Checking Communication Cables Placement in Chargers

Introduction

The Communication cables in many Pii charger products come together in each charger's installed rack controller. This document can provide general information regarding the specific purposes of the many communication ports and can serve as a trouble-shooting tool to help ensure each cable has been placed in the correct port.

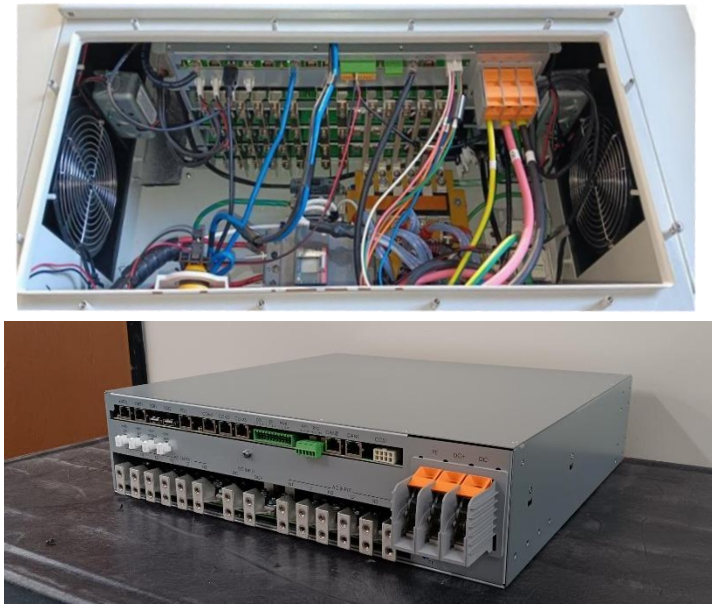


Figure 1: Rack controller (above) as installed and wired in a 30 kW EV quick charger and (below) when uninstalled

IMPORTANT SAFETY INSTRUCTIONS – SAVE THESE INSTRUCTIONS

ELECTRICAL WARNINGS – WARNING! RISK OF ELECTRIC SHOCK!

WARNING! RISK OF ELECTRIC SHOCK! ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS TYPE OF EQUIPMENT AND THE HAZARDS INVOLVED SHOULD ADJUST, MODIFY, AND SERVICE THIS EQUIPMENT, WHICH IS REQUIRED TO MAINTAIN THE CHARGER'S INTERTEK LISTING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! SHUT OFF POWER SUPPLY BEFORE BEGINNING INSTALLATION ACTIVITIES OR MAINTENANCE WORK. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SEVERE INJURY OR DEATH.

WARNING! RISK OF ELECTRIC SHOCK! THIS EV QUICK CHARGER CONTAINS HIGH VOLTAGE POWER THAT IS POTENTIALLY DANGEROUS IF NOT HANDLED PROPERLY.

CAUTION! The installer is responsible for conforming to all local and national electrical codes and standards applicable in the jurisdiction this equipment is installed in, including providing suitable wire sizes per NEC for the input configuration.

Check Communication Cables Placement

1. **For safety, before connecting or disconnecting any cable inside the charger, turn Off charger's AC Main Switch.**

   Locations of AC Main Switch vary by charger model. Check the model-specific installation manual or service module for the location of your charger's AC main switch. For example, the AC main switch for the 30 kW EV Quick Charger is shown here.

   a. Remove the lower-front panel on the 30 kW or 60 kW charger using a T25 Torx driver.

   b. Turn OFF chargers AC main switch inside the 30 kW charger.

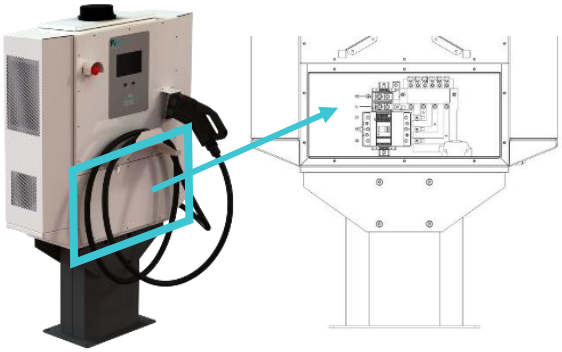
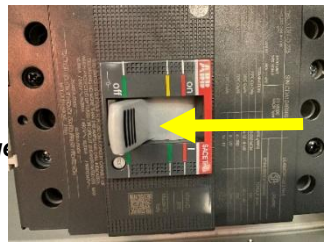


Figure 2: EV quick charger's lower- front panel of 30kW charger

Figure 3: 30 kW charger's AC Main Switch inside charge in OFF position



OFF

2. **Be mindful that charger's AC input wires are still live.**

WARNING! RISK OF ELECTRIC SHOCK! THIS EV QUICK CHARGER CONTAINS HIGH VOLTAGE POWER THAT IS POTENTIALLY DANGEROUS IF NOT HANDLED PROPERLY.

The **input** wires inside the open lower-front panel of some chargers OR the opened right-side door of other chargers, and coming up from the bottom remain **live**—Do not touch!

The remainder of the system is without power and can be handled safely.

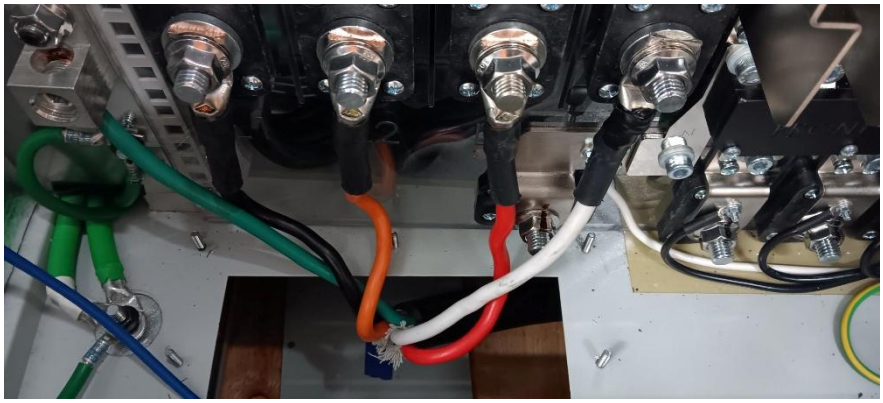


Figure 4 – WARNING! Don't touch Input wires inside right-side door if they are live live

3. **Communications cables terminate in the back of the rack controller. It sits atop a stack of rectifiers. For ease of identification, here is the rack controller by itself:**

Figure 5: Uninstalled Rack Controller

4. **Now here, rack controller is installed as part of a power stack:**

Figure 6 –Rack Controller installed in a power stack

5. **Figure 7 isolates the rack controller connectors involved in communication:**

Figure 7 – Labeled communication connectors isolated

The ports are assigned as follows:

ENET1—ethernet connection to the modem

ENET2—alternate modem (or aux) port

USB1—is for RFID (under the display screen)

USB2—alternate RFID (or aux) port

TEST—laboratory purposes

COM1—display screen

COM2—auxiliary

COM3—auxiliary

DI1—surge protector

DI2—emergency stop button

RY1/2—not in use

CAN0—1st shelf controller below, which then daisy-chains to the others

(meter boards also daisy chain, ultimately reporting through CAN0 as well)

CAN1—heat exchange controller, in 120/180 and Bi-directional chargers only

CCS1—charge cable

Coms issues and solutions:

Between EV & Charger

a. Charger PE not terminated (examine and tighten, if loose or disconnected)
b. Recessed CCS1 connector pin (tug test, push in with small needlenose)

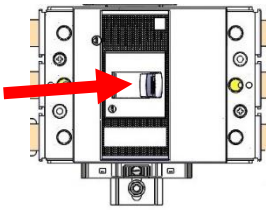
Between rack controller and rack:

RJ45 located incorrectly (move to CAN0)

General

a. check all connections (push ‘til click, remove & reconnect, tighten screw)
b. test wires for continuity, using multimeter (swap for new, if shorted)

6. **When finished checking communications cable connections in rack controller, turn On Charger’s AC Main Switch inside the charger.**



ON

Figure 8: Sample AC Main Switch in a charger in the ON position