Product Manual

Smart ConnectDER™

Version 3

A Meter Collar for Rapid Grid Interconnection of Distributed Energy Resources (DERs)

ConnectDER, Inc.
2001 Jefferson Davis Hwy, Suite 403
Arlington, VA 22202
571-969-1701
info@connectder.com

TABLE OF CONTENTS

INTRODUCTION 4
- DOCUMENT VERSION 4
- SYMBOLS USED IN THIS MANUAL 4
- FEATURES 5
- BOX CONTENTS 6
- TABLE 1 - ORDERING INFORMATION 7
- INTERNAL WIRING SCHEMATICS 8
  - FIGURE 1 - LOAD SIDE FACTORY CONFIGURATION 8
  - FIGURE 2 – LINE SIDE FACTORY CONFIGURATION 9
- FIGURE 3 – JUNCTION BOX DISPLAY DETAILS 10
- FIGURE 4 - METERING, COMMUNICATIONS AND CONTROLS CONCEPT 10

INSTALLATION 11
- PACKAGE INSPECTION 11
- ITEMS REQUIRED FOR INSTALLATION 12
- METER REMOVAL 12
- REMOVE THE METER AND METER SOCKET COVER 13
- INSTALL THE NEUTRAL LEAD 14
  - 4-JAW METER SOCKET 14
  - 5-JAW METER SOCKET 21
- PLACE THE CONNECTDER IN THE METER SOCKET 22
- RE-INSTALL THE METER 24
- CHECK THE CIRCUIT BREAKER AND COVER 25
- INSTALL THE JUNCTION BOX AND CONNECT THE RACEWAY 26
- TERMINATE THE FIELD WIRING 29
- PREPARE THE SYSTEM FOR PROVISIONING 30
- PROVISION THE SYSTEM USING “INSTALLER” CREDENTIALS 31
- PROVISION THE SYSTEM USING “ADMIN” CREDENTIALS 36

CONNECTDER CLOUD™: ADMIN USER GUIDE 37
INTRODUCTION 37
USER INTERFACES 37
TABLE 4 – CONNECTDER CLOUD ACCESS 37
TABLE 5 - ROLES AND PERMISSIONS MATRIX 37
MANAGING USER ACCOUNTS 38
CREATING A USER 38
APPLYING FILTERS TO SEARCH FOR USERS 39
EDITING A USER 40
DELETING A USER 41
DOWNLOADING USER DATA 41
MANAGING CONNECTDER UNITS 41
APPLYING FILTERS TO UNITS 42
VIEWING UNIT INFORMATION 46
TABLE 6 – DESCRIPTION OF UNIT INFORMATION 46
EDITING UNIT INFORMATION 49
MANAGING TAGS 50
APPLYING BATCH ACTIONS TO UNITS 51
MANAGING DER DATA 54
VIEWING UNIT DER DATA 54
VIEWING DER DATA FOR SPECIFIC TIME PERIODS 56
DOWNLOADING UNIT DER METERING DATA 57
VIEWING UNIT RAW DER METERING DATA 58
USING THE MAP VIEW 59
TABLE 7 - TROUBLESHOOTING 60
SPECIFICATIONS 61
ConnectDER, Inc. FACTORY WARRANTY 63
CONTACT 65
APPENDIX 66
SAMPLE WIRING DIAGRAMS 66

INTRODUCTION

The SMART ConnectDER™ is UL Listed equipment that enables rapid interconnection of grid-ready distributed energy resources (DERs). The device creates a safe, standardized, low cost alternative to traditional wiring methods. It contains onboard metering, communications, and controls to unlock alternative tariff models and grid management capabilities.

The SMART ConnectDER operates in parallel with the utility grid. It is approved for use with grid-interactive photovoltaic (PV) systems where the inverter(s) meets UL 1741 requirements.

The SMART ConnectDER can be factory configured to terminate DER field wiring to either the load side or line side of the utility meter. Refer to the ConnectDER website for more information.

DOCUMENT VERSION

This document is titled "V3 Product Manual Smart v2.2F 091517".

It is available online at the following URL:

connectder.com/products/connectder-products-manuals

Password:

!installer1

Installers are advised to check the URL periodically for revised versions of this document.

SYMBOLS USED IN THIS MANUAL

WARNING Designates instructions that if not followed could cause death, serious injury or damage to property.

NOTE Designates helpful information.

FEATURES

- Enables rapid connectivity for PV systems and other DERs.
- Revenue grade metering for PV/DER circuit.
- Multiple communications options to track and manage DERs via the ConnectDER Cloud.
- Remotely-controlled internal relay to open or shut the DER circuit.
- Clearly labeled field wiring terminals inside a weatherproof junction box.
- Junction box with tag-out capability providing security and safety before and after the DER installation occurs.
- Integrated overcurrent protection up to 80 amps (15-80 amps, standard breaker size increments), in10kAIC rating.
- Externally resettable circuit breaker under a polycarbonate cover with tag-out capability for added installer safety.
- Finger guard that prevents contact with live parts inside the unit.
- Compatible with form 2S and 12S meter sockets, both ringless and ring-type.
- Factory-configured for either line-side or load-side DER interconnection.

BOX CONTENTS

The package contains the following items:

1. Qty. (1) ConnectDER meter collar.
2. Qty. (1) weatherproof junction box base and cover.
3. Qty. (4) junction box base mounting screws, #6/19, 5/8" long Philips head.
4. Qty. (4) junction box cover screws, #6/19, 5/8" long Philips head.
5. Qty. (1) neutral wire pigtail (white, THHN stranded), 24 inches in length.*

**#10 AWG for units with integrated circuit breaker 15 - 30 amps.*
#8 AWG for units with integrated circuit breaker 35 – 40 amps.
#6 AWG for units with integrated circuit breaker 45 – 60 amps.
#4 AWG for units with integrated circuit breaker 70 – 80 amps.

The conductor must have a minimum ampacity as the line conductors protected by the circuit breaker inside the ConnectDER unit. *Use copper conductor only and refer to the torque values on the product label.*

WARNING *Some PV inverter manufacturers specify a full-sized neutral conductor (i.e. the same size as the line conductors) as part of the inverter output wiring.* ***The 5th jaw inside a form 12S meter socket may have only nominal ampacity, intended to be sufficient for the utility meter to calculate kW usage on 120/208v systems.***

In 4-jaw meter sockets, and ***in cases where the 5th jaw in the meter socket has insufficient ampacity to support the PV inverter or other DER:***

- *Attach a copper wire pigtail from the rear of the ConnectDER to a neutral point inside of the meter socket.* ***The conductor must have a minimum ampacity as the line conductors protected by the circuit breaker inside the ConnectDER unit.***
- *Use a method approved by the utility and authority having jurisdiction (AHJ).*

It is the responsibility of the installer to ensure the neutral pigtail or the 5th jaw (where present) in the meter socket provides equal or greater ampacity as permitted to be protected by the integrated circuit breaker.

More information regarding the neutral connection is contained in the "INSTALL THE NEUTRAL LEAD" section of this document.

TABLE 1 - ORDERING INFORMATION

Commented [cjc1]: Please take the reference to simple out of the diagram

A sample part number is S-B-5-02-IH-10-60A, where:

- S: ConnectDER, Smart version
- B: DER load side connection point
- 5: The number of jaws (Smart units are 5-jaw only)
- 02: Meter form 2S
- IH: Ethernet to Cellular modem
- 10: AIC rating of the integrated circuit breaker
- 60A: Ampere rating of the integrated circuit breaker

Ordering Information

Example Part Number: S - B - 5 - 02 - IH - 10 - 60A

Product Version:	S = Smart
Grid Interconnection Point:	B = Load side T = Line side[1]
Number of Jaws:	5 = 5 jaws
Meter Form:	02 = 2S 12 = 12S
Modem Type:	IH = Ethernet to cellular JC = Cellular only
AIC Rating:	10 = 10k[2] 22 = 22k
Overcurrent Rating:	15A = 15 amps 20A = 20 amps 25A = 25 amps[3] 30A = 30 amps 35A = 35 amps[3] 40A = 40 amps 45A = 45 amps[3] 50A = 50 amps 60A = 60 amps 70A = 70 amps[3] 80A = 80 amps[3]

[1] Line side available for utility-owned systems only.

[2] 22kAIC available pending regulatory approval. Verify the ampere interrupting capacity rating requirement with the utility.

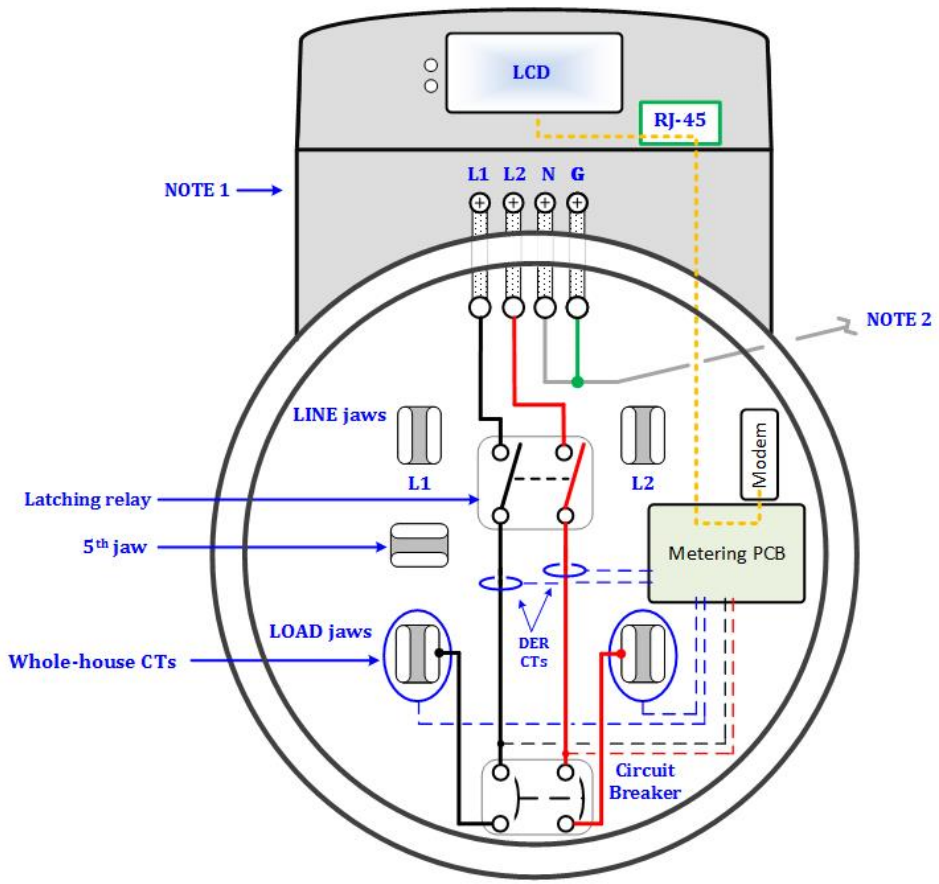
[3] Incremental circuit breaker sizes (25, 35, 45) and 70 or 80 amp ratings may have a longer lead time.

TABLE 1

NOTE **CONFIGURATION SUBJECT TO UTILITY APPROVAL.**

INTERNAL WIRING SCHEMATICS

FIGURE 1 - LOAD SIDE FACTORY CONFIGURATION



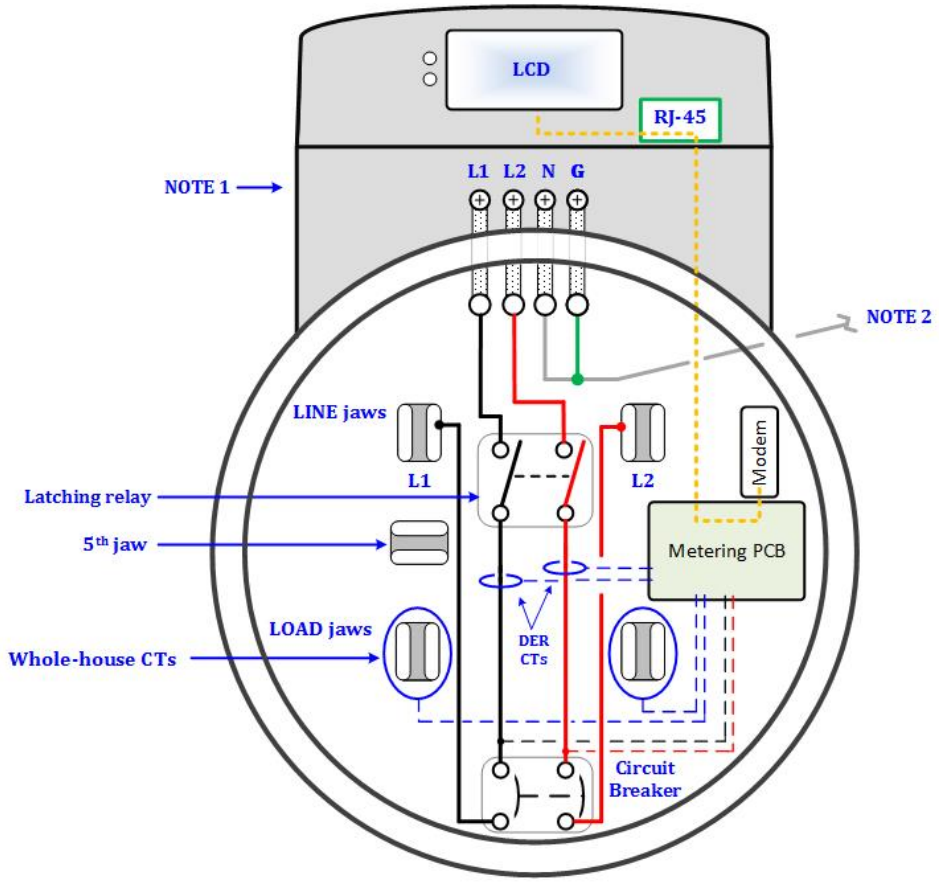
NOTES

1. Factory-furnished weatherproof junction box. Contains terminal block for DER field wiring termination.
   - Output wiring from PV inverter.
   - Branch circuit wiring to EV charger.

2. Neutral conductor exiting the rear of the ConnectDER. (Optional neutral source connection in lieu of 5th jaw).

FIGURE 1

FIGURE 2 – LINE SIDE FACTORY CONFIGURATION



NOTES

1. Factory-furnished weatherproof junction box. Contains terminal block for DER field wiring termination.
   - Output wiring from PV inverter.
   - Branch circuit wiring to EV charger.

2. Neutral conductor exiting the rear of the ConnectDER. (Optional neutral source connection in lieu of 5th jaw).

FIGURE 2

FIGURE 3 – JUNCTION BOX DISPLAY DETAILS

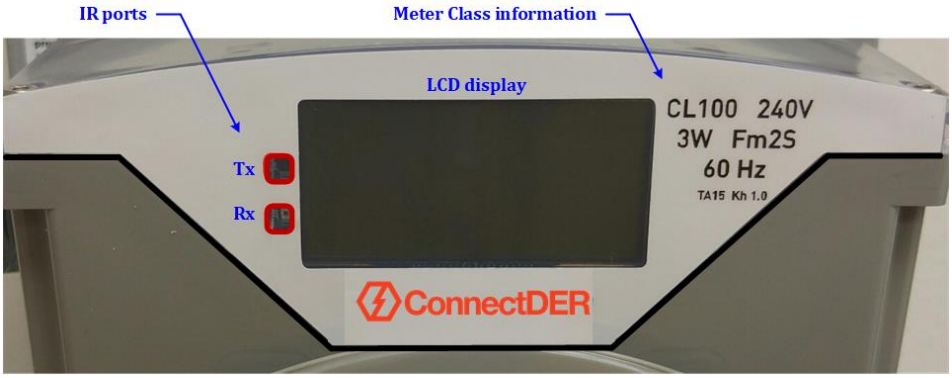


FIGURE 3

FIGURE 4 - METERING, COMMUNICATIONS AND CONTROLS CONCEPT

Commented [cjc2]: Since ZigBee isn't even on the roadmap, we should remove it from this diagram. The product manual should document existing features. AMI is at least on the roadmap.

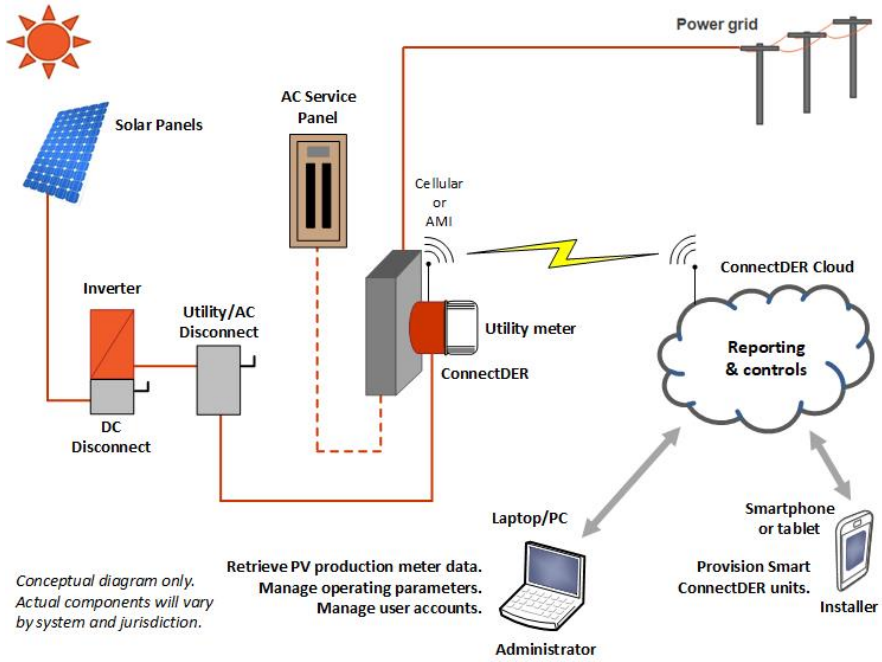


FIGURE 4

INSTALLATION

PACKAGE INSPECTION

1. Verify the ConnectDER is undamaged shipping.

2. Verify the ConnectDER is configured with the proper line or load-side interconnection.
3. Verify the ConnectDER is equipped with the proper circuit breaker for the application.
4. Verify the screws for the junction box base are furnished.

5. Verify the screws for the junction box cover are furnished.

Verify the neutral pigtail (copper wire w/white insulation) is furnished.

ITEMS REQUIRED FOR INSTALLATION

NOTE

The following tools are needed to install the ConnectDER:

1. A torque wrench and/or torque screwdriver to cover a range from 2 to 50 in/lbs.
2. A #2 Philips screwdriver bit for use with torque wrench/screwdriver.
3. A ¼" flat screwdriver bit for use with the torque wrench/screwdriver.
4. A pair of wire cutters.
5. A wire stripper.
6. Suitable metering equipment such as a digital volt-ohmmeter.

Other items needed:

- Tools to attach the raceway to ConnectDER junction box and terminate field wiring.
- An approved wiring connector to terminate the neutral pigtail inside the meter socket, if applicable.
- An additional meter locking ring (for ring-type meter sockets).
- Additional utility tamper-prevention seals.

At a minimum, the installer should use the following safety personal protective equipment (PPE):

1. A flash shield.
2. Safety glasses.
3. A pair of rubber gloves.
4. A pair of leather gloves.
5. Calorie rated clothing.

Other equipment may be required by utility procedures. These requirements will be communicated to the installer by their employer during the training process.

METER REMOVAL

WARNING

In most service territories, meter removal will be a utility function. Contact your utility for specific information on their standard practices and/or to schedule a visit by utility or utility approved personnel to remove the meter. If power is not removed from the equipment prior to working inside the meter socket, electric shock, arc flash hazards, fire, serious injury or death may result.

REMOVE THE METER AND METER SOCKET COVER

WARNING

Contact the utility for specific information on their standard practices and/or to schedule a visit by utility or utility-authorized personnel to remove the meter.

FIGURE 5

Remove the utility tamper-prevention seal(s).

1. Remove the locking ring (for ring-type meter sockets).
2. Remove the electric meter as shown in **FIGURE 5.**
3. Inspect the meter socket terminals for damage such as loose or broken wires, damaged jaws, etc.

The ConnectDER may be installed in meter sockets of **any age**, provided:

- The meter socket and service entrance conductors are in good condition and comply with utility requirements and local codes.
- The minimum work space clearances (as specified by the serving utility) are maintained after the ConnectDER is installed.
- The 5th jaw has sufficient ampacity or there is satisfactory means to terminate the neutral pigtail. A neutral pigtail is required for all 4-jaw meter sockets.

ConnectDER use in shallow "button" type meter sockets is not recommended.

Temporarily block off all energized parts with appropriate insulating material or insulating device. Set the ConnectDER circuit breaker to the OFF position. This ensures the field wiring terminals will be de-energized after inserting the ConnectDER into a live meter socket.

INSTALL THE NEUTRAL LEAD

4-JAW METER SOCKET

WARNING **All 4-jaw meter sockets require a neutral conductor pigtail** to be attached from the rear of the ConnectDER to a neutral point inside of the meter socket.

Before beginning, make sure that the ConnectDER circuit breaker is open (OFF).

FIGURE 6 below depicts the inside of a typical 4 jaw meter socket.

This model has a single accessory position, circled in red. Many sockets have a second accessory position, depicted below as a blue dot. If these accessory positions are not in use (such as for a grounding electrode conductor), they are the preferred option for securing the neutral connection. These accessory positions may contain pressure terminal(s) or hardware for the connection of compression (ring) terminals. Terminate in accordance with the marked torque values or per the terminal manufacturers specifications. Potential alternatives are suggested on the next page if these are not available.

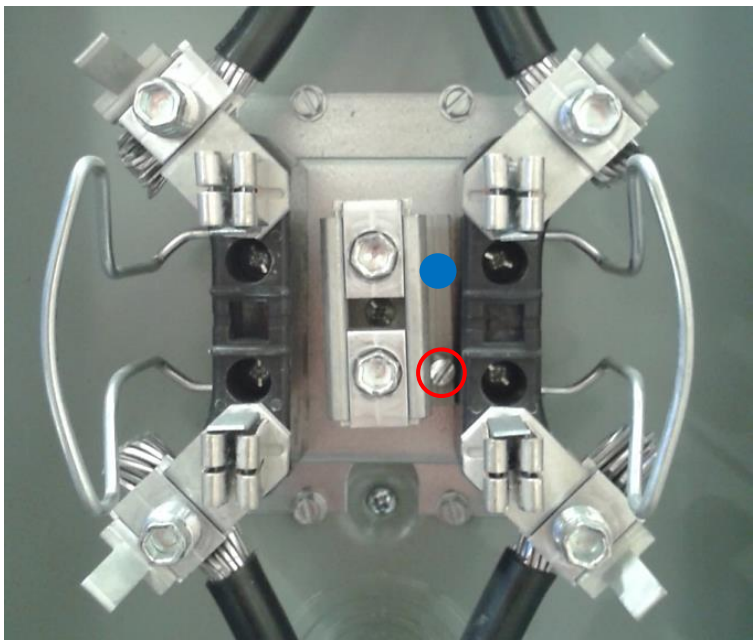


FIGURE 6

Possible options for connecting the neutral pigtail to the meter socket, in case there is no spare terminal as shown in **FIGURE 6** (previous page):

Connect the end of the neutral wire pigtail lead to the load side grounded neutral conductor. Use a suitable Listed pressure connector such as a gutter tap, split bolt connector, or parallel groove clamp. More detail about each is provided below.

These suggestions are not intended to be a full listing of options, and ConnectDER does not endorse one particular method over another. Consideration should be given to routing and securing the wiring in such a way that it is protected from non-insulated live parts.

If a neutral pigtail other than the furnished AWG size is required, it must be furnished by the installer. Wire terminations at the ConnectDER must be made with copper conductors only.

WARNING Install this and other neutral termination options in accordance with the manufacturer's instructions.

FIGURE 7 depicts a "Parallel Tap Connector" or "Gutter Tap Connector". Multiple manufacturers offer equivalent products.

FIGURE 7

1. Removable component for the "main" or "run" conductor, referring to the existing load side service entrance neutral conductor within the meter socket. Often there is no need to disconnect the existing wire provided there is enough slack to manipulate the conductor.
2. Termination point for the "tap" conductor, in this case the ConnectDER neutral pigtail.

Check to see that the connector you select is

- available in sizes to accommodate the correct range of run and tap conductors
- suitable for use for either copper or aluminum conductors
- available with an insulating cover if required
- UL listed or otherwise approved by the utility and AHJ.

FIGURE 8 depicts a "Split-Bolt Connector" or "Split-Bolt Bug". Multiple manufacturers offer equivalent products.

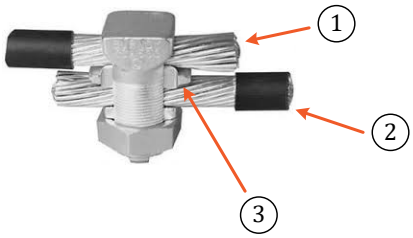


FIGURE 8

1. "Main" or "run" conductor, referring to the existing load side service entrance neutral conductor within the meter socket. Often there is no need to disconnect the existing wire provided there is enough slack to manipulate the conductor.
2. Tap conductor, in this case the ConnectDER neutral pigtail would be terminated here.
3. Pressure bar that separates the run and tap conductors. This makes it possible to splice aluminum (often the residential service entrance cable is aluminum) to copper.

Check to see that the connector you select is

- available in sizes to accommodate the correct range of run and tap conductors
- suitable for use for either copper or aluminum conductors
- UL listed or otherwise approved by the utility and AHJ.

If a neutral pigtail other than the furnished AWG size is required, it must be furnished by the installer. Wire terminations at the ConnectDER must be made with copper conductors only.

WARNING Install this and other neutral termination options in accordance with the manufacturer's instructions.

FIGURE 9 depicts a “Parallel Groove Clamp” or “Parallel Groove Connector”. Multiple manufacturers offer equivalent products.

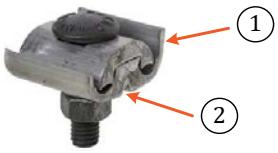


FIGURE 9

1. One side of the clamp may be larger for the “main” or “run” conductor, referring to the existing load side service entrance neutral conductor within the meter socket. Often there is no need to disconnect the existing wire provided there is enough slack to manipulate the conductor.
2. Termination point for the “tap” conductor, in this case the ConnectDER neutral pigtail.

Check to see that the connector you select is

- available in sizes to accommodate the correct range of run and tap conductors
- suitable for use for either copper or aluminum conductors

UL listed or otherwise approved by the utility and AHJ.

If a neutral pigtail other than the furnished AWG size is required, it must be furnished by the installer. Wire terminations at the ConnectDER must be made with copper conductors only.

WARNING Install this and other neutral termination options in accordance with the manufacturer’s instructions.

WARNING

The approaches to ground and neutral connections have numerous variables. The connection method can vary based on utility and authority having jurisdiction requirements, accessory components chosen, meter socket type, and overall system configuration.

Coordinate with your utility and authority having jurisdiction to establish acceptable methods in cases where methods recommended below cannot be employed.

Due to the wide variety of meter socket styles and locations where a neutral could be terminated, a given site may require a longer neutral than the one provided in the box, or a different type of wire. ***It is the responsibility of the installer to make certain the neutral is terminated in an approved manner.***

Possible options for connecting the neutral pigtail to the meter socket:

If a grounded terminal is available, attach the end of the neutral wire pigtail lead. This option is depicted in **FIGURE 10** below. Torque to manufacturers specified value.

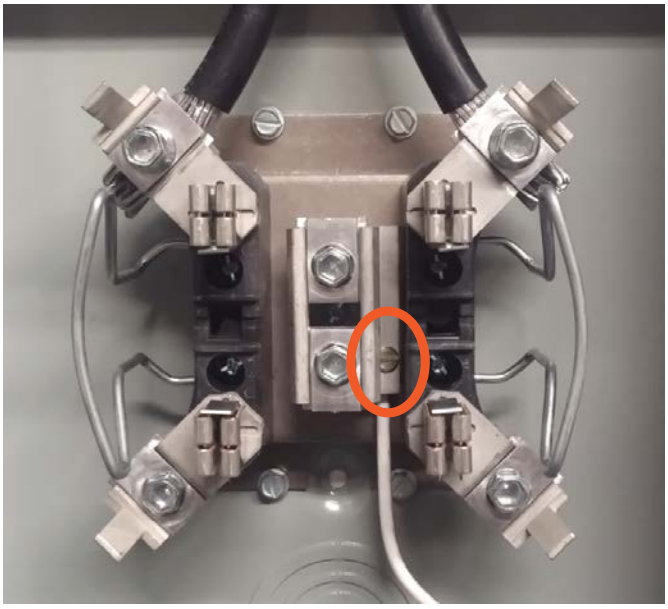


FIGURE 10

For ring-type meters, reinstall the meter cover while routing the neutral lead through the cover opening.

Bend the other end of the neutral lead 90 degrees before terminating it at the ConnectDER. This will help it avoid contact with non-insulated live parts when inserting the ConnectDER into the meter socket. See **FIGURE 11.**

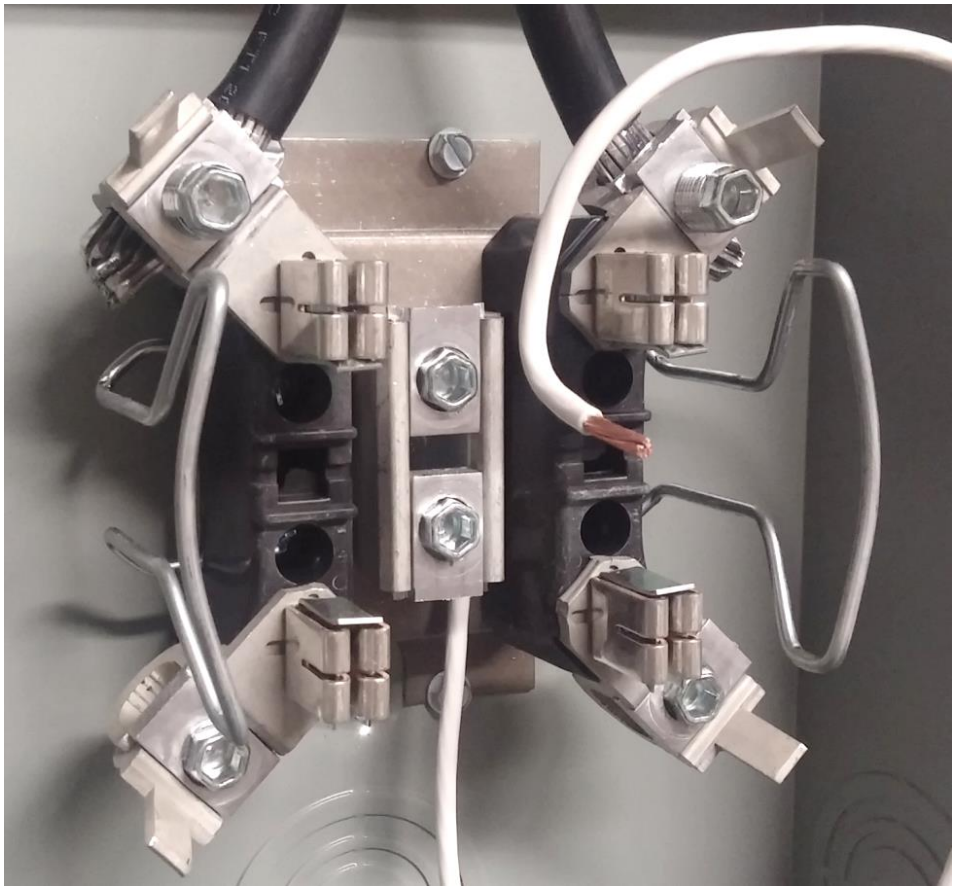


FIGURE 11

Terminate the neutral lead to the ConnectDER using a screwdriver as shown below in **FIGURE 12**. Torque the connection to the values shown in **TABLE 2** below. (NOTE: Ringless type meter socket shown below).

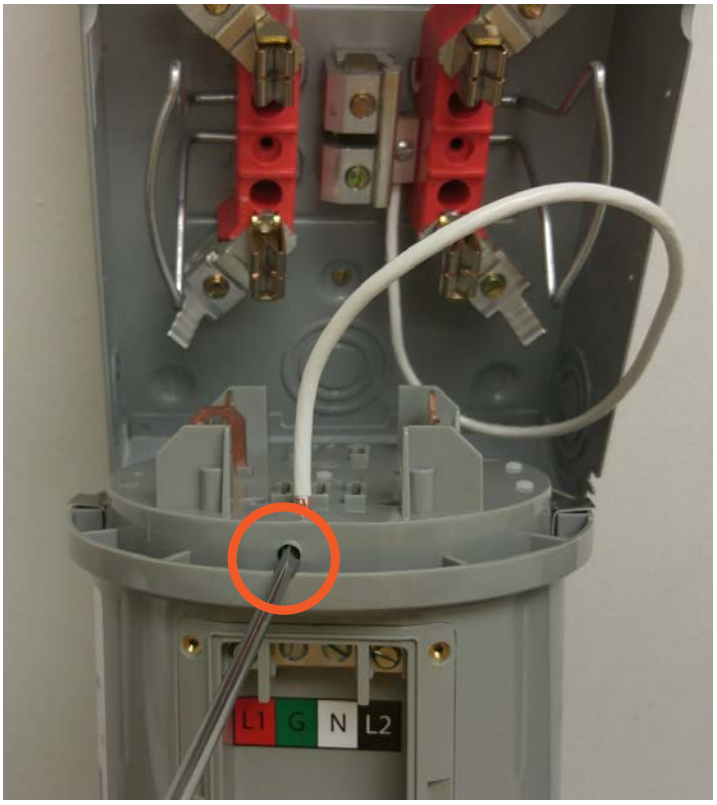


FIGURE 12

TABLE 2

NEUTRAL PIGTAIL WIRING TORQUE VALUES	
Wire size (AWG)	**Torque value**
14-12	15 in/lbs.
10-6	40 in/lbs.
2-4	50 in/lbs.

5-JAW METER SOCKET

WARNING *Some PV inverter manufacturers specify a full-sized neutral conductor (i.e. the same size as the line conductors) as part of the inverter output wiring.* ***The 5th jaw inside a form 12S meter socket may have only nominal ampacity, intended to be sufficient for the utility meter to calculate kW usage on 120/208v systems.***

In 4-jaw meter sockets, and ***in cases where the 5th jaw in the meter socket has insufficient ampacity to support the PV inverter or other DER:***

- *Attach a copper wire pigtail from the rear of the ConnectDER to a neutral point inside of the meter socket.* ***The conductor must have a minimum ampacity as the line conductors protected by the circuit breaker inside the ConnectDER unit.***
- *Use a method approved by the utility and authority having jurisdiction (AHJ).*

It is the responsibility of the installer to ensure the neutral pigtail or the 5th jaw (where present) in the meter socket provides equal or greater ampacity as permitted to be protected by the integrated circuit breaker.

Follow the instructions in the "4-JAW METER SOCKET" section to install a neutral pigtail.

PLACE THE CONNECTDER IN THE METER SOCKET

1. Confirm the ConnectDER circuit breaker is in the open (OFF) position.

2. Be certain to install the ConnectDER in the proper orientation. The field wiring terminals are at the top of the device and the circuit breaker is at the bottom.

3. Insert the ConnectDER into the meter socket ensuring any wire or added terminations are prevented from contacting non-insulated live parts within the existing meter socket as shown in **FIGURE 13.**

4. Make sure that all contacts are seated in the meter socket jaws. This is especially of concern in older meter sockets with loose and slightly misaligned jaws.

FIGURE 13

1. There is limited clearance to slide a ringless cover over both the breaker switch and terminal pocket.

2. Once the device is set in the meter socket, slip the cover on.

3. Slowly work the cover over both the breaker switch and terminal pocket, taking care not to gouge or damage them. To clear the breaker switch, it may be necessary to tip the ConnectDER DOWN, and angle the top edge of the meter socket cover towards the meter socket.

4. Then, slip the upper edge of the meter socket cover under the top lip of the meter socket housing, and latch the cover. See **FIGURE 14**.

FIGURE 14

RE-INSTALL THE METER

1. For ring-type sockets, install a locking ring to secure the ConnectDER to the meter socket cover. (Ringless cover shown in **FIGURE 15**).
2. Install a lock ring and tamper-prevention seal to secure the utility billing meter to the ConnectDER.
3. Install a tamper-prevention seal in the latch to secure the meter socket cover.

FIGURE 15

CHECK THE CIRCUIT BREAKER AND COVER

1. Confirm the circuit breaker is in the OFF position as shown in **FIGURE 16**.

FIGURE 16

2. Confirm the cover is aligned properly and securely shut as shown in **FIGURE 17**.

FIGURE 17

3. Install a lockout device until the ConnectDER field wiring is terminated.

INSTALL THE JUNCTION BOX AND CONNECT THE RACEWAY

NOTE If the raceway will be attached at a later time, install the junction box according to steps 4 and 5, then install the junction box cover as directed in step 4, "TERMINATE THE FIELD WIRING"). The junction box may remain in place when installing the raceway.

1. Drill the conduit hole for the power raceway as shown in **FIGURE 18.** The conduit entry be used on either side of the junction box. A ¼" pilot bit at the top of the power groove locates the center of a ½", ¾" or 1" trade size conduit opening. Confirm the field wiring terminals are de-energized using an appropriate meter.

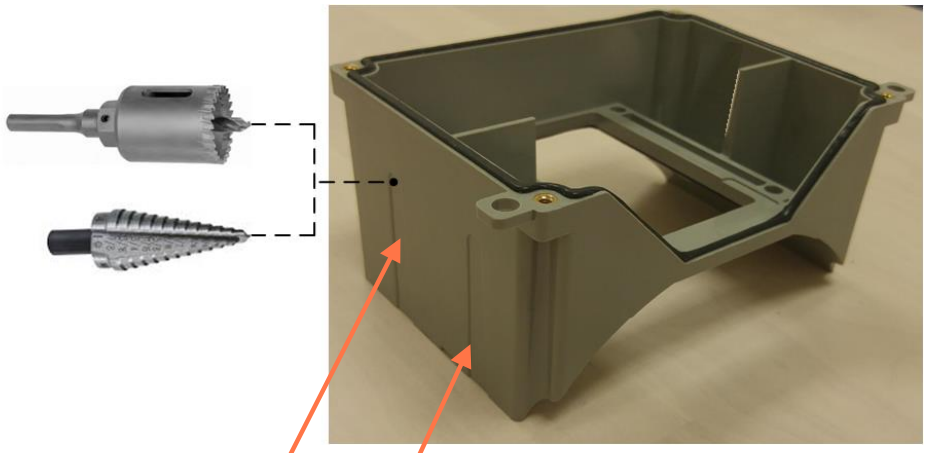


FIGURE 18

Power conduit entry groove

Communications conduit entry groove

2. Drill the raceway hole using the appropriate sized hole saw. Remove any shavings from the interior of the junction box.

NOTE **DO NOT USE A KNOCKOUT PUNCH – IT MAY CRACK OR BREAK THE JUNCTION BOX.**

3. Install a Listed wet location-rated raceway connector.

4. Confirm the field wiring terminals are de-energized using an appropriate meter.

5. Install the junction box to the top of the ConnectDER™ unit using the Philips screws furnished with the unit. **Tighten the screws to 5 in/lbs. using a #2 Philips bit.** Make sure the seal is fully compressed and the box makes contact with the body of the terminal pocket. See **FIGURE 19**.

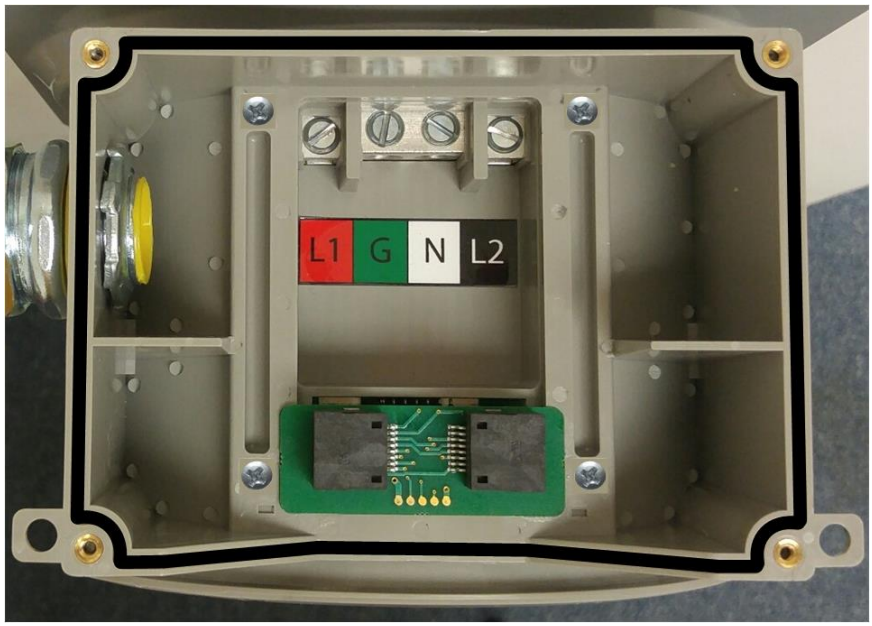


FIGURE 19

NOTE **USE A TORQUE DRIVER TO TIGHTEN THE SCREWS TO 5 IN/LBS.**

6. Attach the field wiring raceway approved by the AHJ and the utility.

7. Provide some extra length of raceway when using flexible liquidtight conduit. This allows easier access to the inside of the meter socket in the future.

8. Use 90-degree connectors on the ends of the raceway where practical. Strap the raceway securely to the mounting surface as shown in **FIGURE 20** to minimize inadvertent or intentional contact with the raceway.

FIGURE 20

TERMINATE THE FIELD WIRING

1. Verify the wiring is clear of faults using suitable metering equipment.
2. Pull the wiring into the junction box.
3. Connect the field wiring to the terminals as shown in **FIGURE 21** and tighten to the values shown in **TABLE 3** below.

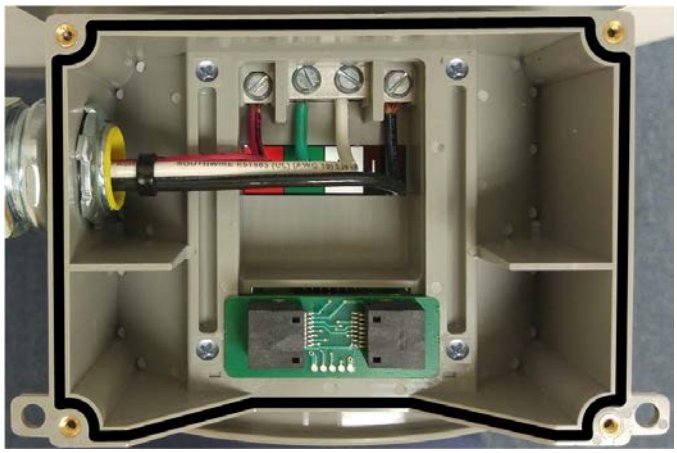


FIGURE 21

TABLE 3

FIELD WIRING TORQUE VALUES	
Wire size (AWG)	**Torque value**
14-10	35 in/lbs.
8	40 in/lbs.
6-4	45 in/lbs.
3	50 in/lbs.

4. Attach the junction box cover using the Philips screws provided. Tighten until the lid bottoms out on the base so the gasket is fully compressed. **Torque to 5 in/lbs.**

NOTE **USE A TORQUE DRIVER TO TIGHTEN THE SCREWS TO 5 IN/LBS.**

PREPARE THE SYSTEM FOR PROVISIONING

1. Install one or more tamper-prevention seals on the junction box cover (optional, such as the green seal shown in **FIGURE 22**).

2. Confirm the PV or other DER system passed inspections by the AHJ and the utility where applicable.

3. Remove the lockout on the circuit breaker cover, open the cover and switch the breaker to the "ON" position.

4. Close the breaker cover using the thumbscrew.

5. Install tamper-prevention seal on the breaker cover (optional).

FIGURE 22

PROVISION THE SYSTEM USING "INSTALLER" CREDENTIALS

1. Verify that utility power is present.
2. Verify the ConnectDER circuit breaker is shut. The LCD will activate only when the circuit breaker is shut and power is applied.
    a. If the ConnectDER is installed upside down, the LCD displays "FLIPPEd" as shown in **FIGURE 23**. Provisioning may proceed only when the ConnectDER is properly installed.

FIGURE 23

3. Once the ConnectDER is properly installed, the term "no CEL" will appear until the internal cellular modem registers with the cellular network. See **FIGURE 24.**

FIGURE 24

4. Once the unit registers with the cellular network the term "b4 EnA" appears as shown in **FIGURE 25.** The unit may now be provisioned using "Installer" account credentials.

FIGURE 25

5. Log in to the URL provided by the ConnectDER Service Center on your Smartphone, laptop or tablet. Refer to **FIGURE 26** for a successful login (home screen).

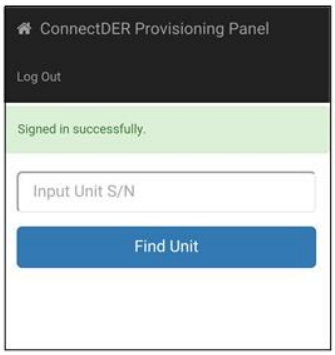


FIGURE 26

6. Enter the unit serial number (Input Unit S/N) and select "Find Unit". The current unit details appear as in **FIGURE 27**. *NOTE: It may be necessary to scroll down to view the full contents of the screen.*

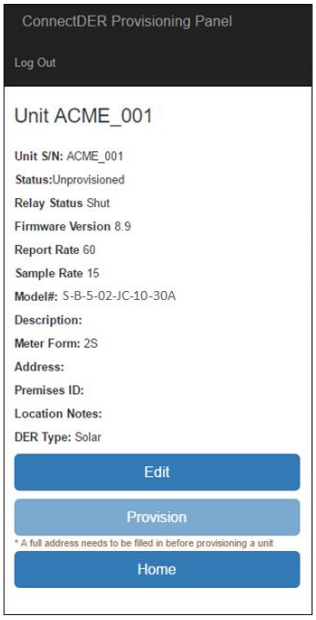


FIGURE 27

7. Select "Edit". Only the items editable by an installer will appear as shown in **FIGURE 28.**

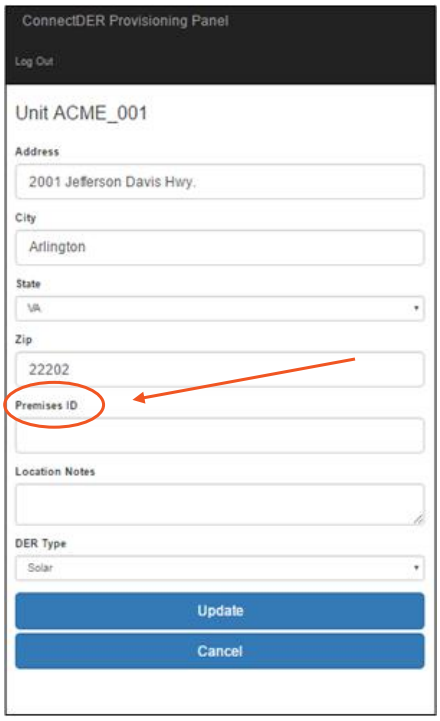


FIGURE 28

NOTE

"Address", "City", "State", and "Zip "are required to be populated in order to provision the unit.

The Premises ID is intended to be the single unique identifying key linking UNITS to the existing customer information or meter data systems.

The Premises ID may be any unique identifier the utility chooses. It may be edited by both the Admin and Installer user accounts.

8. Fill in the Address, City, State, and Zip Code. The Premises ID, Location Notes, and DER Type are optional. They may be filled in later at the discretion of a user with "Admin" account privileges.

9. Select "Update". Verify all information is correct.

10. Select the "Provision" button.

11. Confirm "Provision Requested" is at the top of the screen. The initial status will display "Provisioning", then change to "Operational" after communications with the ConnectDER Cloud is established. See **FIGURE 29** on the next page.

NOTE

Refer to the troubleshooting section if the status displays “Provisioning Error”.

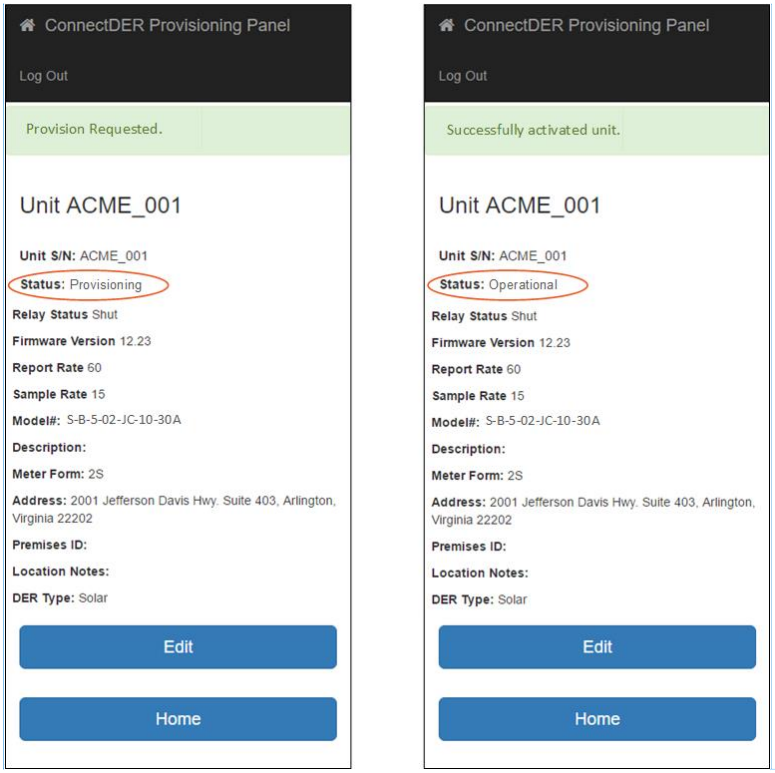


FIGURE 29

12. The ConnectDER LCD will display a “thumbs up” as shown in **FIGURE 30** once provisioning has successfully completed. It could take up to 60 seconds.

FIGURE 30

Commented [cjc3]: These pictures are out of date. Max Closed Delay is no longer an available parameter.

NOTE

The ConnectDER contains a remotely-controlled internal relay to open or shut the DER circuit. The presence of an arrow as shown in **FIGURE 31** indicates the relay is SHUT.

FIGURE 31

The relay is OPEN when no arrow is visible.

NOTE

The LCD scrolls automatically and displays the following values of the DER circuit:

V (voltage, including one decimal place)
A (amperes, including one decimal place)
P kWh (energy produced, whole numbers)
C kWh (energy consumed, whole numbers)

13. Lastly, if there is a critical system failure that renders the smart functions inoperable, a skull and crossbones icon is displayed as shown in **FIGURE 32**. More troubleshooting information is included in this manual.

FIGURE 32

PROVISION THE SYSTEM USING "ADMIN" CREDENTIALS

1. Ensure the ConnectDER is properly installed, energized and indicating "b4 EnA" is displayed on the LCD as shown previously in **FIGURE 25.**
2. Log in to the URL provided by the ConnectDER Service Center on your Smartphone, laptop or tablet.
3. Select the "Table" view.
4. Select the desired unit by clicking on its "Unit S/N" hyperlink.
5. Select "Edit Unit" and enter the Address, City, State, and Zip Code. The Premises ID, Location Notes, and DER Type are optional.
6. Select "Update Unit", then click "OK".
7. Select the "Provision" button. The status will change to "Provisioning", then to "Operational" once provisioning is completed.

CONNECTDER CLOUD™: ADMIN USER GUIDE

INTRODUCTION

NOTE When using cellular communications, the cellular plan on the ConnectDER unit must be activated to communicate with the ConnectDER Cloud™. Coordinate activation with the ConnectDER Service Center or your cellular plan provider as necessary.

Smart ConnectDER unit and user account information:

- The Smart ConnectDER units assigned to your company have been pre-populated in the ConnectDER Cloud. Each unit has a fixed serial number, shown as "Unit S/N".
- The "Admin" user account permits managing resources within your company only.
- Admin users may create additional Admin user accounts and more restrictive "Installer" accounts for use within your company only.

USER INTERFACES

The ConnectDER Cloud is a web-based application accessible from a variety of browsers.

Table 4 below lists the three access points to the ConnectDER Cloud.

TABLE 4 – CONNECTDER CLOUD ACCESS

Application	Hardware	Users
ConnectDER Cloud UI	PC or laptop with web browser*	Company Admins
Installer Dashboard (ConnectDER Provisioning Panel)	Smartphone or tablet	ConnectDER unit Installers
Smart ConnectDER Display (Read-only)	Smart ConnectDER unit	ConnectDER unit Installers & Homeowners

*Supported web browsers:

- Internet Explorer 10 (Windows 7 only)
- Internet Explorer 11
- Safari 9.1 and higher
- Mozilla Firefox (latest)
- Google Chrome (latest)

TABLE 5 - ROLES AND PERMISSIONS MATRIX

PERMISSIONS	User Accounts		
	Admin	Installer	Read-Only
UNITS			
Create*			
Provision		●	
Edit	●	●	
Unit S/N*			
Model#*			
Comms type*			
Comms provider *			
Description	●		
Premises ID	●	●	
IP Address (detected by			
Status (detected by firmware)			
Firmware version*			
DER type	●	●	
Tags (create, view, edit, and delete	●		
Tags (apply one more tags to	●		
Location (Address, City, State, Zip)	●	●	
Location notes	●	●	
Hex status (detected by firmware)			
Meter form (detected by			
Perform batch actions	●		
Unprovision	●		
Relay position (OPEN/SHUT)	●		
Sample rate*			
Report rate*			
Perform unit data reporting	●		●
Select units using filters	●		●
Select data	●		●
Export data	●		●
Delete*			
USER ACCOUNTS			
Create	●		
Delete	●		
Edit	●		
Name	●		
Email	●		
Password	●		
Role (Admin or Installer)	●		

*These functions are factory-defined and/or managed by ConnectDER Staff Administrators.

MANAGING USER ACCOUNTS

CREATING A USER

1. Log in to the URL provided by the ConnectDER Service Center from a laptop or desktop computer. The top of the home screen (Index page) displays the Company name on the left and name of the Admin user on the right as shown in **FIGURE 33.**

FIGURE 33

The "Signed in successfully" bar disappears after five seconds.

2. Select "Users" at the top left of the screen.

3. Select "New User" at the top right of the screen.

4. Fill in the User Details (Name, Email).

5. Select "Admin", "Installer" or "ReadOnly" from the Role drop-down list.

6. Click the "Create User" button.

FIGURE 34

The "User was successfully created" bar disappears after five seconds.

7. The user will be e-mailed a link to the login page and prompted to create his or her password at the first login. Click the "Resend Intro Email" button, shown at the top right of **FIGURE 34** if the user hasn't logged in before the link expires in 72 hours.

APPLYING FILTERS TO SEARCH FOR USERS

Filters may be applied to narrow down user search criteria.

NOTE: Filters become effective only after clicking "**Apply**".

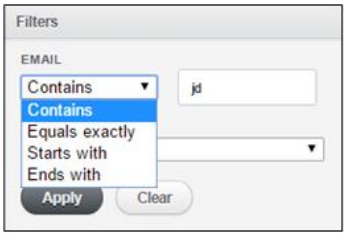


FIGURE 35

In **FIGURE 35** at left, users are returned if they contain the letters "jd" in any part of their email address.

Select "Equals exactly" and enter the exact email address you are searching for.

Select "Starts with" and enter the first character(s) of the email address desired.

Select "Ends with" and enter the last character(s) of the email address desired.

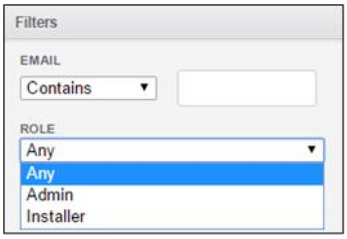


FIGURE 36

In **FIGURE 36** at left, "Any" means users in any role.

"Admin" means only users in the Admin role.

"Installer" means only users in the Installer role.

Remember, filters are effective only after clicking "Apply".

EDITING A USER

1. Select “Users” at the top left of the screen.

NOTE: The user list may be sorted by “Email” and “Role” by clicking on the corresponding column title.

2. Select any filters you wish to narrow the selection and click “Apply”.

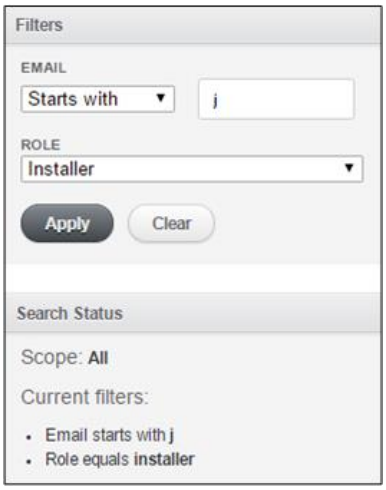


FIGURE 37

Applying a filter to both the email address and role displays the “Search Status”.

In **FIGURE 37** at left only users meeting **both** criteria will be displayed in a list.

3. Select “Edit” for the user you wish to edit.

4. Edit the Name, Email, and Role as necessary.

5. Select “Update User”.

6. You are now in the “View” (read-only) screen for that person’s User Details.

7. Confirm your edits are correct. Select “Edit User” to make further changes.

DELETING A USER

1. Select "Users" at the top left of the screen.
2. Select any filters you wish to narrow the selection and click "Apply".
3. Select "Delete" for the user you wish to delete.
4. Click "OK" in the warning dialog box.

DOWNLOADING USER DATA

1. Select "Users" at the top left of the screen.
2. Select any filters you wish to narrow the selection and click "Apply".
3. Select the "CSV" link at the bottom left of the table. (Download: CSV)
4. User data is saved as a comma separated values file and may be opened with Excel.

MANAGING CONNECTDER UNITS

1. Log in to the URL provided by the ConnectDER Service Center from a laptop or desktop computer. The top of the home screen (Index page) displays the Company name on the left and name of the Admin user on the right, as shown in **FIGURE 38.**

FIGURE 38

The "Signed in successfully" bar disappears after approximately five seconds.

APPLYING FILTERS TO UNITS

Filters may be applied to narrow down unit search criteria.

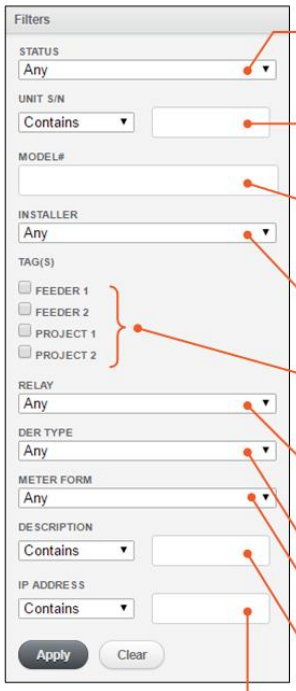
In "Chart" view, filters reduce the number of units displaying data.

In "Table" view, filters reduce the number of units listed for further action by the Admin.

In "Map" view, filters reduce the number of units displayed on the map.

No filters are applied by default. All units are displayed. Refer to **FIGURE 39** for an explanation of the **default conditions**.

Filters are additive. In other words, **the more filters applied, the more selective the results.**



"Any" means units in all states are displayed, subject to other filters.

Blank "UNIT S/N" means no serial numbers (or parts of serial numbers) are filtered.

Blank "MODEL#" means no models numbers (or parts of model numbers are filtered.

"Any" displays units provisioned by all installers, subject to other filters.

Clear check boxes mean all units are displayed regardless if they have a tag or not.

"Any" means all relay states are displayed, subject to other filters.

"Any" means all units are displayed, subject to other filters.

Clear check boxes mean both meter forms are displayed.

Blank field displays all units, subject to other filters.

Blank "IP ADDRESS" means no IP addresses (or partial IP addresses) are filtered

FIGURE 39

Remember, filters are effective only after clicking "**Apply**".

Refer to **FIGURE 40** for tips on using the "STATUS" filter:

Commented [cjc4]: "Upside Down" has been replaced with "Flipped"

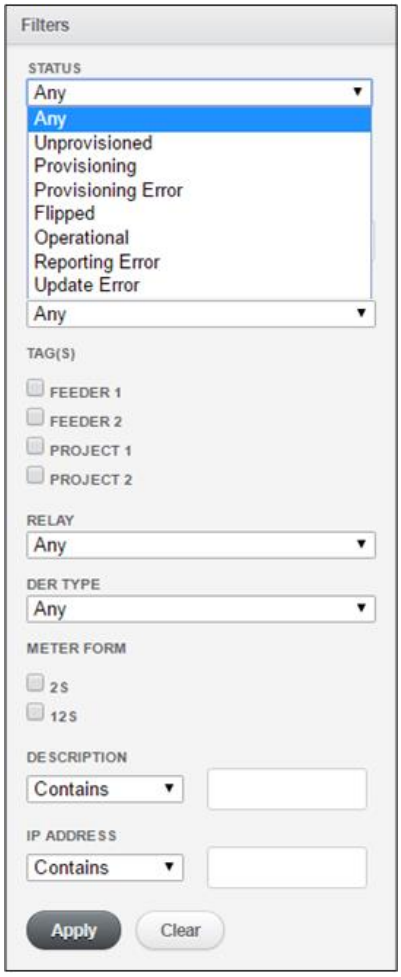


FIGURE 40

"Any" means units in all states are displayed, subject to other filters.

"Unprovisioned" means:

a. The unit has not yet been provisioned by an installer, or
b. The provisioned unit has been unprovisioned by an Admin.

"Provisioning Error" means the unit attempted be provisioned but failed after five minutes.

"Flipped" means the ConnectDER unit is installed upside down.

"Operational" means the unit is provisioned and is reporting data.

"Report Error" indicates the unit failed to report data after 3 attempts.

"Update Error" means the unit failed to receive update data from the server.

Other filtering tips are shown in **FIGURE 41** through **FIGURE 46.**

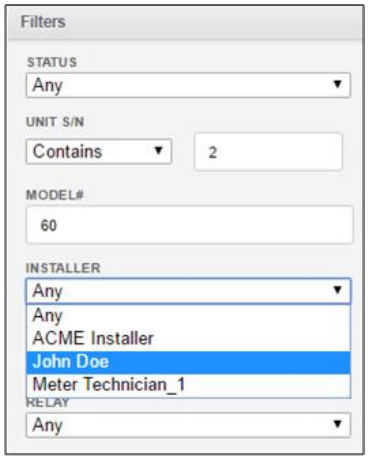


FIGURE 41

Entering "2" in the "UNIT S/N" field returns only units with serial numbers that contain the number "2".

Entering "60" in the "MODEL#" field returns only units with model numbers that contain the number "60".

Selecting an installer name returns only units provisioned by that person.

The **more filters applied, the more selective the results.**

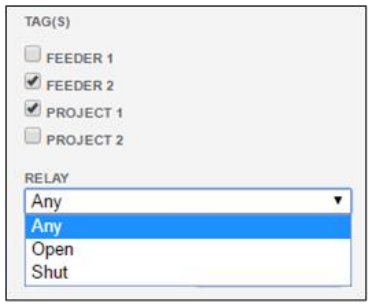


FIGURE 42

Checking boxes will return units with those tags applied.

In the example at left, units will be returned if they have EITHER tag applied.

"Any" means units with the relay in either position.

"Open" means only units with the relay open.

"Shut" means only units with the relay shut.

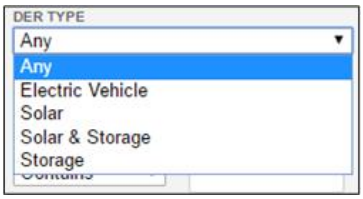
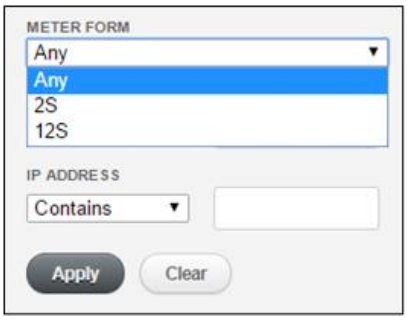


FIGURE 43

Filtering by DER type returns only those units, subject to other filters.



The drop-down list allows filtering on any units, type 2S meter forms or type 12S meter forms, subject to other filters.

FIGURE 44

Commented [cjc5]: We should add a figure and instructions for DER Type as well

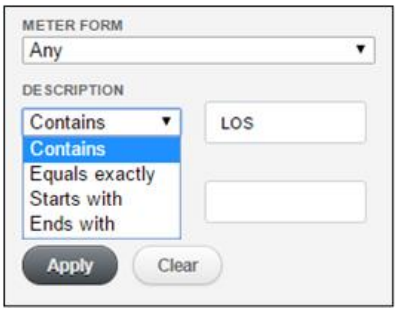


FIGURE 45

"Contains" returns units containing the letters "LOS" in any part of their description.

"Equals exactly" returns units with the exact description entered.

"Starts with" returns units with first character(s) of the targeted description.

"Ends with" returns units with the last character(s) of the targeted description.

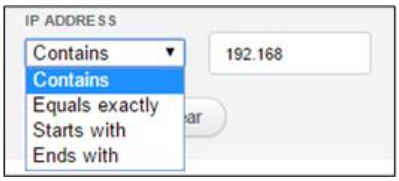


FIGURE 46

"Contains" returns units containing the "192.168" in any part of the unit IP address.

"Equals exactly" returns units with the exact IP address entered.

"Starts with" returns units with first character(s) of the IP address.

"Ends with" returns units with the last character(s) of the IP address.

Remember, filters are effective only after clicking "**Apply**".

Click the "Clear" button to remove all filters.

VIEWING UNIT INFORMATION

1. Select "Units" at the top left of the screen.
2. Select the "Table" view.
3. Select filters if necessary and click "Apply" to narrow your search.
4. Click on the individual unit's serial number.
5. Unit information and map appear. It may be necessary to scroll down to view the entire page. See **FIGURE 47.**

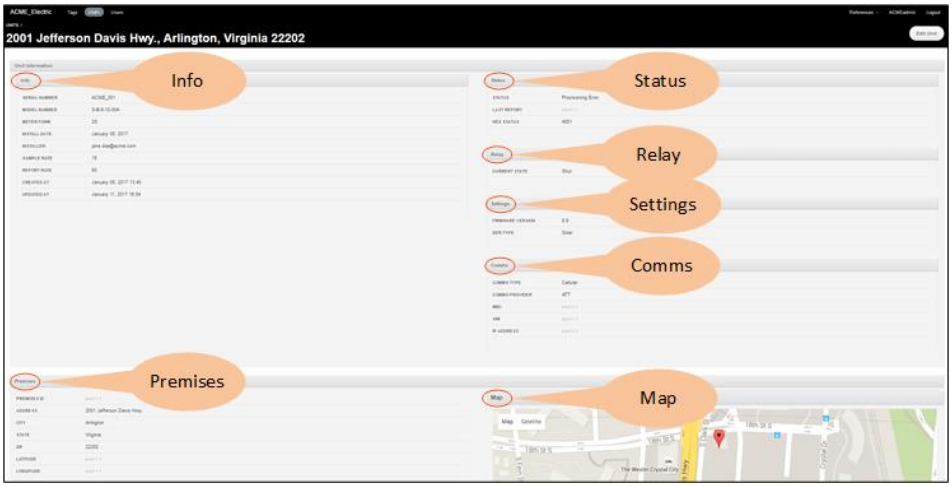


FIGURE 47

TABLE 6 – DESCRIPTION OF UNIT INFORMATION

Info	Description
UNIT S/N	Unit serial number, assigned at the factory.
MODEL NUMBER	Unit model number, assigned at the factory.
METER FORM	Unit meter form (2S or 12S) assigned at the factory.
INSTALL DATE	The date the unit was provisioned.
INSTALLER	E-mail address of the installer who provisioned the unit.
SAMPLE RATE	The time interval (in minutes) that the unit takes a measurement and stores the data for periodic reporting.
REPORT RATE	The time interval (in minutes) that the unit reports its collection of data to the ConnectDER Could database.
CREATED AT	Date and time (UTC) the unit was created in the Cloud database.

Table 6 - “Unit Information” descriptions, continued from previous page:

Status	Description
UPDATED AT	Date and time (UTC) of the last update to the unit information.
STATUS	The current operating status of the ConnectDER unit.
LAST REPORT	Date and time (UTC) the unit last reported to the Cloud database.
HEX STATUS	The code indicating the system health status of the ConnectDER unit.

Relay	Description
CURRENT STATE	The position of the internal relay switch on the DER circuit. OPEN means the relay is open and the DER/PV is physically disconnected from the utility grid. SHUT means the relay is shut and the DER/PV is physically connected to the utility grid.

Settings	Description
FIRMWARE VERSION	The current version of the operating system running on the ConnectDER unit.
DER TYPE	The type of Distributed Energy Resource the unit is integrated with.

Status	Description
COMMS TYPE	The communications method used by the unit.
COMMS PROVIDER	The communications provider used by the unit.
IMEI	The International Mobile Equipment Identity number, where applicable.
SIM	The Subscriber Identity Module number, where applicable.
IP ADDRESS	The IP address of the ConnectDER unit, where applicable.

Premises	Description
PREMISES ID	The Premises ID is *intended to be the single unique identifying key* linking UNITS to the existing customer information or meter data systems. The Premises ID may be any unique identifier that meshes with the utility's system. It may be edited by both the Admin and Installer user accounts.
ADDRESS	ConnectDER unit street address.
CITY/STATE/ZIP	ConnectDER unit city/state/zip code.
LATITUDE	ConnectDER unit's GPS coordinates, automatically drawn from the ADDRESS and CITY/STATE/ZIP.
LONGITUDE	
DESCRIPTION	Admin-defined option to indicate a project, group, anything deemed helpful.
LOCATION NOTES	A place to record helpful information about the specific location of a ConnectDER unit at the premises.
TAGS	Admin-defined labels used for applying to individual units, organizing them into groups.

To download the Unit Information in spreadsheet format:

1. Click the "Table" button at the top right of the chart.

2. Select and apply filters if you wish to save unit information on a specific group of units.

3. Click the link "CSV" at the top left or bottom left of the page ("Download: CSV").

4. The list of characteristics for the selected set of units are saved as an Excel file.

EDITING UNIT INFORMATION

1. Click the "Table" button at the top right of the chart.

2. Select and apply filters if necessary.

3. Click on the Unit S/N of the desired unit.

4. Click the "Edit Unit" button at the top right of the screen.

NOTE The Premises ID is *intended to be the single unique identifying key* linking UNITS to the existing customer information or meter data systems.

Tag(s) may be applied or removed from the unit to assign it to one or more groups. Check the boxes to assign one or more tags to that unit, and clear the boxes to remove tag(s) from that unit. Managing the tags themselves is covered in the next section.

5. Edit the following fields as desired under "Location":
    a. Address
    b. City
    c. State (via the drop-down list)
    d. Zip
    e. Location notes.
6. Select the "Update Unit" at the bottom left after finishing the edits.

7. Click "OK" in the warning dialog box.

MANAGING TAGS

1. Select "Tags" at the top left of the screen. A list of available tags is displayed. Units may have one or tags actually applied or not; this is merely the list to choose from.

2. To create a new tag:
    a. Select "New Tag" at the top right of the screen.

    b. Enter a name for the tag.

    c. Select "Create Tag".

3. To manage existing tags:
    a. Select "View" to browse the "Tag Details".

    b. You may edit or delete the tag from this screen.

    c. Select "Edit" to edit the tag name, and click "Update Tag" to save the changes.

    d. To delete a tag, select "Delete" and click "OK" in the warning dialog box.

You may also manage tags from the "Batch Actions" button in the Table view.

APPLYING BATCH ACTIONS TO UNITS

1. Select "Units" at the top left of the screen.
2. Select the "Table" view at the top right of the screen.
3. Select filters if necessary and click "Apply" to narrow your search.
4. Check the boxes to the left of the units you wish to apply batch actions to. Checking the top box selects all boxes in the list.
5. Select the "Batch Actions" button as shown in **FIGURE 48.**

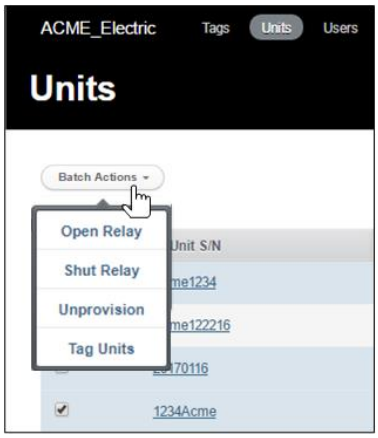


FIGURE 48

6. Select "Open Relay" to open the internal ConnectDER relay on selected units. A "Relay Open requested" message appears for five seconds as shown in **FIGURE 49.** The relay will open at the **<u>top of the next hour.</u>**

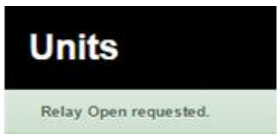


FIGURE 49

Clicking on the unit serial number in the Table view opens the Information view of that unit. The relay status is depicted as shown in **FIGURE 50.**

FIGURE 50

NOTE The button at the top right shown in **FIGURE 51** changed from "Open Relay" to "Shut Relay" as soon as the batch action was initiated. An Admin user can use this button to cancel the batch action (Open Relay) command before the top of the hour.

FIGURE 51

7. Select "Shut Relay" to shut the internal ConnectDER relay on selected units. A "Relay Shut requested" message appears for five seconds as shown in **FIGURE 52.** The relay will shut at the **top of the next hour.**

FIGURE 52.

Clicking on the unit serial number in the Table view opens the Information view of that unit. The relay status is depicted as shown in **FIGURE 53.**

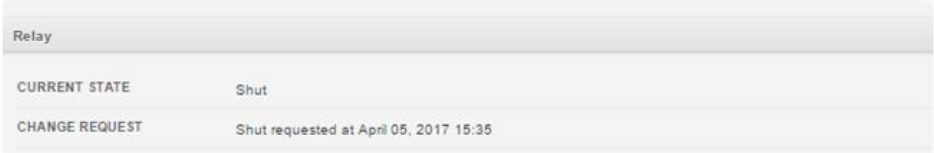


FIGURE 53

NOTE The button at the top right shown in **FIGURE 54** changed from "Shut Relay" to "Open Relay" as soon as the batch action was initiated. An Admin user can use this button to cancel the batch action (Open Relay) command before the top of the hour.

FIGURE 54

8. Select "Unprovision" to unprovision one or more units.
    - This deactivates the metering, control and communications functions of the selected ConnectDER units.
    - The cellular communications plan remains active.
    - The ConnectDER remains in the Company list of units for future provisioning.

9. Select “Tags Units” to apply tags to selected units.
    - The “Apply Tags” dialog box appears as shown in FIGURE 55.
    - Select the tags desired and click “OK”.

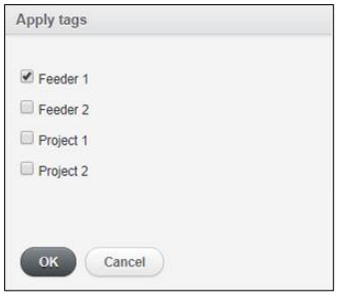


FIGURE 55

MANAGING DER DATA

VIEWING UNIT DER DATA

Click on the “Units” button at the top left of the screen to return to the home screen (Index page). By default, this screen displays a graph (“Chart” view), **FIGURE 56.**

The chart displays the cumulative kilowatt-hours <u>produced</u> for EACH unit within your organization measured since the last system reset. In general this will be from the time the units were provisioned.

FIGURE 56

Place the cursor on any part of the chart to display the value for that hour in the upper right corner of the chart. Click on any part of the chart to lock the values in place. The times displayed are adjusted to that of the browser. See **FIGURE 57.**

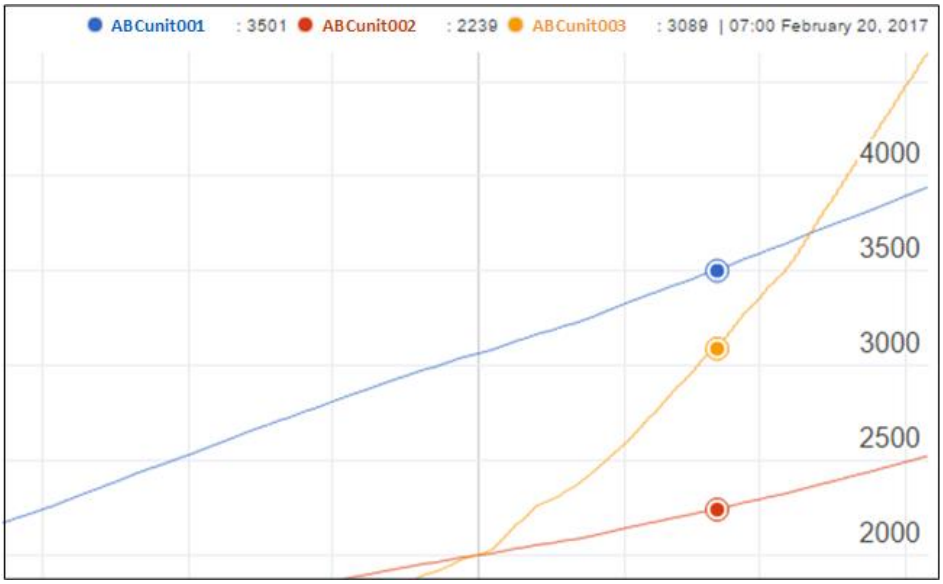


FIGURE 57

Select any filters you wish to apply in order to narrow down the list of units. Applying the filters returns to the cumulative "Energy Produced (kWh)" chart for the filtered list.

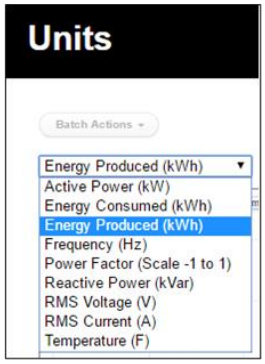


FIGURE 58

Select the desired parameter from the dropdown list shown in **FIGURE 58** to display the values for the filtered list.

VIEWING DER DATA FOR SPECIFIC TIME PERIODS

Click on the "Units" button at the top left of the screen to return to the home screen (Index page).

Select a "Zoom" time frame to display the most recent block of data. The most recent month is shown below, indicated by the slider at the bottom right of **FIGURE 59.**

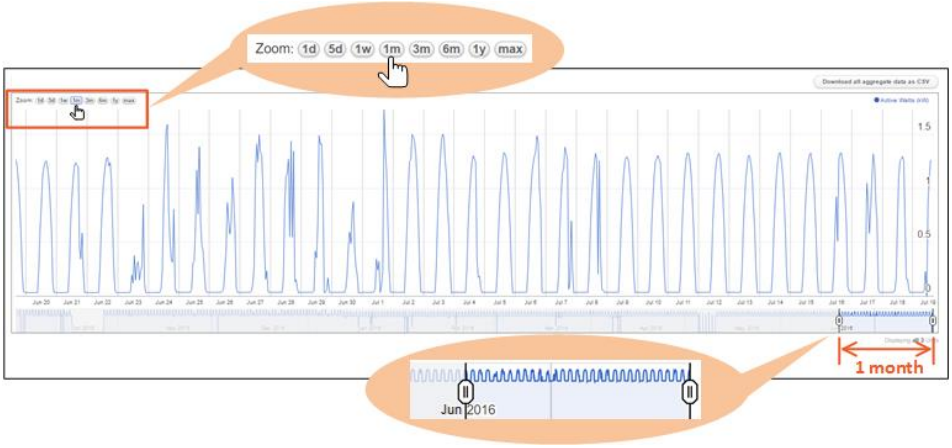


FIGURE 59

Move the cursor to the edge of the slider to resize it to a custom time period. The cursor changes to a double-ended arrow as shown in **FIGURE 60.**

FIGURE 60

The cursor changes to a 4-way arrow when placed on the slider as shown in **FIGURE 61.**

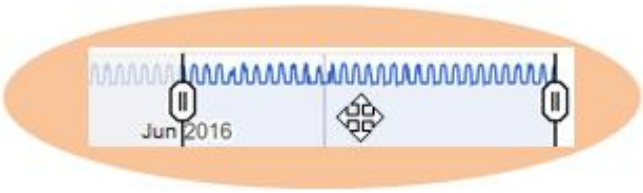


FIGURE 61

Move the slider to the left to display the block of data as reported in the past, as shown in **FIGURE 62.**

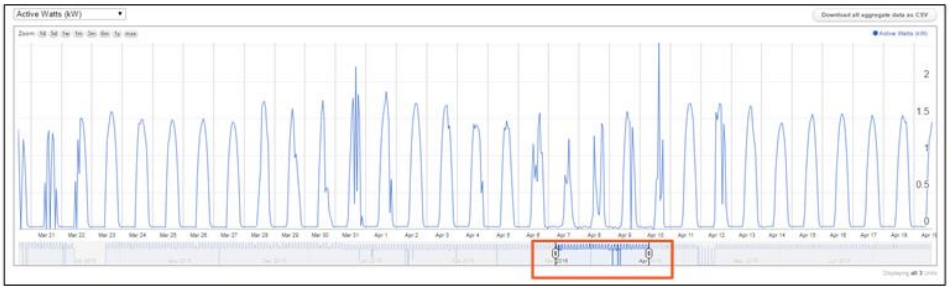


FIGURE 62

DOWNLOADING UNIT DER METERING DATA

Click on the "Units" button at the top left of the screen to return to the home screen (Index page).

To download the metering data from the "Chart" view:

1. Select and apply any filters to target a specific group of units or single unit.
2. Click the "Download all aggregate data as CSV" button at the top right of the chart.
3. The time series data for the selected units in aggregate are saved as an Excel file.

NOTE: If no filters are applied, all the DER data from all the units will be downloaded.

Data for an individual unit may be downloaded two ways:

1. Filter down to the single unit in "Chart" view and click the "Download all data as CSV" button.

   OR

2. Switch to "Table" view.
   a. Select a unit by clicking on its serial number to open the unit information page.
   b. Scroll to the bottom of the page.
   c. Under "Raw Data", click the "CSV" link. (Download all data for unit: CSV)

VIEWING UNIT RAW DER METERING DATA

NOTE:

- The Chart view displays the measurements taken at the top of the **hour.**
- The CSV file contains the measurements taken every **15 minutes.** Download the CSV file as described in the previous step. Open the file using MS-Excel. A sample of data is shown in **FIGURE 63.**

A	B	C	D	E	F	G	H	I	J	K
Sampled At	Serial Number	Power Factor (Scale -1 to 1)	Frequency (Hz)	Active Power (kW)	Reactive Power (kVar)	Temperature (F)	Energy Consumed (kWh)	Energy Produced (kWh)	RMS Voltage (V)	RMS Current (A)
12/4/2016 17:30	ABCunit1	1	59.98	1.63992	0.08908	29	0	1685	247.8	6.65
12/4/2016 17:30	ABCunit2	0.92	60	0.52472	0.23348	32.6	0	2839	246.4	2.33
12/4/2016 17:30	ABCunit3	1	60	0.46392	0.01756	33.2	0	1876	247.3	1.93
12/4/2016 17:15	ABCunit1	1	59.93	1.59091	0.0898	28.9	0	1684	247.6	6.46
12/4/2016 17:15	ABCunit2	0.92	59.93	0.50597	0.2332	32.4	0	2839	246.3	2.26
12/4/2016 17:15	ABCunit3	1	59.94	0.4655	0.01764	33	0	1876	247.2	1.94

FIGURE 63

NOTE:

- The "Sampled At" column lists the measurement date and time **in UTC**.
- The Chart view displays the date and time from **your local machine's browser.**

USING THE MAP VIEW

Click on the "Units" button at the top left of the screen to return to the home screen (Index page).

Select the "Map" button at the top right of the screen. All units are displayed by default as shown in **FIGURE 64**. Holding the cursor over a unit location displays the unit serial number(s) at that location.

FIGURE 64

Zoom in for more detail. Apply filters to reduce the number of units displayed.

Clicking on a location brings up the link to view the Unit Information.

Click on the blue link shown in **FIGURE 65** (serial number) to view the Unit Information.

FIGURE 65

TABLE 7 - TROUBLESHOOTING

PROBLEM	CORRECTIVE ACTIONS
Installer application not functioning on smartphone running Safari browser.	Ensure cookies are enabled.
LCD display is blank.	Verify utility power is available. Verify integrated circuit breaker is shut.
"**no Cel**" displays continuously.	Confirm the cellular modem is activated. Confirm the selected carrier has cellular service available in that location.
"**b4 EnA**" displays continuously.	Installer: Confirm Unit Information with your company administrator. Perform the provisioning process in this guide. Administrator: Confirm Unit Information in the ConnectDER Cloud. If necessary, contact ConnectDER, Inc.
Installer application & UI display "Provisioning Error".	Verify utility power is available. Verify integrated circuit breaker is shut. Verify cellular modem is activated and the carrier has coverage in your area.
Installer application & UI display "Report Error".	Verify utility power is available. Verify integrated circuit breaker is shut. Verify cellular modem is activated and the carrier has coverage in your area.
Installer application & UI display "Update Error".	Verify utility power is available. Verify integrated circuit breaker is shut. Verify cellular modem is activated and the carrier has coverage in your area.
☠ Skull and crossbones icon is displayed.	Ensure the junction box lid and LCD contacts are seated properly. Contact ConnectDER, Inc.

SPECIFICATIONS

MECHANICAL SPECIFICATIONS

Enclosure rating	NEMA 3R
Enclosure type	Injection molded polycarbonate, UL 94 V0 flame rating
Cooling	Natural convection
Dimensions (H x W x D)	6.7 x 6.7 x 5.25in (170 x 170 x 133mm) collar 8.5 x 6.7 x 5.25in (246 x 170 x 133mm) w/ j box
Weight	4lb (1.8kg)
Shipping weight	5.5lb (2.5kg)
Mounting system	Blade interface w/ 4-jaw or 5-jaw meter socket
Electric meter compatibility	Type 2S, 12S
Meter socket compatibility	Ringless and ring-type meter sockets
Circuit interface point	Line-side or load-site circuit interface (by factory)
Conduit connections	Groove provided for ½", ¾", or 1" trade size (power), ½" trade size (communications)

SAFETY INFORMATION

Applicable safety standard	UL2745: Meter Socket Communications Equipment
File Number	E468258

UTILITY INERACTIVE SOURCE RATINGS

Maximum power	15000 W
Maximum voltage	240 V
Maximum continuous PV current	64 A
Continuous combined current, PV/ grid	160 A
Inverter wiring termination	Box lugs, maximum wire size 3AWG
Grid connection type	Split-Ø/ 3W (2S/ 4-jaw), 1Ø/ 3W (12S/ 5-jaw)
Grid wiring termination	Blade interface with meter socket for L1/ L2, pigtail for neutral, 5th jaw stab standard

OVERCURRENT PROTECTION

Type	Eaton BR, 120/ 240V, externally resettable
Overcurrent ratings available	15-45A in 5A increments, 50A-80A in 10A increments
Current interrupting rating	10k AIC rating

ENVIRONMENTAL

Ambient operating temperature range	-22°F to 158°F (-30°C to 70°C)
Ambient storage temperature range	-40°F to 176°F (-40°C to 80°C)

METERING SPECIFICATIONS

Form	2S, 12S
Class	100

Accuracy	0.5%
Frequency	60Hz +-5%
Burden	<3W
Standards	ANSI C12.1, ANSI C12.20, UL Subject 2745
Operational Temp Range	-40°F to 185°F (-40°C to 85°C)
Humidity	0% to 100% (non-condensing)

INTERFACES

LCD	Watt hours and status
Terminal connections	Up to 3AWG wire

CELLULAR SPECIFICATIONS

LTE CATM1:

Data Rate: 1.0D/1.0U Mbps

LTE Bands: B13(700)

Output power: Class 3 • (0.2W, 23 dBm) @ LTE

NOTE Additional information, such as test results and detailed component information is available for review, upon request, at the discretion of ConnectDER.

ConnectDER, Inc. FACTORY WARRANTY

Note: this description of ConnectDER limited factory warranty is effective on January 1, 2015 and supersedes all prior warranty descriptions.

10 Year Warranty

A ten year warranty applies to the Smart ConnectDER.

The ConnectDER factory warranty provides technical support, shipping costs, and repair or replacement part costs during the warranty period. The warranty period begins 3 months after shipment from ConnectDER or the date of commissioning, whichever can be proven to start later, subject to the conditions listed below.

Warranty Conditions

ConnectDER will advance ship a new unit to the customer if the device is determined to be defective within the first 90 days after a new installation.

If a device is determined to be defective more than 3 months after installation, and during the ConnectDER factory warranty period, one of the following services, as selected by ConnectDER, will be performed at no charge:

1. Exchange for a new or refurbished device (of equivalent value according to model and age).
2. Repair the defective device at ConnectDER's facility.

In the case of an exchange, the remainder of the eligible warranty will be transferred to the replacement device.

If the warranty applies, the transport costs (via standard ground shipping) are covered by ConnectDER.

In order to fulfill its obligations under this limited warranty, ConnectDER may require a copy of the purchase receipt, the warranty certificate, installation documentation, or other evidence of the warranty if ConnectDER is unable to confirm warranty entitlement. End-use customers are encouraged to retain such documentation. The serial number must be included on the documentation provided in order to determine warranty entitlement.

Exclusion of Liability

The ConnectDER limited factory warranty does not cover damages that occur due to:

- transport damage
- incorrect installation or commissioning
- failure to observe the procedures in the product manual
- modifications, changes or attempted repairs
- incorrect use or inappropriate operation
- failure to observe applicable safety regulations
- force majeure (e.g., lightning, over voltage, storm, fire)
- cosmetic defects which do not directly influence or degrade form, fit, function

Additional claims due to direct or indirect damage especially compensation claims for damages due to loss of profits, or revenue, or incurred costs arising from disassembly and mounting, are expressly excluded in the absence of a written contract agreement with ConnectDER.

How to Obtain Warranty Support

ConnectDER products are designed and built for reliability. However, in the unlikely event of a failure, please contact the ConnectDER Technical Service Line at (571) 969-1701 where a ConnectDER Technical Support Representative will assist you. Proper fault diagnosis may require a qualified Solar PV service technician to be at the ConnectDER device location and equipped with a digital AC/DC voltmeter. The onsite service technician may be asked to take voltage and/or other measurements from the device, or perform other troubleshooting techniques as conditions permit.

Support hours: 9:00am to 5:00pm Eastern Time.

Additional information will be required such as model number, serial number, job site name, original date of installation, PV array configuration, and a description of any modifications that have been performed on the product.

Replacement Procedure and Conditions

ConnectDER will cover transport costs via standard ground shipping. If expedited shipping is requested, the shipping costs will be billed to the customer. ConnectDER does not provide new replacement equipment to distributors or installers who exchange new equipment from their stock to customers in the field at their own discretion.

All unresolved contractual or financial issues between the customer and ConnectDER must be resolved before material exchange can occur.

Customer or their installer is expected and requested to repack the defective equipment in the same shipping box used to ship the replacement, and manually apply the ConnectDER provided return shipping label(s) to the box of the equipment to be returned.

CONTACT

ConnectDER, Inc.

HEADQUARTERS
2001 Jefferson Davis Hwy. Suite 403
Arlington, VA 22202

Tel. (571) 969-1701

SERVICE CENTER
2037 Washington Ave.
Philadelphia, PA 19146

info@ConnectDER.com

APPENDIX

SAMPLE WIRING DIAGRAMS

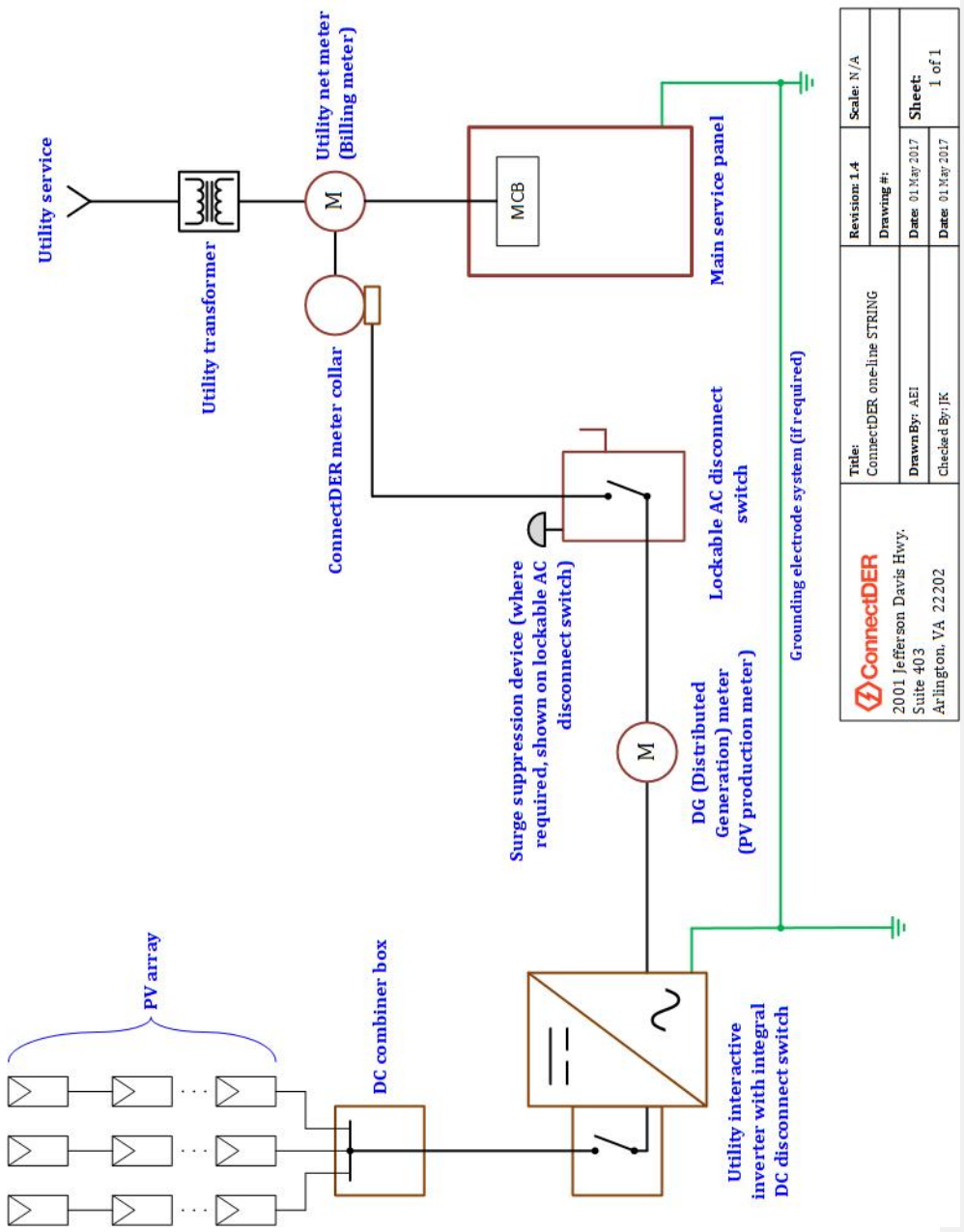
NOTE

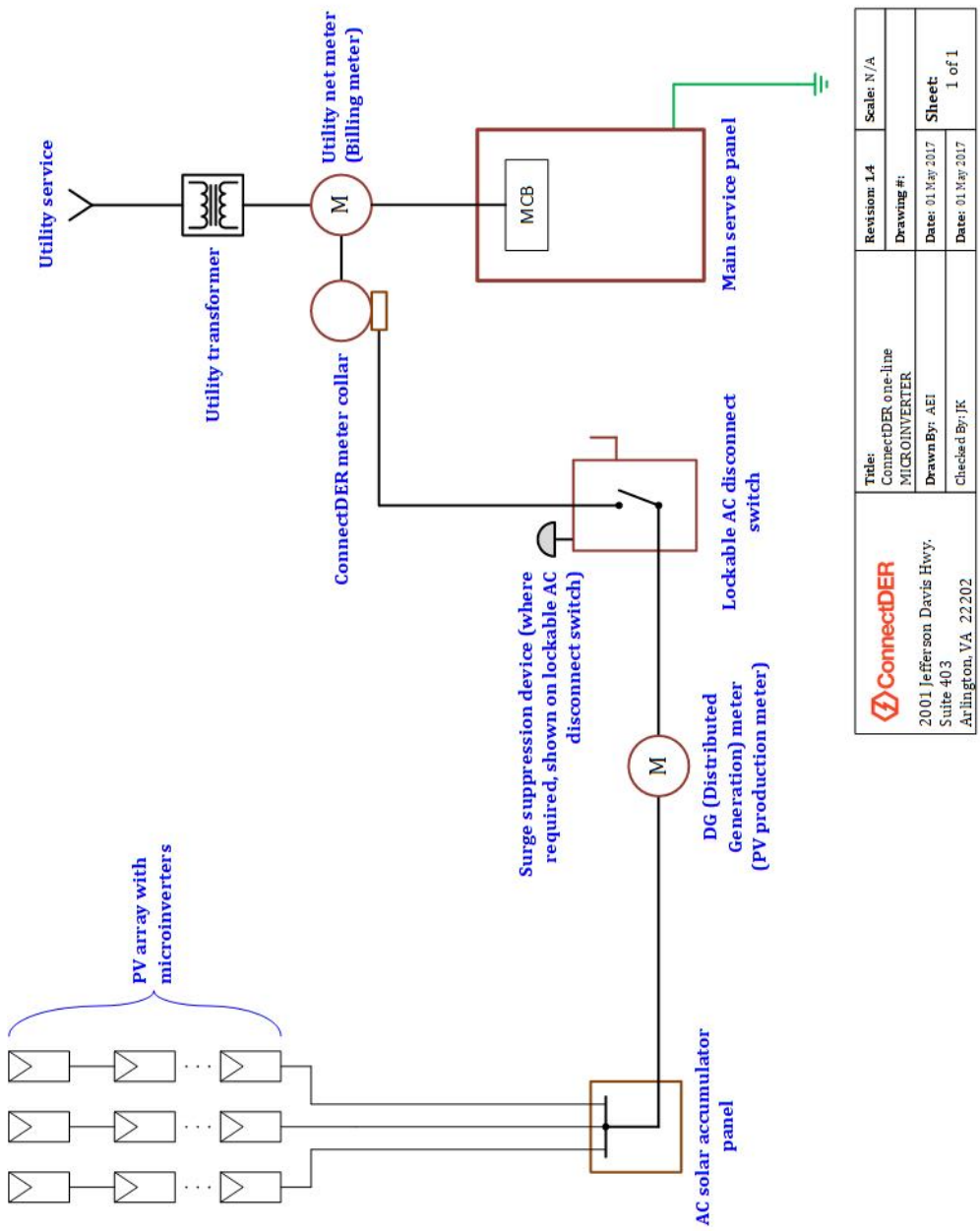
The following drawings are intended to illustrate the general components of a PV system including the ConnectDER™. These examples may assist PV installation contractors with incorporating the ConnectDER™ unit into the engineered drawings they submit for approval to the AHJ.

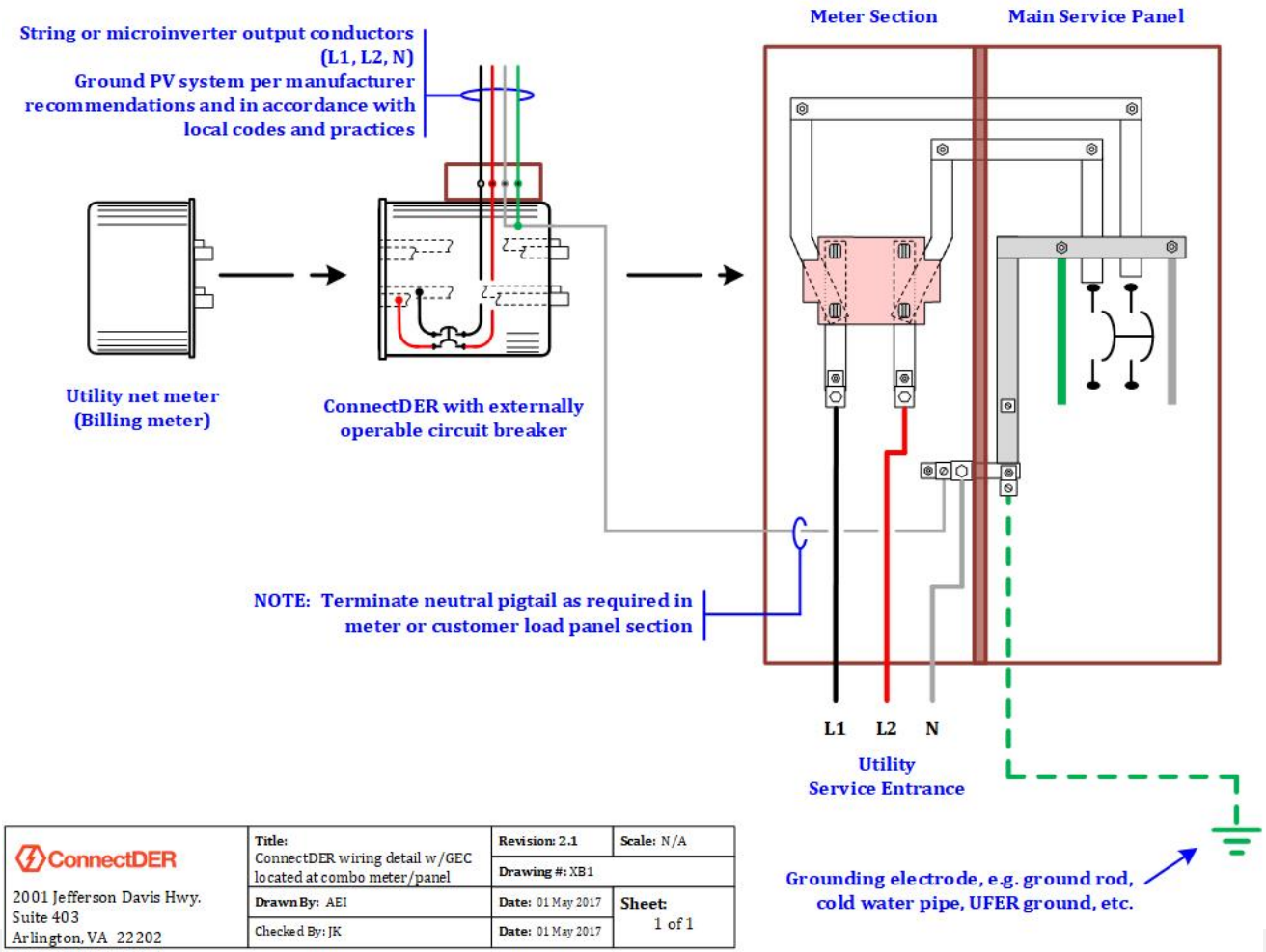
- ***ConnectDER one-line STRING inverter.***
- ***ConnectDER one-line MICROINVERTER.***

The following drawing is intended to illustrate one possible wiring configuration with a Square D model # SC40M200S meter/panel combination outdoor service entrance unit. Actual parts and methods must be approved by the AHJ and utility.

- ***XB1***


Utility service
Utility transformer
Utility net meter
(Billing meter)
M
MCB
Main service panel
ConnectDER meter collar
Lockable AC disconnect
switch
Surge suppression device (where
required, shown on lockable AC
disconnect switch)
M
DG (Distributed
Generation) meter
(PV production meter)
Grounding electrode system (if required)
PV array
DC combiner box
Utility interactive
inverter with integral
DC disconnect switch
ConnectDER
2001 Jefferson Davis Hwy.
Suite 403
Arlington, VA 22202
Title:
ConnectDER one-line STRING
Revision: 1.4
Scale: N/A
Drawing #:
Drawn By: AEI
Date: 01 May 2017
Sheet:
1 of 1
Checked By: JK
Date: 01 May 2017


Utility service
Utility transformer
Utility net meter (Billing meter)
M
MCB
Main service panel
ConnectDER meter collar
Lockable AC disconnect switch
Surge suppression device (where required, shown on lockable AC disconnect switch)
M
DG (Distributed Generation) meter (PV production meter)
PV array with microinverters
AC solar accumulator panel
ConnectDER
2001 Jefferson Davis Hwy, Suite 403
Arlington, VA 22202
Title: ConnectDER one-line MICROINVERTER
Revision: 1.4
Scale: N/A
Drawing #:
Drawn By: AEI
Date: 01 May 2017
Sheet: 1 of 1
Checked By: JK
Date: 01 May 2017



ConnectDER 2001 Jefferson Davis Hwy. Suite 403 Arlington, VA 22202	Title: ConnectDER wiring detail w/GEC located at combo meter/panel	Revision: 2.1	Scale: N/A
		Drawing #: XB1	
	Drawn By: AEI	Date: 01 May 2017	Sheet: 1 of 1
	Checked By: JK	Date: 01 May 2017	

CONNECTDER CELL CARRIER

Commented [VC6]: Added Telit module info and stock FCC disclaimer

The ConnectDER Cell Carrier card is a first party PCB that allows the SMART ConnectDER™ to interface with a Telit ME910C1-NA Cellular Module. ConnectDER is utilizing Telit's FCC grant for the module (FCC ID: RI7ME910C1NA) to obtain certification for use in the SMART ConnectDER™ (FCC ID: 2AXR4-CELLTELIT31).

FCC STATEMENT

FCC Identifier: 2AXR4-CELLTELIT31
Name of Grantee: Infinite Invention, Inc. DBA ConnectDER

This device complies with Part 15 of the Federal Communications Commission (FCC) Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.
This device must accept any interference received, including interference that may cause undesired operation.

CAUTION:
Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this 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 manufacturer's instructions, may cause interference harmful to radio communications.

This device contains FCC Certified RF module: FCC ID 2AXR4-CELLTELIT31

This device is approved for mobile and fixed use with respect to RF exposure compliance. The antenna of this transmitter must provide a separation distance of at least 20 cm from all persons. Installers must be provided with antenna installation instructions and transmitter operating conditions and instructions for satisfying RF exposure compliance. The final product operating with this transmitter must include operating instructions and antenna installation instructions, for end-users and installers to satisfy RF exposure compliance requirements. There is no guarantee, however, that interference will not occur in a particular installation.

Multi-transmitter, supporting simultaneous transmission configurations, have not been evaluated and shall be evaluated according to KDB Publication 447498 and §15.31(h) and §15.31(k) composite system and § 2.1 end product terms and concepts. Compliance of this device in all final product configurations is the responsibility of the Grantee. Installation of this device into specific final products may require the submission of a Class II permissive change application containing data pertinent to RF Exposure, emissions and host/module authentication, or new application if appropriate. The maximum antenna gain including cable loss for compliance with radiated power limits, RF exposure requirements and the categorical exclusion requirements of 2.1091 is 9.01 dBi for LTE FDD 2 frequency band, 6.00 dBi for LTE FDD 4 frequency band and 6.94 dBi for LTE FDD 13 frequency band.