powermat®

Charging Spot 3.1

Installation Guide

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1. Introduction

This document objective is to help the contractor to install Powermat Wireless Charging system in the venue.

1.1. Complementary Documents

Before reading this guide, it is recommended to read the below documents

- Powermat system components
- Store layout guide

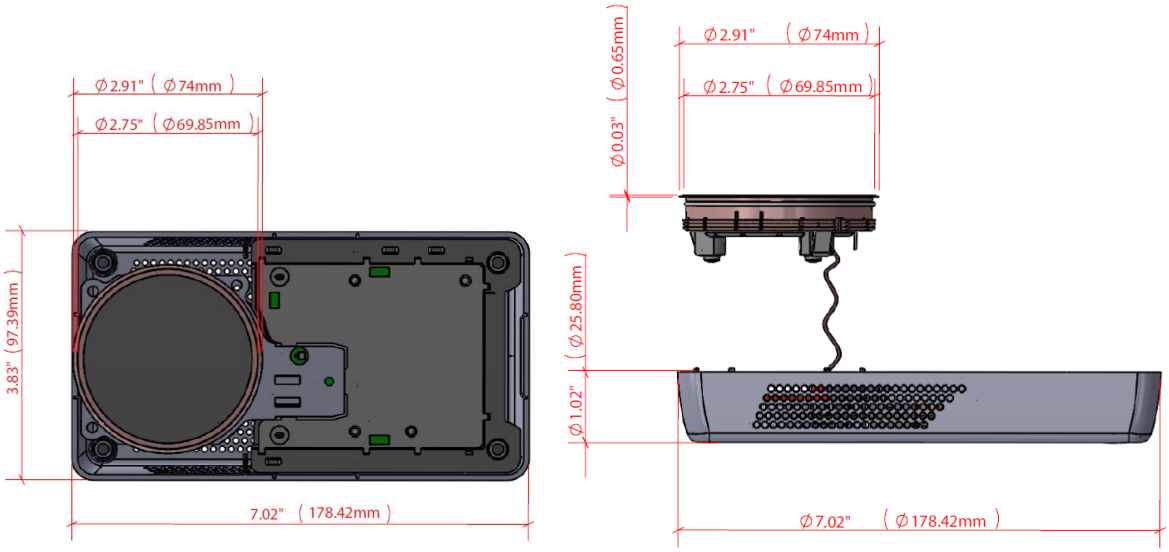
Both documents can be downloaded from Powermat sales web page.

2. Safety, Warnings, Disclaimers

- Powermat Charging Spot 3.1 is designed for installation by Powermat certified installers.
- Never open or repair the device. It should only be done by an authorized specialist.
- Do not install the device under an electrical conductive surface.
- Never use the device if it is damaged or wet.
- Observe a sufficient distance from warm or wet elements.
- Do not use the device outdoors.
- Make sure all electrical connections and power supply cables connected are in accordance with safety guidelines and instruction manual.
- Keep all parts out of reach of children.
- Never replace damaged power supplies yourself! Disconnect the devices and contact a specialist.
- Compliance with local and regional code
    - All components provided are certified according to rules and regulations
    - Compliance with any codes, rules, and regulation as far as wiring, wiring methods, and techniques lies entirely with the contractor.
    - Please verify with these codes, rules, and regulations before starting any installation.

3. Mechanical Schematics and Specifications

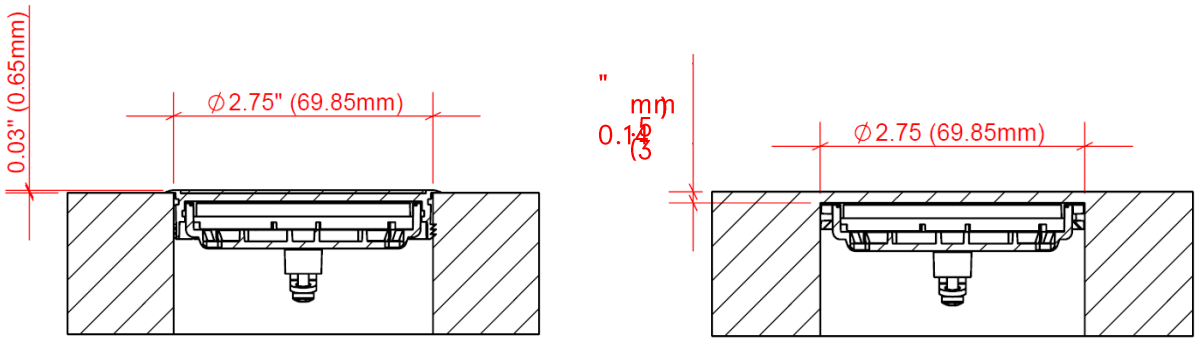
3.1. Charging Spot Schematics



3.2. Installation Configurations

Powermat's Charging Spot 3.1 could be installed in either a surface-mounted or a sub-surface configuration. Due to the required milling accuracy, and necessary permanent spot marking, Powermat does not endorse on-site sub-surface installations.

3.3. Sub-surface vs Surface Mounted



Surface-Mounted Installation

Sub-surface installation

3.4. Charging Spot Specifications

Parameter	Surface-Mounted	Sub-surface
Hole Profile	Through hole	Partial Cavity
Cavity diameter	2.75" (70mm) Ø	2.75" (70mm) Ø
Top Surface Footprint	Horizontal: 2.9" (74mm) Ø Vertical: 0.025" (0.65mm) above surface	Permanent spot position marking
Bottom surface Footprint	Width: 3.83" (97.28mm) Length: 7.02" (178.31mm) Thickness: 1.03" (26.16mm)	Width: 3.83" (97.28mm) Length: 7.02" (178.31mm) Thickness: 1.03" (26.16mm)
Drill Tools	TCT, bi metal, or diamond grit hole saw Hand tool ok (if used with jig)	CNC / routing – shop only
Surface Material	Wood/MDF/ply, Corian, stone surfaces	Wood/MDF/ply, Corian, stone surfaces
Substrate*	No substrate ok	No substrate ok
Minimum Thickness	0.5" (12.7mm)	0.5" (12.7mm)(to be verified)
Maximum Thickness	3"	3"

4. Drilling guidelines

1. **Step 1 - mark the spots locations on the table**
    1. Make sure it's according to the quantity requested per table
    2. Mark all the locations **before** drilling and make sure all are aligned vertically and horizontally
    3. Make sure not to mark a place above a leg or a bracket
    4. When marking the drill locations use painters tape, this will prevent surface chipping while drilling see Figure 1: Marking the Charging Spots location

Figure 1: Marking the Charging Spots location

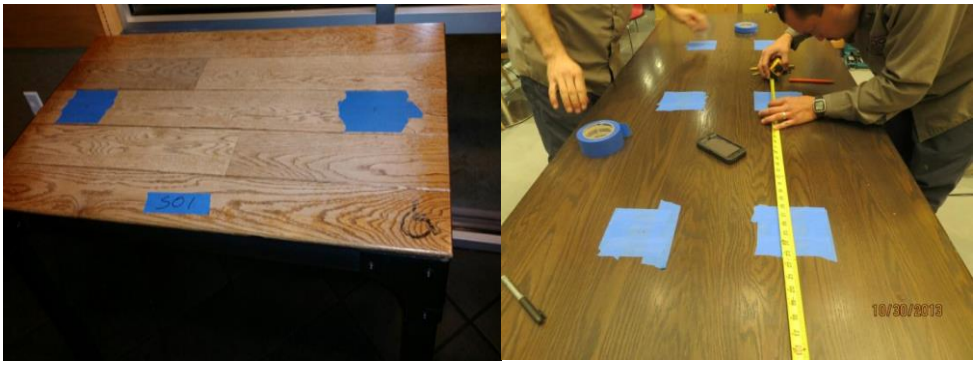


Figure 2: Drilling over a bracket

2. **Step 2 - Verify again table thickness**
   The charging spot can be installed in tables between ¾" to 3" (19.05 mm – 76.2 mm)

3. **Step 3 – Drilling**

General guidelines:

a. Drilling can be done with a hand tool
b. Make sure the hole saw is facing exactly 90 degrees to the surface
c. It is recommended to use a bit as part of the hole saw
d. Make sure drilling area is covered with painters tape to avoid surface chipping see Figure 1

NOTE: After drilling, make sure to clean burrs and splinters around top ream in order to ensure proper fit.

NOTE: Charging Spot requires a wooden substrate underneath any stone surface

Table 1: Drilling Requirements Surface Mounted

Drilling Requirement	Value
Hole Profile	Through hole
Hole Diameter	2.75" (70mm) Ø
Drilling Tool	**On-site Drilling:** • Bi metal hole saw 2.75" / 70mm • Diamond grit hole saw– to be used with a proper jig *for on-site hand tools, masking of the hole with painters tape and the use of a pilot bit is recommended
	Off-Site Drilling: • TCT hole saw – with shop bench-press • CNC/ router – shop only • Diamond grit hole saw– to be used with a proper jig

Table 2: Drill Type Selection

Surface Materials	Drill types
Wood and wood composites	All drills can be used
Corian	All drills can be used with the exception diamond grit hole saw
Quartz and Granite	Diamond grit hole saw only

Important note: *Charging Spot requires a wooden substrate underneath any stone surface*

Figure 3: Hole saw with a drill bit

Table 3: Drilling Requirements Sub-surface

Drilling Requirement	Value
Hole Profile	Partial Cavity
Cavity Diameter	2.75" (70mm) Ø
Thickness of surface above cavity	0.14" (3.5mm)
Drilling Tool	**On-site Drilling:** NA
	Off-Site Drilling: • CNC/ router – shop only

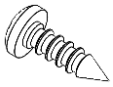
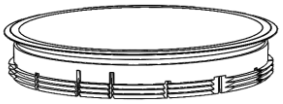
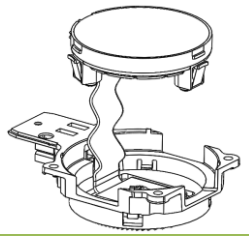
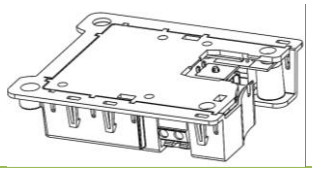
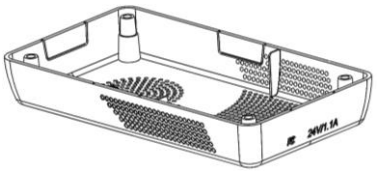
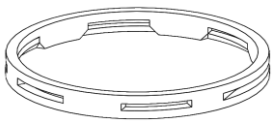
5. Charging Spot Installation

In order to power the Charging Spots, they should be connected to a power source.

The system works on a safe DC power, which is converted from the AC power outlet in the wall by a power adaptor.

1. Charging Spot Kit – Components:

Table 4: Charging Spot Kit components list

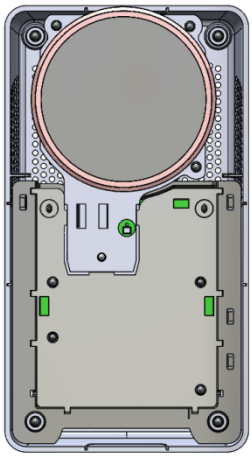
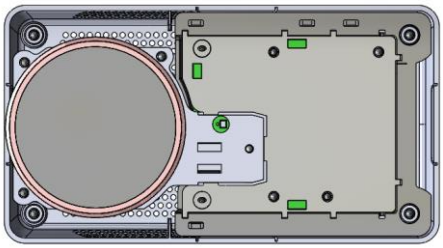
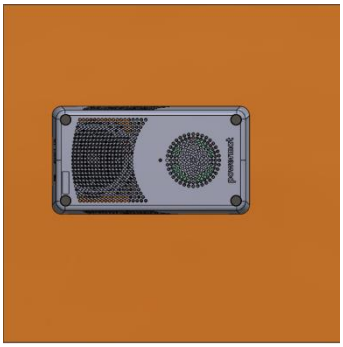
Installation Hardware	
A. 4 x #6 3/8" screws	
B. 4 x #6 1" screws	
C. 4 x screw plugs	
Charging Spot Assembly Parts	
D. 1 x surface-mounted cap	
E. 1 x silicone gasket	
F. Magnetic module sub-assembly	
G. Electronics module sub-assembly	
H. Charging Spot Housing	
I. 1 x centering spacer ring (for Sub-surface assembly only)	

2. **Required tools and parts:**
    1. #2 Phillips screw driver
    2. Narrow Flat head screw driver
    3. Cutting pliers
    4. 16/2, stranded, general purpose low voltage wire, CL3 & UL rated
    5. Approved Powermat power supply
    6. Transparent Silicone

4. Before you start

1. Inspect drilled holes/cavities and verify they are clean of burrs and obstructions.
2. Determine the intended orientation of all Charging Spots in relation to the surface based on wiring layout and surface frame / legs.

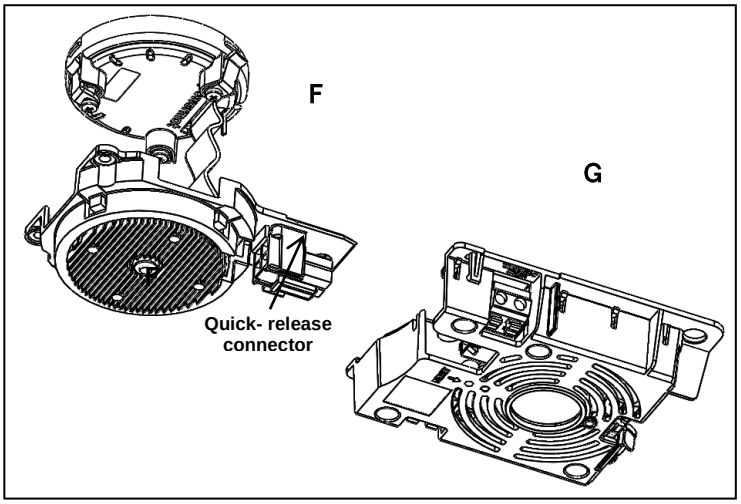
Table 5: Charging Spot orientation options

Perpendicular Orientation	Parallel Orientation
	
	

5. Magnetic Module Subassembly - Surface Mounted

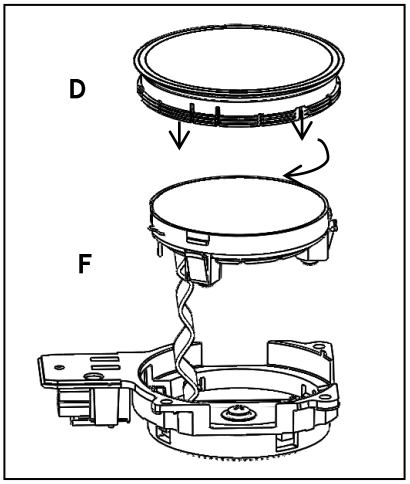
1. Separate magnetic module sub-assembly (F) from electronics module sub-assembly (G) by pressing the quick release connector lever and pulling gently.

Figure 4



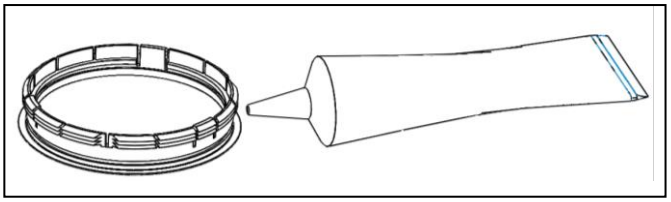
2. Hold the magnetic module such that the quick-release connector points toward the desired installation orientation of the electronics module and housing.
3. Place the cap (D) on the coil encasing in accordance with the desired direction of the artwork printed on the cap (facing the intended user), then turn the cap a ¼ of a turn, such that it cannot be separated by pulling it away from the magnetic encasing. Try to pull it out to verify it is properly connected.

Figure 5



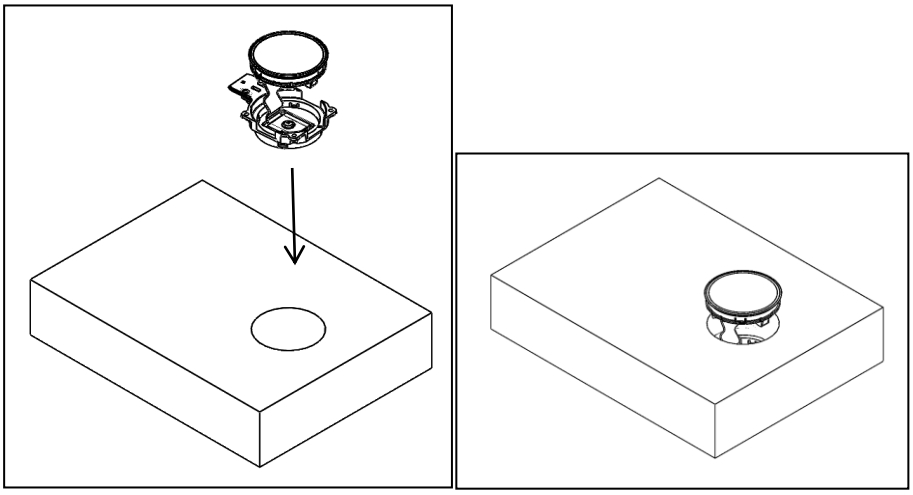
4. Add 3-4 dots of silicone on inner bottom lip of the cap (D). This silicone will keep the cap tightly secured to the surface.

Figure 6



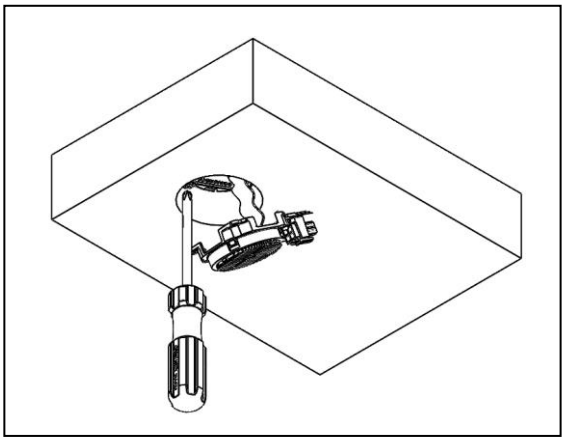
5. Pass the heat sink mount through the hole from the top of the surface, and press the surface-mounted cap onto the hole, so the cap shoulders sit snug against the surface. If the cover fits unevenly, remove and identify the problem. File any burrs as needed.

Figure 7



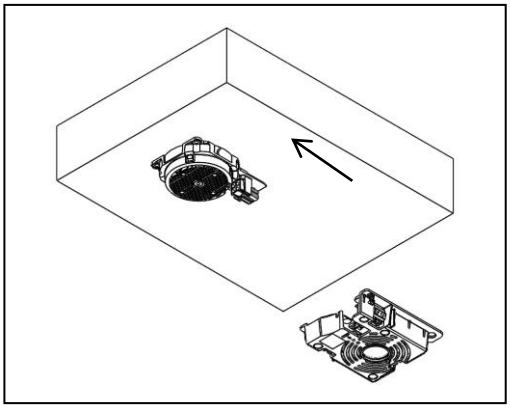
6. Using one hand, firmly press the cap against the surface to prevent it from rising, and the artwork from rotating. Reach from underneath the surface, and using your other hand, tighten the 3 latches evenly until the cap and the coil encasing sit securely in place.

Figure 8



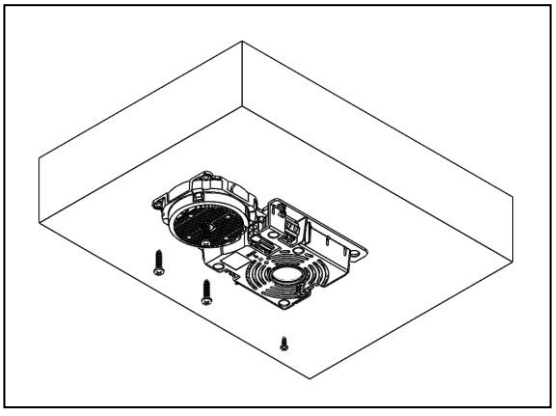
7. Verify the cap sits tight against the surface and that it cannot be turned or pulled out.
8. Slide the electronics module sub-assembly (G) into place to connect with the magnetic module sub-assembly (F) until clicked in place.

Figure 9



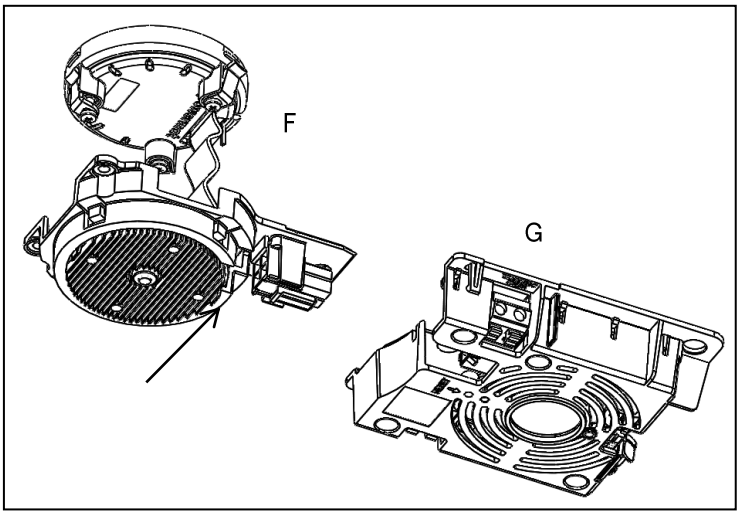
9. Accurately align and square the electronic module subassembly according to the desired orientation of the CS for wiring. Secure the heat sink mount to the surface using 3 x #6 3/8" screws (A). Secure electronic module sub-assembly (G) using 2 x #6 1" screws (B).

Figure 10

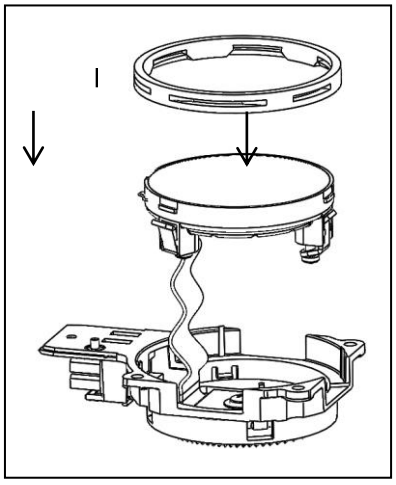


6. Magnetic Module Subassembly – Sub-surface Installation

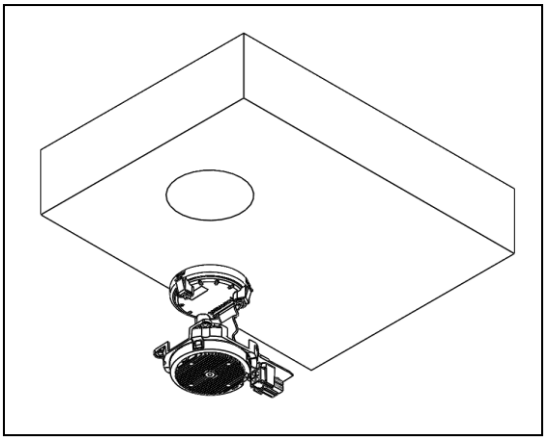
1. Separate magnetic module subassembly (F) from electronics module subassembly (G) by pressing the quick-release connector lever and pulling gently.



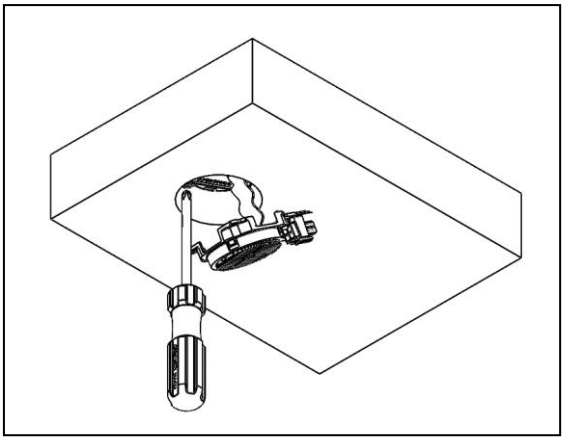
2. Place the centering spacing ring subassembly (I) on top of the coil encasing on the magnetic module subassembly



3. Pointing the quick-release connector in the general intended orientation of the electronics module, insert the coil encasing all the way into the cavity, and hold it in place. It is important to verify the encasing sits flat and tight against the surface layer.



4. While pressing the coil encasing firmly upwards, tighten the 3 latches firmly into the cavity.



6. Wiring

1. **Before you start**
    - Wiring should be done as discreetly as possible
    - It is required to use **16gage** DC wires at the minimum
    - Wires may not 'jump' from two surfaces (i.e. counters) if there is a gap between surfaces, wiring should run down the leg of one counter, along the baseboard or underneath the chair rail, and then up the leg of the next counter.
    - It is recommended to use wire channels in order to protect the wires
    - All movable tables should use a tether box (See design guidelines)
    - Wire channels should either be in a horizontal or vertical direction until hitting either the tile base at the bottom of the wall or the chair rail, whichever is closer. Do not run wire channeling in anything other than a vertical or horizontal direction.
    - When running AC power from a floor outlet to the underside of a community table, a black floor plate and black conduit should run up the leg of the table to a junction box mounted on the underside of the table
    - The junction box will split and run AC power to the power strips and DC power to a power supply that will be wired to the Charging Spots
    - Loose wires should be replaced with conduit on underside of table

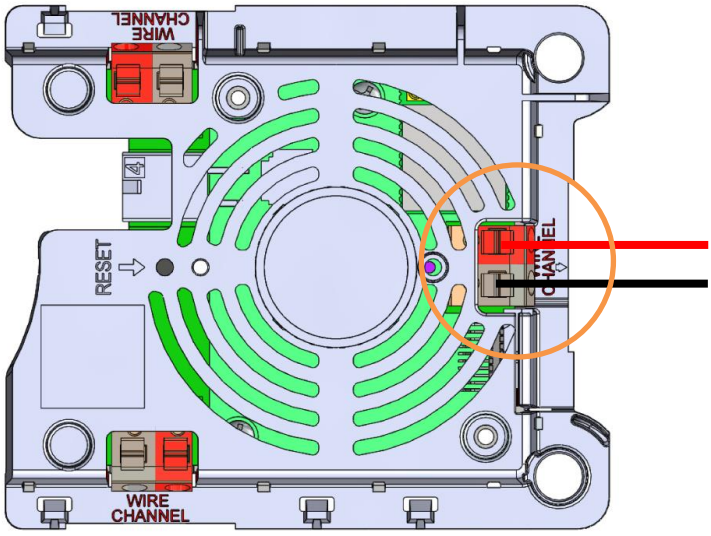
Important note: When working with power take necessary percussions to avoid safety hazards

2. Charging Spot Wiring

1. Determine wiring path, and identify the jacks you would like to use for your input.
2. Using a narrow flat head screwdriver, push the respective terminal button, and insert the positive wire (red or sometimes white) into the red DC push wire jack terminal, and the negative wire (black) into the grey DC push jack terminal.

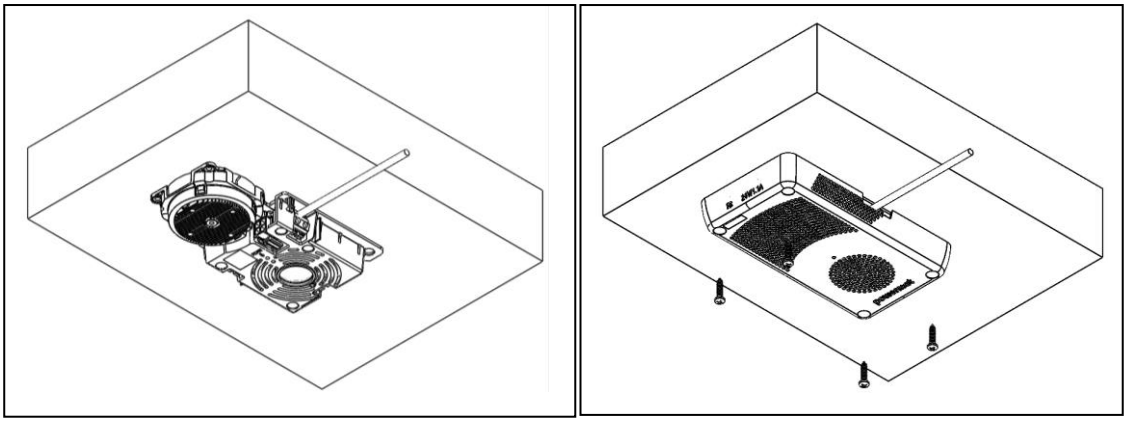
NOTE - Make sure to connect wire polarities correctly. Reversing polarities will cause permanent damage to the Charging Spot.

Figure 11: Charging Spot electrical module, wiring locations



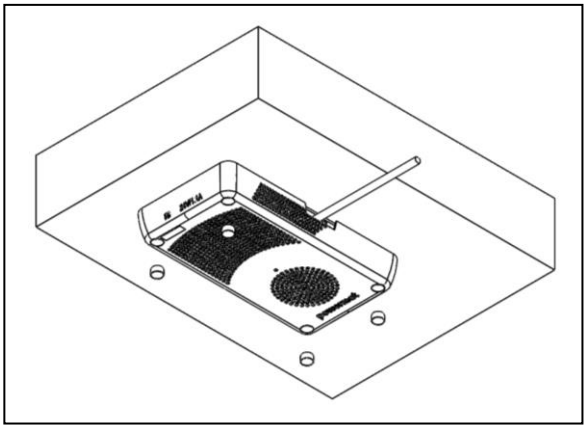
3. Take out the sticker attached to the Charging Spot and place it on the Charging Spot housing (H).
4. Cut the proper knockouts in the Charging Spot housing (H) using cutting pliers,
5. Secure the Charging Spot housing to the surface using 4 x #6 1" screws (B)

Figure 12



6. Place screw plugs (C) over mounting screw holes, and press until flush.

Figure 13



7. Connect wires to the Powermat-approved power supply. As previously, make sure to match polarities according to the respective wire color-coding or to the daisy chain

3. Using Powermat Daisy-Chain Wiring Harnesses

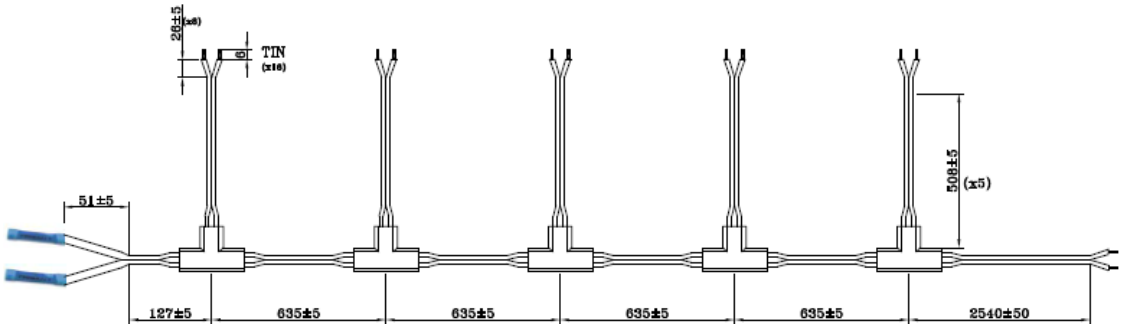
Powermat uses specially designed wiring harnesses to provide the necessary power to the table mounted Charging Spots. These wiring harnesses are daisy chained within the table in one of the following two different configurations.

- 'Inline' Wiring Harness
- 'T6' Wiring Harness

These wiring harnesses can be configured to supply power to up to 8 CSs from one power supply.

1. Inline or one way wiring harness:

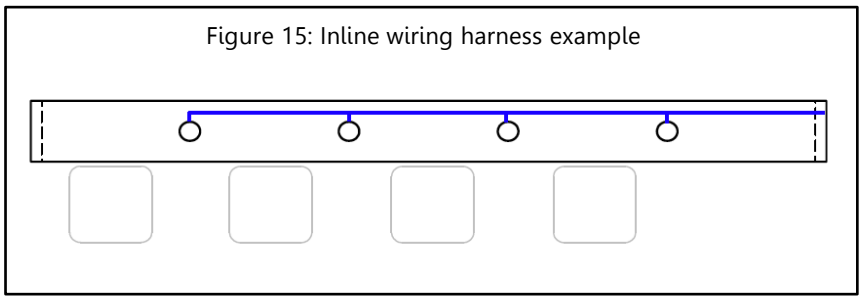
Figure 14: Inline wiring harness



a. 'Inline' Daisy Chain Setup:

Below is an example of a table that uses an 'Inline' daisy chain wiring harness to connect its Charging Spots.

Figure 15: Inline wiring harness example

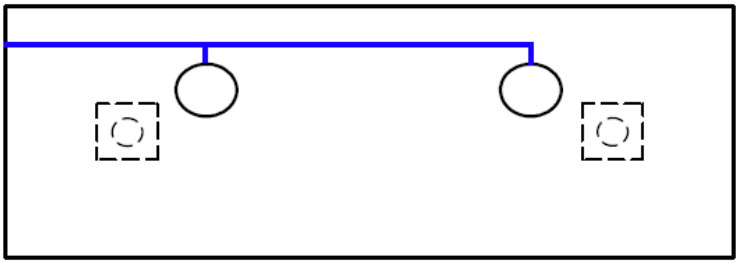


b. 'Inline' Daisy Chain with Pigtails Chopped:

Below is an additional example of a table that uses an 'Inline' daisy chain wiring harness to connect its Charging Spots. This example, though, shows a table that has only two Charging Spots. In this case the wiring harness is shortened by cutting its pigtails.

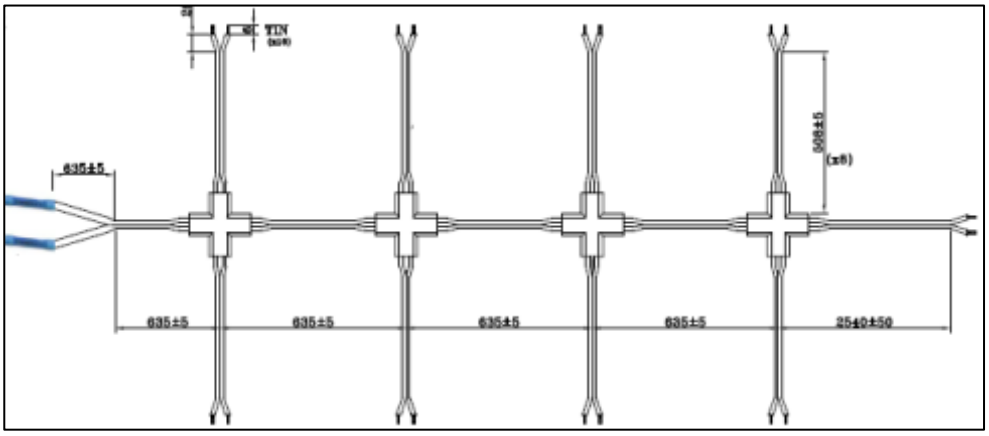
Note: Wiring harness pigtails are shortened (cut) if there are less Charging Spots than wiring harness connectors on a daisy chain, or if the distance between the Charging Spots is greater than the given distance on the daisy chain. In addition, you can connect 2 daisy chains using the open crimps at the end of the cable. This is done when more than 5 Charging Spots need to be connected.

Figure 16: Inline wiring harness example #2



2. 'T6' or two way wiring harness

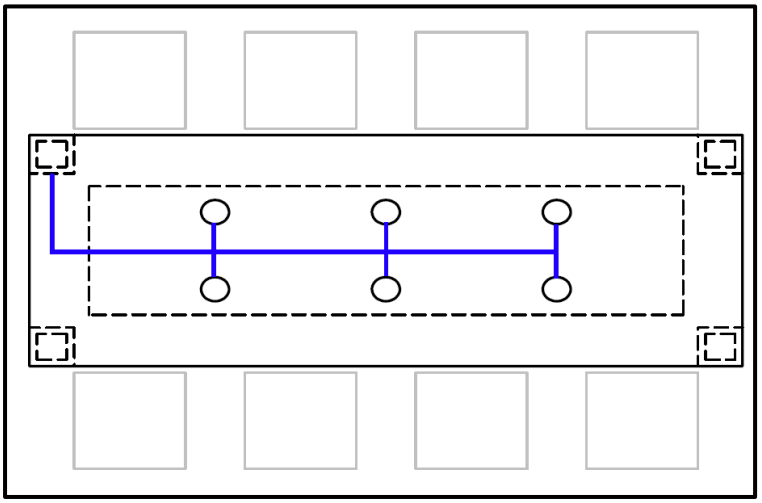
Figure 17: 'T6' harness and its connectors



a. 'T6' Daisy Chain

Below is an example of a table that uses a 'T6' daisy chain wiring harness to connect its Charging Spots.

Figure 18: 'T6' harness wiring example



7. Power Delivery Guidelines

This section will deal with wall wiring, AC to DC work and power supplies

1. Powerbox:

The Powermat Powerbox comes in two versions, a **120W** power supply and an **180W** power supply. The Powerbox provides the required power to the Charging Spots. The uniqueness of the Powerbox is that it allows you to maintain your two socket power outlet for other purposes, while providing the necessary DC power – up to 4 Charging Spots on the 120W version and up to 8 Charging Spots on the 180W version. The Powerbox also comes in a hard wired version. This is used when surface mounted outlets are available, or to tap into a junction box.

Figure 19: "Bladed" Powerbox

a. **Before you install**

Make sure you use the correct Powerbox according to the number of the Charging Spots planned for the table (if up to 4 – use 120W, if up to 8 – use 180W) and according to the power outlet (recessed – use the "blade" version, wall mounted/junction box – use the "hard wired" version). The best way to see the difference between 120W and 180W is by size (180W is bigger).

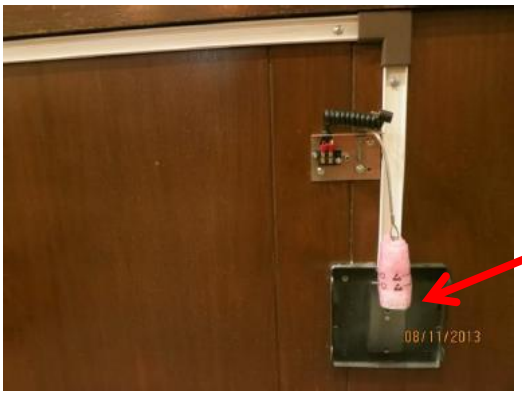
b. **Installing Powerbox**

Mount the back plate of the Powerbox to the wall:

i. In case of a standard recessed outlet, (i) remove the plastic cover, (ii) make sure the black pin is inserted to the "Ground" bottom socket

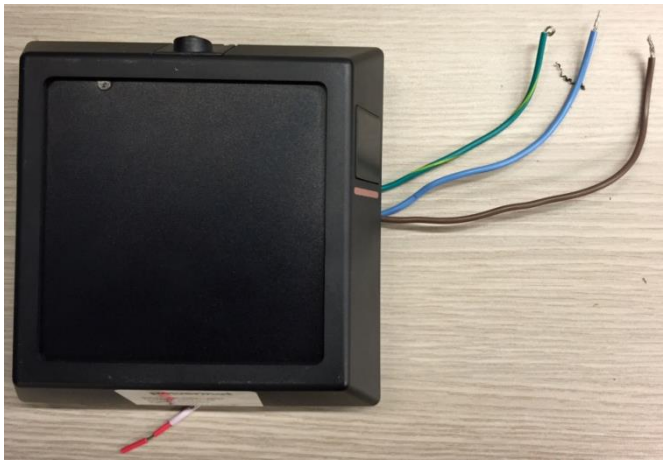
ii. In case of a regular wall mount, cut the black pin and mount the plate

Figure 20: Powerbox back plate



c. Break the proper knockouts and attach the wire channel to the back plate through the gap
d. Insert the Powerbox to the back plate; make sure the red/white DC wires are facing the correct direction (to the wire channel).
    i. For "bladed" version – make sure the blades are fully inserted to the upper socket
    ii. For "hard wired" version, properly connect the AC wires to the junction box

Figure 21: "Hard Wired" Powerbox



    iii. Crimp the Powerbox DC wires to the main wire running to the table inside the wire channel

NOTE –

- **Please use a certified electrician when installing a hard wired Powerbox**
- **Do not connect the Charging Spots before Powerbox is fully installed and Powered.**

2. Standard power supply

The power supply contains a standard barrel connector (5.5mm). The kit includes a female connector to use with the power supply.

Standard power supply installation:

a. Mount the power supply to the wall (Powermat offers an optional enclosure for 120W power supply which can be mounted to the wall)
b. Crimp the female connector to the main wire running to the table
c. Connected the power supply to the main wire using the barrel connectors
d. Plug the power supply to the AC outlet

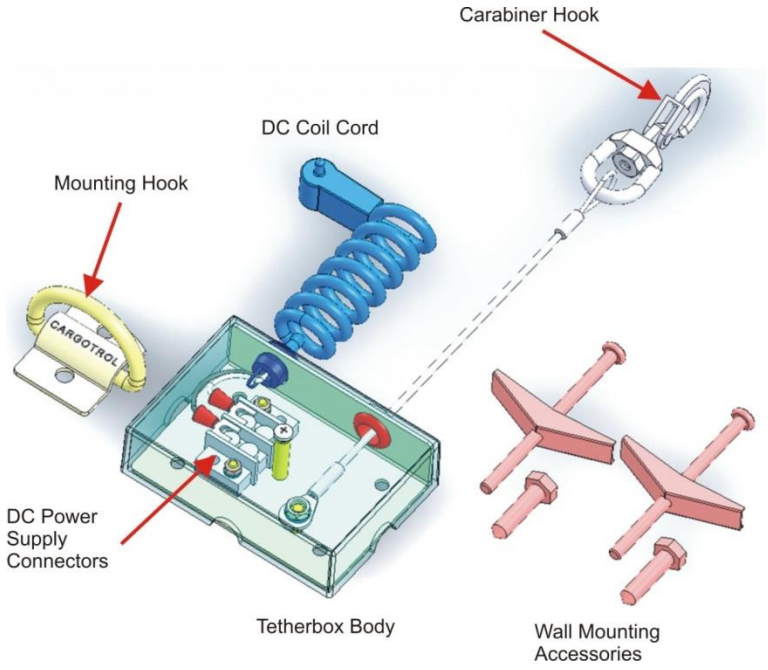
Figure 22: Standard power adaptor and an optional enclosure

8. TetherBox Installation

If you have selected to install movable table, the next step will provide you with the guidelines on how to avoid power disconnections. The TetherBox is used to deliver DC power to movable tables located near a wall

1. **TetherBox parts:**
    a. Mounting Hook
    b. Carabiner Hook
    c. DC Coil Cord
    d. DC Power Supply Connectors
    e. TetherBox Body
    f. TetherBox Cover
    g. Wall Mounting Accessories
    h. Connector mounting clamp
    i. Female DC connector

Figure 23: Powermat TetherBox parts



1. **<u>TetherBox Installation:</u>**
    a. Mount the TetherBox body to the wall closest to the table. This is done using the Wall Mounting Accessories.
    b. Connect the mounting hook to the bottom surface of the table using 2 wood screws

c. The Carabiner Hook is snapped onto the Mounting Hook. This limits the table's movement.
d. Connect the main wires (from the power supply) to the DC connectors in the TetherBox body. This provides DC power to the DC coil cord.
e. Connect (crimp) the female DC connector to the table daisy chain
f. Connect the DC Coil Cord to the under table daisy chain. This provides DC power to the Charging Spots.
g. Mount the joint DC connectors to the table using the clamp.
h. Close the TetherBox Cover.

Figure 24: TetherBox location, as close as possible to the surface

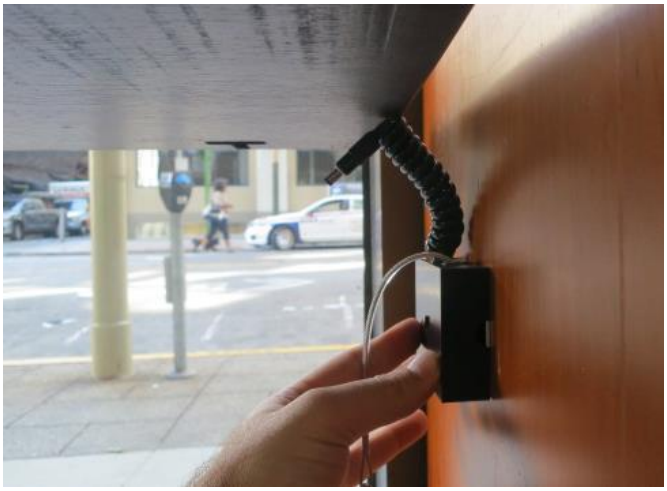


Figure 25: DC connectors mounted to a table using a clamp

9. Final checklist to verify Charging Spots are powered up

1. Make sure all daisy chains are connected to their Charging Spots
2. Make sure all daisy chains are connected to the power supplies
3. Make sure all power supplies are plugged in
4. For Powerbox 120W – make sure the power is on (top side button)
5. **Place a phone with a ring on the Charging Spot and verify charging**

10. Network Communication (for Tap to Charge)

This chapter contains guidelines to install Powermat Gateway in the venue.

1. **Gateway Kit contains**
   - Gateway
   - Power supply
   - Network cable

2. **Gateway connectivity requirements**
   The Powermat gateway requires an open connection to the internet, with no proxy servers or firewalls. Below are detailed requirement.

Table 6: Powermat gateway connectivity requirements

Network Interface Requirements
1 available Ethernet WAN port

Network Configuration Settings

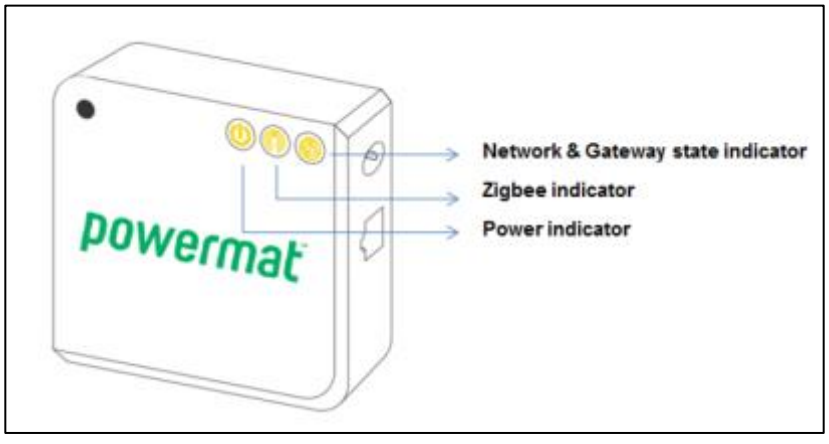
Protocol	Mandatory	Default	Alternative
DHCP/NAT	Yes	DHCP	NAT require IP address, default gateway and subnet mask
DNS	Yes	8,8,8,8	If not available alternate DNS server should be provided
HTTPS	Yes	Fixed set of URLs / SSL over port 443	N/A
NTP	Yes	pool.ntp.org / UDP over port 123	If service not available alternate NTP server should be provided
Proxy	No	Disabled	Can be enabled, require proxy server and port

3. Defining Gateway location:
   - The gateway should be placed in a high location as possible, close to the ceiling
   - The gateway distance from the first Charging Spot, should not exceed 30ft.
   - The gateway should not be blocked by any metal body
   - In case there is a wall between the gateway and the Charging Spots, the distance should not exceed 20ft.
   - Make sure the gateway can be connected to a power source and to the internet port in this location

Figure 26: Gateway recommended location and setup

4. Setup the Gateway
    - Once the gateway location is set, mount the holder to the wall
    - Place the gateway in the holder
    - Plug the GW to the power outlet and to the internet port – GW power LED (most left light) indicator will be green
    - GW will start initiation. After few minutes, network LED (most right light) will be **solid green**
    - If the network LED does not become solid green after five minutes, check that network cable is connected and internet port is active. Then unplug it from power and plug back.
    - In case the above is not helping, contact Powermat support center.

Figure 27: Gateway indicators



5. **Connect the Charging Spots to the GW**
   Please contact Powermat support center to schedule an online connection support@powermat.com.
6.