

T0006623

SMART AC OUTLET

USER GUIDE

DESCRIPTION

The Smart AC Outlet has the form factor of a standard NEMA 5-15R Decorator style duplex tamper-resistant receptacle but incorporates a LoRa radio with power control and monitoring circuitry which allows for the following remote user features:

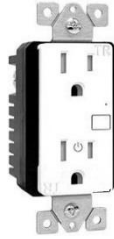
- Power on-off control and status
- Measurement of consumed energy (kWh), line voltage (Vrms), load current (Arms), load power (real, reactive, and apparent, W), line frequency (Hz), and load power factor.

Note that only the lower receptacle is controlled and monitored, the top receptacle is always live when line power is connected to the module and any connected load does not contribute to the energy monitoring.

The Smart AC Outlet also has a momentary contact push-button switch located on the faceplate for local user on-off control of the controlled receptacle as well as an LED for local status indication.

SPECIFICATIONS

Dimensions	43 mm (1.7") W x 46 mm (1.8") D x 104 mm (4.1") H
Weight	0.12 kg (0.26 lb)
Air Interface	LoRa US915 (902 - 928 MHz) Class C
Operating Control	Type 1.C Action
Environment	Indoor residential & commercial 0 to 40 °C (-40 to 104 °F) 5 - 95% non-condensing RH Pollution Degree 2
Line	120 VAC, 60 Hz, 15 A circuit
Load	1800 W (15 A) Resistive 1000 W Incandescent 5 A Electronic ballast 1200 VA Standard ballast ½ HP Motor



Wire Termination	Max. 2 wires per terminal except 1 wire for Ground #14 - #12 AWG copper or copper clad solid conductor 16 mm (5/8") strip length Torque terminal screw to 2.3 N.m (20 lbf-in)
Surge Prot.	IEEE C62.41 Category A
Impulse Voltage	2500 V
Approvals	cUL (E515077) FCC Pt. 15, RSS-247, FCC Pt. 27

WARNINGS AND PRECAUTIONS

- **TO AVOID FIRE, SHOCK, OR DEATH, ALWAYS TURN OFF POWER at the circuit breaker or fuse panel before wiring the module!**
- If you are unsure or uncomfortable with installation of this module, consult an electrician.
- To be installed in a standard electrical box and used in accordance with appropriate electrical codes and regulations.
- To be installed with copper or copper clad wires only.
- Exercise caution when powering loads from the LoRa radio-controlled receptacle. Loads connected to this receptacle may be automatically powered on by a timer or by a remote user. Such unexpected operation may present a hazardous condition for local personnel.
- This product shall not be used with medical and/or life support equipment.

INSTALLATION PROCEDURE

1. Locate the electrical box into which the Smart AC Outlet will be installed.
2. Remove power to the wiring by turning off circuit power at the circuit breaker or fuse panel.
3. Test the existing wiring to ensure that power has been removed.
4. Inspect the electrical box, a box depth of at least 2" is required. The electrical box may be metal or plastic but a plastic box will result in the best all-around RF performance.
5. Identify the appropriate wiring diagram for your installation situation.
6. Strip wire insulation back 5/8" (16 mm) and maintain a straight conductor for each of the wires to be terminated to the receptacle module.
7. Connect the wires to the module in accordance with the wiring diagram by inserting the bare wire fully into the wire

hole for each of the Line (Hot), Load, and Ground terminals on the receptacle module.

8. Once the module is fully wired, push the wiring and the module into the electrical box, secure the module with the two mounting ear screws, and install the trim plate with the two trim plate screws. Always use a plastic faceplate for best RF reception.
9. Reapply power to the circuit. The module faceplate LED will now begin to flash indicating connection to a LoRa network is underway.
10. Connect a load and test using the local on-off control button on the receptacle faceplate.
11. Commission the module on the appropriate LoRa network.

OPERATION



REMOTE OPERATION

The top receptacle is always on and does not contribute to load energy metering. Only the bottom receptacle is on/off controllable through the LoRa radio network. By default, the bottom receptacle will be off after AC power is applied to the module. The bottom receptacle can be turned on/off through the LoRa remote interface.

Measurement of energy supplied by the bottom receptacle as well as other real-time parametric information including line voltage, load current, load power (real, reactive, and apparent), and load power factor is available through the LoRa radio network.

Please refer to the TEKTELIC Communications AC Sensors Technical Reference Manual (TRM) for details regarding the LoRa network interface.

LOCAL OPERATION

The bottom receptacle can be turned on/off by pressing momentarily the faceplate control button. This load status change will be reported over the LoRa network.

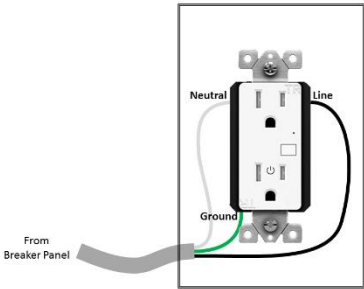
The module faceplate has an LED indicator which can be interpreted according to the following logic:

Solid Blue	Load power is OFF Module is connected to LoRaWAN
Dark	Load power is ON Module is connected to LoRaWAN
90% On - 10% Off 1s cadence	Load power is OFF Module is connecting to LoRaWAN
10% On - 90% Off 1s cadence	Load power is ON Module is connecting to LoRaWAN

WIRING DIAGRAMS

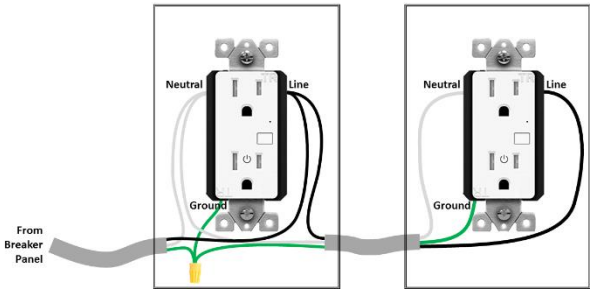
The following diagrams illustrate common installation diagrams, other options are possible. Always follow appropriate electrical codes and regulations.

Single Outlet End of Run



Note: An electrical box ground wire is required.

Multiple Outlet Run



Note: An electrical box ground wire is required.

COMPLIANCE STATEMENTS

FCC

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.

To comply with FCC exposure limits for general population / uncontrolled exposure, this device should be installed at a distance of 20 cm from all persons and must not be co-located or operating in conjunction with any other transmitter.

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 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.

IC

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s license-exempt RSS(s). Operation is subject to the following two conditions:

- 1. This device may not cause interference.
- 2. This device must accept any interference, including interference that may cause undesired operation of the device.

This device should be installed and operated with minimum distance 0.2 m from human body.

Cet appareil contient des émetteurs / récepteurs exemptés de licence qui sont conformes aux RSS exempts de licence d’Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis aux deux conditions suivantes:

- 1. Cet appareil ne doit pas provoquer d’interférences.
- 2. Cet appareil doit accepter toute interférence, y compris les interférences pouvant entraîner un fonctionnement indésirable de l’appareil.

Cet appareil doit être installé et utilisé à une distance minimale de 0,2 m du corps humain.