

# ACUITY MONITORING & CONTROL AND COMMSSAFE NETWORKING

# FIELD INSTALLATION MANUAL

RELEASE DATA: 2024-02-29 VER 1.0



**CommsSafe** aderis ENERGY

RELIABLE COMMUNICATIONS ANYWHERE

AC-30

**WARNING!**  
ELECTRICAL HAZARDS  
This equipment is to be maintained by authorized personnel only.

**ELECTRICAL RATING**  
MAX Current: 0.35A @ 400V AC  
0.40A @ 120V AC  
AC Input Range: 3w 220-575V AC  
Control Panel SCORE 100A

**DANGER**  
HIGH VOLTAGE  
ELECTRICAL HAZARD  
DO NOT TOUCH  
EQUIPMENT SURFACES  
UNLESS YOU ARE  
A QUALIFIED ELECTRICIAN

CONTACT US FOR SUPPORT  
(470) 387-9011  
help@aderisenergy.com  
www.aderisenergy.com

ENCLOSURE 117101

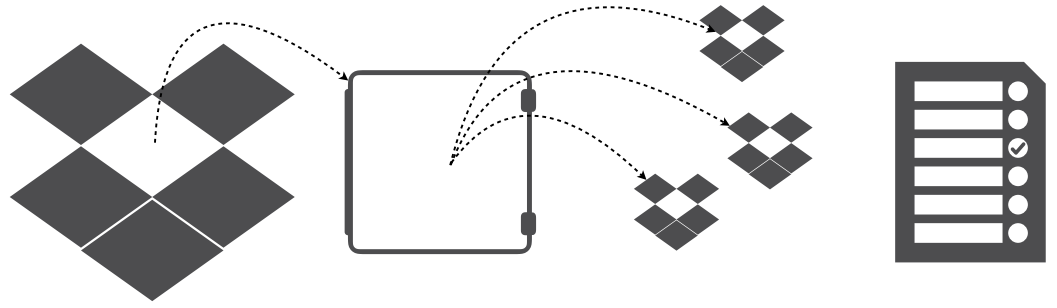


# INSTALLER QUICK START GUIDE

## STEP 1

### Unbox the CommsSafe Product.

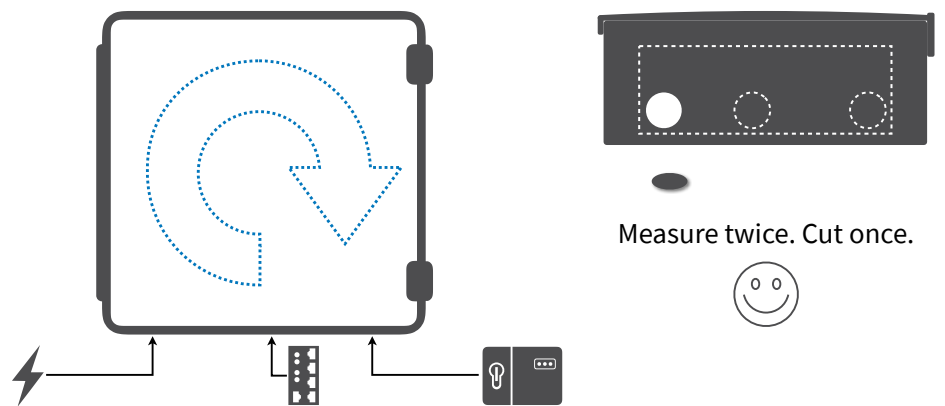
- Inspect all deliverables for damage.
- Remove all packing materials and individually packed components from inside the enclosure.
- Verify contents and quantities match BOL.
- Remote any damage, missing, or extra components with photographs to [help@aderisenergy.com](mailto:help@aderisenergy.com) immediately.



## STEP 2

### Make Enclosure Conduit Entries.

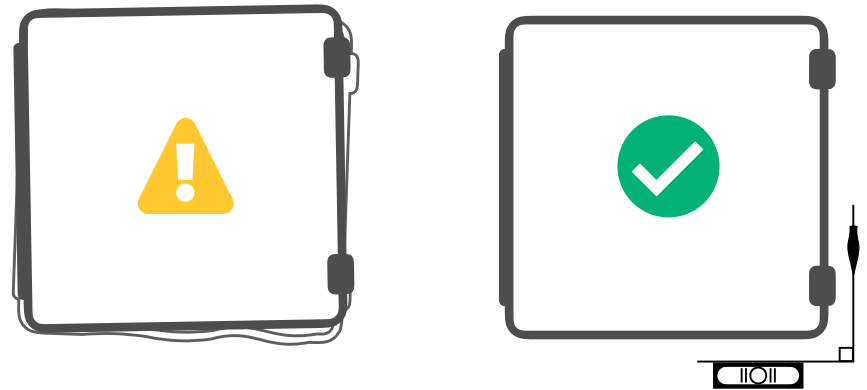
- All CommsSafe products follow a clockwise layout with control power entering on the left, and RS-485 inverter/sensor input/outputs on the right, and networking in the middle.
- Conduit entry placement should only be made in the designated area described on the next page.
- Enclosure penetrations should only be made on the bottom surface of the enclosure.



## STEP 3

### Enclosure Mounting.

- CommsSafe dimensions and mounting holes are described in detail on the next page.
- Use large fender washers to span gaps in u-channel when necessary to provide adequate flange contact area.
- Enclosures should be mounted square, plum, and level; without warping to ensure proper door seal.
- Leave roughly 6" on the left and right side of the enclosure to ensure proper clearance for door swing and lock access.



## STEP 4

### Power, Inverter, Network, and Sensors.

- Based on the specified power source, use the connection information described in detail on the next page.
- Based on the selected network switch, use the connection information described in detail on the last page.
- Based on the inverter communication type (RS-485 or network), use the connection information described in detail on the last page.
- Based on the specified sensor suite, use the connection information described in detail on the last page.
- When there is a battery backup, the battery must be connected after shipping as described on the next page.



Always use the correct tools and torques for wiring connections.



Always use the correct wire gauges and material for wiring connections.



**EasyBUS**

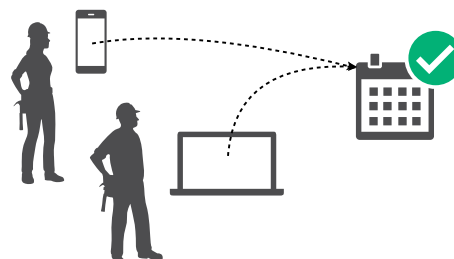
An Open Deployment Standard for Serial & Network Connected Field Telemetry Devices

**DO NOT** re-wire, remove, or modify any EasyBUS™ sensor whips. Scan to learn more.

## STEP 5

### Done. Contact Aderis for Remote Commissioning.

- Utility backed is required for most remote commissioning activities, unless generator power, or other equipment energization arrangements have been made.
- For scheduling of our remote resources, contact Aderis 2-4 weeks in advance of when you expect to be ready for hot commissioning.
- All field installed network and RS-485 communications should be fully treated end-to-end, and all equipment IP addressed and Device ID configured prior to remote commissioning activities with Aderis.



Call & Request Support  
(470) 387-9011



**FOCUS**  
Schedule Commissioning via  
an Online Support Request





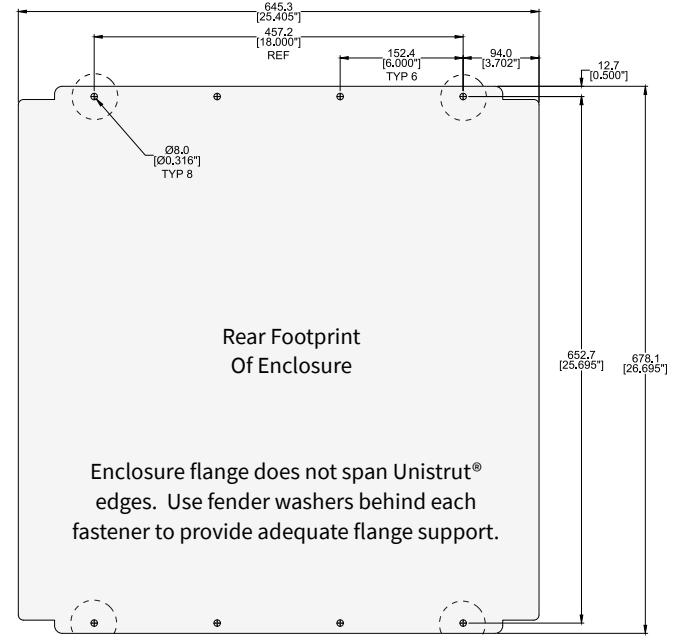
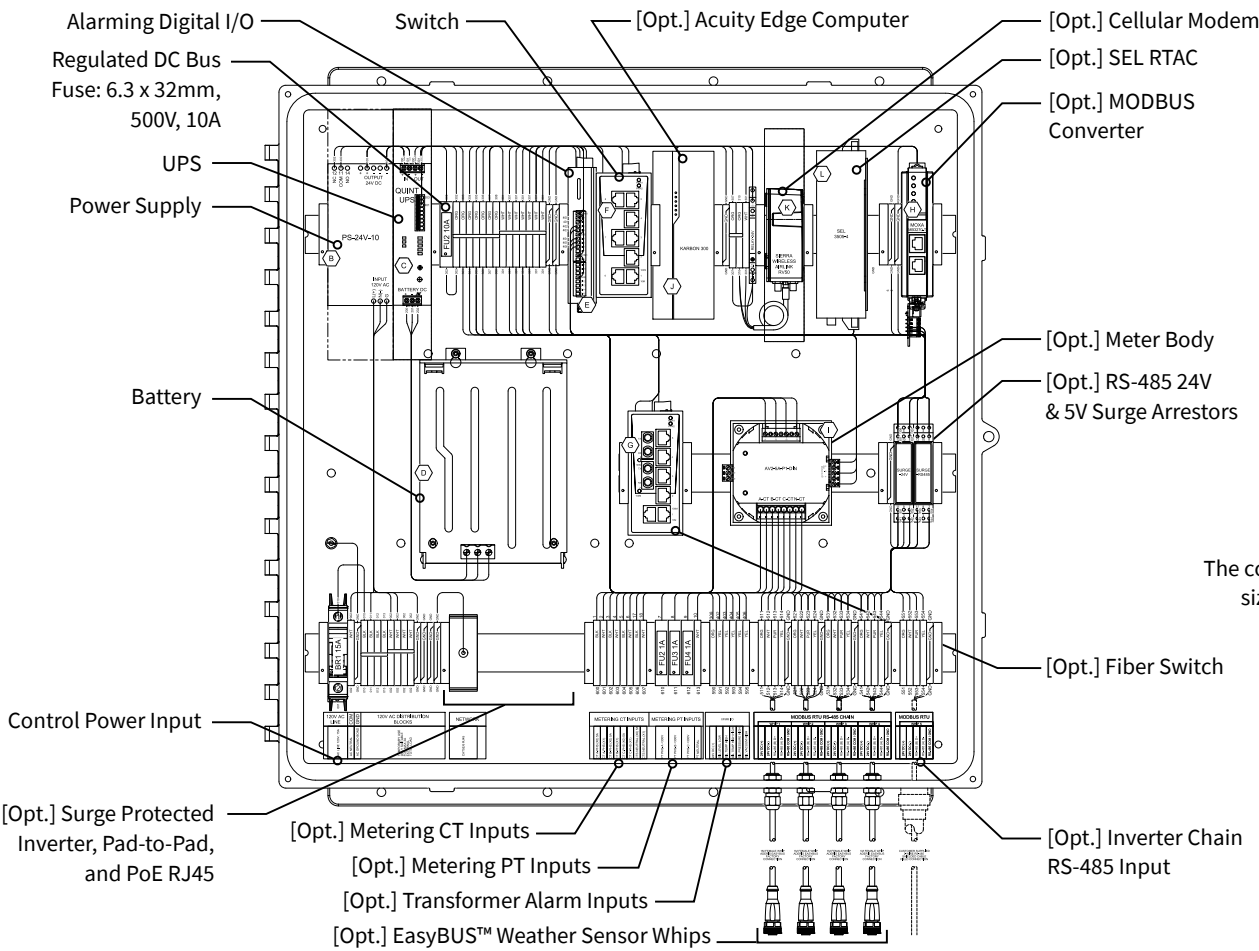
# INSTALLER TECHNICAL SUPPORT & CONFIGURATION SPECIFICATIONS

Project Name: \_\_\_\_\_  
 Project Number: \_\_\_\_\_  
 Enclosure Location: \_\_\_\_\_

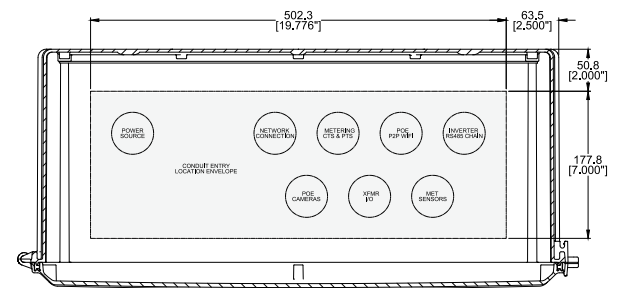
No  Yes **CommsSafe AC-1Ø**       No  Yes **Aderis ION**  
 No  Yes **CommsSafe AC-3Ø**       No  Yes **Aderis SOLAR**  
 No  Yes **CommsSafe DC-1.5K**       No  Yes **Aderis STORAGE**

## Enclosure Mounting & Major Component Locations

Although facility-specific equipment may vary slightly, all control enclosures follow a similar termination and component arrangement, as well as an identical mounting footprint.



The controls enclosure is not pre-drilled for any conduit entries. Actual conduit size, qty, and locations are at determined the discretion of the installer.



## Facility-Specific Configuration

<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Acuity - Factor 201 Comp. &amp; LTE Cell.</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>MODBUS 24V Surge Arrestor</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Ethernet Switch [RJ45 Only]</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Acuity - Karbon 300 Edge Computer</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>MODBUS 5V RS485 Surge Arrestor</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Ethernet Switch [RJ45 &amp; MM (ST)]</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>SEL RTAC 3505</b> <input type="checkbox"/> 01 <input type="checkbox"/> 01-FX <input type="checkbox"/> 04	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>MOXA MGate MB3701-T MODBUS</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Ethernet Switch [RJ45 &amp; SM (SC)]</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>SierraWireless RV50X Cellular Modem</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>ICP-DAS tGw-725i MODBUS (Gateway)</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Metering for Vref:</b> <input type="checkbox"/> 300V <input type="checkbox"/> 690V
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>SierraWireless RV55 Cellular w/ Wifi</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>ICP-DAS tSh-735i MODBUS (Sharing)</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Included CTs - Ratio __: __</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Internal Cell. Paddle Ant.</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Inverter RS-485 Connection (Isolated)</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Included PTs - Ratio __: __</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty 1 - Internal WiFi Paddle Ant.</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Inverter Network Connection (Surge)</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Inverter Mfg Data Aggregator</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty 1 - External Mag-Base Cell. Ant.</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>EasyBUS™ External Sensor Whips</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>PoE</b> <input type="checkbox"/> Hub <input type="checkbox"/> 24V [WiFi] <input type="checkbox"/> 48V [Cam]

<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - POA Irradiance</b> <input type="checkbox"/> Tilt <input type="checkbox"/> Tube	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Silicon Reference Cell</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - P2P WiFi Ant</b> <input type="checkbox"/> UI <input type="checkbox"/> TP
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Rear-POA Irr.</b> <input type="checkbox"/> Tilt <input type="checkbox"/> Tube	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Ext. Ambient Air Temp</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Camera</b> <input type="checkbox"/> Cam Pass-thru
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - GHI Irradiance</b> <input type="checkbox"/> Tilt <input type="checkbox"/> Tube	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Integrated WS - Lufft WS</b>	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Transformer Digital Alarming</b>
<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Rear-GHI Irr.</b> <input type="checkbox"/> Tilt <input type="checkbox"/> Tube	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ - Soiling</b> <input type="checkbox"/> DustIQ <input type="checkbox"/> FracSun	<input type="checkbox"/> No <input type="checkbox"/> Yes <b>Qty __ -</b>

## Control Power Terminations

<p><input type="checkbox"/> No <input type="checkbox"/> Yes</p> <p><b>120V Single-Phase Control Power</b></p> <p>Power supply is compatible with AC voltages ranging from 85-277V, with a current draw of 3A MAX. When an auxiliary power outlet is installed, 115-125V is required.</p> <p>Branch circuit protection is required (WITHOUT GFCI).</p> <p>Circuit Breaker Wiring Instructions Wire Size: #18 - #10 AWG Stranded Cu Terminal Torque: 2.5 N-m (22.2 Lb-In)</p> <p>Terminal Block Wiring Instructions Wire Size: #30 - #12 AWG Stranded Cu Terminal Torque: 0.7 N-m (6 Lb-In)</p>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes</p> <p><b>480V Three-Phase Control Power</b></p> <p>Power supply is compatible with AC voltages ranging from 320-575V Line-to-Line, with a current draw of 0.4A MAX. Two or three phases may be used for control power source. <i>When a three-phase sub-meter is installed, all three electrical phases are required.</i></p> <p>Branch circuit protection is required (WITHOUT GFCI).</p> <p>480V/277 AC 3-PHS LINE 480V 3-PHS AC DISTRIBUTION BLOCKS</p>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes 1,000V DC <input type="checkbox"/> Yes 1,500V DC</p> <p><b>1,000-1,500V DC - PV Control Power</b></p> <p>Power supply is compatible with DC voltages ranging from 510-1,650V DC, with a current draw of 1.0A MAX.</p> <p>Branch circuit protection for (+) &amp; (-) of 2A+ is recommended.</p> <p>Fuse: Littelfuse SPXC 1500V 6A P/N: SPXC006.T</p> <p>PV Fuse Block Wiring Instructions Wire Size: #4 - #14 AWG Stranded Cu Terminal Torque: 3.0 N-m (26.5 Lb-In)</p>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes</p> <p><b>UPS &amp; Battery Backup</b></p> <p>To prevent discharge during prolonged storage, batteries are shipped with the negative (-) terminal disconnected. Open battery cover to access wire &amp; fuses.</p> <p>Reconnect Wire</p> <p>12V DC Battery</p> <p>12V DC Battery</p> <p>Fuse: Littelfuse Automotive 80V DC, 25A, P/N: 166.7000.5252</p>
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# INSTALLER TECHNICAL SUPPORT & CONFIGURATION SPECIFICATIONS

## Network Connections

No  Yes

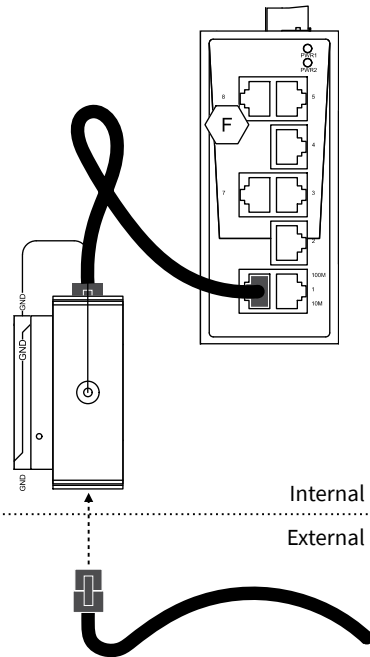
### Ethernet Switch

Ethernet switches supports ethernet and fast ethernet (10/100mbps) for distances up to 328 feet (100m). UOS, the switches provided are unmanaged are require no field configuration.

Ethernet switches use RJ45 connectors with a phone-jack-style plastic connector. While networking between components located inside the controls enclosure may be plugged into the switch's ports direction, any ethernet connection that originated from another location outside the controls enclosure should be landed on an ethernet surge arrestor.

Common examples of external ethernet connections include: meters, central inverters, tracker controllers, SMA string inverters connected using Speedwire®, CPS (Chint) FlexGateway ethernet port connections, network cameras, external wireless antennas, and pad-to-pad communications.

Aderis strongly recommends installers use ethernet cable that is electrically shielded and has telecom-grade, UV resistant, weather resistant cable for all external connections.

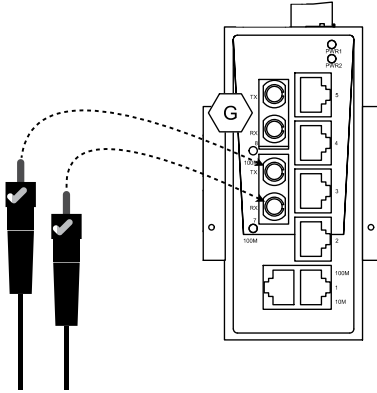


No  Yes

### Multi-Mode (MM) Fiber Switch

MM fiber switches supports fast ethernet (100mbps) for distances up to 1.2 miles (2km). UOS, the switches provided are unmanaged are require no field configuration.

MM switches use straight-tip (ST) connectors with a round bayonet-style shape. Fiber connectors should be landed directly on the switch's ST plugs.

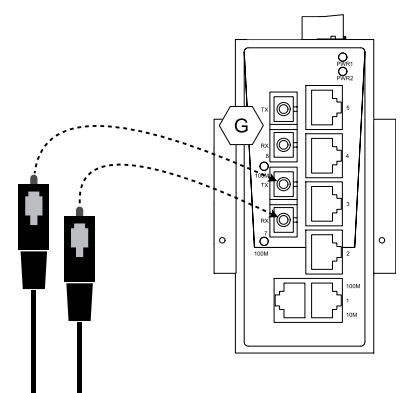


No  Yes

### Single-Mode (SM) Fiber Switch

SM fiber switches supports fast ethernet (100mbps) for distances up to 24.8 miles (40km). UOS, the switches provided are unmanaged are require no field configuration.

SM switches use standard-connectors (SC) with a square shape with locking tab. Fiber connectors should be landed directly on the switch's SC plugs.



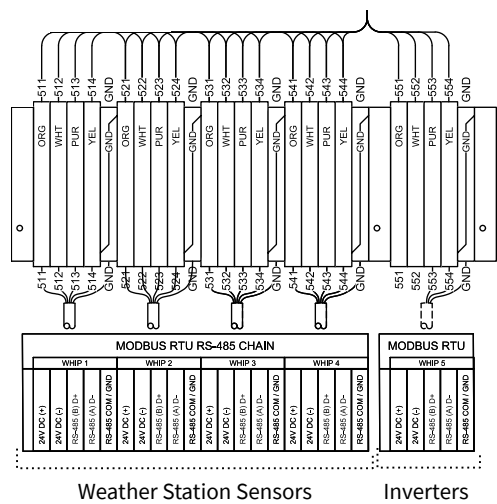
## MODBUS RTU SERIAL (RS-485) Connections

No  Yes

### 2-Channel RS-485 Breakout

The RS-485 breakout is designed to support both self-powered, and external-powered MODBUS RTU devices. Devices only requiring a two (2) wire twisted pair for communication are self-powered and require only the transmit (Tx) and receive (Rx) wires to be connected, along with a shield/ground wire. Devices that require four (4) wire connection require the same Tx and Rx twisted pair wiring as well as an additional to (2) wires for 24V DC positive (+) and negative (-) external power as well.

The standard terminal block breakout supports a total of five (5) separate locations to land individual RS-485 wiring. From left-to-right, the first four locations (1, 2, 3, and 4) share a single RS-485 port on the protocol converter and all devices connected to these locations must share the same baud rate, stop bit, and parity configurations, with no conflicting device IDs.



The right-most location, location five (5), is connected to the second RS-485 port on the protocol converter, and may be configured with a different baud rate, stop bit, and parity configuration than the devices connected to the other four (4) locations, and use duplicate device IDs.

This fifth location is typically used for inverter string RS-485 terminations, while the first four (4) locations are used for weather station sensors.

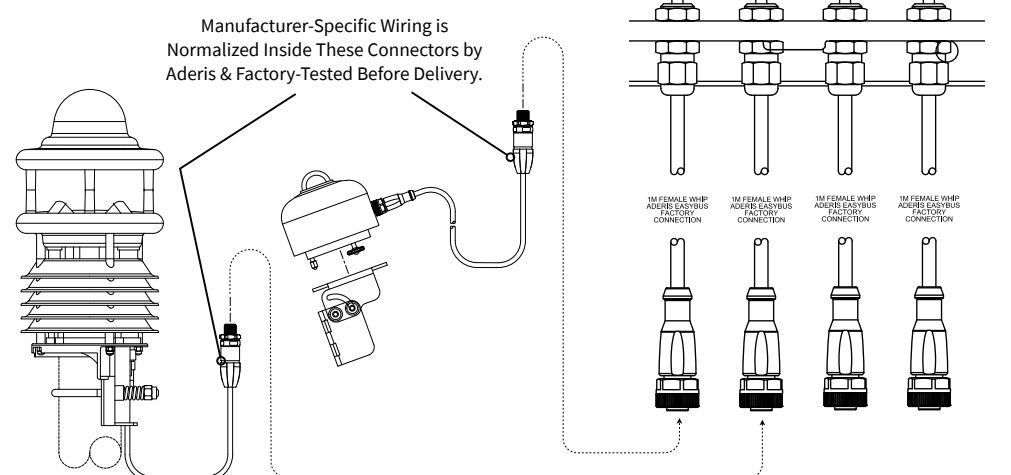
No  Yes

### EasyBUS™ Serial Connections

When Aderis provides weather station sensors connected with RS-485 wiring requirements, each sensor is pre-wired and factory tested to connect using an industry standard M12 5-pin connector.

These connectors normalize the wiring requirements of each sensor, so that each sensor only needs to be connected to the included whips.

No knowledge of unique sensor color codes are required. Sensor damage due to misfiring is eliminated. No field wiring is required.

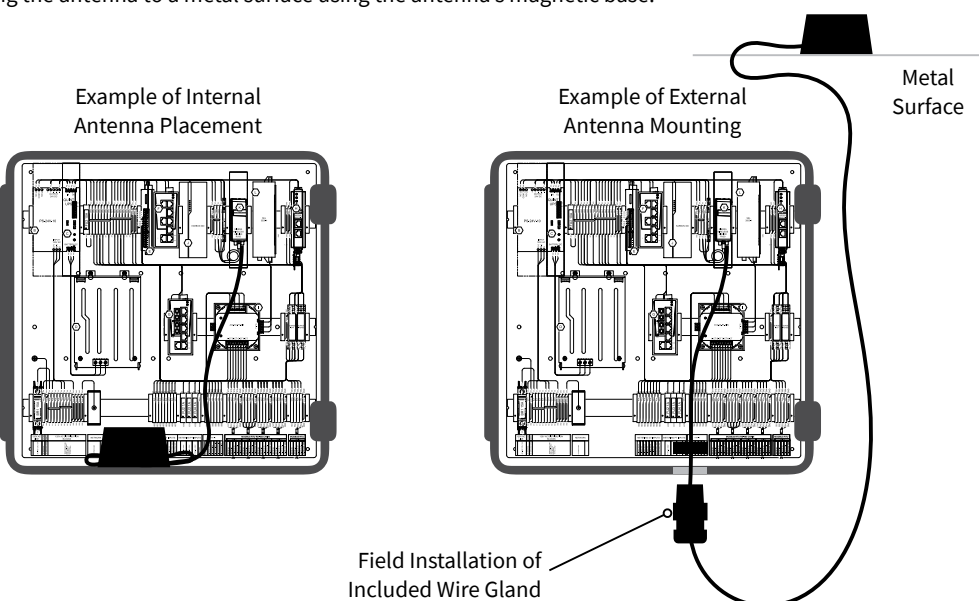


## CELLULAR MODEM ANTENNA INSTALLATION

No  Yes

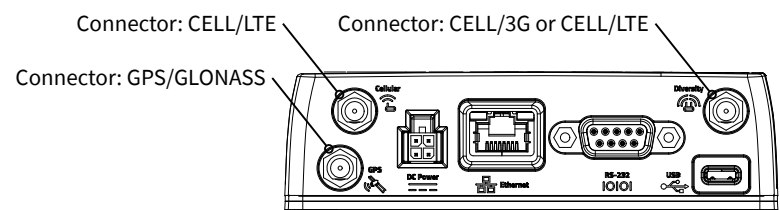
When specified with a cellular modem, the CommsSafe arrives with an antenna suitable for 4G/LTE networks.

In many situations, the CommsSafe polycarbonate enclosure allows ample cellular signal strength with the antenna mounted inside the enclosure, as shown in the figure to the bottom-left. In cases where the antenna needs to be mounted external to the CommsSafe enclosure, Aderis provides a dedicated wire gland for mounting the antenna to a metal surface using the antenna's magnetic base.



For external mounting of the cellular antenna, the antenna will need to be disconnected from the back (bottom) of the modem to allow for routing through the wire gland and field-drilled pass-thru in the bottom of the CommsSafe enclosure.

It is important to reconnect the antenna's leads to the correct SMA connector terminals.



Proper cellular modem functionality and cellular network signal strength may be determined by observing the four (4) indicator lights on the front (top) of the modem.

