

# ConnectDER Solar Meter Adapter + Smart Module Installation Manual - Version 4 (V4)



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## SYMBOLS USED IN THIS MANUAL



WARNING

Designates information highlighting the risk of death, serious injury, or damage to property.



NOTE

Designates helpful information.

## INTRODUCTION



NOTE - Version 2.3 of this document supersedes all previous versions. It is the responsibility of the party installing, replacing, and/or servicing the Solar Meter Socket Adapter (the “installer”) to obtain and follow the most current installation document.

The ConnectDER™ Solar Meter Socket Adapter (“MSA”) is a UL Listed device that enables rapid interconnection of grid-tied PV systems. It creates a safe, standardized, low-cost alternative to traditional wiring methods.

Underwriters Laboratories, Inc. (UL) grants its listing after verifying that products meet a high level of safety and quality, and conform to numerous codes and standards, one of which is the most current edition (2020 edition for the V4 MSA) of the National Electrical Code (NEC).

The MSA operates in parallel with the utility grid. It is approved for use with interconnected electric power production sources in accordance with Article 705 of the NEC such as Listed grid-interactive photovoltaic (PV) systems where the inverter(s) meets UL 1741 requirements.

The installer assumes all responsibility and risk associated with the safe and intended use of the MSA as expressed in the current installation document. Any deviation from the methods or applications in this manual will violate the product’s UL listing, 2020 NEC Article 110.3(B), and void the product warranty.

Contact ConnectDER, Inc. at [support@connectder.com](mailto:support@connectder.com) for the most current document and technical support before installing, replacing, and/or servicing the MSA. Always follow utility and Authority Having Jurisdiction (AHJ) requirements.

Please read these instructions in their entirety before installing an MSA.



**WARNING - The ConnectDER Solar MSA contains live parts capable of causing death, injury, or damage to property.**

Installation and servicing of the MSA, all associated wiring and interconnections must be performed only by qualified personnel. Article 100 in the NEC defines a qualified person as *one who has the skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.*

Turn off the power supply and all other potential electricity sources before installing or servicing the MSA. The graphics in this document depict **deenergized** equipment.

Use a calibrated voltmeter to confirm conductive parts are deenergized before touching. Use factory-insulated tools.

**Do not alter the MSA, or any other equipment or conductor in a manner that voids its listing or warranty. Do not attempt to replace the integrated PV circuit breaker or modify any other components.**

ConnectDER recommends practicing the installation and wiring of the MSA using deenergized equipment before proceeding with field installations.



**WARNING - The MSA is permitted to interconnect a UL 1741-listed parallel source to the supply side of the main service disconnecting means. The MSA shall not interconnect electric vehicle chargers, batteries, or other loads. The 180-amp combined utility and PV rating is permitted only when the PV is an input source to the MSA circuit breaker.**

**Loads** connected the PV breaker must be limited to the minimal current that inverter(s) require to start, commission, and monitor a PV system.

## SOLAR METER SOCKET ADAPTER FEATURES

- Enables rapid connectivity for PV systems.
- Quick-connect and quick-release reversible weatherproof junction box for field wiring.
- Readily accessible circuit breaker for overcurrent protection and AC PV disconnect.
- Lockout/tagout capability for safety and security.
- Compatible with ringless, ring type, and lever bypass meter sockets\*, form 2S and 12S, 200 amps maximum.



WARNING - \*For lever bypass meter sockets, ConnectDER recommends:

- Locking out alternate/backup sources of power.
- Removing power from the premises loads.
- Actuating the lever bypass to facilitate meter removal.
- Removing the meter.
- Positioning the lever bypass to deenergize the load-side meter socket jaws.

This is covered again in the [INSTALLATION PROCEDURE](#).

### Additional features, Solar MSA + Smart Module only:

- Whole house metering.
- Revenue grade metering for PV circuit.
- Infrared (IR) port for calibration.
- Cellular communications to track PV data via the ConnectDER Cloud™

#### WHAT'S NEW FOR V4

- The weatherproof junction box has been upgraded to a quick-connect and quick-release version. Utility meter technicians can safely remove the junction box for MSA inspection and servicing, leaving the PV circuit field wiring intact.
- Reduced overall depth.
- Rated for 180 amps continuous combined utility + PV current.
- Improved circuit breaker cover.

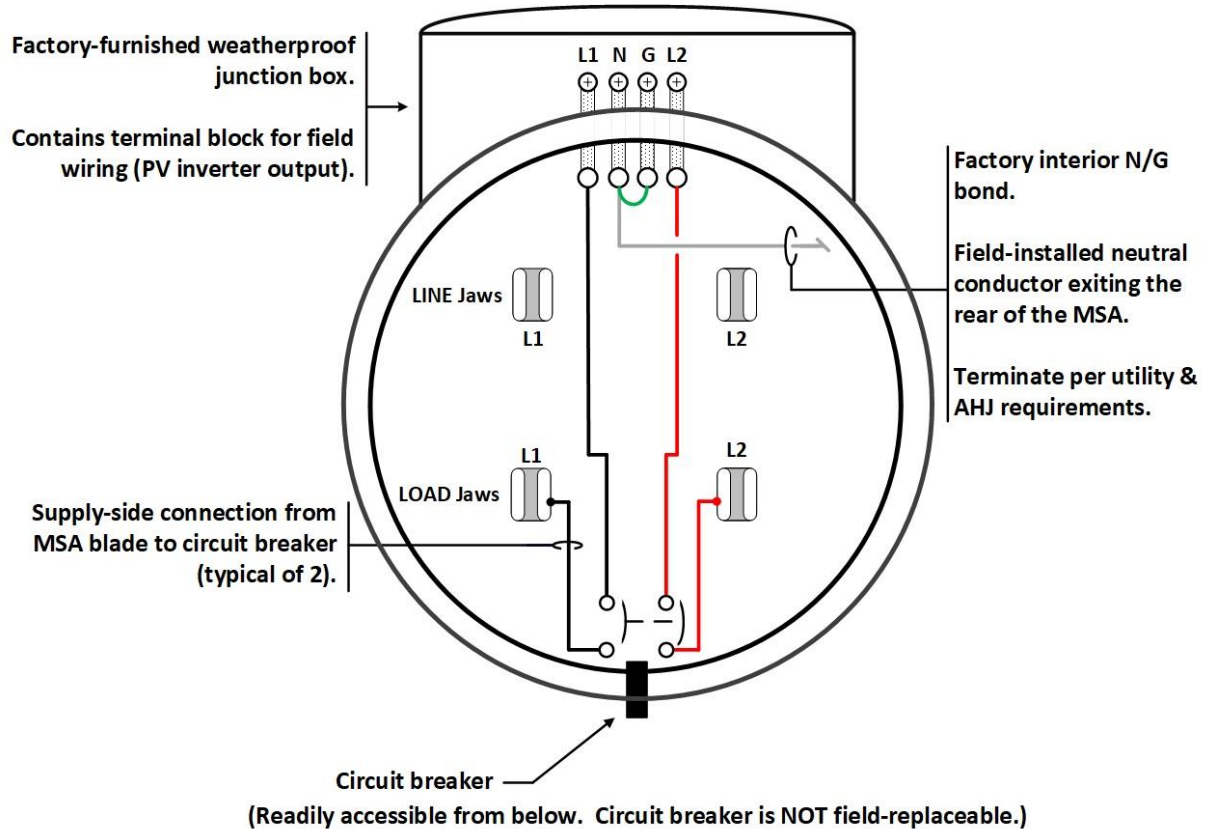
#### MSA + Smart Module only:

- The LCD display is moved to the main adapter housing.
- The wired Ethernet port is eliminated. There are no low voltage external connections.
- The Smart Module is powered by the line side of the meter socket (continuously on, like a billing meter).



## WIRING SCHEMATICS

Figure 1 – Power Wiring Schematic



**NOTE** – The MSA creates a supply side PV interconnection on the load side of the billing meter. Interconnection at the line side of the billing meter is available for utility-owned systems only. The MSA contains a factory-installed neutral-to-ground bond.

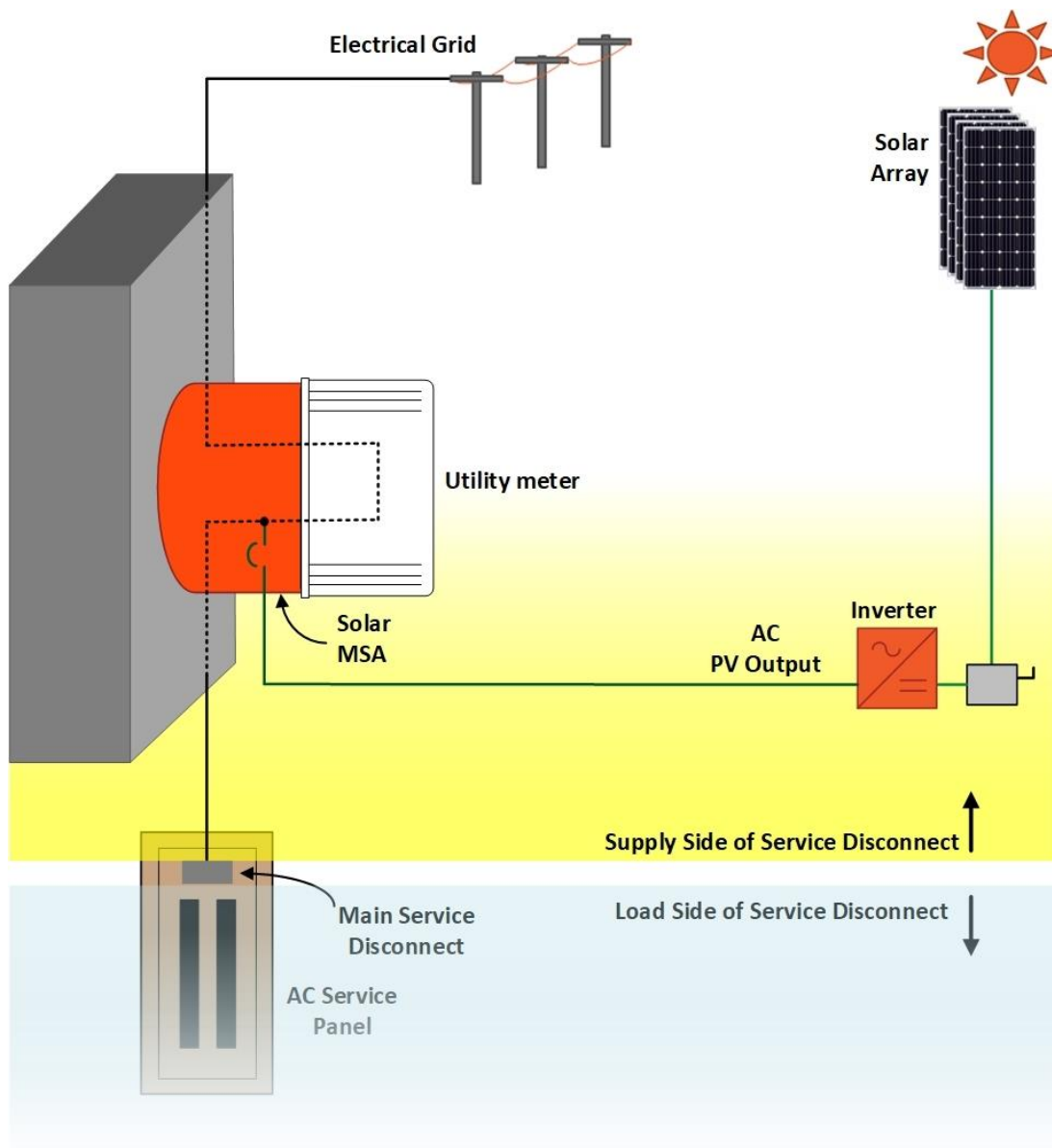


**WARNING** – The MSA is only suitable for use on the supply side of the service disconnecting means.

The MSA must be installed with the junction box at the top and the integrated circuit breaker at the bottom. Do not install the MSA in any other orientation.

The MSA creates a connection to the supply side of the service disconnect as shown in **Figure 2**.

**Figure 2 – Conceptual Supply-Side Solar PV Interconnection**



## BOX CONTENTS

The package contains the following items. Verify the contents are complete before proceeding with installation:

Qty.	Item
------	------

- |   |   |
|---|---|
| 1 | Solar Meter Socket Adapter.   |
| 1 | Quick-connect and quick-release junction box with a 1" threaded closure plug.   |
| 1 | Locking ring for attaching the meter to the MSA.                                |
| 1 | Neutral pigtail, white, #6 AWG THHN stranded copper.                            |
| 2 | Tamper-resistant seals.   |
| 1 | Label with installation reminders and a QR code to access installation manuals. |



**WARNING** – It is the responsibility of the MSA installer to ensure a white neutral pigtail is installed with **every unit**.

The neutral pigtail must have a minimum ampacity equal to the ungrounded conductors protected by the MSA internal circuit breaker. Use a method approved by the utility and the AHJ to attach the white pigtail from the MSA to a neutral point inside of the meter socket.



**NOTE** - More information regarding the neutral connection is contained in the "[INSTALL THE NEUTRAL LEAD](#)" section of this document.

## INSTALLATION PREPARATION

### SITE INSPECTION

There are several types of existing residential meter sockets suitable for MSA installation. Some common types, namely single gang, multi-gang, and combination meter socket/load centers are covered in this section. All three are available in ringless and ring type configurations.

Begin assessing the suitability of a meter socket by ruling out two instances:

1. Rule out shallow meter sockets (sometimes referred to as “button” or “puck-type” meter sockets) as shown in **Figure 3**. They lack the interior space and means to accommodate a neutral pigtail.

**Figure 3 – Shallow Meter Socket (Not Recommended)**



2. Rule out meter sockets with inadequate space to install a neutral pigtail, signs of damage, excessive rust, evidence of loose or damaged service conductors, and enclosures loosely secured to the structure.

3. Confirm if the utility is restricting MSA usage to ringless (**Figure 4**) or ring type (**Figure 5**) meter sockets. The MSA supports both configurations.

**Figure 4 – Single Gang Ringless Meter Socket**



Ringless meter sockets use a small raised flange to hold the meter in place with the cover closed. They do not use a separate locking ring.

Ringless meter sockets are locked through a sliding lever as shown here, or by other means implemented by the utility.

**Figure 5 – Single Gang Ring Type Meter Socket**



Ring type meter sockets have an extruded flange on the cover...



...for a locking ring to secure the utility meter.

4. Confirm if multi-gang meter sockets (**Figure 6**) are on the utility's approved equipment list. They may present additional neutral wiring and service access issues over single gang meter sockets. ConnectDER recommends researching the manufacturer's documentation for potential compatibility.

MSA compatibility with multi-gang meter sockets may be permitted by the utility and/or AHJ on a case-by-case basis. Care must be taken to ensure that the MSA junction box may be inserted and disconnected (lifted up a minimum of 2") and the field wiring raceway does not block access to circuit breakers and/or the removal of meter socket covers.

Multi-gang meter sockets may accommodate only the top socket, or left and right sockets, or none at all.

**Figure 6 – Multi-Gang Meter Sockets**



5. Confirm if combination meter socket/load centers (**Figure 7**) are on the utility's approved equipment list. They may present additional neutral wiring and service access issues over single gang meter sockets. ConnectDER recommends researching the manufacturer's documentation for potential compatibility.

**Figure 7 – Combination Meter Socket/Load Centers**



NOTE - The neutral pigtail from the MSA is normally terminated in the meter socket compartment. The neutral pigtail is required as part of the installation and is a component of the MSA itself; therefore, it should be permitted in and confined to the metering compartment. Check with the AHJ and utility to verify if the neutral connection must remain entirely within the meter socket compartment, or if it may cross any barrier to the customer premises wiring section.

6. An MSA shall not be installed on meters already equipped with a socket adapter such as a whole-house surge protection MSA (**Figure 8**).

**Figure 8 – Existing Meter and Socket Adapter**



7. Account for other considerations:
  - a. Check with the utility for other potential prohibited installations. Do not install an MSA where it is subject to physical damage.
  - b. Verify the MSA model number(s) approved for use by the utility.
  - c. Verify the meter socket is accessible with adequate working clearance. The MSA extends the billing meter 4.6 inches forward from the meter socket.
  - d. Check with the utility and the AHJ before installing an MSA indoors. The MSA contains an overcurrent device. Overcurrent devices are not permitted in bathrooms, over steps of a stairway and where subject to physical damage.
  - e. Verify the existing meter indicates the service voltage is either 208 or 240volts, 200 amps maximum, 3-wire, and either form 2S or form 12S. Check with the utility in order to specify the correct meter form when ordering. (Some utilities are deploying 12S/five-jaw meter sockets but installing 2S/four-jaw net meters.)





**WARNING – Do not alter the MSA, conductors, or any other equipment in a manner that voids its listing or warranty.**

### **PACKAGE INSPECTION**

1. Inspect the box and verify the contents are complete and in good condition. Contact ConnectDER at [RMA@connectder.com](mailto:RMA@connectder.com) in case of damage or missing components.
2. Open the circuit breaker access door at the bottom of the MSA and verify the ampere rating on the circuit breaker handle matches what was ordered.
3. Verify the MSA has the correct meter form: 4-blade (form 2S), or 5-blade (form 12S).

### **ITEMS REQUIRED FOR SOLAR METER ADAPTER INSTALLATION**



**NOTE –** The following items (provided by the installer) are required to install a Solar Meter Adapter into a meter socket:

Qty.	Item
1	One or more torque drivers to cover a range from 2 to 50 in-lbs.
1	7/64" hex key.
1	7/64" hex bit for use with a torque driver.
1	¼" flat blade screwdriver.
1	¼" flat blade bit for use with a torque driver.
1	Wire cutters.
1	Wire strippers.
1	Calibrated digital volt-ohmmeter or other suitable metering equipment.
1	Approved wiring connector to terminate the neutral pigtail inside the meter socket.
1 lot	Additional tamper-prevention seals.
1 lot	Insulation material for the neutral connection in the meter socket.
1	"Meter Grabber™" or equivalent tool to safely remove and reinstall the electric meter.

The items required to terminate PV field wiring are listed in the "[INTERCONNECT THE PV WIRING](#)" section of this document.

## SAFETY EQUIPMENT

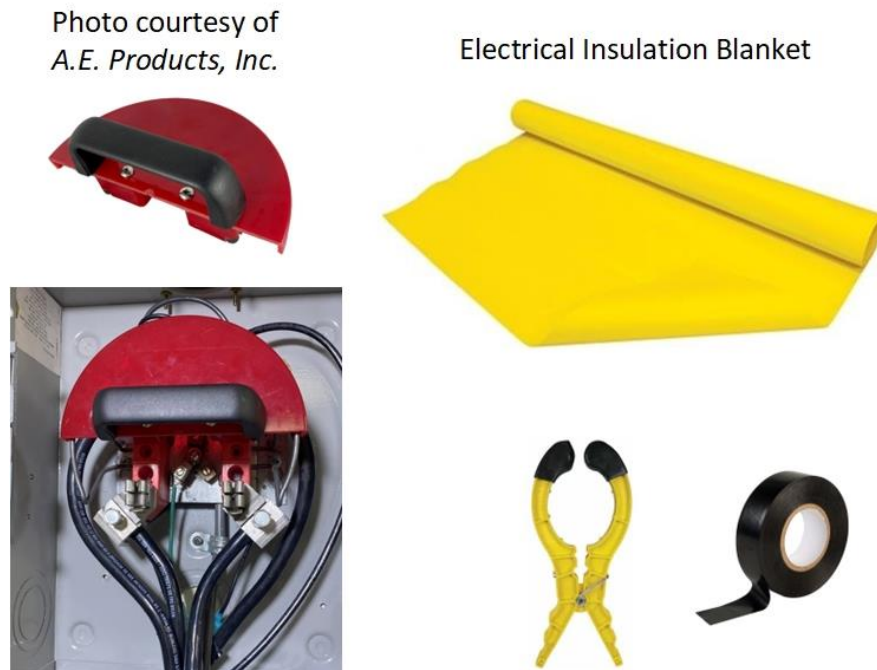
Follow your employer's requirements for personal protective equipment (PPE) and procedures. Comply with all applicable OSHA regulations. NFPA 70E (Standard for Electrical Safety in the Workplace) training is recommended for MSA installers.

At a minimum, the installer should use the following PPE:

Qty.	Item
1	Safety glasses.
1	Full-face arc-flash shield.
1	Leather/rubber insulated electrical glove kit, minimum class 00 (500v AC).
1 lot	Calorie rated clothing for the site's arc flash rating.

When the meter socket cannot be fully isolated from utility power, ConnectDER recommends insulating live parts within the meter socket. Equipment examples include a safety cover for energized jaws, and a 1000V electrical insulation blanket that can be cut to size, temporarily applied, then taped and/or clamped into place. **(Figure 9)**. Contact the serving utility for other safety tips or procedures.

**Figure 9 – Protection From Energized Parts**



## INSTALLATION PROCEDURE



**WARNING** – Solar Meter Adapter installation must be performed by qualified personnel only. Electric shock, arc flash hazards, fire, serious injury or death may result if power is not removed from the meter socket prior to the MSA installation.

### REMOVE THE EXISTING UTILITY METER

**In many service territories, the meter must be removed by the utility.** An increasing number of utilities are permitting qualified personnel to remove the meter or install the MSA. Contact the serving utility to verify the standard practice and/or schedule a visit by the utility or utility-approved personnel to remove the meter.

1. Notify the homeowner that power will be interrupted.
2. **Verify that the homeowner has all turned off and locked out/tagged out any alternate electrical sources such as backup generators, battery systems, etc.**
3. Turn off the branch circuits, then open the main service disconnect at the service equipment to prevent arcing when removing (and reinstalling) the meter. **The line side meter socket jaws will remain energized.**
4. Remove all jewelry, put on the appropriate PPE, and follow your employer's safety procedures. Remove the tamper-prevention seals.
5. Remove the locking ring (for ring type meter sockets). For ringless meter sockets, remove the meter socket cover.
6. For lever bypass meter sockets, actuate the lever to facilitate meter removal.
7. Using a "Meter Grabber" or similar tool, remove the electric meter and store it safely.
8. For lever bypass sockets, position the lever bypass to deenergize the load-side meter socket jaws.
9. Inspect the meter socket terminals for loose or broken wires, damaged jaws, and other signs of damage. Confirm the meter socket and service entrance conductors are in good condition and comply with utility requirements and local codes.

## INSTALL THE NEUTRAL LEAD



- Attach the white pigtail from the rear of the MSA to a neutral point inside of the meter socket. The neutral pigtail must have a minimum ampacity equal to the line conductors protected by the MSA internal circuit breaker.
- Use a method approved by the utility and the authority having jurisdiction (AHJ).

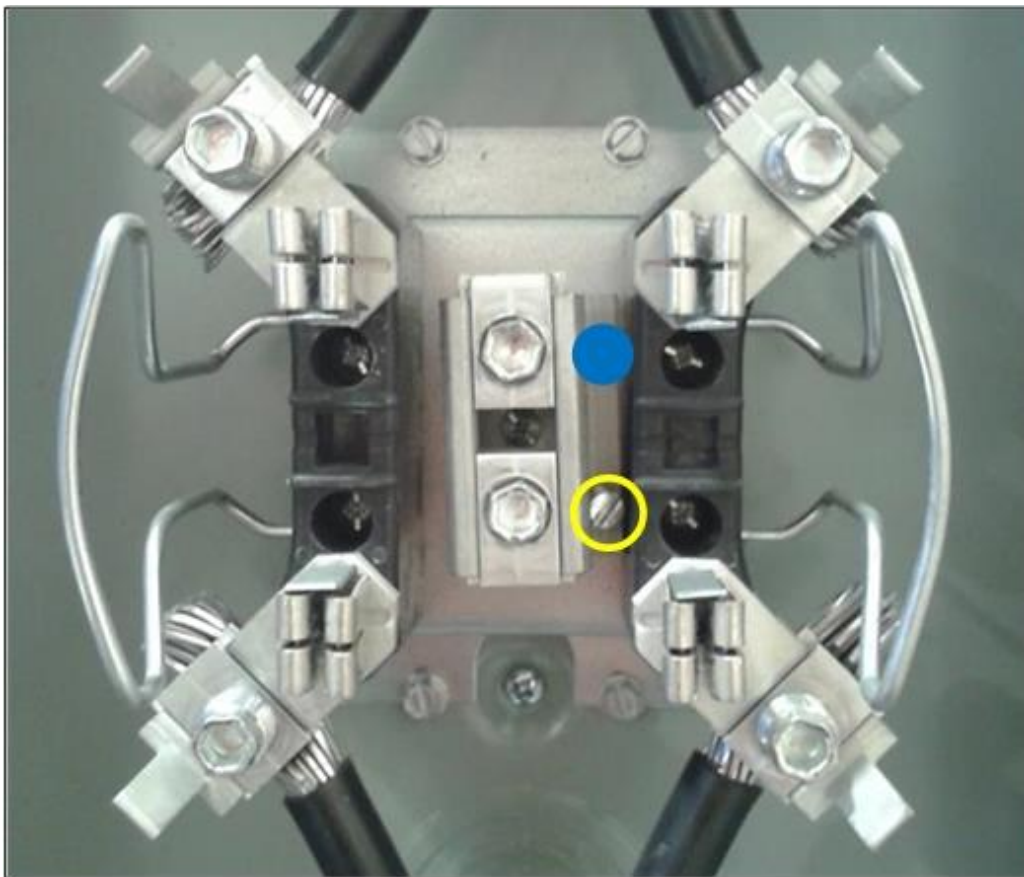


**WARNING** **ALL METER SOCKETS** require a neutral conductor pigtail to be attached from the rear of the MSA to a neutral point inside of the meter socket. Failure to install a neutral conductor may result in damage to equipment and void the manufacturer's warranty.

It is the responsibility of the MSA installer to ensure a white pigtail is installed with **every unit**.

1. Install a hot jaw safety cover and/or insulation blanket over live parts if the meter socket must remain energized.
2. Identify the method to terminate the neutral pigtail inside the meter socket. **Figure 10** depicts the interior of a typical 4-jaw meter socket. This model has a single accessory position, circled in yellow. A second accessory position may be available where the blue dot is shown.

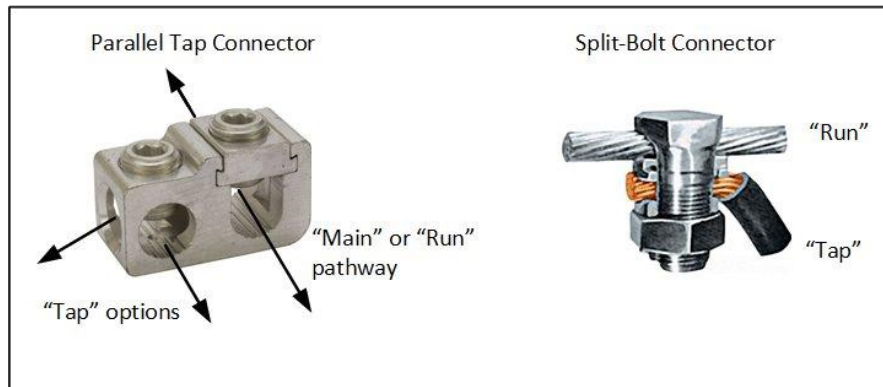
**Figure 10 – 4-Jaw Meter Socket**



These accessory positions may contain pressure terminals or hardware for the connection of compression lug terminals. Terminate the neutral pigtail in accordance with the manufacturer's torque specifications.

If an accessory position is unavailable, two potential alternatives are suggested in **Figure 11**. Additional options may be available. ConnectDER does not endorse one method over another. All neutral connection wiring methods must be installed in accordance with the manufacturer's instructions and approved by the utility and AHJ.

**Figure 11 – CU/AL Compatible Neutral Connection Options**



Both of these options are available with UL listing and:

- A component for the "main" or "run" conductor, namely the existing load side (of the meter) neutral conductor within the meter socket. The existing neutral conductor remains terminated within the meter socket while the parallel tap or split-bolt connector is installed.
- A termination point for the "tap" conductor (#6 AWG neutral pigtail from the MSA).
- Assorted sizes to accommodate a range of run and tap conductors.
- Approval for use with both aluminum and copper conductors.



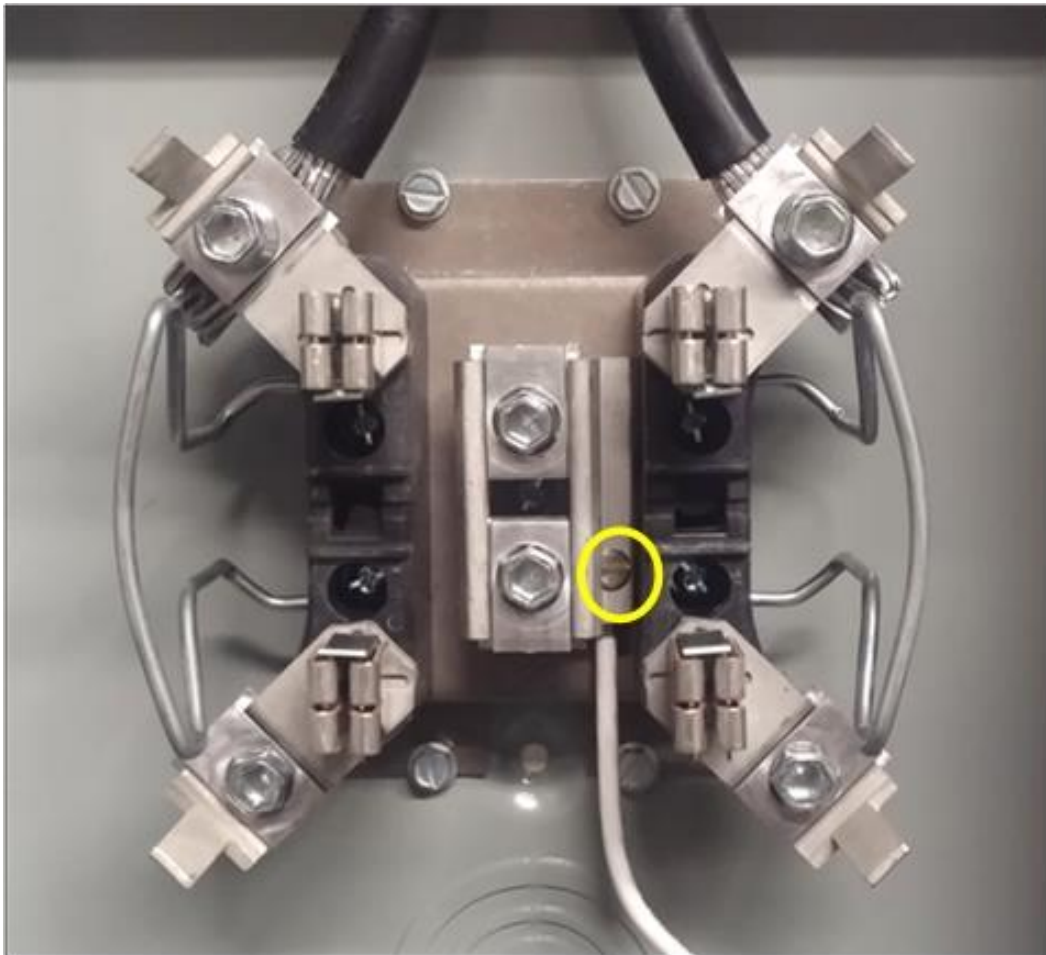
NOTE – As of January 1, 2023, **NEC 230.46** requires pressure connectors and devices for splices and taps installed on service conductors shall be marked "suitable for use on the line side of service equipment" or equivalent. If no product is available for that use case, the AHJ may permit products that comply with the most recent previous edition of the NEC that was adopted by the jurisdiction per **NEC 90.4(D)**.



WARNING – Terminate the neutral pigtail using a method acceptable to the utility and the AHJ.

3. Confirm energized parts are isolated with appropriate insulating material. See **Figure 9**.
4. Terminate the neutral lead to the meter socket using a spare accessory as shown in **Figure 12** (preferred), or by another method approved by the utility and the AHJ.

**Figure 12 – Terminate the Neutral to the Meter Socket**



5. Trim, strip and route the neutral conductor within the meter socket (**Figure 13**) in a manner to avoid damaging the insulation. Position the other end to terminate near the top and center of the MSA.

**Figure 13 – Route the Neutral Within Meter Socket**





6. For ring type meter sockets, reinstall the meter cover while routing the neutral lead through the cover opening (**Figure 14**). For ringless meter sockets, connect the neutral lead to the MSA before reinstalling the cover (see step #18).

**Figure 14 – Reinstall the Ring-Type Cover**



7. Remove the junction box from the MSA body by hand, pulling it straight upward.
8. Strip  $\frac{1}{2}$ " (approximately 13mm) of insulation from the neutral pigtail furnished with the unit.
9. Terminate the neutral lead to the MSA using a  $\frac{1}{4}$ " flat blade screwdriver as shown in **Figure 15**.

**Figure 15 – Terminate the Neutral to MSA**



10. Torque the #6 AWG neutral connection at the MSA to 40 in-lbs.

## INSTALL THE MSA INTO THE METER SOCKET

1. Confirm the MSA circuit breaker is in the open (OFF) position. See **Figure 16**.

**Figure 16 – Verify MSA breaker is open (OFF)**



2. Remove the temporary insulation protection.
3. Shut the circuit breaker cover.
4. Ensure the MSA is positioned with field wiring contacts at the top and circuit breaker at the bottom.
5. Align the MSA stabs with the socket jaws, ensuring all wire and additional terminations will avoid non-insulated parts within the meter socket.
6. Carefully insert the MSA into the meter socket with steady force.
7. **Ensure the MSA stabs are securely seated in the meter socket jaws. The MSA should not move freely once properly seated.**

8. For ringless meter sockets, reinstall the meter socket cover over the MSA, taking care not to cause damage. Tight clearances may necessitate manipulation of the cover around the MSA. See **Figure 17**.

**Figure 17 – Reinstall the Meter Socket Cover**



9. For ring type meter sockets, install a locking ring to secure the MSA to the meter socket cover.

10. Verify the meter socket cover is fully engaged. Confirm the circuit breaker cover opens freely. See **Figure 18**.

**Figure 18 – Circuit Breaker Cover**



### REINSTALL THE UTILITY METER



**WARNING** - This will energize the line side terminals at the service disconnect.

1. Ensure the meter is right-side up and align the utility meter stabs with the MSA jaws.
2. Firmly press the meter into the MSA, ensuring a secure fit.
3. Install a lock ring to secure the utility meter to the MSA.

## VERIFY THE VOLTAGE AT THE MSA

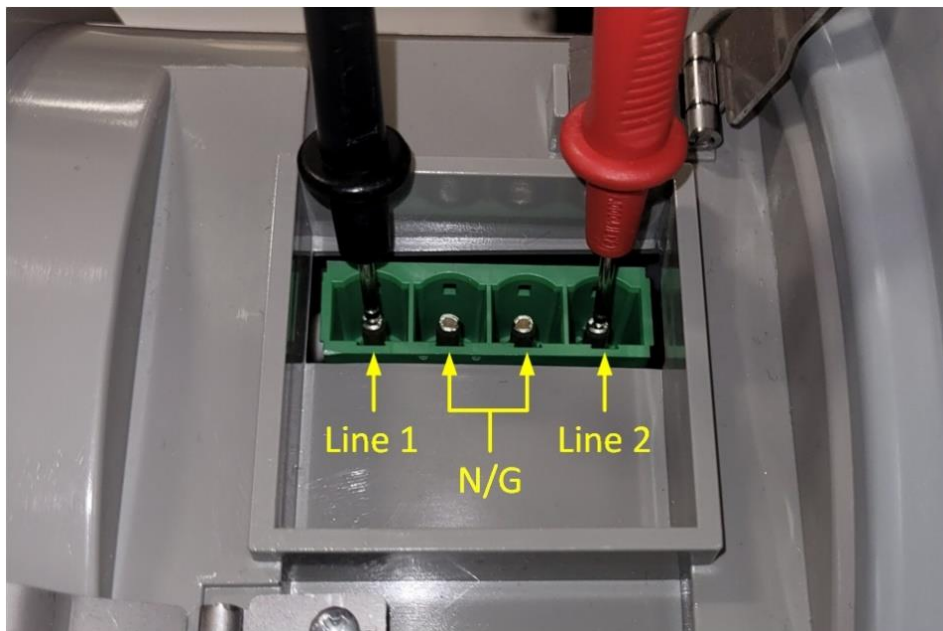
1. Place the MSA circuit breaker in the closed (ON) position.



WARNING – Be careful to avoid shorting across any pins with meter probes.

2. Using proper PPE, verify the presence of appropriate service voltage at the top of the MSA as shown in **Figure 19**. Check L1-L2, L1-N/G, and L2-N/G. Do not proceed with installation until the voltages meet expected values.

**Figure 19 – Verify the Voltage at the Quick-Connect Contacts**



3. Return the MSA circuit breaker to the open (OFF) position, then verify the contacts are deenergized.
4. Shut the cover to the circuit breaker and lock it out until the PV wiring is interconnected.

## INSTALL THE MSA JUNCTION BOX

1. If the PV wiring is to be performed at this time, refer to the “[INTERCONNECT THE PV WIRING](#)” section of this document. Otherwise, complete the installation to make the assembly weatherproof and safe.
2. Confirm the MSA circuit breaker is in the open (OFF) position and locked out.
3. Flip the junction box locking clasps open as shown in **Figure 20**.

**Figure 20 – Junction Box Locking Clasps**



4. Confirm the 7/64" screws on the bottom of the junction box (**Figure 21**) are torqued to 6 in-lbs. in case they loosened during shipping.

**Figure 21 – Torque the Junction Box Screws**





5. Install the junction box by aligning its contact pins with the those embedded in the MSA body and pressing firmly downward. Seal the conduit entry hole with the provided threaded plug as shown in **Figure 22**.

**Figure 22 – Junction Box Installation**



6. Reposition the locking clasps to secure the junction box.
7. Install tamper-prevention seals on the lock rings, the meter socket cover, and the junction box clasps as shown in **Figure 23** unless directed otherwise by the utility or the AHJ.

**Figure 23 – Tamper-Prevention Seals**



8. Verify with the homeowner that any alternate/backup power sources are ready for reconnecting, and then restore utility power by closing the Service Disconnect.
9. The installation for MSA is complete and ready for PV interconnection.

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## INTERCONNECT THE PV WIRING

### ITEMS REQUIRED FOR PV INSTALLATION



NOTE – The following items (provided by the installer) are required to connect PV wiring to an MSA:


Qty.	Item
1	One or more torque drivers to cover a range from 2 to 20 in-lbs.
1	7/64" hex key.
1	7/64" hex bit for use with a torque driver.
1	3/16" flat blade screwdriver.
1	3/16" flat blade bit for use with a torque driver.
1	Wire cutters.
1	Wire strippers.
1	Calibrated digital volt-ohmmeter or other suitable metering equipment.
1 lot	Tools to install PV raceway to the MSA junction box. Use 1" liquidtight flexible nonmetallic conduit type LFNC with a straight connector to enter the MSA junction box.
1	Threaded reducing bushing for conduit under 1" trade size.
1 lot	Tamper-prevention seals. (Only two are furnished with the MSA).


### SAFETY EQUIPMENT



WARNING – PV/Interconnection wiring must be performed by qualified personnel only. Follow your employer's requirements for personal protective equipment (PPE) and procedures.

## INSTALL THE PV WIRING AT THE MSA JUNCTION BOX

 NOTE – The reversible junction box enables conduit entry from the left or right side of the meter. Use a straight liquidtight connector at the junction box to ensure a weatherproof seal. **IMPORTANT: Provide enough slack (i.e., a service loop or “drip loop” ) in the flexible conduit to permit junction box removal (pulling straight up a minimum of 2 inches).**

 NOTE – The MSA should be wired **first**, and the other end (such as an ac PV disconnect switch or PV production meter) second. It is easier to terminate the conductors at the MSA junction box by wiring it first.

1. Use type THHN insulated, **copper** conductors only. Select the wire gauge by following its 75°C ampacity .
2. Verify the PV power production source wiring is clear of faults using suitable metering equipment.
3. Remove jewelry, put on the appropriate PPE, and follow your employer’s safety procedures.
4. Place the MSA circuit breaker in the open (OFF) position, shut the breaker cover and lock it out following your company’s lockout/tagout (LOTO) practices.
5. Follow procedures for removing the tamper-prevention seals from the junction box clasps.
6. Flip open the junction box clasps.
7. Pull the junction box up by hand to remove it from the MSA body. Once removed, ensure that no moisture or debris enters the pin area while wiring the junction box. See **Figure 24** on the next page.

Figure 24 – Junction Box Removed



8. Using a 7/64" hex key, remove the bottom cover of the junction box, taking care not to damage the gasket material surrounding the green contact assembly. TAKE CARE NOT TO LOSE THE 7/64" SCREWS.
8. Remove the 1" threaded plug from the junction box.
9. Install the conduit connector onto the junction box, (then pull the PV wiring through the conduit connector into the box).

10. Strip the insulation exposing wire 18mm (approximately 0.71"). See **Figure 25**.

**Figure 25 – Wiring at Junction Box**



11. Slide each conductor into its individual wiring bay. Ensure all strands from each conductor enter the screw terminal area.

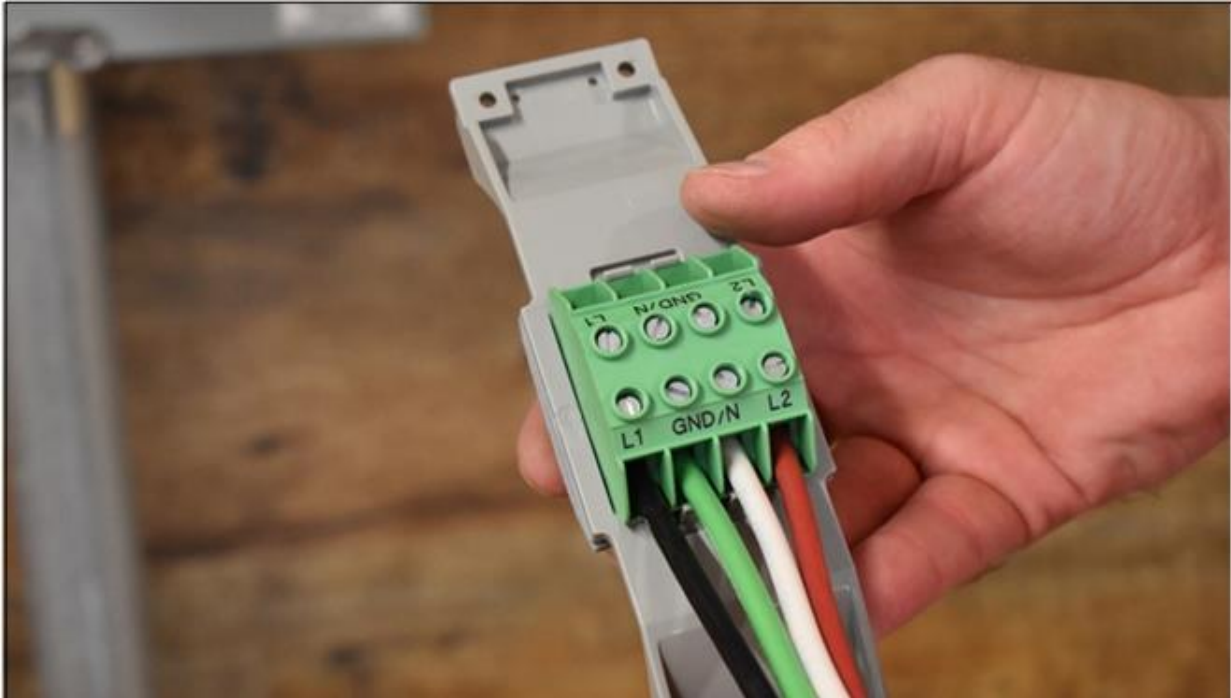
12. Tighten the screw terminals, ensuring that only the copper conductor is being compressed (**not** the insulation).

13. Terminate the wiring to the terminal block and tighten by hand to hold the conductors in place.

14. Perform a gentle “pull-test” by hand to ensure there are no loose connections.

15. Torque each screw terminal to 15 in-lbs. See **Figure 26**.

**Figure 26– Wiring at Terminal Block**



16. Route the excess slack back through the conduit connector and reassemble the junction box.

17. Reinstall the 7/64" hex cap-head screws and torque to 6 in-lbs.

18. Slide the raceway over the wiring and secure it to the raceway connector.

## INSTALL THE JUNCTION BOX

1. Align the pins of the junction box over the pins embedded within the MSA as shown in **Figure 27**.

**Figure 27 – Align the Junction Box Pins**



2. Press firmly down on the junction box and ensure it is securely seated.



3. Secure the junction box with the metal clasps in front of and behind the box. See **Figure 28**.

**Figure 28 – Secure the Clasps**



4. Install two tamper-resistant seals – one each at the front clasp and rear clasp as shown in **Figure 29**.

**Figure 29– Tamper-Prevention Seals**



## COMPLETE THE CONDUIT AND WIRING, ENERGIZE AND TEST

1. Install, support, and terminate the other end of the raceway and conductors to the next enclosure (such as an ac PV disconnect or PV production meter). **IMPORTANT: Provide enough slack (i.e., a service loop or "drip loop") in the flexible conduit to permit junction box removal (pulling straight up a minimum of 2 inches).**
2. Remove the lockout/tagout (LOTO) device and place the MSA circuit breaker in the closed (ON) position.
3. Test for proper voltage and polarity at the next enclosure.
4. Follow your company's safety procedures to extend the wiring as needed.
5. Follow the manufacturer's instructions to commission the PV system.

## VERIFY SOLAR METER ADAPTER + SMART MODULE STATUS

1. Check the LCD screen on the side of the MSA. Confirm the status is normal by:
  - a. A “thumbs-up” on the LCD screen, AND
  - b. One red light on the D2 LED of the infrared port, AND

(to the right of the infrared port):

- c. Top (RED) STATUS LED – off
- d. Below the red STATUS LED = (GREEN) STATUS LED – solid green
- e. Below both STATUS LEDs = COMMS LED – solid green



NOTE – The D2 LED may be difficult to see in bright sunlight. See **Figure 30**.

**Figure 30 – Solar Meter Adapter + Smart Module Normal Status**



The display will scroll through the following screens:

Energy Produced (kWh)

Energy Consumed (kWh)


ConnectDER-specific unit information (Network statistics, FW version, hex status, S/N).

Voltage (V)

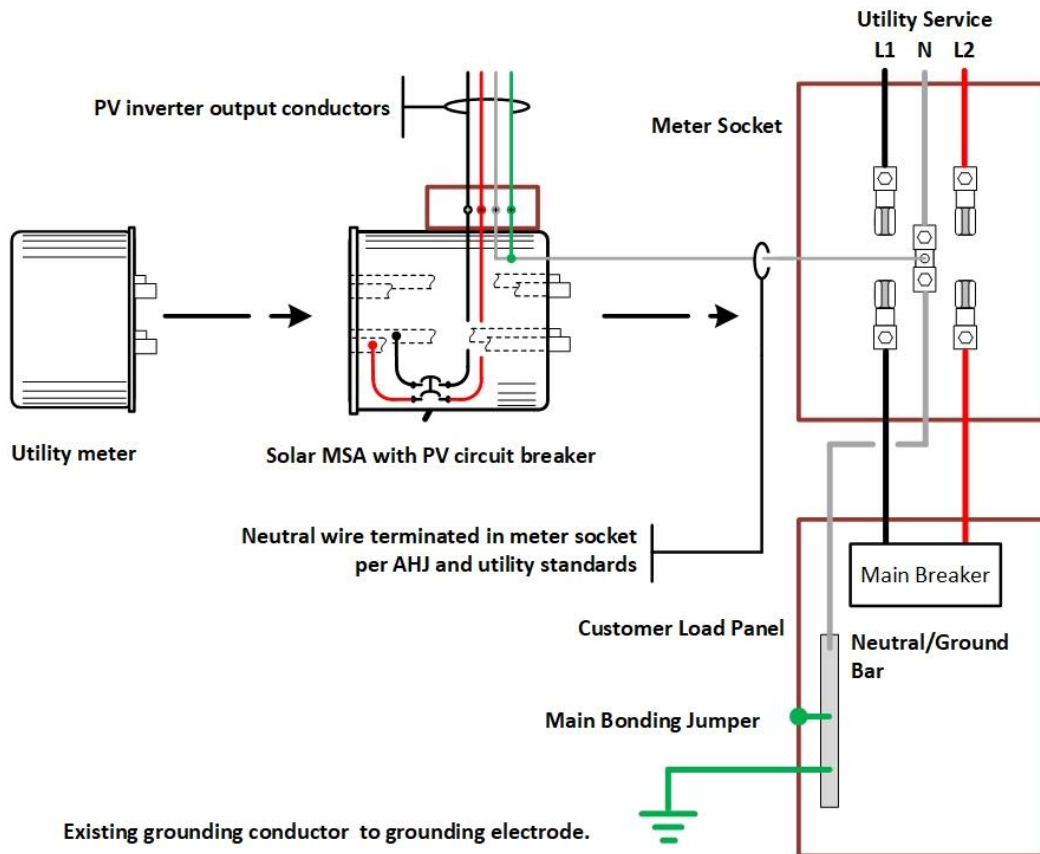
Current (A)

ConnectDER-specific unit information (Network statistics, FW version, hex status, S/N).

## SOLAR METER ADAPTER + SMART MODULE TROUBLESHOOTING

Symptom	Corrective Action
LCD is blank.	Verify utility power is available.
“no Cel” displays continuously.	Confirm the carrier has cellular service in that location.
 Thumbs-up icon does not display.	Device may not be provisioned in the ConnectDER Cloud. Contact ConnectDER to ensure the device has been provisioned and exists in the Cloud database.
LCD displays “6L 5d FAIL” or hex code “E4B3”	Indicative of an SD card issue. If possible, power down the device for 20 seconds and power on again. If the issue persists, contact ConnectDER.
LCD displays hex code “E633” or “E631”	Indicative of an over-the-air (OTA) update failure. Contact ConnectDER.
LCD displays “LCD Err”	Indicative of a possible device failure. If possible, power down the device for 20 seconds and power on again. If issue persists, Contact ConnectDER.
RED STATUS LED – blinking red or OFF	Wait 60 seconds, it may turn off and the GREEN STATUS light should turn on solid green. If not, contact ConnectDER.
RED STATUS LED – solid red	Contact ConnectDER.
GREEN STATUS LED – OFF	Wait 60 seconds, it may turn solid green. If not, contact ConnectDER.
GREEN COMMS LED - blinking	Acquiring IP address. Wait 30-60 seconds, it should turn solid green. If not, contact ConnectDER.

## APPENDIX – SOLAR PV INTERCONNECTION WIRING EXAMPLE



**NOTE** – The Solar Meter Adapter creates a supply-side PV interconnection on the load side of the meter. Line side of meter interconnection is available for utility-owned systems only. The MSA contains a factory-installed neutral-to-ground bond.



**WARNING** – The MSA is only suitable for use on the supply side of the service disconnecting means. The MSA must be installed with the junction box at the top and the integrated circuit breaker at the bottom. Do not install the MSA in any other orientation.

## SOLAR METER ADAPTER MODEL NUMBERS

FORM 2S METER TYPES					
Model Number	Product Version	Grid Interconnection*	No. of Jaws	AIC Rating	Overcurrent Protection Rating
<b>G-B-4-10-15</b>	V4 Smart	Load Side	4 jaws	10kAIC	15 Amnere
<b>G-B-4-10-20</b>	V4 Smart	Load Side	4 jaws	10kAIC	20 Amnere
<b>G-B-4-10-25</b>	V4 Smart	Load Side	4 jaws	10kAIC	25 Amnere
<b>G-B-4-10-30</b>	V4 Smart	Load Side	4 jaws	10kAIC	30 Amnere
<b>G-B-4-10-35</b>	V4 Smart	Load Side	4 jaws	10kAIC	35 Amnere
<b>G-B-4-10-40</b>	V4 Smart	Load Side	4 jaws	10kAIC	40 Amnere
<b>G-B-4-10-50</b>	V4 Smart	Load Side	4 jaws	10kAIC	50 Amnere
<b>G-B-4-10-60</b>	V4 Smart	Load Side	4 jaws	10kAIC	60 Amnere

FORM 12S METER TYPES					
Model Number	Product Version	Grid Interconnection*	No. of Jaws	AIC Rating	Overcurrent Protection Rating
<b>G-B-5-10-15</b>	V4 Smart	Load Side	5 jaws	10kAIC	15 Amnere
<b>G-B-5-10-20</b>	V4 Smart	Load Side	5 jaws	10kAIC	20 Amnere
<b>G-B-5-10-25</b>	V4 Smart	Load Side	5 jaws	10kAIC	25 Amnere
<b>G-B-5-10-30</b>	V4 Smart	Load Side	5 jaws	10kAIC	30 Amnere
<b>G-B-5-10-35</b>	V4 Smart	Load Side	5 jaws	10kAIC	35 Amnere
<b>G-B-5-10-40</b>	V4 Smart	Load Side	5 jaws	10kAIC	40 Amnere
<b>G-B-5-10-50</b>	V4 Smart	Load Side	5 jaws	10kAIC	50 Amnere
<b>G-B-5-10-60</b>	V4 Smart	Load Side	5 jaws	10kAIC	60 Amnere

**\*Line side available for utility-owned systems only.**

**Model Number suffixes indicate the following options:**

02 = 2S meter firmware

12 = 12S meter firmware

TX = Cellular communications

NB = Without the Bridge wireless communications module

NR = Without relays

00 = No meter firmware

WR = With PV relays

## SOLAR METER ADAPTER SPECIFICATIONS

MECHANICAL SPECIFICATIONS		UTILITY INTERACTIVE SOURCE RATINGS	
<b>ENCLOSURE RATING</b>	NEMA 3R	<b>MAXIMUM POWER</b>	11.52 KW AC
<b>ENCLOSURE TYPE</b>	Injection molded polycarbonate, UL 94 V0 flame rating	<b>MAXIMUM VOLTAGE</b>	240V
<b>COOLING</b>	Natural convection	<b>MAXIMUM CONTINUOUS PV CURRENT</b>	48A
<b>DIMENSIONS (H X W X D)</b>	6.7 x 6.7 x 4.6in adapter housing only 8.1 x 6.7 x 4.6in with junction box	<b>CONTINUOUS COMBINED CURRENT, PV/GRID</b>	180A
<b>WEIGHT</b>	3lb (1.3kg)	<b>INVERTER WIRING TERMINATION</b>	Terminal block
<b>SHIPPING WEIGHT</b>	4lb (1.8kg)	<b>GRID CONNECTION TYPE</b>	Split- $\phi$ /3W (2S/4-jaw), 1 $\phi$ /3W (12S/5-jaw)
<b>MOUNTING SYSTEM</b>	Blade interface with 4-jaw or 5-jaw meter socket	<b>GRID TERMINATION METHOD</b>	Blade interface with meter socket for L1/L2, pigtail for neutral, optional 5th stab
<b>ELECTRIC METER COMPATIBILITY</b>	Type 2S, 12S	<b>FIELD TERMINAL RATING</b>	75°C
<b>METER SOCKET COMPATIBILITY</b>	Ringless and ring-type meter sockets		
<b>PV INTERFACE POINT</b>	Factory configured, line side or load side of the meter. Line side is for utility use only.		
<b>CONDUIT CONNECTION</b>	Threaded for single 1" NPT fitting, use reducer bushings as needed		
<b>TERMINAL CONNECTIONS</b>	L1, L2, N, G; Up to #6 AWG wire		
SAFETY INFORMATION		OVERCURRENT PROTECTION	
<b>APPLICABLE SAFETY STANDARDS</b>	UL 414 – Meter Sockets	<b>TYPE</b>	Eaton BR, thermal magnetic 120/240V, externally resettable
<b>FILE NUMBER (STANDARDS)</b>	E361188	<b>OVERCURRENT RATINGS AVAILABLE</b>	15-50A in 5A increments, 60A
<b>AMBIENT AIR OPERATING TEMPERATURE RANGE</b>	-22°F to 158°F (-30°C to 70°C)	<b>CURRENT INTERRUPTING RATING</b>	10k AIC rating
<b>AMBIENT AIR STORAGE TEMPERATURE RANGE</b>	-40°F to 176°F (-40°C to 80°C)		
<b>CURRENT INTERRUPTING RATING</b>	10k AIC rating		

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