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M2M-W02 (Wireless Monitor Controller)

INSTALLATION GUIDE

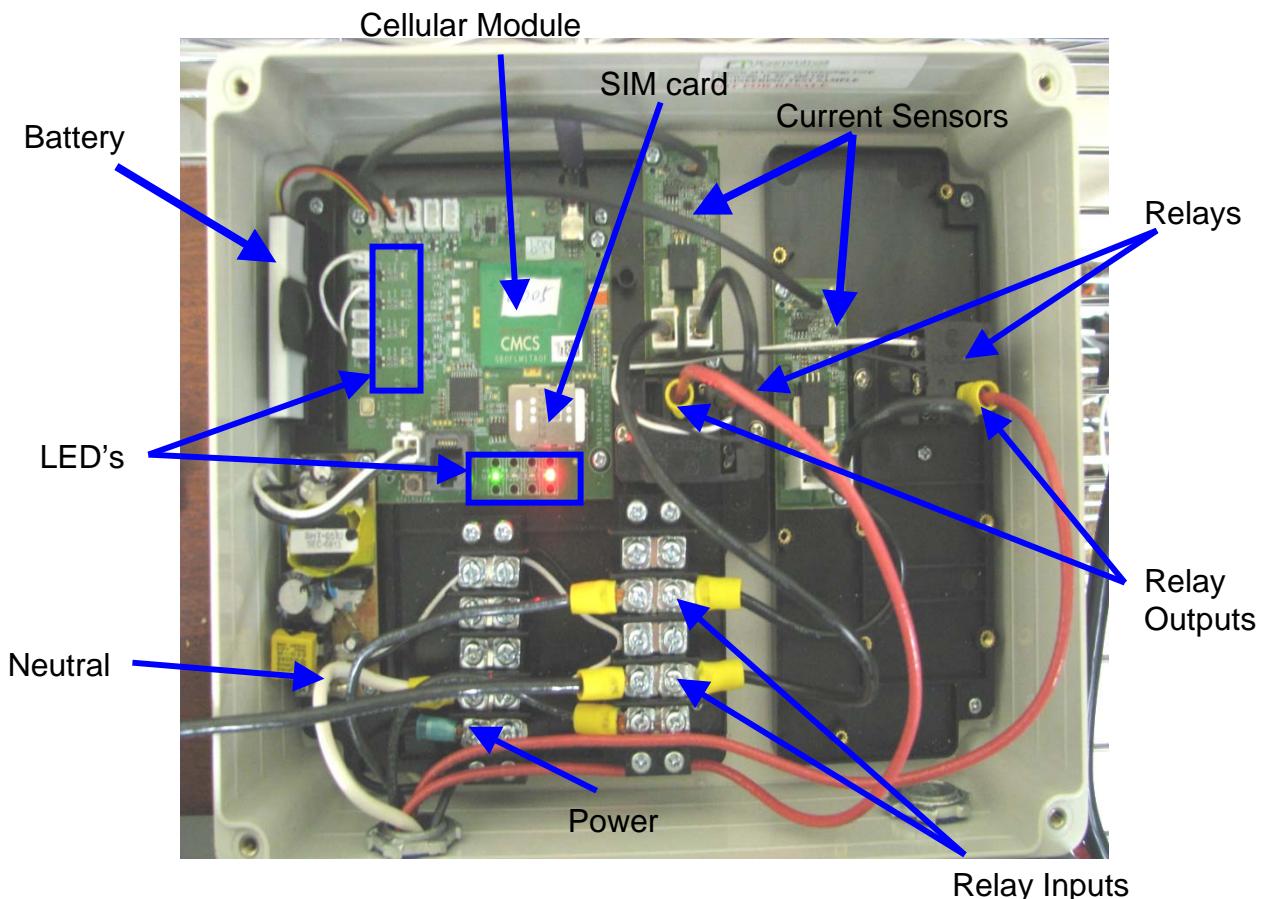
This is a Step by Step guide to help you correctly install the M2M-W02 controller. Please note that not all sites are the same, and that this guide only deals with a couple of site possibilities.

Tools and Material Requirements:

- Flat head screwdriver
- Small Phillips head screwdriver (preferably magnetic)
- Open end connectors (minimum of 8 per site)
- Female connectors (minimum of 4 per site)
- Drill with approximately 13/16 hole bit, or multi hole bit.
- Silicone tube w/ gun
- 3 to 4 self tapping metal screws
- Nipple w/ nut to pull wires through
- Wire cutter, stripper, and crimper



M2M-W02 Unit Overview



Battery: So the controller will stay online in case utility power is lost

Current Sensors: Measures the amp reading during each on/off cycle

Cellular Module: Communicates with the cellular network to send and receive data

SIM card: Is the unique cellular address specific to the controller (same as a phone number)

Relays: The main control for turning the lights on and off

Relay Outputs: Wires going to the lights, once relays are activated voltage will flow through these wires to the lights.

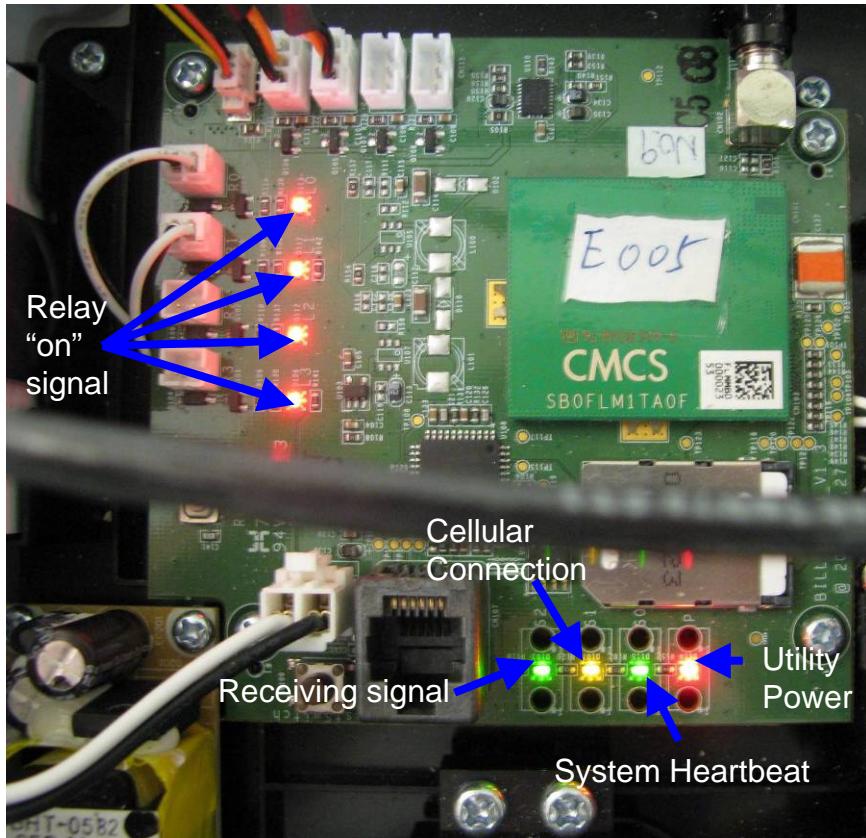
Relay Inputs: Coming off the breakers to the relays, source voltage to the lights

Power: Connects to the Utility power from the breaker to power the controller

Neutral: Return path for the voltage, connects with the neutral from the breaker box

LED's: Indicators to let you know what the controller is currently doing at any given time.

LED's Overview



- **Utility Power:** (Red LED) Solid when the controller is connected to utility power
- **System Heartbeat:** (Green flashing LED) Flashes whenever the system is powered and operating properly
- **Receiving Signal:** (Yellow LED) Shows when the controller is currently receiving a message
- **Cellular Connection:** (Green LED) Flashes if the controller is trying to connect or Solid when connected to a cellular connection
- **Relay "on" signal:** (Red LED's) Solid if the corresponding relays are on

During the calibration process there are a couple of combinations to the LED's that also mean something:

- When you receive system information messages you will notice that the **Yellow** LED will first turn on showing it is receiving a message, but then both the middle LED's will then flash together for about 1 minute while it processes the message.
- Also, after you press the calibrate button the middle two LED's should flash rapidly together for about 20 minutes while the lights are warming up. And that is also when the Relay "on" LED's should also light up

Installation Overview

1. Activate the SIM card in the M2M-W02 monitor.
2. Turn all breakers off.
3. Determine where to mount the M2M-W02 monitor based on the site. Select a location where the M2M-W02 can be mounted firmly in place, not interfere with access to (or the operation of) other equipment and where you will have easy access to the required utility power.
4. Mark where to make a hole through the M2M-W02 enclosure for mounting.
5. BEFORE DRILLING any holes in the M2M-W02 enclosure remove the base plates inside the M2M-W02 monitor with a magnetic Phillips head screwdriver (7 small screws).
6. Once the M2M-W02 enclosure is empty, drill the hole you marked in Step 4 through the enclosure and the breaker box and drill 3 or 4 self-tapping screws into the M2M-W02 enclosure for mounting.
7. Securely mount the M2M-W02 enclosure to the breaker box and replace the base plates.
8. Pull wires through the True Tracker: **Controller AC; Neutral; Relay Inputs** (from circuit breaker to relay) and **Relay Outputs** (from relay to lights).
9. Refer to the wiring diagram that matches the site configuration and connect each wire inside the M2M-W02 enclosure as shown in the wiring diagram.
10. Seal the outside edges of the enclosure with silicone to protect from the environment.
11. Wrap the wires into the breaker box with electric tape or a tie wrap so they are neat and easy to work with in the future.
12. Turn circuit breakers back on (Look for **red** and **green** LEDs to illuminate inside of the M2M-W02 monitor)
13. After the **red** LED inside of the M2M-W02 monitor is illuminated, plug in the Battery
14. After the **green** LED stops flashing and is solid **green** the M2M-W02 monitor has connected to the cellular network.
15. Call **Commtiva Technology Corp.** to have information sent to the M2M-W02 monitor to enable it for operation. You will need to provide site and location information such as number of panels, number of lights on each panel and the SIM card number associated with the M2M-W02 Monitor.
16. Once the M2M-W02 monitor receives the required information the **Yellow** LED will light up.
17. Shortly after the **Yellow** LED illuminates the 2 middle LEDs (1 will be **Yellow** and 1 will be **green**) will flash simultaneously for about 1 minute.
18. Once the 2 middle LEDs (1 will be **Yellow** and 1 will be **green**) stop flashing press the **Brown** calibrate button on the main controller board. This will turn the billboard lights on for 20 minutes. During this time the 2 middle LEDs (1 will be **Yellow** and 1 will be **green**) will flash rapidly and the relay "ON" LEDs will light up.
 - SEE LED's Overview on previous page
19. Verify that the M2M-W02 monitor is operational by confirming that the billboard lights are ON, or use an amp clamp or current meter to see if the output wires are drawing any current. If the lights are on they should be drawing current. You can figure about 4 amps per bulb on a 120V setup or 2 amps on a 240V setup.
20. After you have verified the M2M-W02 monitor is operational fasten the enclosure lid securely so no moisture can get in.

STEP BY STEP GUIDE

As soon as you reach your work area the first thing you should do is **shut off each breaker** to avoid electrical shock (Illustration 6.1). You can also take the top cover off of the M2M-W02 unit right away.



Illustration 6.1

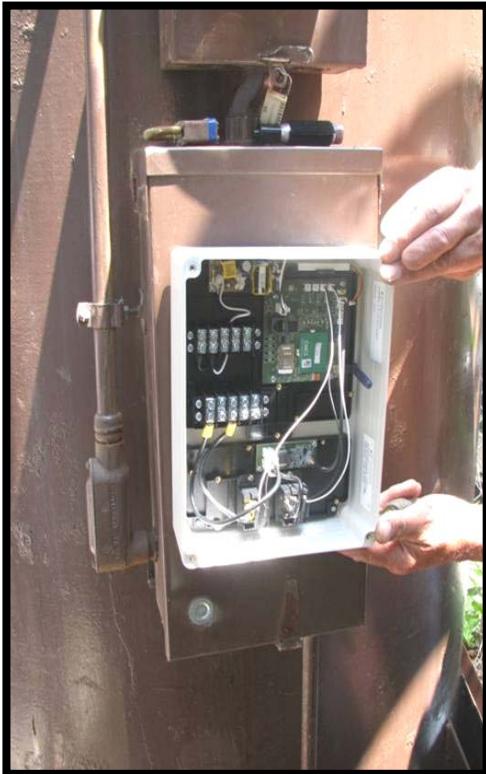


Illustration 6.2

Keep in mind what is behind the door, as there are only two places you can drill a hole in back of the M2M-W02 enclosure (see the red circles in Illustration 6.3). Try to make it easy to reach each all of the wires you need: Utility power, Neutral, inputs and outputs off the relay(s).

In order to drill a hole you must **take off the base plates** inside the enclosure, to avoid damaging any parts while you drill the hole.

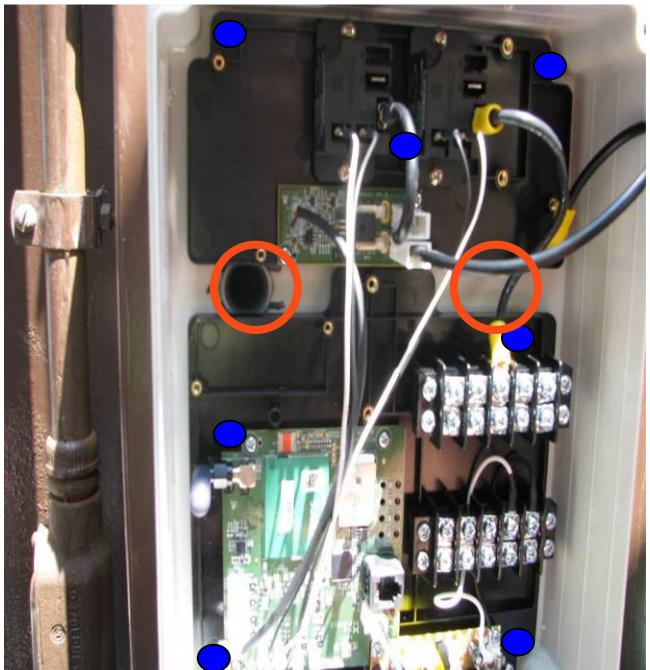


Illustration 6.3

Be sure to mark where you are going to drill the hole before you take off the base plates. (Illustration 6.3) There are 7 small screws (blue circles in Illustration 6.3) that hold the base plates on. It is best to use a magnetic Philips screwdriver for these screws because of their size.

The hole can be drilled in either the right or left opening.

Be sure to also drill 3 or 4 self-tapping screws into the box to mount it firmly. Once it is mounted firmly you can then replace the base plates that you took out earlier.

Pulling Wires

The example on the left is a 240v single face board. So you will only need 6 wires to go from the box and into the M2M-W02 Module. For each additional relay in the box there will be 4 more additional wires to go to the M2M-W02 module on a 240v system (2 relay inputs and 2 outputs).

One of the wires you will need is utility power, coming from the auxiliary breaker.



Illustration 7.1

The relay inputs come off the breakers and go to the relay inside the box (Illustration 7.1). Refer to the example on the right. You will need one relay input for each relay in the True Tracker. You will also need an output wire for each relay that will deliver the electricity to the lights when the relays are on.

Another wire that you will need to go into the unit is the neutral. Make sure that the exposed copper is not corroded if you are using the original wire.

Connecting Wires

Now it is time to connect the wires to the controller. (refer to Illustration 7.2) Begin by pulling each wire through the hole you created into the enclosure. The Utility power and neutral will hook up next to each other on the first connector block. Each will use an open end connector. On the True Tracker, black is for the power and white is for neutral.

The relay input wires will connect into the next connector block using an open end connector.

For a detailed diagram on how you wire different configurations please refer to the wiring and configuration diagrams provided in the **Quick Install Guide** that is in every M2M-W02 box.

The relay outputs will connect into the relays on the module using a female connector.

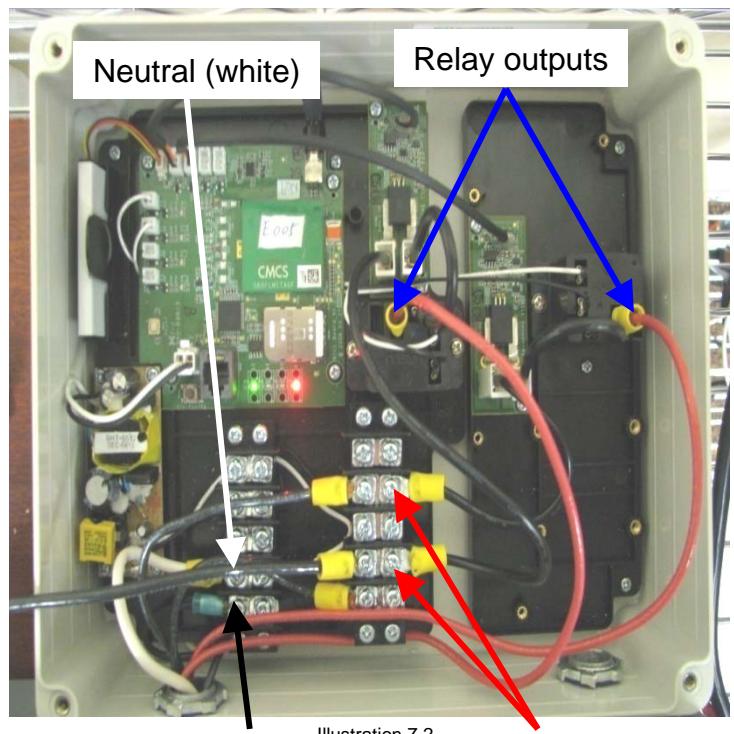
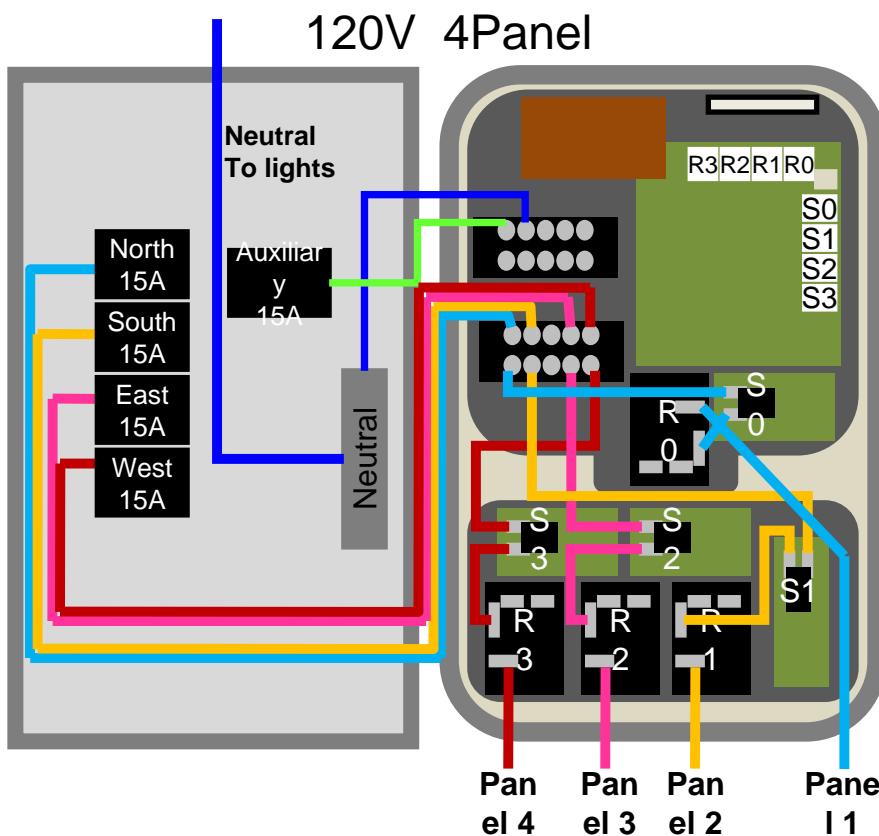


Illustration 7.2

Utility power (black)

Relay inputs

While making all of these connections inside the True Tracker, try to keep each individual wire neat and tucked away to prevent any complications with future repairs.



If you have a 2 or more face board however the order in which you connect the wires does matter. In this example (refer to Illustration 8.1) you will see 4 relays inside the M2M-W02 module. If you were to have a 4 face board you would connect the lowest panel number to Relay 0 or "R0". And the highest panel number to relay 3 or "R3".

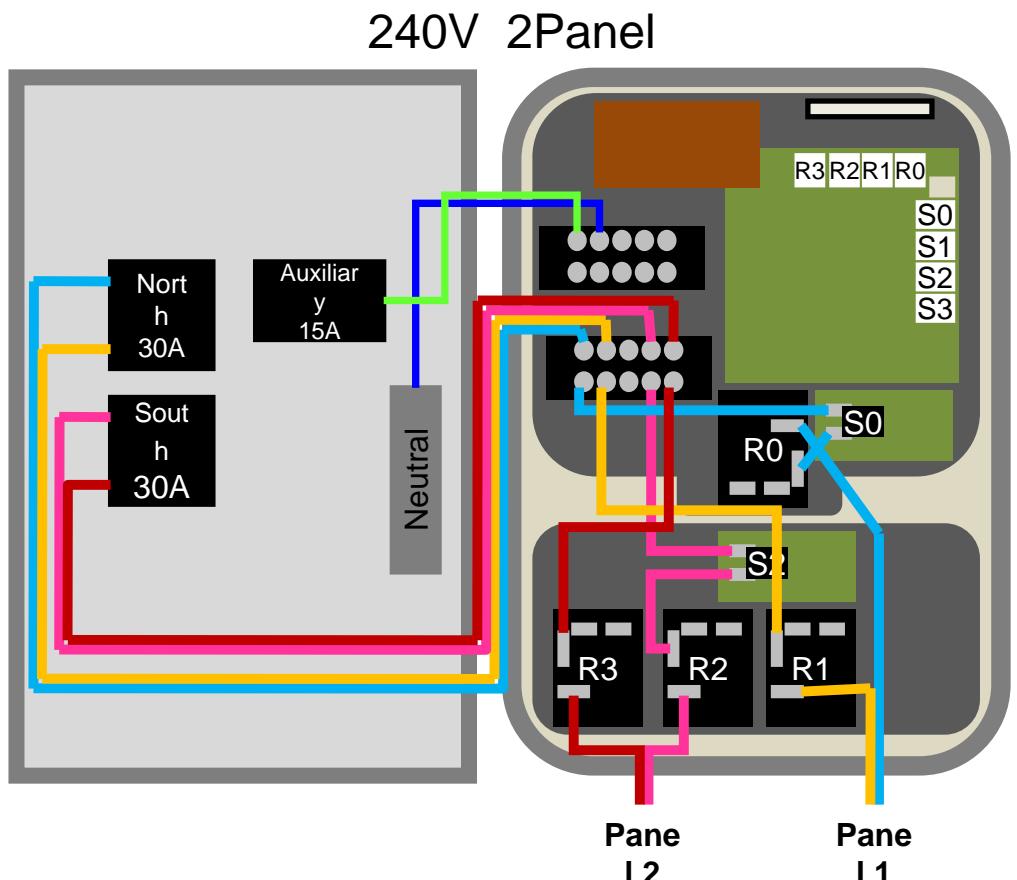
For Example if the panel numbers were 2111, 2112, 2113, and 2114. 2111 relay outputs would connect to R0 while 2112 would connect to R1, 2113 to R2, and 2114 to R3.

As for the relay input wires simply follow from the relay to the connection block to see which wires match up.

Illustration 8.2 is a 2 face board 240v. Again the lower panel number would go to the lower relay numbers.

For example, if your panel numbers were 2140 and 2141. Panel 2140 would connect to R0 and R1 while panel 2141 would connect to R2 and R3.

Also keep in mind that these relays are not actually numbered and this diagram is simply for reference.



Clean up and Weather Protect

Once the unit is wired make sure to seal around the entire enclosure with silicone to prevent moisture from getting inside. (refer to Illustration 9.1)



Illustration 9.1

Now would also be a good time to make everything neat and easy to work on next time it may need maintenance. This may also prevent wires from stretching or breaking every time the door is opened. You can also turn the power back on at this time.



Illustration 9.2



Illustration 9.3

Be sure to remember to plug in the battery after you turn the power on and you see the red light on the controller board.

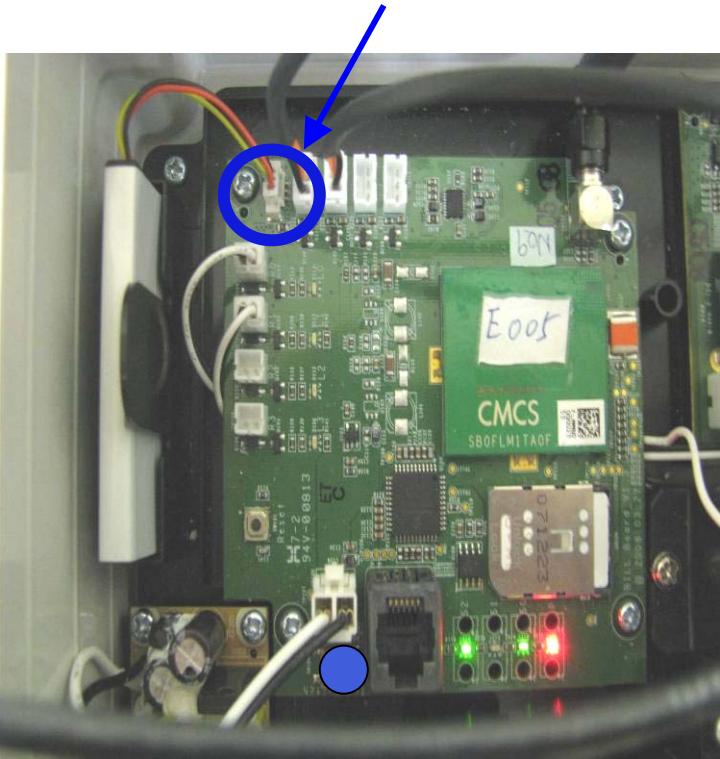


Illustration 9.4

Calibration

Once you have the power turned on you will notice two lights right away, the red light, which is utility power and the green light, which indicates whether or not the module is connected to a cellular network. If the green light is flashing that means it is trying to connect and once it is solid means it is connected. Once it is fully connected to a cellular network you can then get the information sent to the module. (refer to LED overview for LED information)

To get the information sent to the controller please contact Commtiva via telephone **(815)344-0678**. Commtiva will need to know the panel numbers, how many lights are on each panel the location of the board, and the SIM card number. They will then program the controller and set it up for operation. You will know when the controller has received the information when the yellow light on the board turns on.

The 2 middle LED's should then flash simultaneously for about 1 minute. **Once they stop flashing together you can then press the Brown calibrate button.** (Blue circle in Illustration 9.4)

Once the button is pressed you will notice red LED's turn on for each relay.

Pressing the calibrate button will turn on the billboard lights for 20 minutes to allow them to warm up. During this time the middle 2 LED's should flash rapidly. The module will then go through a 10 minute sampling to take a current reading and calibrate itself. You do not have to wait for the module to complete this warm up before you verify that it is working.

Verification

A quick and easy way to see if the module is working is to see if the lights are turned on after you press the calibrate button. Usually during the daytime however it is hard to tell if they are on.

The other easy alternative is to use an amp clamp or current meter (refer to illustration 10.1) to see if the output wires are drawing any current. If the lights are on then they should be drawing current. You can figure about 4 amps per bulb on a 120V setup, or 2 amps on a 240V setup.

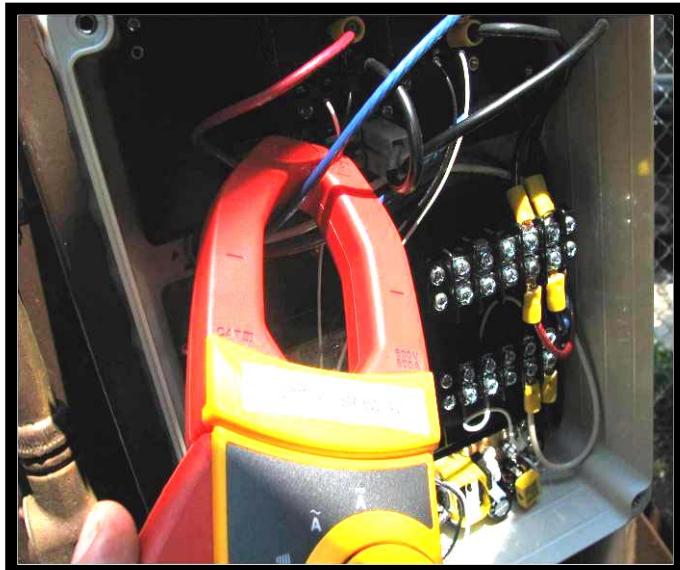


Illustration 10.1

After you press the calibrate button on the M2M-W02 board and you have verified that it is working properly you can now put the cover back on the unit make sure the lid is fastened securely to ensure no moisture can get in.

Congratulations on installing the M2M-W02 successfully!



Illustration 10.2

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

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.

CAUTION:

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

This device complies with Part 15 of the FCC Rules. 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.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated in accordance with provided instructions and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

RF exposure warning This equipment must be installed and operated

in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance