

## emp.2 Installation Instructions

### 1) Panel Preparation and Installation

- a. Remove cover and set aside.
- b. Review mounting site and determine the best position for mounting the emp.2 panel.
- c. The panel should be mounted as close to the circuit wiring being monitored as possible.
- d. The panel is to be mounted high enough so that the conduit entrance (Figure 1A) is via the bottom **ONLY**.
- e. Access shall be via two (2) or less, 1 inch (2.54cm) conduits (Figure 1A).
- f. **Do not** remove the interior electronics and PCB.
- g. Conduits to enter via the bottom of the cabinets only and be located no less than 1.5 inches (3.81cm), center line from the back of the cabinet. Use a piece of cardboard or wood to protect the internal electronics when drilling into the panel for the conduit entry.
- h. Preferred method is seal tight flexible conduit and appropriate connectors and supports.
- i. Four mounting brackets (Figure 1B) are located on the back side of the cabinet and are to be used for mounting. **DO NOT DRILL** back of the cabinet.

### 2) Interior Wiring for the Monitoring and Control Panel

#### emp.2 Power Source

- a. The emp.2 is designed for residential energy monitoring.
- b. The power source for the emp.2 is 240 volts' single phase and is accessed by the host power panel being monitored.
- c. The circuit shall be a 15 amp two pole circuit breaker and terminated on the terminal block (Figure 1C and Figure 3H) at the lower left hand corner of the monitoring control panel labeled "L1 – N – L2".

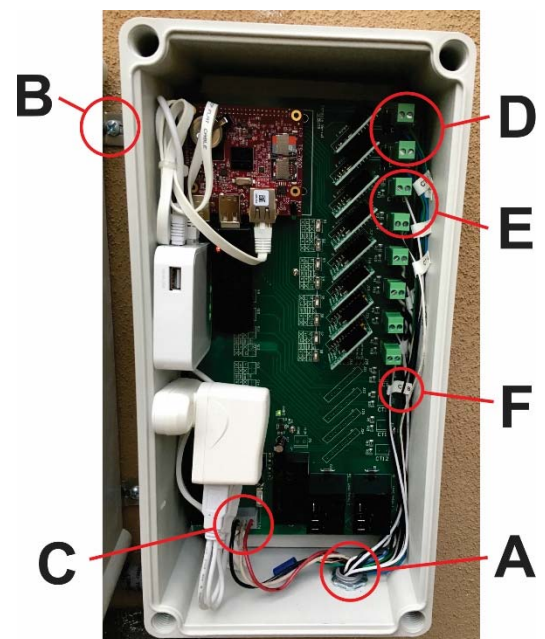


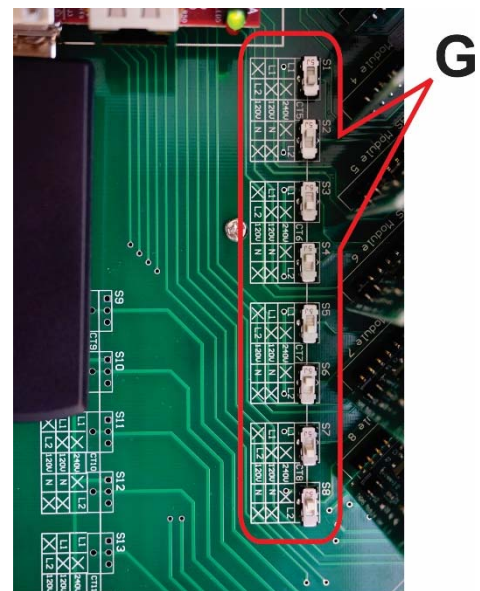
Figure 1

**CT Termination at emp.2**

- d. CT 1 and 2 terminals (Figure 1D) are set aside for total panel kW monitoring. The CT itself will be attached to the incoming L1 and L2 in the power panel. “L1” terminated on CT terminal #1 (CT1-L1). “L2” terminated on CT terminal #2 (CT2-L2). Care should be taken when setting these two CTs to preserve polarity. The arrow on the CT side label should point in the direction of the panel and circuit breakers.
- e. CT 3 and 4 terminals (Figure 1E) are pre-designated for “Solar” monitoring if PV cells have been installed. Incoming power from the solar inverter will be monitored at the solar circuit breaker or disconnect. “L1” terminated on CT terminal #3 (CT3-L1). “L2” terminated on CT terminal #4 (CT4-L2).
- f. CT’s 5 thru 8 terminals (Figure 3I) are for miscellaneous loads within the residence, i.e. A/C units, electric water heater, swimming pool pump, electric range, oven, etc. These appliances are typically 240 volts, but large 120 volt loads may also be monitored.
- g. All appliances monitored on CT5 thru CT8 will be monitored utilizing “L1” phase only, the load phase “L2” will not have a CT.
- h. It is essential that CT leads can be “tracked” from the emp panel to the circuit panel for trouble shooting. Therefore, all CT leads should be labeled (Figure 1F) with the appropriate CT number every two feet and care should be taken to land each CT lead at the correct terminal block.
- i. The CT has two wires, one black and one white (Figure 3J). The black wire will always be terminated on the left-hand side of the terminal block and the white wire will be terminated on the right-hand side of the terminal block.
- j. Check to make sure that the locking snap on the CT is tightly closed after the CT is set on the wire being monitored. Pliers may have to be used to compress the CT to snap the lock shut.

**D.I.P. Switch Settings**

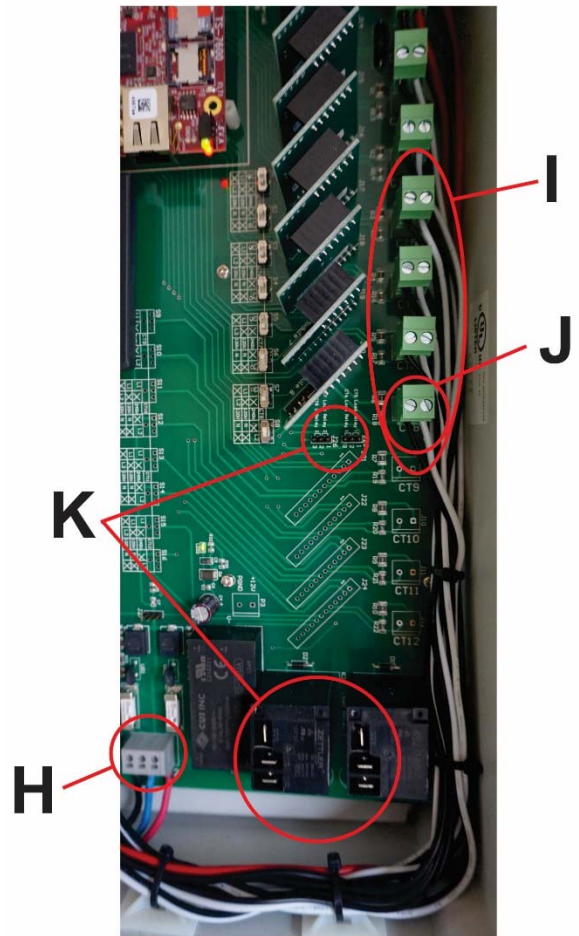
- k. The D.I.P. switch settings (Figure 2G) must be set to match the load being monitored.
  - i. Top setting: Use this setting when the CT is landed on “L1” of a 240 volt circuit
  - ii. Second/middle setting: Use this setting when the CT is landed on “L1” of a 120 volt circuit
  - iii. Third/bottom setting: Use this setting when the CT is landed on “L2” of a 120 volt circuit
- l. See detail sketch on wiring diagram.



**Figure 2**

### **Relay Wiring and “Jumper” Setting**

- m. There are two relays (Relay #1 and #2, Figure 3K) at the bottom right of the control cabinet. Relay #1 on the right and relay #2 on the left. The purpose of these relays is to turn on or off any non-critical load being monitored, such as a pool pump that can be de-energized for short periods in order to minimize demand charges from the utility.
- n. The relays can be controlled by one of two TARAS modules (Figure 3K) and the “Jumper” setting (J25 and J26 just below TARAS Module 8) determine which TARAS card will control the relay. Relay “R1” can be controlled by TARAS module 5 or 6. Relay “R2” is controlled by TARAS module 7 or 8. Typically, the factory setting for the jumpers will be 5 (for Relay 1) and 7 (for Relay 2).
- o. It is essential that the Jumper is set such that the CT for that TARAS Module is monitoring the same circuit that is routed through the relay. For example, if the Jumper for Relay 1 is set to 6 then CT-6 should be on the same load that is wired through Relay 1.
- p. Wiring via the relays requires one leg of the load to be wired from the circuit breaker through the relay terminals (not shown, but plug directly into the relay) and back to the load being controlled. Extend the circuit wiring using appropriately rated wire as necessary. Terminal connectors will have to be crimped onto the wiring to connect to the terminals on the relays. The “outside” terminal on the relay should be used and the “middle” terminal is left blank.



**Figure 3**