three Output Cable Connectors	Examine connectors, and replace any connector that exhibits signs of damage (splits, cracks, exposed or pitted power pins, etc.), or excessive wear, and discoloration.	*		*		

ProCore™ Edge Component Description	Maintenance Verification / Action	Schedule				
		Daily, by User	Monthly	Trimonthly	Yearly	Triennially
Cool Air Intake and Hot Air Exhaust Vents	Inspect the cool-air intake vents at the system back and hot-air exhaust vents at the system lower-front for any reduced airflow or blockage. Remove any airflow obstruction to ensure proper system cooling.	*	*			
ProCore Exterior	Examine the charger exterior for signs of damage or excessive wear. Repair or replace any system that has been damaged in such a way that conductors are exposed, or the cabinet may contact internal conductors.	*			*	
ProCore Interior	Vacuum out dust from the charger interior using a vacuum designed for electronic systems. Pay close attention to electronic devices to prevent damage. It may be necessary to vacuum out dust more frequently if the unit is installed in a highly dusty environment.			*	*	
ProCore Interior Harness Connections	Examine for signs of damage or wear or discoloration in all harness connections.				*	

ProCore™ Edge Component Description	Maintenance Verification / Action	Schedule					
		Daily, by User	Monthly	Trimonthly	Yearly	Triennially	
Check for discoloration: NEGATIVE DC OUTPUT POSITIVE DC OUTPUT	Examine the high-current path for signs of discoloration and replace any discolored components, making sure to use the correct torque on all fasteners.				*		
DC Output Fuse	Fuses do not require maintenance until an overcurrent event causes them to open, or if they experience excessive heat due to a loose connection.					*	
Data Contacts on Output Connectors	The data contacts in the output cable has a life expectancy of 5000 disconnection cycles.						
	Disconnections per Day	Replace Contacts (Months)					
	4	40					
	7	24					
	9	18					
	13	12					
	25	6					

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## Replacing a Module

1. Unplug any vehicles connected to the charger.



### NOTE

Always press the STOP button on the ProCore Edge battery display before disconnecting SB cables from a battery. Pressing the STOP button will prevent the possibility of electrical arcing.

2. Turn OFF the AC power at the breaker and lock it out:
  - a. Remove the AC input by performing a LOTO to safely remove AC input from service.
  - b. Disconnect the battery charger from the input power and battery connections before servicing the unit. Lockout/tagout the input power according to OSHA 29 CFR 1910.147.
  - c. Rest the unit – allow 30 minutes to discharge prior to servicing, then test the components to ensure it is properly discharged.



### DANGER

#### IMPORTANT

Make sure the charger is completely POWERED OFF and that NO BATTERY IS CONNECTED before opening the charger door and replacing a power module. Power module replacement should only be performed by qualified (service) personnel.

3. Open the charger door.

To unlock the door and open it, use a flathead screwdriver to turn the latch on the side of the charger.



Fig. 38 – Latch on the Side of the Charger

4. Disconnect the power cables.

Disconnect the DC output cable (below left) and the three-phase AC input cable (below right) from the power module to be replaced by squeezing the clamp releases and pulling.

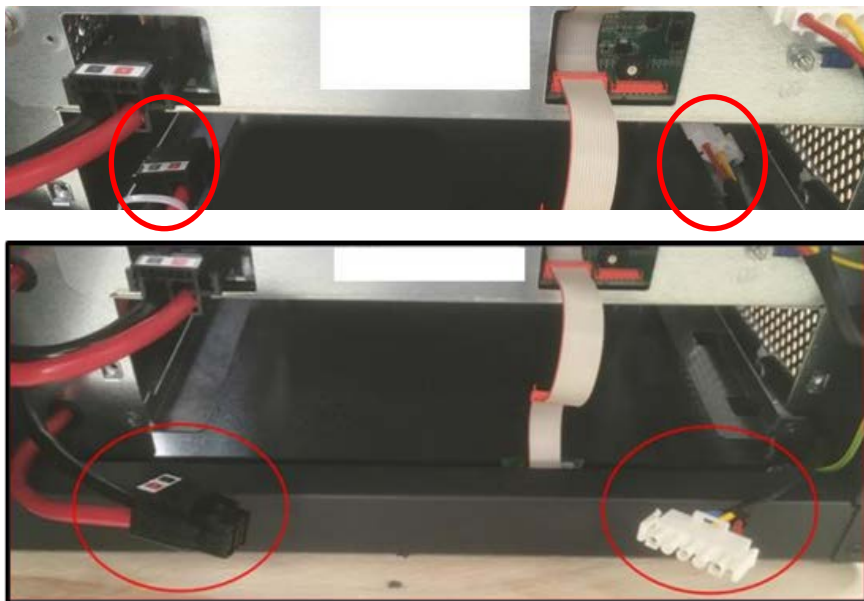


Fig. 39 – Disconnected Power Cables

5. Use a 7-mm socket wrench to disconnect the ground cable.



Fig. 40 – Ground Cable Disconnection

6. Disconnect the power module communication cable(s).

The two possible configurations for power module communications are a single-cable connection and a multi-cable connection – see the next two pages for each of these configurations.

## 7. Single-Cable Connection

For a single-cable connection, start by disconnecting the end of the cable from the termination block located at the very bottom of the charger. Then unplug the communications, starting from the bottom power module, until the module to be replaced has been disconnected.

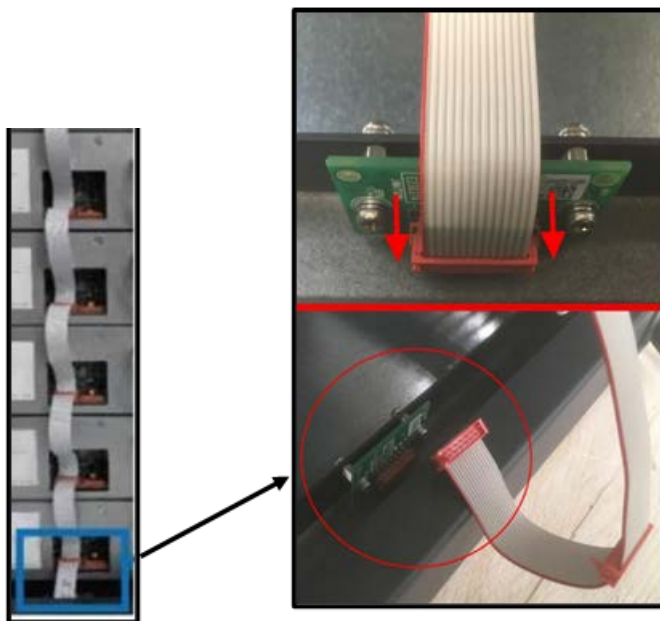


Fig. 41 – Single Cable Connection



### NOTE

The ribbon cable has a red edging to denote Pin 1.

While facing the module, always insert the connectors so the cable red line is on the left.



## 8. Multi-Cable Connection

For a multi-cable connection, only the communication cables from the module to be replaced need to be disconnected.

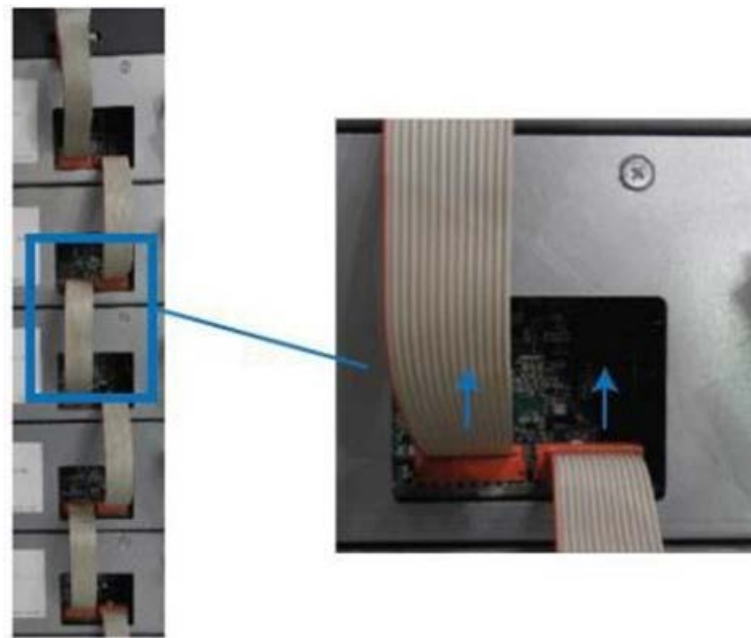


Fig. 42 – Multi-Cable Connection

9. Loosen the mounting screws and remove the power module.
10. Using a flathead screwdriver, turn each mounting screw counterclockwise until the spring ejects and releases the screw from the nut. Carefully pull out the power module.

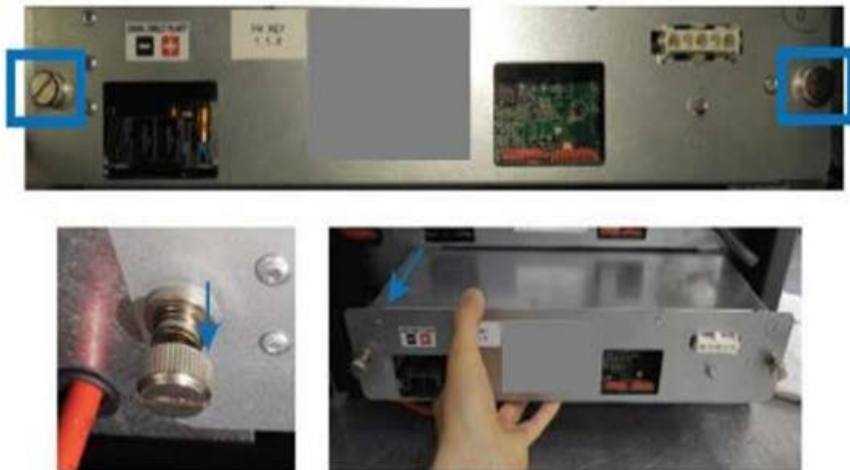


Fig. 43 – Power Module Removal

11. Insert the replacement power module, and set the module position selector.
12. Insert the replacement power module.

Use a flathead screwdriver to tighten the mounting screws by pushing in and turning clockwise.



Fig. 44 – Replacement Power Module Insertion

13. Using a small flathead screwdriver (ideally with a 0.4-mm × 2-mm tip and no bigger than 0.7 mm × 3 mm), adjust the power module position selector (below left) to match the power module position (below right).

### 3-Bay and 5-Bay Cabinets

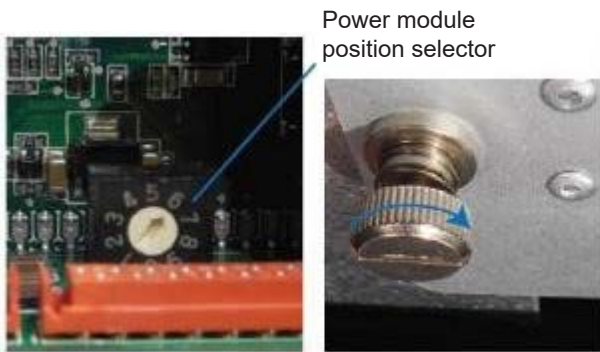


Fig. 45 – Power Module Position Selector

Charger
Module 1
Module 2
Module 3
Module 4
Module 5

Fig. 46 –  
Power Module  
Positions

The power module positions are 1 through 3 for the three-bay and 1 through 5 for the five-bay. The Module 1 position always starts at the top slot.

# 10-Bay Cabinet

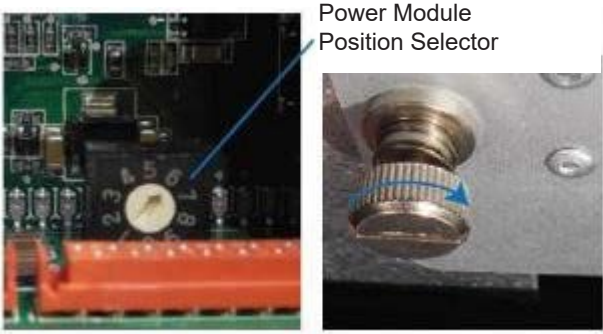


Figure 47 – Power Module Position Selector

The power module positions are 1 through 10 – the Module 1 position always starts at the top slot.

Charger
Module 1
Module 2
Module 3
Module 4
Module 5
Module 6
Module 7
Module 8
Module 9
Module 10

Figure 48 – Power Module Positions

14. Reconnect all communication cables that were disconnected in steps 4 through 6.
15. Connect the flat cable(s) to the power module.

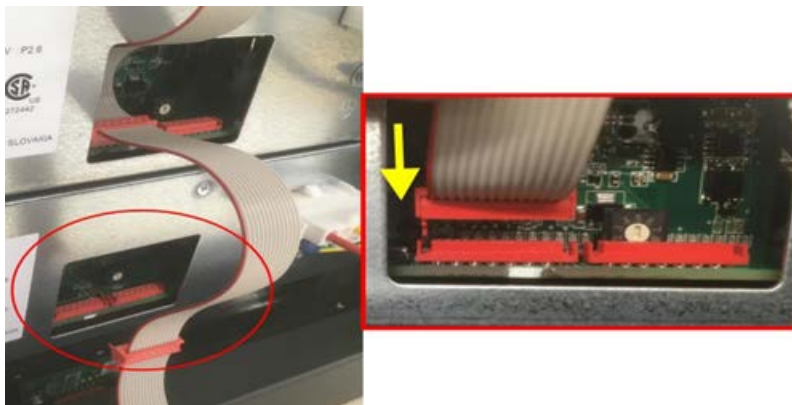


Fig. 49 – Flat Cable Reconnection to the Power Module

16. Connect the flat cable to the termination block.

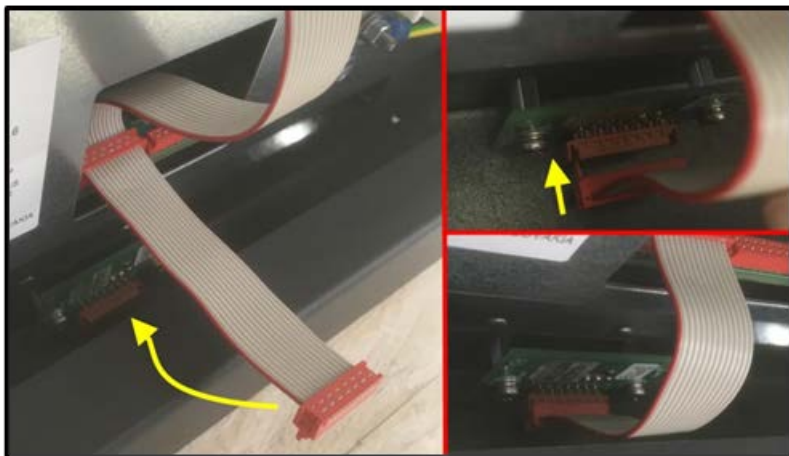


Fig. 50 – Flat Cable Connection to the Terminal Block

17. Reconnect the DC output cable (below left) and AC input power cable (below right) that were disconnected in step 4.
18. Reconnect the ground cable that was disconnected in step 5 with an M4 flange nut with 18.5 in-lb (2 Nm) of torque (below right).

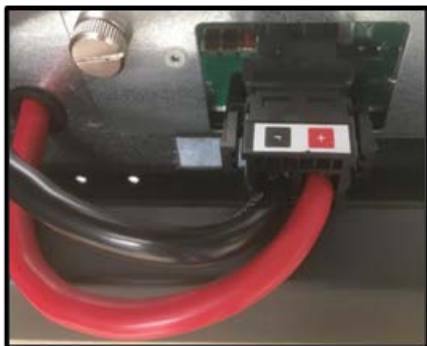


Fig. 51 – Reconnected DC Output Power Cable

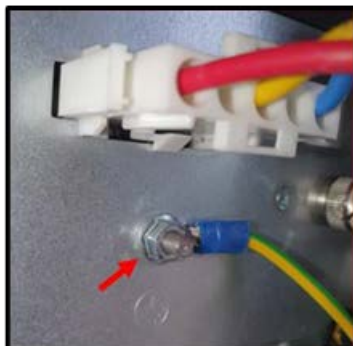


Fig. 52 – Reconnected Ground Cable and AC Input Power Cable

19. Close the charger door and use the flathead screwdriver to turn the latch counterclockwise to lock the door.



## Replacing the Output Cable

### DC output power cable connection

1. Unplug any vehicles connected to the charger.



#### NOTE

Always press the STOP button on the ProCore Edge battery display before disconnecting SB cables from a battery. Pressing the STOP button will prevent the possibility of electrical arcing.

2. Turn OFF the AC power at the breaker and lock it out.
3. Wait five minutes for the capacitor voltages to bleed down.
4. Remove the TORX TX25 screws from the DC output power cable panel located at the bottom left of the charger, and pull the panel up and away from the charger cabinet.

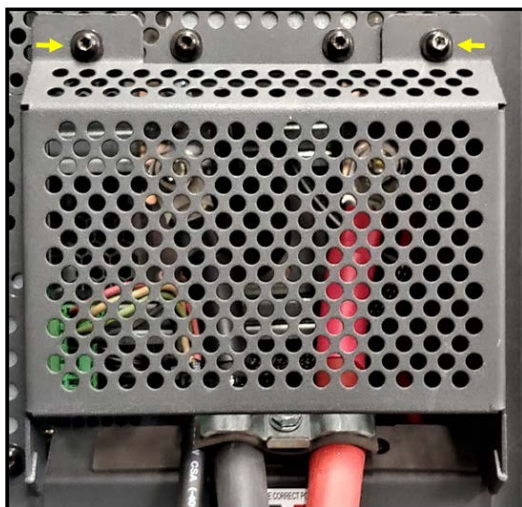


Fig. 53 – Torx TX25  
Screws Securing  
the DC Output Power  
Cable Panel

Within the panel, three- and five-bay cabinets have two DC output power bus bars: one for the positive (red) DC output power cable and one for the negative (black) DC output power cable.

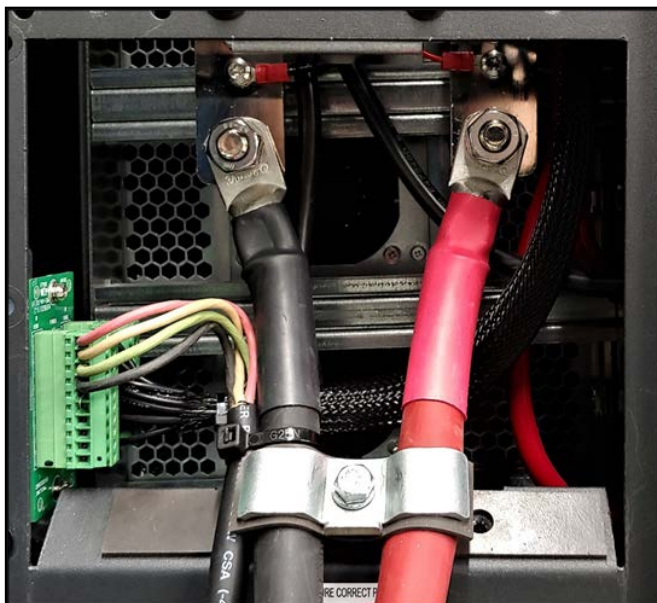


Fig. 54 – Three- and Five-Bay Bus Bar Arrangement

On the 10-bay cabinet, there are two DC output power bus bar bridges within the panel: one for the positive (red) DC output power cable and one for the negative (black) DC output power cable.

As shown below, there are two bus bar and clamp configurations:

- KIT-BUS BAR\_CLAMP 350MCM CBL
- KIT-BUS BAR\_CLAMP 2X4/0 CBL

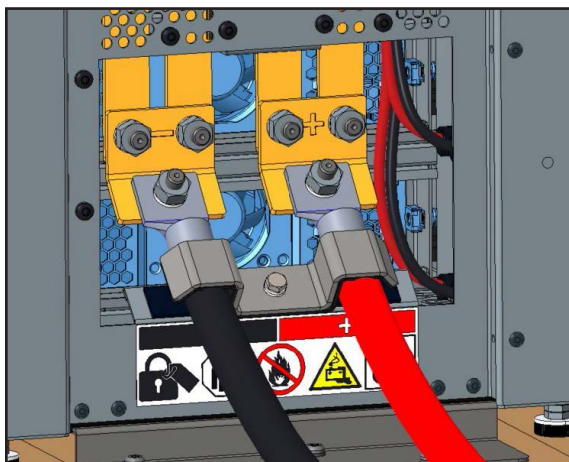


Figure 55 – Bus Bar and Clamp Kit for 350MCM Output Cable 1

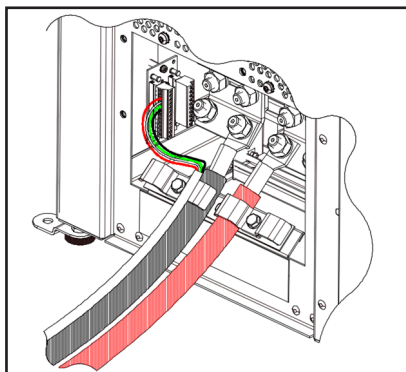


Figure 56 – Bus Bar and Clamp Kit for 2x4/0 Output Cable

5. The positive cable connects to the bus bar stud on the right, and the negative cable connects to the bus bar stud on the left, with 216.83 in-lb (24.5 Nm) of torque.

**3-Bay and 5-Bay Cabinets:**

To secure them for strain relief, fasten the provided lower clamp to the DC output power cables with 53.1 in-lb (6 Nm) of torque.

**10-Bay Cabinet:**

Fasten the provided lower clamp to the DC output power cables with 39.78 in-lbs (4.5 Nm) of torque to secure them for strain relief.

**NOTE**

Prior to fastening the lower clamp, ensure the gray protective rubber sleeve is on the upper side of the DC output power cables.

## Replacing the Controller PCBA

Parts kit # 5910975 contains the following items:

- System Controller PCBA
- Display (attached to the controller PCBA with VHB tape)
- Most recent software uploaded for Light Bar and applications

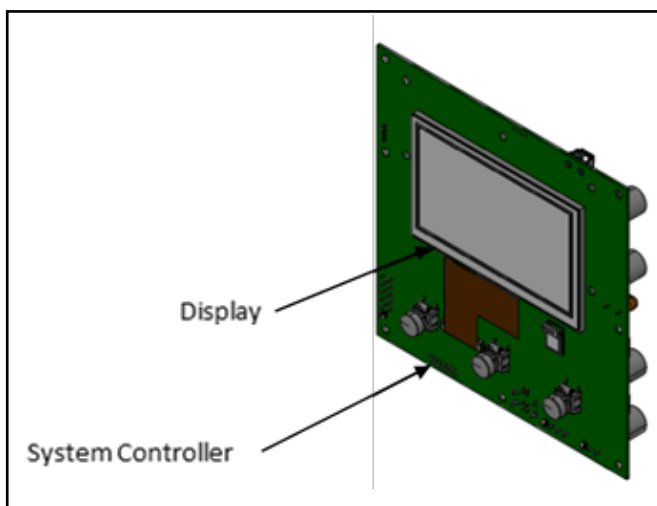


Fig. 57 – Controller PCBA

(Continued)

### Procedure:

1. Perform the lockout/tagout procedure before servicing the charging station.
2. Open the front door and unplug the seven cables (J1 – J7) as shown below.
3. Remove the seven screws as shown to the right, then remove the PCBA.
4. Install the new/replacement PCBA and tighten the screws with 0.44 lb-ft (0.3 Nm) of torque.
5. Plug in cables J1 – J7 as shown below.

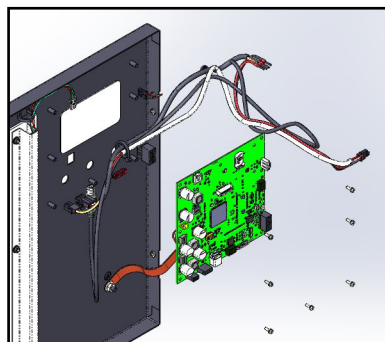


Fig. 58 – PCBA 3/4 View

5. Plug in cables J1 – J7 as shown below.

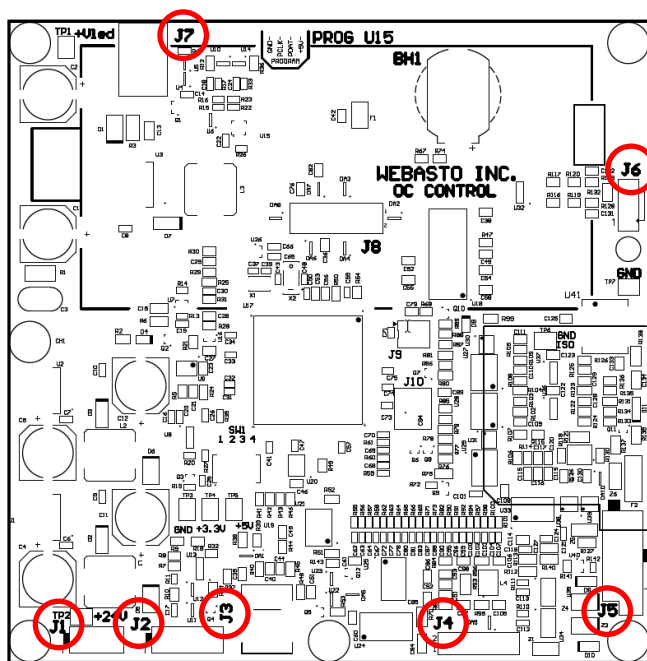


Fig. 59 –  
PCBA Rear  
Facing View

## Replacing the Door Panel

### Removal

#### Special Notes About Door Replacement:

- The replacement door hinge has increased from 1mm to 1.5mm in thickness.
- The hinge itself is riveted to the cabinet side only.

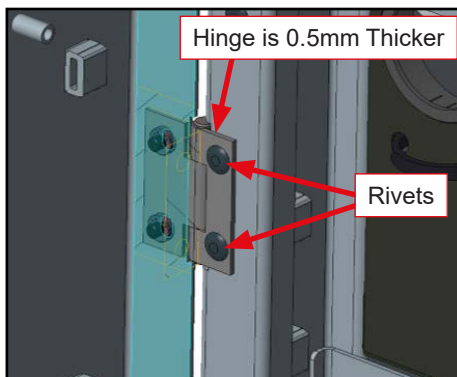


Fig. 40 – Inside Cabinet View  
Cabinet-Side Rivets

- The door is secured to the hinge using two M4 bolts per hinge.
- The door can be detached from the hinge by unscrewing the bolts.

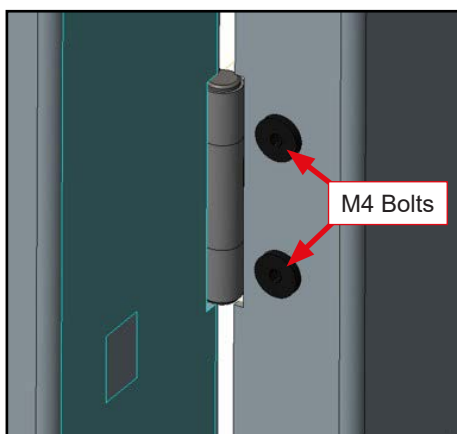


Fig. 60 – Outside Cabinet View  
Replacement Door Bolts  
Door-Side Only

- A single pin helps to properly align the door with the top of the cabinet.
- It also helps to prevent the lock from being detached by excessive movement or jarring during transport.

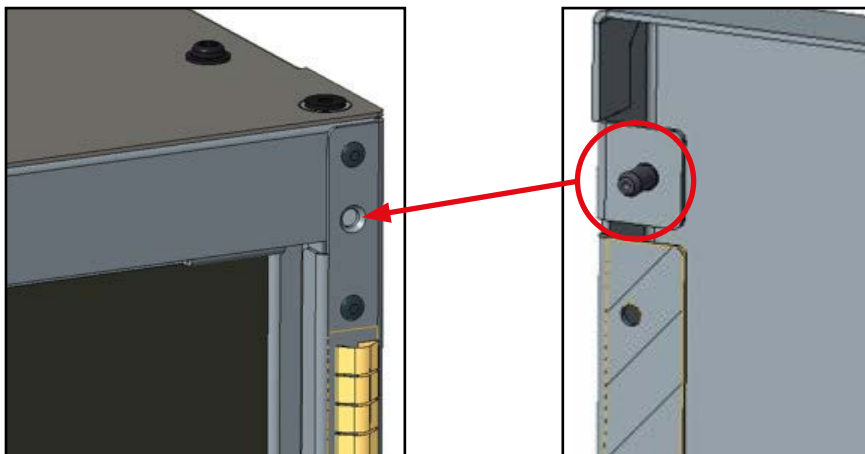


Fig. 61 – Alignment Pin

- **The replacement door can only be installed using the new ProCore Edge cabinet featuring the hinge/pin design.**
- The replacement door is **not** fitted with the System Controller.
- The replacement door does **not** come with replacement M4 bolts – it must be installed using the existing M4 bolts on the charger.



Fig. 62 – Replacement Door



- The cable clamp for the 3-bay and 5-bay cabinet has also been improved.
- The new clamp is made from 3mm steel, and it can accommodate cables from 11 - 21mm in diameter.
- For 5-bay cabinets, install a 5mm spacer.
- For 3-bay cabinets, a spacer is not necessary.

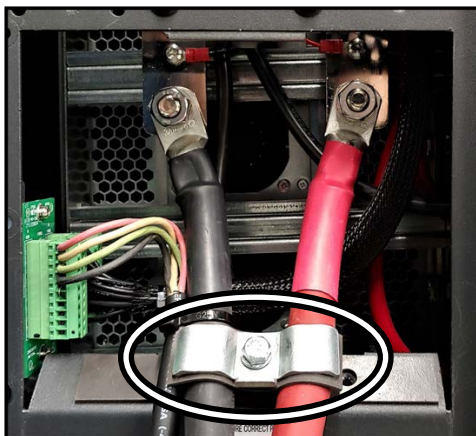


Fig. 63 – Cable Clamp  
Inside the Charger Cabinet

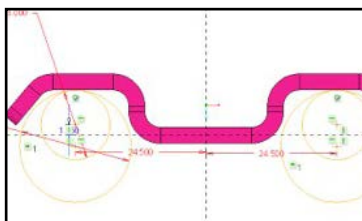
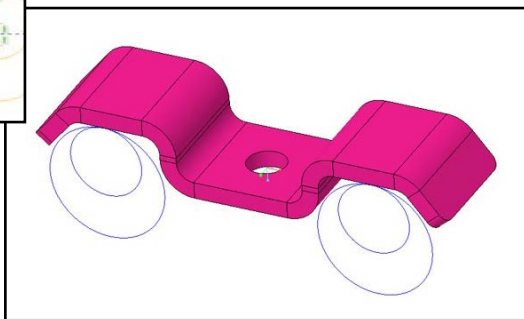


Fig. 64 – New Clamp



## Installation

To install the replacement door:

1. Unbolt the existing (original) door from the charger cabinet – be sure to retain the M4 bolts as these must be reused in step 3 below.

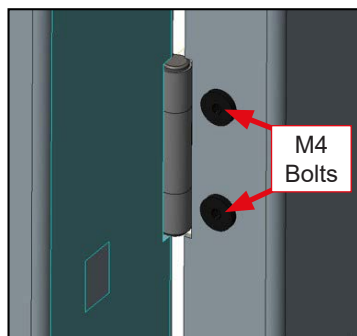


Fig. 65 – M4 Bolts

2. Install the replacement door by aligning the pin (circled below).

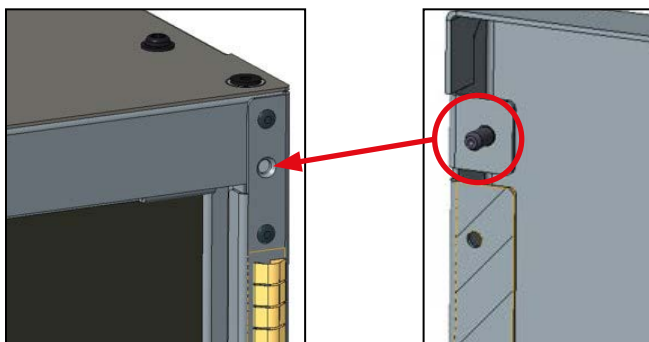


Fig. 66 –  
Align the Pin

3. Install the M4 bolts and tighten them with 1.2 Nm of torque.

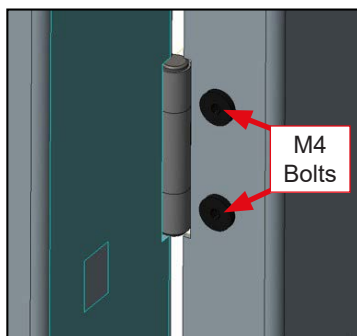


Fig. 67 – M4 Bolts

## Interface Board Communication Connectors / Replacing the Fuse

1. Remove the TORX TX25 screws from the DC output power cable panel (as shown below), and pull the panel up and away from the charger cabinet.

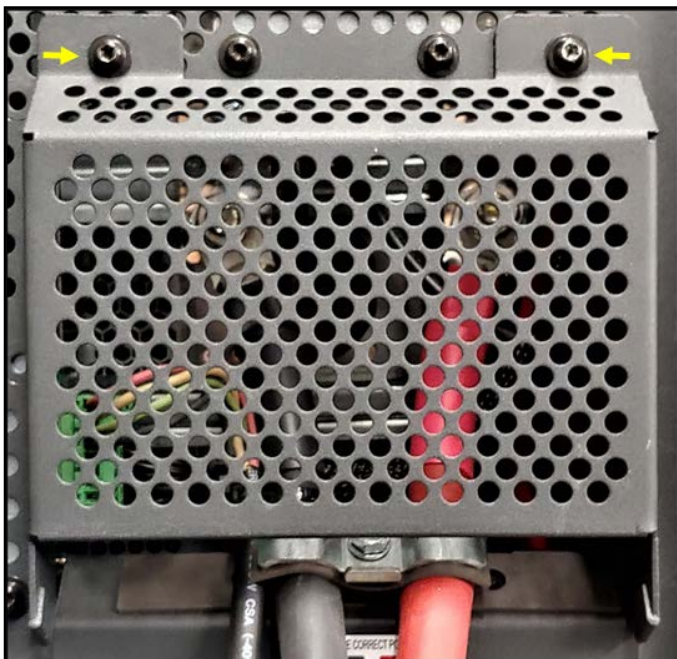
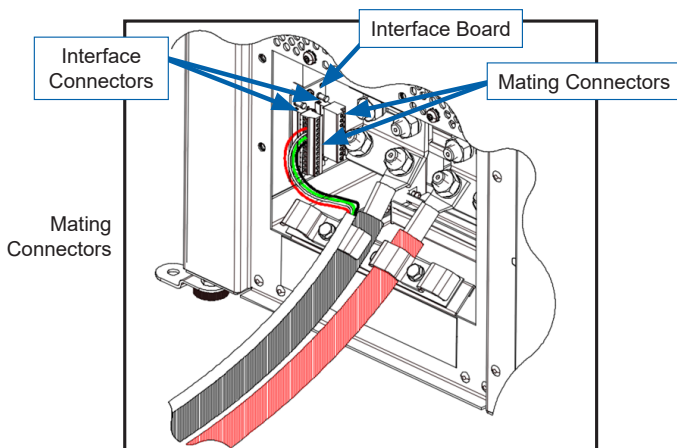
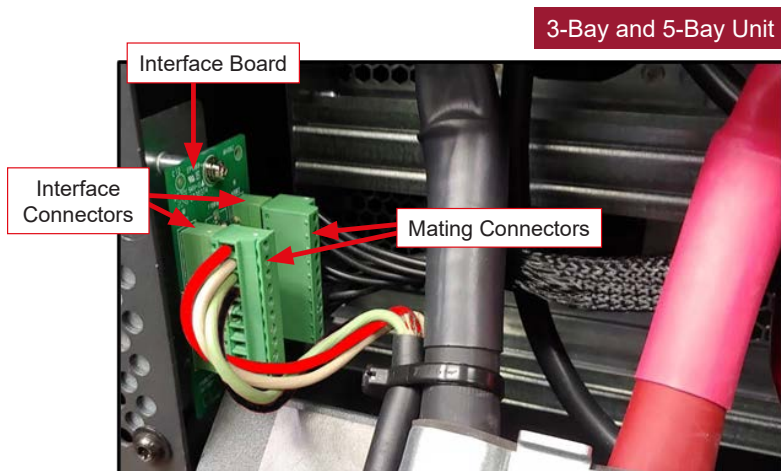


Fig. 68 – Torx Screws

2. Disconnect the two mating connectors by pulling them from the interface connectors, which are mounted directly onto the interface board.

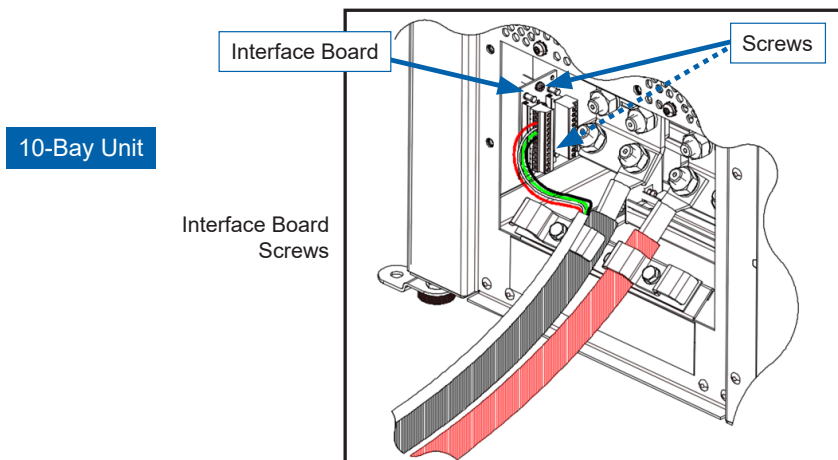
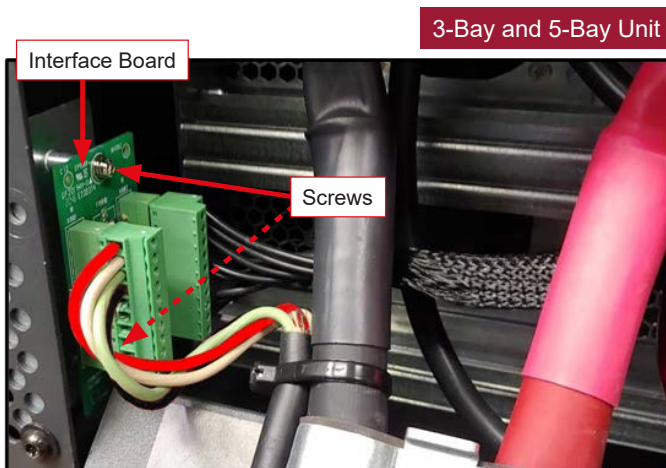
Do **not** disconnect the wires from the mating connectors.

Fig. 69 – Mating Connectors



3. Remove the two screws securing the interface board, and remove the interface board from inside the charger cabinet.

Fig. 70 – Interface Board Screws



4. To replace the fuse on the interface board, gently lift it up from the small retainers. To install a new fuse, gently press the new fuse into the retainers as shown to the right.

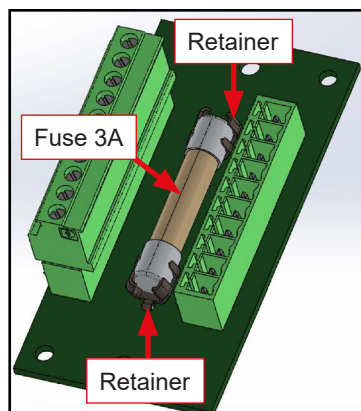


Fig. 71 – Fuse

5. Installation of the user interface is the reverse order of removal.

Be sure to reconnect the two mating connectors to the interface connectors as shown below.

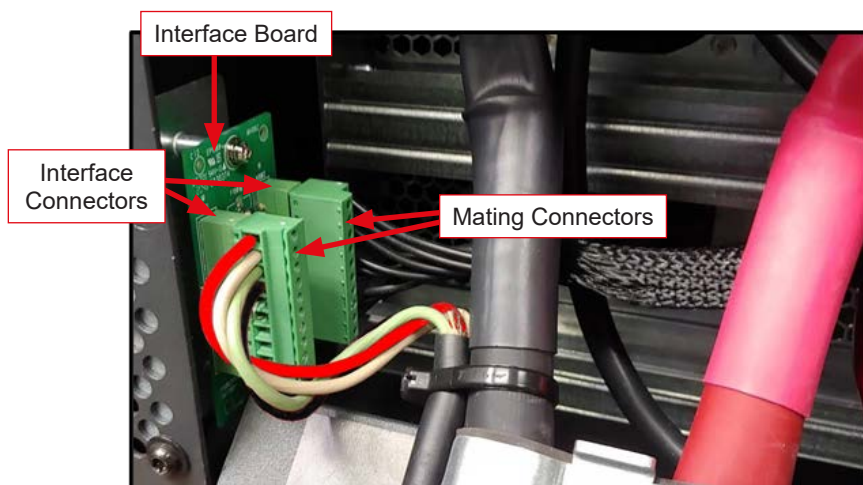


Fig. 72 – Interface Board

## Firmware Updates

### Software Download, Software Update & Installing Software Using the Mobile Application

**Purpose:** This section describes how to use the Webasto SW Updater mobile application for iOS platforms to load firmware onto an Webasto Product over a Bluetooth connection.

**Scope:** This section describes the general procedures as they apply to any Webasto device supporting uploads over Bluetooth with the Webasto SW Updater app.

**Installing the Application:** To use the Webasto SW Updater app, it must first be installed on your iOS mobile device. If it is not currently installed, do the following:

1. Tap the **App Store** icon on your iPhone/iPod Touch from the home screen.
2. Tap the magnifying glass to perform an app search, and type in “Webasto Updater” to search for the Webasto SW Updater mobile app.

If you have a QR reader on your iPhone, you can also use it to read the QR codes below to open the App Store download page for the Webasto SW Updater and the Webasto PosiCharge ProCore App.

**Special Note:**

The recently updated **PosiCharge ProCore and ProCore Edge Mobile Application User Guide 24692-05-0303** is available on [TechWasto.com](http://TechWasto.com) under *Tech Docs > Charging Systems > Operations > PosiCharge Industrial Charging > MHE > ProCore Charging Line.*



Download the  
Webasto SW Updater App



Download the  
PosiCharge™ ProCore App

Fig. 73 –  
Software App  
QR Codes

3. An app with this icon should appear in the results.

4. Tap the **GET** button on the result associated with the application – the **INSTALL** button will appear – tap it.
5. Enter your Apple ID password to sign in to the iTunes store to confirm your identity when prompted. The download and installation will continue.
6. After the download and installation are complete, you can tap the **OPEN** button in the Play Store listing to open the Updater app. Alternatively, the app can be accessed by locating its icon from the home screen.

### Adding the AVB File:

The firmware file to load comes in the form of a binary file with extension .AVB. This must be received as an email attachment on your mobile device.

To add the file to the SW Updater App, touch the attachment and hold until you see a list of app icons to select from.

Select the Webasto Updater icon. 

NOTE: You may need to click the ellipsis (...) to see it.

When the app opens, you will be directed to the Device List screen with the file you just added selected for upload. If you wish to upload this file immediately, skip to **Selecting Target Devices**.

### Selecting an AVB File:

If you previously added an AVB file via email attachment, you may load it again by opening the Webasto Updater app directly. You will see the Select File screen as shown to the right.

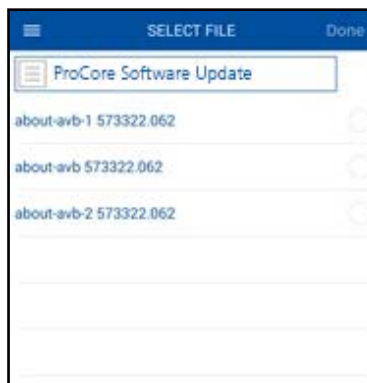


Fig. 74 – Selecting an AVB File



## Managing AVB Files:

You can delete a file from the file list by swiping it left – this reveals a delete button you can press to delete the swiped file.

## Selecting Target Devices:

Once an AVB file is selected, you may enter the Select Device screen as shown to the right.

The Selected file will appear at the top of the screen. A list of nearby Webasto devices with Bluetooth advertisement signals will appear below it, along with the signal bar strength of each.

Shown below each device name (as set by the customer) is the version of software currently installed. If the version cannot be obtained, it will appear as “?.???”.

You may select and deselect as many devices as you wish, making sure they are the proper device type for the software file being uploaded.

Assuming no interruptions occur, the estimated time required to upload to all devices is printed at the bottom of the screen.

If you want to change the file to be uploaded, use the hamburger menu in the top left corner to navigate back to the Select File screen and make another selection.

When you are finished selecting devices, select **Upload** to start the upload process.



Fig. 75 – Selecting Target Devices

## Uploading Software:

When the upload begins, you will see the Upload Progress screen as shown to the right.

The list of selected devices is shown with an individual status indicator and progress bar.

The time left and percent completion of the entire batch job is shown at the bottom of the screen. This screen is designed to run without interruption so you may leave your device unattended while the upload is in progress.

When all uploads have completed, you may select **Stop** to return to the Device Select screen again.

If any of the uploads fail, the app will continue to cycle through them to retry indefinitely until you select **Stop** and confirm you wish to cancel the upload.

If you select **Stop** during the upload, all pending uploads are canceled, but the current load in progress cannot be interrupted or the equipment will be rendered inoperable until the next upload is performed.

After the current load completes – whether successful or not – the upload will stop. At this point, selecting **Stop** again takes you back to the Device Select screen.

If an upload is interrupted by the app closing, the mobile device going out of range, or the Webasto Equipment powering OFF, you can re-try the upload again when conditions are restored. The Webasto Equipment will still be listening for the app.



Fig. 76 – Uploading Software

## Voltage Driven vs BMID Communications

### Default Battery Setup for Voltage-mode Charging

ProCore chargers can operate with or without a BMID.

BMIDs provide the charger specific charging parameters for each vehicle and monitor the battery voltage and temperature during charging. A BMID effectively allows the charger to safely charge each battery at a high rate while preventing overheating.

Some sites do not need these high charging rates and do not use BMIDs. Here the charger uses preset charging parameters that allow a charging rate that is safe for all batteries at the site.

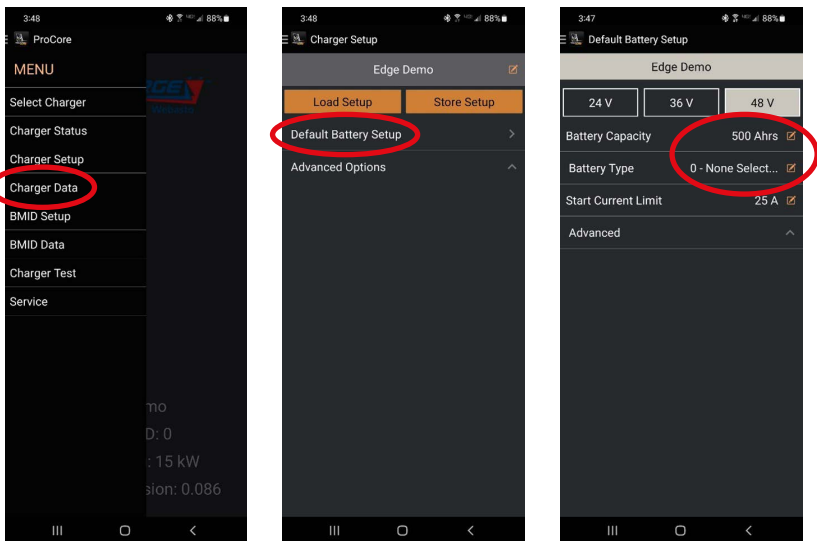


Fig. 77 – Default Battery Setup

There are separate tabs for 24V 36V, and 48V (or 48V, 72V, 80V, 96V). Each battery voltage tab must be setup individually. Generally, only the battery capacity and battery type need to be changed from the factory defaults.

Someone familiar with the batteries used at the site should determine the smallest capacity battery of each voltage that will be charged. This capacity and battery type should be used to set these values using the ProCore App.

For example, here the 48V tab is set to 765 Ah and Exide Tubular Flooded. The recommended Start Current Limit for voltage-mode charging is 25 A / 100 Ah.

**DO NOT FORGET TO SAVE THE SETTINGS!!!**

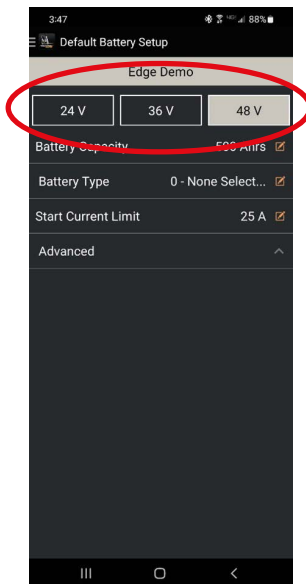


Fig. 78 – Default Battery Setup

## Power Module Firmware Update

This document provides instructions for updating the firmware on ProCore Edge 48V and 80V power modules and firmware v1.14.0.

### Required Software

Software	Description
BL_CAN_v2.15.0.exe	Firmware detection program
PM3K-80_PWM_v1.14.0.dfu	Firmware v1.14.0
Tera Term	Terminal program for accessing the EDGE diagnostic console

### Required Hardware



CAN BUS Ribbon Cable



PCAN-USB Adaptor



Micromatch Adaptor



DB9 Cable

Definitions and Acronyms

AC	Alternating Current
BMS	Battery Management System
CAN	Controller Area Network
HMI	Human Machine Interface Board / System Controller Board
PCBA	Printed Circuit Board Assembly
Rev	Revision
SW	Software
UUT	Unit Under Test

Procedure Log

User the table below to record who performed the procedure and the date.

System S/N	Module S/N	Firmware Rev	Date	Initials

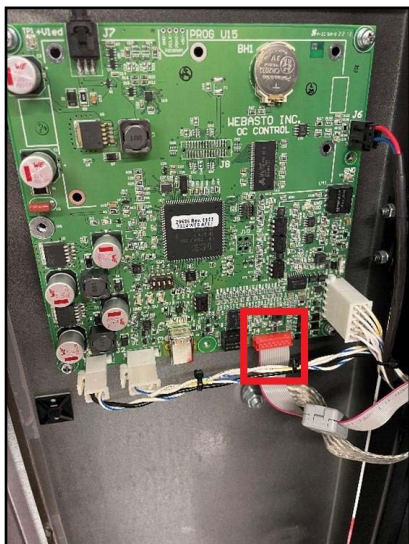
## Setup Instructions

The following hardware and software components are needed to prepare for the firmware update:

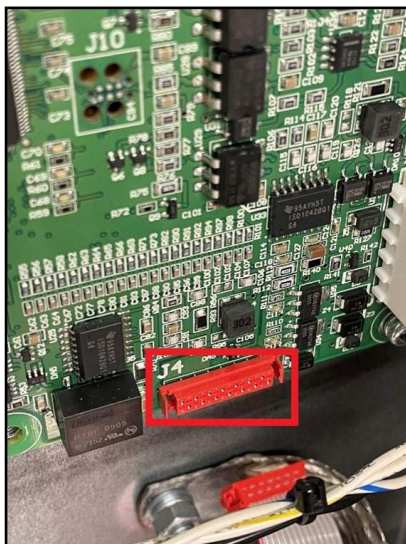
- Procore Edge 15kW charger
- Procore Mobile App
- Test Laptop with Tera Term, Peak Software, and Firmware EXE. File
- Peak Can Connector
- USB-A to USB-B cable

## Setup Procedure

1. Disconnect the J4 connector from the HMI board.



J4 Connected



J4 Disconnected

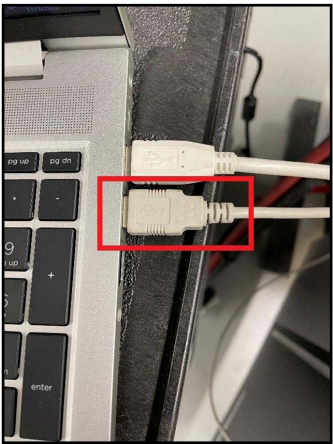
2. Connect the PEAK adaptor on the PC to the UUT on one of the modules for the firmware installation/update.



PEAK Adaptor to Power Module  
Example 1



PEAK Adaptor to Power Module  
Example 2



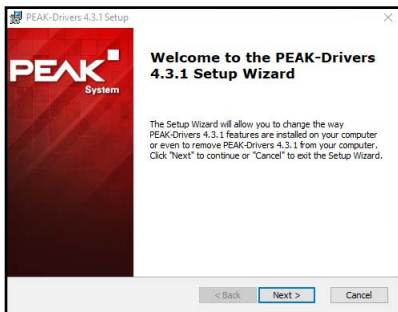
PEAK USB Connection to PC/Laptop



3. If the PEAK software is already loaded on the laptop, skip this step and go to step 8.

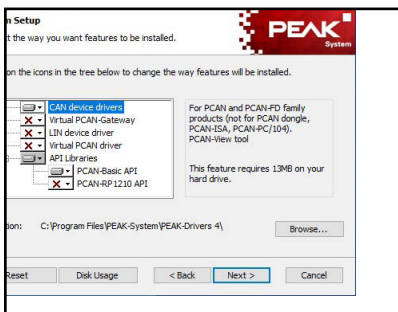
If not, Run [PeakOemDrv.exe](#) as shown below, then select **Next**.

4. Accept the terms, then select **Next**.

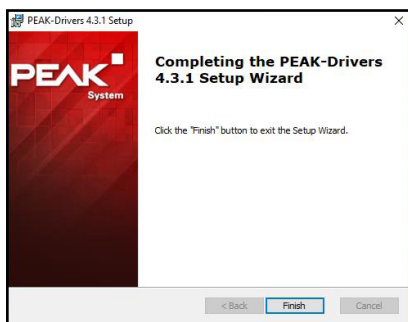


5. Select the CAN device drivers and the PCAN-Basic API, then select **Next**.

6. Select **Install**.



7. When the installation is complete, select **Finish**.

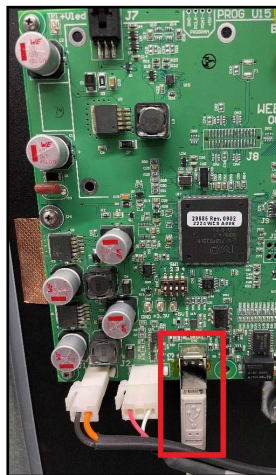


8. Check to see if the LED display is already ON for all power modules. If they're ON, go to step 10.

If not, connect the USB cable on J3 of the HMI board to the PC port.

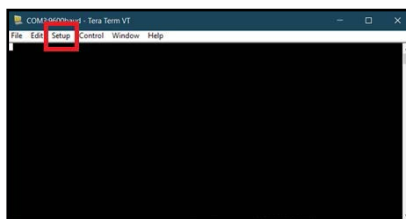
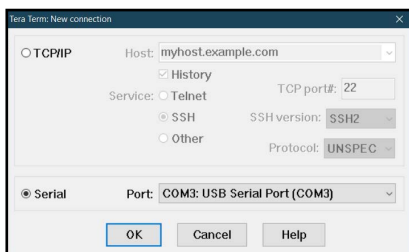


Module LEDs ON

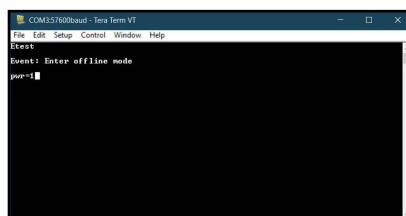
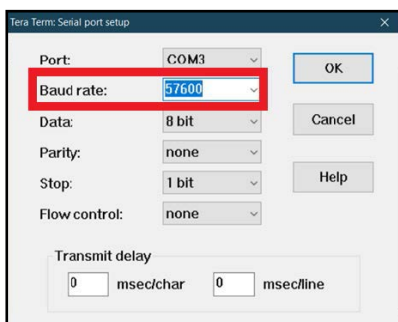


Connect USB Cable on J3 of the HMI Board to the PC Port

9. Open Tera Term and select **Serial**, then select the correct port in the **Port** drop-down.
10. Next, select **Setup**, then **Serial**.



11. In the Serial port setup screen, use the Baud rate drop-down to change it to **57600**, then select **OK**.
12. In the Tera Term command window, type **Etst**, then type **pwr=1** and select the **Enter** key to power ON the UUT.



13. Confirm the power module LEDs turn ON – this confirms that all modules are powered ON.



LEDs ON = Modules are  
powered ON

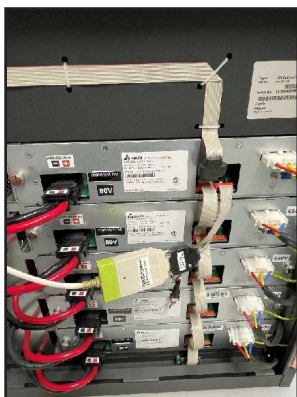
## Firmware Update

The following hardware and software components are needed to complete the firmware update:

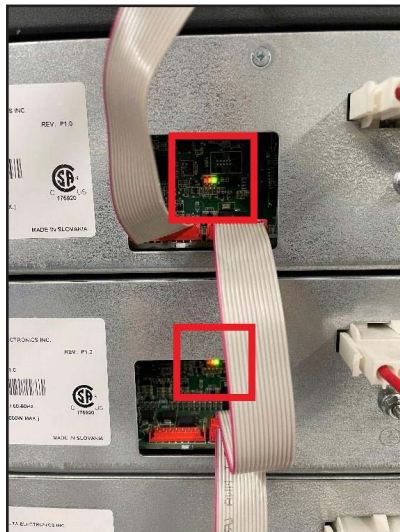
- Procore Edge 15kW charger
- Procore Mobile App
- Test Laptop with Tera Term, Peak Software, and Firmware EXE. File
- Peak Can Connector
- USB-A to USB-B cable

Before starting, confirm which version of the bootloader and application firmware are currently installed.

1. Confirm that only power cables (up to 10) are connected to the CAN bus ribbon cable.
  - Remove the system controller.
  - Remove the BMS.
2. Confirm that each connected module has a unique CAN ID set on the rotary switch.
3. Plug the PCAN-USB adaptor into a USB port on a Windows PC.
4. Connect the PCAN-USB adaptor to an empty Micromatch connector on one of the power modules using the DB 9-pin-to-Micromatch adaptor. (See images below).



5. Apply AC to the power modules and verify the UUT is ON by checking each power module LED.



6. Run **BL\_CAN\_v2.15.0.exe**.
7. Record the first variant, which indicates the bootloader revision(s).
8. Record the second variant, which indicates the application version(s).

**WARNING:** If any bootloader is < **00.02.02.00**, take a screen shot of the BL\_CAN output and forward it to the responsible SW engineer. DO NOT PROCEED WITH THE FIRMWARE UPDATE.

9. Drag the relevant binary file onto BL\_CAN\_v2.15.0.exe **80V modules PM3K-80\_PWM\_v1.14.0.dfu** and **48V models PM3K-48\_PWM\_v1.14.1.dfu**.
10. Check to see if the binary file is valid – the update will proceed on all connect modules simultaneously.
11. With the update complete, disconnect the PCAN from the module, then reconnect the ribbon cable/ CAN connector to J4 on the System Controller.
12. On Tera Term, type in **PM** and select **Enter** – this will display the power module information. The software version displayed should be **1.14.0**.

**NOTE:** The module type and serial number displayed varies, depending on the ProCore Edge 48V or 80V.

```

COM157600baud - Tera Term VT
File Edit Setup Control Window Help
Event: Battery disconnected
Exit CAN listen mode
PM

Module 1 type is 48U 4800AC
State = Standby
Serial No: 000000020-1924000050
SW Version: 1.14.0
Voltage = 48.0 V
Current = 0.00 A
HE Temp = 22.50 C
NTC Temp = 26.25 C
Fan Speed = 0 RPM
Interlock = ON
Module not in use

Module 2 type is 48U 4800AC
State = Standby
Serial No: 000000020-1924000014
SW Version: 1.14.0
Voltage = 48.0 V
Current = 0.00 A
HE Temp = 22.50 C
NTC Temp = 22.50 C
Fan Speed = 0 RPM
Interlock = ON
Module not in use

Module 3 type is 48U 4800AC
State = Standby
Serial No: 000000020-1924000047
SW Version: 1.14.0
Voltage = 48.0 V
Current = 0.00 A
HE Temp = 22.50 C
NTC Temp = 26.25 C
Fan Speed = 0 RPM
Interlock = ON
Module not in use

Module 4 type is 48U 4800AC
State = Standby
Serial No: 000000020-1924000023
SW Version: 1.14.0
Voltage = 48.0 V
Current = 0.00 A
HE Temp = 23.75 C
NTC Temp = 38.75 C
Fan Speed = 0 RPM
Interlock = ON
Current Cmd = 0.00

Module 5 type is 48U 4800AC
State = Standby
Serial No: 000000020-1924000033
SW Version: 1.14.0
Voltage = 48.0 V
Current = 0.00 A
HE Temp = 25.00 C
NTC Temp = 40.00 C
Fan Speed = 0 RPM
Interlock = ON
Current Cmd = 0.00
Module 0 is not detected

5 modules detected
  
```

Webasto Charging Systems, Inc.  
1333 S. Mayflower Ave., Ste 100  
Monrovia, CA 91016  
USA

Corporate headquarters:

Friedrichshafener Str. 9  
82205 Gilching  
Germany

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