Quick Start Guide
FR-482C1DRNAJ &
FR-802C1DRNAJ

Suite 210 5-420 Erb St. W. Waterloo, On, N2L 6K6 Canada
Phone: +1 (519) 404-2810 • www.fractalev.com • contact@fractalev.com

IMPORTANT SAFETY INSTRUCTIONS

WARNING – When using electric products, basic precautions should always be followed, including the following. This manual contains important instructions for Models FR48C and FR80C that shall be followed during installation, operation and maintenance of the unit. When the instructions are exactly the same for all models, specific model numbers are not required to be specified:

a) Read all the instructions before using this product.

b) This device should be supervised when used around children.

c) Do not put fingers into the electric vehicle connector.

d) Do not use this product if the flexible power cord or EV cable is frayed, has broken insulation, or any other signs of damage.

e) Do not use this product if the enclosure or the EV connector is broken, cracked, open, or shows any other indication of damage.

f) CAUTION: To reduce the risk of fire, only connect your charger to a circuit with a branch circuit overcurrent protection of 125% of the selected max amperage setting of the device following ANSI/NFPA 70 (US) C22.1 (Canada)

SAVE THESE INSTRUCTIONS

LEGAL AND REGULATORY INFORMATION

Legal and Regulatory information about this product, including FCC and Industry Canada Identifiers, may be accessed via the touch screen. From the main screen:

- Step 1. Press the Help Icon
- Step 2: Press 'Legal'

GROUNDING INSTRUCTIONS

This product must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the product.

Charger Quick Start FR48C/FR80C

Note: This charger should be registered at www.FractalEV.com for online visibility and configuration. Certain features are only available from the FractalEV Portal.

Features:

- Touch Screen
- Network connectivity via LTE or Wifi
- RFID/NFC Card reader
- OCPP functionality
- PowerShare Enabled
- Mesh Networking
- Offline or Online operation
- Multiple Local Authorization Modes

You can download complete installation instructions at www.FractalEV.com/Support/Installation or scan the QR Code below

Box Contents

- 1x Electric Vehicle charger with charging cable and mounting bracket (FR48C or FR80C as indicated on the box - all configurations between models are the same except where specifically indicated)
- Installation Hardware Kit:
  - Wall anchors + screws
  - Ring Terminal Kit
  - Bottom Entry Plug
  - ⅛" hex wrench + 4mm hex wrench
- 2x RFID cards
- Quickstart Guide

Note: Installation requires a wire stripper and wire crimper for insulated terminals. Additional tools may be required for wall or pedestal mounting.

Before you leave the site verify the checklist:

Done	Item
Onsite	
☐	Charger registered to the appropriate FractalCloud account. If not, record the following information: Serial Number _____ PoPCode _____
☐ ☐ ☐	Charger connected to Internet via Wifi Charger connected to Internet via Cellular, and Wifi is disabled Charger will be operated offline, and Wifi has been disabled
Onsite or Remote	
☐	Set the charger amperage and turned on PowerShare where needed. Max Amps ____A PowerShare Enabled ___ FallBack Amperage ___A
☐	Change the Settings Pin Code. New Code_____
☐ ☐ ☐ ☐ ☐ ☐ ☐	Authorization Mode set to: Disabled Plug To Charge Local RFID List Any RFID Card Local Pin Code Any Pln Code OCPP (configuration must be completed in FractalCloud)

Icon Reference

Networking Icons can be found at the top of the Driver's Help Screen, and on any Settings Screen.

Wifi Network	
	Not Connected
	Lowest Signal
	Medium Signal
	Best Signal
	Disabled

Cellular Network	
	Not Attached
	Weakest Cellular Signal
	Best Cellular Signal
	Cellular System Disabled

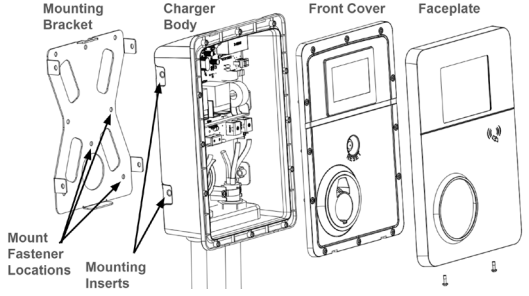
OCPP Connection	
	OCPP Network Connected
	OCPP Disconnect

Internet Connection	
	Internet Connected
	Internet Disconnected

PowerShare Function	
	PowerShare Function Active, connected
	PowerShare Function Active, not connected
	PowerShare Function Disabled

Charger State Display		
LED Color	**Display Text**	**Description**
LEDs off	N/A	Charger is not yet ready or is powered off
Solid Green	Ready	Charger is available for use
Blue/Green 1 second spin	Plugged-in, or Authorized	Charge session has been authorized by user, but vehicle is not plugged in, or Vehicle is plugged in, but the charge session is not yet authorized.
Green 1 second pulse	Idle	Charger is plugged in and session is authorized, but: 1. Vehicle has not requested power yet or, 2. Vehicle has finished charging
Blue 3.5 second pulse	Charging	Charger has energized relays and may be dispensing power
Solid Red	Faulted	Charger has internal issue preventing charging

Installation



Installation Procedure

The FR48C and FR80C are designed for indoor or outdoor conduit installations, with the option to have the AC input wiring from either the bottom or the rear.

For bottom entry installs, the entry hole is sized for 1" conduit (35mm hole size) and an M32 cable gland has been pre-installed. Reducing washers can be used to install ¾" conduit, and a step bit can be used to accommodate 1-¼" conduit.

To use the rear entry option (for wall or pedestal mounting), use a step bit to drill the pre-marked location on the rear of the enclosure. Plug the bottom cable gland with the Bottom Entry Plug. Install ¾", 1", or 1-¼" rigid PVC conduit or non-metallic liquid tight conduit. Sealing washers must be used to achieve a Nema Type 3 rating for this installation method, and are required for outdoor installations.

For wall mounted installations, the charger shall be mounted at a sufficient height from grade such that the height of the storage means for the coupling device is located between 600 mm (24 inches) outdoors and 450 mm (18 inches) indoors, and 1.2 m (4 feet) from grade.

Electrical Installation Requirements

Ensure all connections are powered off before beginning installation.

Select conductor and ground wire sizes in accordance with all local regulations for the installed circuit breaker if operating at less than maximum power. For maximum power, use minimum conductors as below. Upsize conductors if needed.

Product	Circuit Breaker	Conductors
FR48C	60A	6 AWG, 90°C-rated copper stranded or solid
FR80C	100A*	3 AWG, 90 °C-rated copper stranded or solid

** This 100A circuit breaker shall be capable of being locked in the open position. The provisions for locking shall remain in place with or without the lock installed.*

All FractalEV Chargers include a GFCI function (CCID20) as well as continuous ground connection monitoring. Do not install a GFCI circuit breaker.

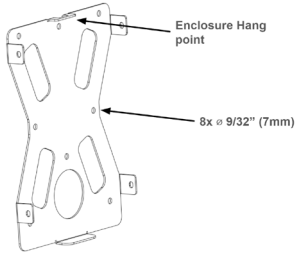
Prepare the enclosure for conduit fitting:

1. Remove faceplate using the 2 phillips screws located on the bottom of the charger
2. Remove the front cover using the 12 encapsulated hex screws around the perimeter of the cover using the ⅛" hex wrench. Once the front cover is loose, remove the white 12-conductor harness connecting the front cover board by unplugging the harness on the power board. The connector retaining clip should be depressed before gently pulling the connector away from the Power board. Set the front cover aside.
3. For bottom power entry:
    a. Remove the pre-installed input cable gland.
    b. For 1"-sized Conduit: test fit the conduit and fittings. The input hole is 35mm for direct install onto 1" conduit.
    c. For ¾"-sized Conduit: use the appropriate reducing washers along with rubber seals.
4. For rear power entry:
    a. Install the supplied "Bottom Entry Plug" into the bottom-entry cable gland, and tighten to seal it.
    b. Locate the rear entry port - The center hole is pre-marked for easy drilling.
    c. For 1"-sized Conduit: use a 1-⅜" (35mm) step bit to drill the center back location of the charger enclosure.
    d. For ¾"-sized Conduit: use a 1-⅛" (29mm) step bit to drill the center back location of the charger enclosure.
    e. Deburr the edges of the drilled power entry hole.

Wall Mount Installation

Before beginning the wall mount of the charger determine the entry point for the wiring. For a rear entry, follow the above rear-wire entry instructions before continuing with wall mounting.

Prepare Surface:



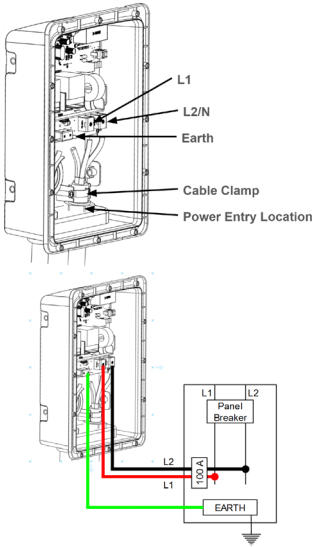
1. Select at least 4 Holes to mount the charger securely.
2. 8 wood screws and anchors are included. Use appropriate fasteners for the attachment surface.
3. Use the drilling template along with a level tool to ensure holes are drilled appropriately.

Mount the Charger

1. Using a 4mm hex wrench, remove the Mounting Bracket from the charger.
2. At the designated location, use provided screws or suitable fasteners to affix the Mounting Bracket to the wall.
3. Hang charger from the enclosure hang point, then slide it downwards to lock into position and install the 4 charger mounting screws.
4. Use appropriate cable glands, bushings and/or fittings to secure the wiring and conduit in place as per either bottom power entry or rear power entry outlined above.

Route wires:

1. Strip wires, terminate with supplied Ring Terminals using an appropriate crimper.
2. Pull wires into the enclosure and, if needed, use the cable clamp to secure the wires. There should be no tension in the wire where it attaches to the PCB terminal.
3. Route wires to the correct PCB terminal, and using a torque driver set between 5Nm to 8Nm (45 to 70 in-lbs), tighten ring terminals securely.



Ring Terminal Selection Chart:

AWG	Use Ring Terminal	Color	Supplied with FR48C	Supplied with FR80C
10-12	RNYM5-6	Yellow	Y	N
6-8	RNYBS8-6	Brown	Y	Y
4-6	RNYBS14-6	Blue	Y	N
2-4	RNYBS22-6	Yellow	N	Y

Close Charger and apply power

1. Carefully reconnect the 10-wire interface harness between the front cover and the Power board, and re-install the front cover.
2. Using the ⅛" hex wrench, tighten all 12 encapsulated screws to 1.4 Nm (12 in-lbs).
3. Reinstall the faceplace, securing with the two phillips screws at the bottom of the charger.
4. Apply power to the charger.

Minimum Settings to operate the charger

Before the charger can be used, it must have Amperage Settings. Once the charger is electrically connected, apply power. The Display will show "Unavailable - missing or incorrect Amperage Settings". Press the help icon to move to the Driver's Help Screen, then the settings icon to access the Installation Settings. Use the default code of:

1357

Once logged in, click "**Set Amperage**". If the charger does not require local PowerShare to be enabled, then simply set the maximum amperage by clicking "**Max Amps**" and entering the maximum amperage for this particular charger. If PowerShare is required for this installation, you must check **Enable PowerShare Follower Mode***, and enter both **Max Amps**, as well as a value under **Fallback**.

Max Amps	Enter the maximum continuous amperage for this charger if all other chargers in its PowerShare group were disabled. *This will typically be determined by the continuous amperage rating of the directly connected circuit breaker.*
Fallback Amperage	Enter the maximum continuous amperage for this charger if every charger in its PowerShare group were operating simultaneously. *This will typically be determined by the continuous amperage rating of the PowerShare group divided by the number of chargers in the group.*

*If **Enable PowerShare Follower Mode** is checked, then the charger will be limited to the Fallback Amperage until the entire group has been configured in PowerShare. Refer to the Complete Installation Guide for detailed instructions to set up PowerShare.

Once the Amperage settings are entered and the charger is rebooted to apply the changes, the charger will operate in AutoStart Authorization Mode - plugging in a vehicle will automatically start a charging session. Select the correct Authorization Mode either under Charger Settings - Auth Mode on the Charger or through the FractalEV portal.

Note: This charger includes two RFID cards for the Local RFID Authorization setting. To use these cards with this setting, follow the prompts after selecting Local RFID Authorization on the charger. Alternatively, other RFID cards may be used following the same process.

Charger Registration

The charger should be registered on FractalEV into the account owner's organization. This is required to access the many advanced features of the charger including Authorization Modes, enabling cellular modem, enabling OCPP mode, etc.

This may be done one of two ways:

1. On your phone or computer, log into your FractalEV account, and click 'Register Charger'. You will be prompted for the serial number and the 'Proof of Possession' (PoP) Pin Code. The PoP Code may be found on the Charger Display on the Settings Screen->Charger Settings, and is a unique 6 digit number. The Serial Number may be found on the same screen, or on the label on the side of the unit.

2. On the Charger Settings screen, you may click the Register button to get a QR Code that may be scanned to auto-register the charger into your account.

Charger Networking

FR48C and FR80C both support 3G/4G multi-carrier connectivity, as well as 2.4Ghz Wifi. Both networking interfaces may be enabled simultaneously, the charger will automatically switch between the two, with a preference for wifi. The icons at the top of the Settings page provide the status of the network.

Note: If the charger is being installed for Cellular only or installed without any networking connection, then Wifi should be disabled for improved Mesh Networking capabilities.

Cellular

Either the built in SIM Card or a customer supplied SIM card may be used. The required SIM Card size is 3FF (Micro). The charger will perform a site scan of the available cellular networks at boot up and this list is shown on the Network Settings page.

To use the built in SIM Card:

1. The charger must be registered to your FractalEV account
2. Navigate to the charger details page and click Activate SIM Card.
3. Within 15-30 minutes, the charger should come online.

To use the Customer-Supplied SIM Card:

1. The charger must be registered to your FractalEV account
2. In the FractalEV portal, navigate to the charger settings page and ensure Enable Customer SIM Slot is checked (it is by default).
3. Remove the front cover of the charger and insert the SIM card.
4. Replace the cover and power up the charger The charger will recognize the new SIM card during boot-up..
5. On the charger display, navigate to the charger settings page, and click 'Set APN'. Enter the APN associated with the SIM card.
6. Reboot the charger.
7. The charger should connect within 5 minutes.

Wifi Credentials

On the Networking Settings page, click **Setup Wifi**. From here, the Wifi function can be disabled, you can clear the stored Wifi credentials, or you can attach to the list of available networks.

In order to speed up the credentialing of multiple chargers, after setting the credentials for the first charger, click **Wifi Cred Share** and enable **Wifi Sharing**. This will allow any other charger without wifi credentials to ask for and receive wifi credentials securely over the Charger Mesh Network.

Factory Reset

To perform a factory reset, take the following steps:

4. Power off the charger for 30 seconds, ensuring the LED ring is completely off.
5. Reapply power to the charger.
6. Remove the charger front cover by removing the two screws located at the bottom of the cover.
7. Press and Hold the Reset button for 12 seconds. This must be done within 5 minutes of the charge being powered up.
8. Upon release, the charger will factory reset
9. Please note:
    - The Amperage Settings will be deleted
    - Any PowerShare settings will be deleted
    - The Settings Screen PinCode will be reset to the default (1357)

User Manual Warning Statements

This device complies with Part 15 of the FCC Rules / Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

MPE Requirements
To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.
To ensure compliance, operations at closer than this distance is not recommended.

Les antennes installées doivent être situées de facon à ce que la population ne puisse y être exposée à une distance de moin de 20 cm. Installer les antennes de facon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l' antenne.
La FCC des éltats-unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son functionnement.