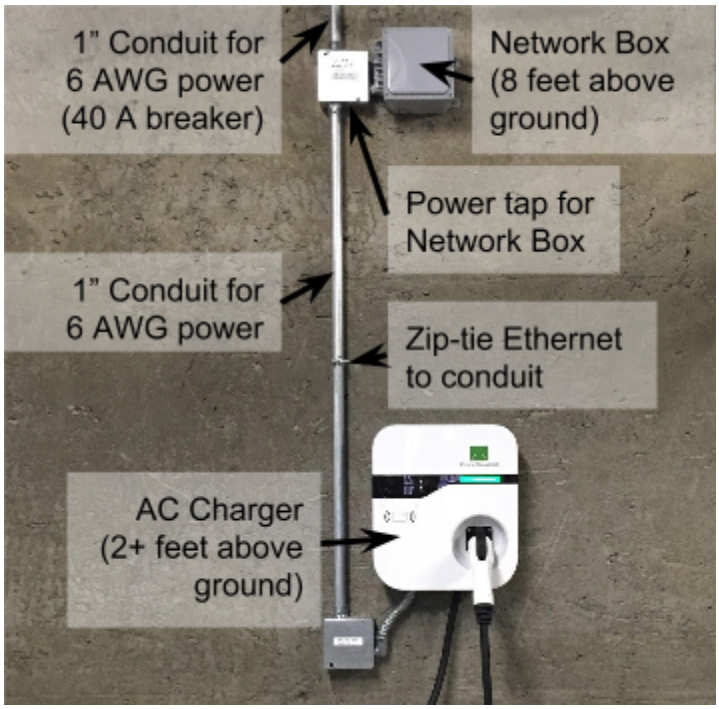
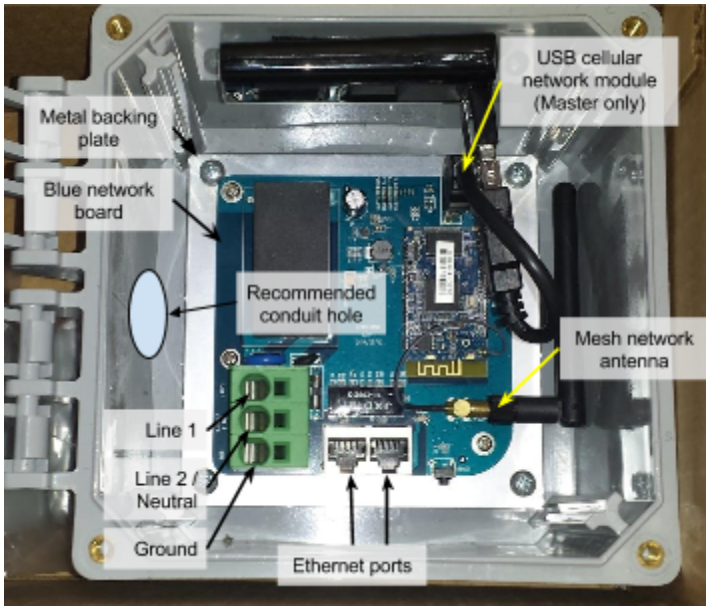
Install-only document

This five-page document specifically intended for installers on the day of installation is designed to serve as an overview of the full EverCharge system installation and testing specifications. **Please read this document in full, as requirements were updated March 10, 2016.**

The full sixteen-page design and installation document is also included in the shipping box, and covers topics such as site planning, power requirements, configuration, troubleshooting instructions, and so forth. Contact EverCharge at install@EverCharge.net or 415-429-2971 if you have any questions or need clarification.



Example installation image



Inside the Network Box

AC Charger requirements

- 208-240V @ 40 amps (110-120V NOT OK)
- 50A-rated copper conductors
- Individual 40A breaker for each AC Charger
- 1" trade size conduit
- Mount at least 18 inches (450 mm) above floor inside, 24 inches (600 mm) outdoors
- Shielded Ethernet connection to Network Box
- Included charge cable (18 feet / 5.5 m) reaches vehicle plug and does not block walkway

Network Box requirements

- Verizon cellular signal required for Master only
- Mount roughly 8 feet (2.5 m) above floor, away from other conduit/pipe
- All wiring must be far from antennas
- Line-of-sight necessary for multiple boxes
- Boxes mounted either vertically one level apart or horizontally < 200 feet (60 m) apart (but not both)
- All antennas must be same orientation (vertical)
- Any always-on power OK (110-240V)

Shopping list / required tools

- ▢ 1" fitting for AC charger knockout
- ▢ 1" trade size conduit
- ▢ 50A-rated (e.g #6 THHN 75°C or #8 THHN 90°C) copper conductors
- ▢ Torx T30 and T20 bits
- ▢ 40A 2-pole breaker
- ▢ Mounting screws/bolts for Network Box
- ▢ STP or FTP Ethernet cable (300V-rated)
- ▢ Laptop with an Ethernet port (or USB-Ethernet adapter)

After the install (including configuration and testing) is complete, before leaving the site, make sure to contact EverCharge so we can update our records and check on the unit. Email/text a photo of the install too.

1. Installing the EverCharge AC Charger

1.1. Before installing

1.1.1. Choose an appropriate mounting location

The EverCharge AC Charger should be mounted on a wall or column adjacent to the electric vehicle parking space. Make sure that:

- ➔ The distance to the vehicle charge port is not longer than the charge cord length of 18 feet (5.5 meters)
- ➔ The charge cord will not obstruct a walkway
- ➔ The AC Charger is in a location protected from a vehicle collision
- ➔ The AC Charger MUST be positioned such that the charging cord receptacle is at least 18-24 inches (450-600 mm) above the ground [NEC 625.50]

1.1.2. Power and grounding requirements

Attach the "Power Managed" warning sticker to the panel where the charger is supplied! The AC charger requires 208-240V across two legs. The AC Charger must be connected to a grounded, metal, permanent wiring system via the equipment grounding terminal on the charger.

1.1.3. Mounting and installation parts

EverCharge recommends the following parts for an AC Charger installation:

EverCharge-supplied components:

- Mounting bracket
- Torx T30 bolts (x3) for securing the AC charger to the mounting bracket
- Cable hanger bracket (optional)
- Torx T20 ¼" expansion bolts (x2) for concrete mounting
- No. 8 wood screws (x2) for wood mounting

Installer-supplied components:

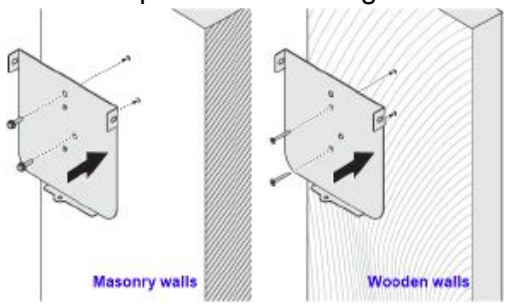
- Conduit of trade size 1" (27mm)
- 1" fitting for conduit knockout on AC Charger
- Enough junction boxes to comply with the Expandability Best Practices
- Copper THHN #6 75℃ or #8 90℃ conductors
- 40 Amp 2-pole circuit breaker
- Shielded Ethernet cable rated for 300V for Network Box connection

Note that, after installation and initialization, the charger should display a solid green LED. If it keeps flashing red for more than a minute, check the Ethernet connection to the Network Box.

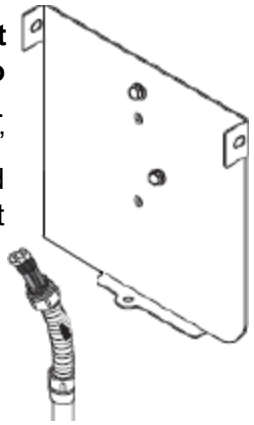
1.2. Step-by-Step AC Charger installation instructions

Disconnect electrical power prior to installing the AC Charger. Failure to do so may cause physical injury or damage to the electrical system and charging unit.

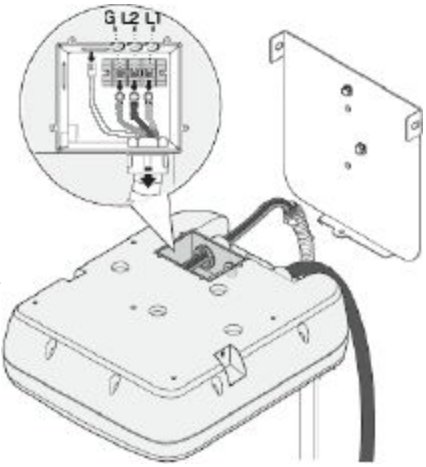
1. **Drill bolt holes** in the wall for the mounting bracket and optional cable hanger.



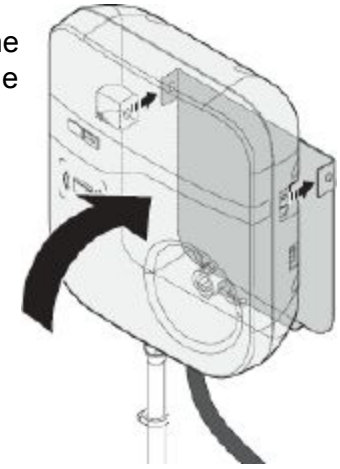
2. **Secure mounting bracket and optional cable hanger to wall** using appropriate bolts. For masonry, use ¼" expansion bolts. For wood studs, use #8 wood screws at least 2 inches in length.



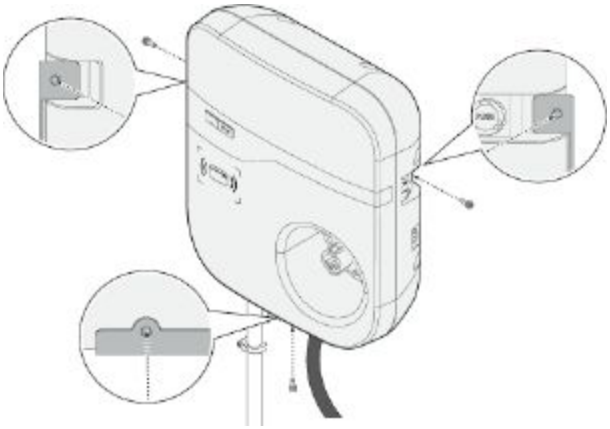
3. **Connect wiring to charger** in accordance with local codes. Use 50A-rated copper conductors and shielded Ethernet cable rated for 300 V. The charger requires 208-240V.



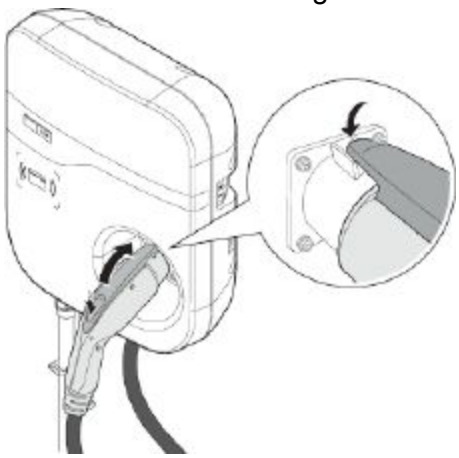
4. **Align screw holes** of the mounting bracket with the AC Charger holes.



5. **Install and secure** with three screws to the support bracket.



6. **Attach charge cable to plug** and hang the rest of the cable on the cable hanger if installed.



2. Installing the EverCharge Network Box

The Master EverCharge Network Box MUST be installed in a location with Verizon cellular reception. If you believe there is no cellular service of any kind please make that clear when you contact EverCharge with your findings.

2.1. Before installing

2.1.1. Connection requirements

The Network Box must be connected to any always-on 110-240V power source and ground. Each Network Box can control up to two EverCharge AC Chargers via shielded Ethernet cables. Network Boxes do not require a connection to an AC Charger if they are just being used to fill in the wireless mesh network.

2.1.2. Power requirements and wiring in-line with an AC Charger

Each EverCharge Network Box consumes less than 0.1A at 110-240V. The Network Box can be wired on the same 40A breaker with the AC Charger using the tap rule [NEC 240.21(B)(1)], as long as the tap conductor is not over 10 ft (3 m) long and has an ampacity of at least 4 amps. EverCharge considers the tap a field installation and the Network Box is a control device in a different enclosure from the tap location.

2.1.3. Ethernet and high voltage wires in the same conduit

Shielded Ethernet cable and high voltage wire cannot share conduit. Zip-tie Ethernet cable to conduit and hide the cable as best as possible. Only if required, run separate conduit just for Ethernet.

2.1.4. Network Box placement and mounting

⚠ **Metal objects (like conduit or pipe) will block or limit Network Box signal.**

- For required functionality, EverCharge encourages mounting the Network Box approximately 8 feet (2.5 meters) high on a column or wall adjacent to the charger, above the height of vehicles, but not so high that the box is at the same height as other pipes running along the ceiling.
- Whenever multiple Network Boxes are necessary, consult EverCharge for system layout.
- **The objective is to obtain line of sight communication whenever possible** and at the very least have no metal conduit, metal plumbing, or metal structures blocking commutation between Network Boxes.
- Select a mounting location no further than 200 feet (60 meters) horizontally or one level vertically from another Network Box.
- All Network Boxes in the system must be able to communicate with at least one other Network Box in the wireless mesh network. Install as many Network Boxes as needed to complete the network given the "200 feet or one level apart" guideline as a max range for a each box.
- **Keep Ethernet cable in conduit or zip-tied, hidden behind it. Do not mount cable to the wall by itself.**
- For example: Do not place a Network Box next to the ceiling on a wall then expect the signal to reach up to the next level of the garage and 200 feet horizontally to a second Network Box. Instead, mount one Network Box on the lower level as normal (8 feet up), the second Network Box on the level immediately above (also 8 feet up), and the third 200 feet away on the same level as the second Network Box.

2.1.5. Mounting and installation parts

The following tools are recommended for the EverCharge Network Box installation:

EverCharge-supplied components:

- 4x Mounting Feet and screws
- Enclosure door screws (discard the plastic hole covers)

Installer-supplied components:

- Shielded Ethernet cable cut to length
- Power cable with an ampacity of ≥ 10% of the circuit breaker capacity [NEC 240.21(B)(1)4]
- Mounting screws or bolts appropriate for the mounting surface

2.2 Step-By-Step Network Box installation instructions

⚠ **Do not coil excess wiring of any kind including Ethernet in the Network Box. Keep power wiring as far away as possible from the antenna and cellular module.**

1. **Mount**: Turn the Network Box upside down and fasten the mounting feet with the included screws. Mount the Network Box to the wall using any acceptable fastening technique, keeping in mind the positioning requirements in Section 2.1.4.
2. **Install Conduit**: Unscrew the backing plate from the enclosure and safely store. Drill a conduit hole on the side of the box opposite from the black mesh network antenna (the hole should be on the side with the hinge). Secure the conduit to the box as appropriate. Reattach the metal backing plate before pulling wire.
3. **Connect Power and Ethernet**: Insert a screwdriver into each terminal, then insert the wire and remove the screwdriver to clamp. Connect the shielded Ethernet cable coming from an AC Charger to an open Ethernet port.
4. **Position Antenna**: All mesh network antennas must be oriented the same direction for proper communication. Keep all antennas as close to vertical as possible.

3. System testing and checklist

After physically installing all of the AC Chargers and Network Boxes, before users can charge their cars, the system must be configured so that at no point does the system ever try to draw more power than is safe. EverCharge generally preconfigures the system before shipping, leaving only a 10-second testing process to the installers.

Make sure that each charger is displaying a solid green LED before starting testing. If a charger blinks red, it does not have a connection to a Network Box. Resolve that before attempting to configure and test. Chargers and Network Boxes require roughly a minute to initialize after getting power, and the chargers will intermittently flash red during initialization.

Complete configuration instructions are in full sixteen-page design and installation document. Please call install support at 415-429-2971 if configuration appears necessary or if testing fails. As long as the network box has cellular service, we can help configure the system remotely.

3.1. Testing instructions

Test an assigned card by tapping it to the charger. The charger should beep twice, then within 10 seconds, it should beep twice again and the LED should cycle between green/orange for two minutes, indicating the card was authorized and the system is ready to charge.

If the charger flashes red or takes longer than 10 seconds to respond after tapping a card, it does not have a good connection with the Master Network Box or the card was not assigned to the tested charger. Make sure all antennas are vertical and there is no conduit/metal pipe near the antenna side of any Network Box.

3.2 Contact EverCharge before leaving the installation at 415-429-2971

3.3. Installation summary checklist

Use the following checklist to make sure that everything has been installed and configured correctly:

- ❏ Transformer, Main Breaker, Panel, subpanel have available capacity
- ❏ Junction Boxes along the entire electrical run for future expandability
- ❏ If applicable, trunk infrastructure wiring sized for the system breaker size
- ❏ AC Chargers are securely and safely mounted on the wall, column, or pedestal adjacent to the electric vehicle parking space
- ❏ AC Chargers are connected to 208V-240V and a 40 amp breaker with 50A-rated conductors
- ❏ Power Managed warning stickers applied on panel feeding chargers
- ❏ Each AC Charger is connected with shielded Ethernet cable to a Network Box
- ❏ Master Network box installed in location with best cellular signal
- ❏ Each Network Box has been supplied with always-on power
- ❏ Access cards tested with assigned chargers, in envelopes for customers
- ❏ **Call 415.429.2971 before you leave**. Send EverCharge the site configuration including locations of each charger and it's serial number at install@EverCharge.net. Be sure to include photos of the install!

4. Specifications

4.1 EverCharge AC Charger

Charging Interface	SAE J1772 compliant charging plug
Input Rating	208-240 Vac, single phase, 40 A, 60 Hz
Connections and Wiring	L1, L2, and ground, hardwired with terminal block
Standby Power	< 5 W
Output Rating	208-240 Vac, single phase, 30 A maximum, 60 Hz, 7.2 kW max.
Internal Residual Current Detection	20 mA CCID per UL 2231
Upstream Breaker	2-pole 40 A breaker on dedicated circuit, non-GFCI type
Electrical Protection	over current, short circuit, over voltage, under voltage, ground fault, surge protection, over temperature
Status Indicators	standby, charging, fault, warning
Buttons/Switches	charger on/off, stop charging
Operating Temp.	-22 F to +122 F (-30 C to +50 C)
Humidity	95% relative humidity, non-condensing
Charging Cable Length	18ft (5.5 m) straight cable
Ingress Protection	NEMA 3R
Cooling	Natural cooling
Dimensions (W x H x D)	13.8 x 15.7 x 5.0 inches (350 x 400 x 126 mm)
Net Weight	15.4 lbs (7kg)
Certificate	UL, cUL

4.2. EverCharge Network Box

Input Rating	120-240Vac, single phase, 0.1A, 60 Hz
Power Connections and wiring	L1, L2 / Neutral and Ground
Nominal Current	0.1A
Energy Management	Limits power to AC Charger per UL 916
Upstream Breaker	Wire in parallel with AC Charger on the same 2 pole, 40A breaker
Network Interface	Dual Ethernet port to support up to 2 x AC Chargers
Electrical Protection	Overcurrent protection
Status indicators	Power, Data
Ingress protection	NEMA 4X
Dimension (W x H x D)	6 x 6 x 4 inches (152.4 x 152.4 x 101.6 mm)
Net Weight	2.0 lbs (0.90 kg)
Certificate	UL, UL 916(Power Management)