PRODUCT MANUAL

Communications Device

ALERT205X

Advanced ALERT2 Flood Warning System



11/2026
Copyright © 2026
Campbell Scientific, Inc.

RELIABLE MONITORING SINCE 1974

Campbell SCIENTIFIC®

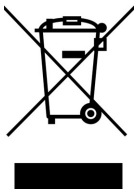
Please read first

About this manual

Please note that this manual was produced by Campbell Scientific Inc. primarily for the North American market. Some spellings, weights and measures may reflect this. In addition, while most of the information in the manual is correct for all countries, certain information is specific to the North American market and so may not be applicable to Europe, Middle East, and Africa (EMEA) or Asia Pacific (APAC) users. Differences include the U.S. standard external power supply details where some information (for example the AC transformer input voltage) will not be applicable for EMEA or APAC use. Please note, however, *that when a power supply adapter is ordered from Campbell Scientific it will be suitable for use in your country*.

Reference to some radio transmitters, digital cell phones and aerials (antennas) may also not be applicable according to your locality. Some brackets, shields and enclosure options, including wiring, are not sold as standard items in the EMEA or APAC market; in some cases alternatives are offered.

Recycling information for countries subject to WEEE regulations 2012/19/EU



At the end of this product's life it should not be put in commercial or domestic refuse but sent for recycling. Any batteries contained within the product or used during the product's life should be removed from the product and sent to an appropriate recycling facility, per The Waste Electrical and Electronic Equipment (WEEE) Regulations 2012/19/EU. Campbell Scientific can advise on the recycling of the equipment and in some cases arrange collection and the correct disposal of it, although charges may apply for some items or territories. For further support, please contact Campbell Scientific, or your local agent.

Table of contents

1. Introduction **1**

2. Precautions **1**

3. Initial inspection **2**

4. Overview **3**

4.1 Canister 3
4.2 Enclosure and panel 5
4.3 VHF radio 6
4.4 GPS 7

5. Specifications **7**

6. Installation **8**

6.1 Canister 9
6.2 Enclosure 11
6.2.1 Enclosure connections 12
6.2.2 Attaching an enclosure to a tripod mast 14
6.2.3 UT6, UT10, UT20, and UT30 tower installation 16
6.2.4 Pole mount 19
6.3 Panel 22

7. Operation **24**

7.1 ALERT205X UI 25
7.1.1 Connecting to the ALERT205X 26
7.1.2 Apply to station 26
7.2 ALERT2 and AL200X settings 27
7.2.1 Ethernet settings 28
7.2.2 Wifi and cellular (optional communications) 29
7.2.3 Add measurements 29
7.2.4 Restoring factory defaults 31
7.2.5 Creating accounts and password 31
7.2.6 Monitor data 33
7.2.7 Diagnostics 34
7.2.8 Change the address of an SDI-12 sensor 34

7.2.9 Update the software 35
7.3 Radio and GPS antenna 36
7.4 System connections 38
7.4.1 Canister field wirable connector 38
7.4.1.1 Sensor interface M12 8-pin connector pin assignments 40
7.4.2 Enclosure and panel terminals 43
7.5 Sensors 44
7.5.1 LevelVue B10 bubbler water level 45
7.5.2 RangeVue 15/30 radar water level sensors 47
7.5.3 CS451 and CS456 pressure transducers 48
7.5.4 RainVue series rain gauges 48
7.5.5 Tipping bucket rain gauges 49
8. Maintenance and troubleshooting 50
8.1 Maintenance 50
8.1.1 When to replace desiccant 51
8.1.1.1 Humidity indicator card 51
8.1.1.2 Optional CS211 smart enclosure sensor 51
8.2 Troubleshooting 52
Appendix A. Canister signal and power block diagram 54

1. Introduction

> NOTE:
> An online version of this manual is available at help.campbellsci.com/alert205x.

The ALERT205X is an advanced remote data transmitter for flood warning stations that collect and report hydrologic and meteorologic measurements in real time. It supports the ALERT2 protocol with expanded sensor support, telemetry options, and advanced user interface.

> NOTE:
> For more information on the ALERT2 protocol, refer to the National Hydrologic Warning Council ALERT2 Technical Working Group website: www.hydrologicwarning.org.

At the core of the ALERT205X, the AL200X operates in Intelligent Network Device (IND) mode connected to the CR310 datalogger. The ALERT205X offers expanded analog inputs, integrated Wi-Fi or Cellular communication options, advanced datalogging, and an intuitive web-based user interface for system configuration.

The transmitter is available in multiple packaging option configurations to support new installations and retrofit upgrades.

Packaging options include:

- Canister
- Enclosure
- Panel

The canister option is typically installed in a weather sealed standpipe. The enclosure and panel share the same panel layout with the enclosure allowing for outdoor installation. The panel option is suitable for installations that have an existing weatherproof enclosure.

2. Precautions

READ AND UNDERSTAND the Safety section.

- GPS input gain, antenna gain less conductor losses, should not exceed 25 dB.
- If protecting GPS input with coaxial surge protector, ensure the protector does NOT block DC voltages.
- Ensure maximum protection against electrical transients/surges. Install coaxial surge protection on all antenna runs.
- The canister should be installed in a weatherproof enclosure. It is designed to protect against light drips of water and small amounts of dust, but it is not rated for outdoor stand-alone use.
- USB is sufficient to power the CR310 for configuration. If power is only supplied over USB, the CR310 will not power up either the radio or attached 12 V sensors.
- The device driver for the CR310 must be installed on your computer before you can connect to the CR310 using USB. See USB or RS-232 communications for instructions on installing the device driver.
- Make sure the latest ALERT205X software is being used on the CR310. See Update the software (p. 35) for instructions on checking the software version and updating.

3. Initial inspection

Inspect the ALERT205X for any obvious signs of damage upon receipt. For each ALERT205X, the following items should be accounted for:

Table 3-1: Parts list

Quantity	Part
1	ALERT205X
1	Humidity indicator card
2	Desiccant bag
5	Cable tie
1	Cable tie mount
1	USB-B cable

4. Overview

The ALERT205X combines the AL200X communicating with a CR310 in IND mode, a Maxon SD-125EL V2 VHF radio, power distribution, and sensor termination in a single, field-ready package. It supports the ALERT2 protocol, logs measurements, and provides sensor input and output to operate connected field devices. The system is powered from a 16 to 32 VDC source. In typical installations this is a solar panel connected to the power input that uses the internal CR310 solar controller to charge a fitted internal battery.

The ALERT205X is available in a canister, enclosure, and panel options depending on your installation application. All three options share the same AL200X, CR310, and radio, so the choice depends on the mounting environment at the site and on how sensor wiring is terminated.

4.1 Canister

The canister option is designed to fit in a standard standpipe with or without an access door. Power input, VHF and GPS antenna, and sensor input and output are made available on the canister lid. Also included is a grounding lug and two extra cable entry points for convenient access to the inside of the canister.

The ALERT205X canister option includes space for up to a 24 Ah battery. The canister includes a battery cable with spade connectors and a 5 amp fuse installed on the positive lead. It also includes a strap to secure the battery inside the canister. The raw battery option can be ordered for installation into the canister.

- 12 Ah battery part number: 8054
- 24 Ah battery part number: 10072

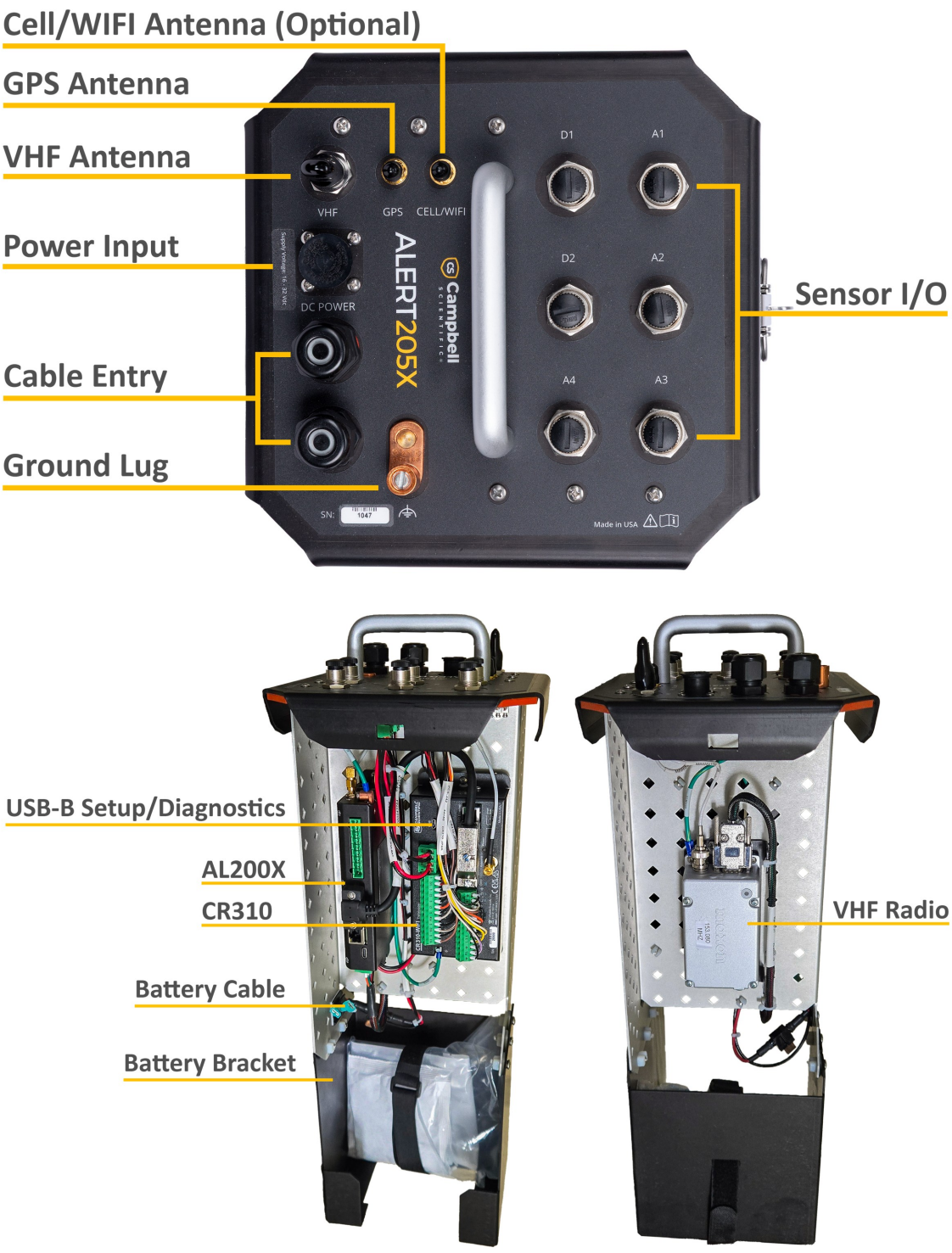


Figure 4-1. ALERT205X canister configuration

4.2 Enclosure and panel

The enclosure option is designed to be mounted to a tripod mast or small vertical pole, a lattice tower, or a large vertical pole. Mounting brackets are ordered separately and are selected by mounting structure. The power input, sensor input and output, and grounding are brought into the enclosure via grommets at the bottom of the enclosure. Terminations are made available on DIN rail terminal block on an angled bracket. The BNC VHF antenna and SMA GPS antenna connections are made available at the bottom of the enclosure.

The ALERT205X enclosure option requires purchasing mounting brackets for the intended mounting structure. The following table will outline what to order for the intended installation.

Table 4-1: Mounting bracket options for ALERT205X enclosure

Part	Part number	Description
Small pole	19002	The 19002 is used to mount an enclosure to a tripod mast or to a user-supplied pole with a 1.25" to 2.1" outer diameter
UT tower	19017	The 19017 is used to mount an enclosure to a UT6, UT10, UT20, or UT30 tower
Large pole	27390	The 27390 provides mounting hardware for attaching an enclosure to a pole with a 4" to 10" outer diameter

The panel option shares the same panel as the enclosure without the bulkhead connections for the VHF and GPS antennas.

The ALERT205X enclosure and panel options include space for up to a 24 Ah battery. The enclosure and panel include DIN rail terminals for installation of the battery. It is recommended to order the BP line of battery products properly sized for your installation. These battery options include a mounting bracket compatible with the panel, a strap for securing the battery, and a cable to connect the battery to the DIN terminals.

- 12 Ah battery part number: BP12 (8065)
- 24 Ah battery part number: BP24 (10074)

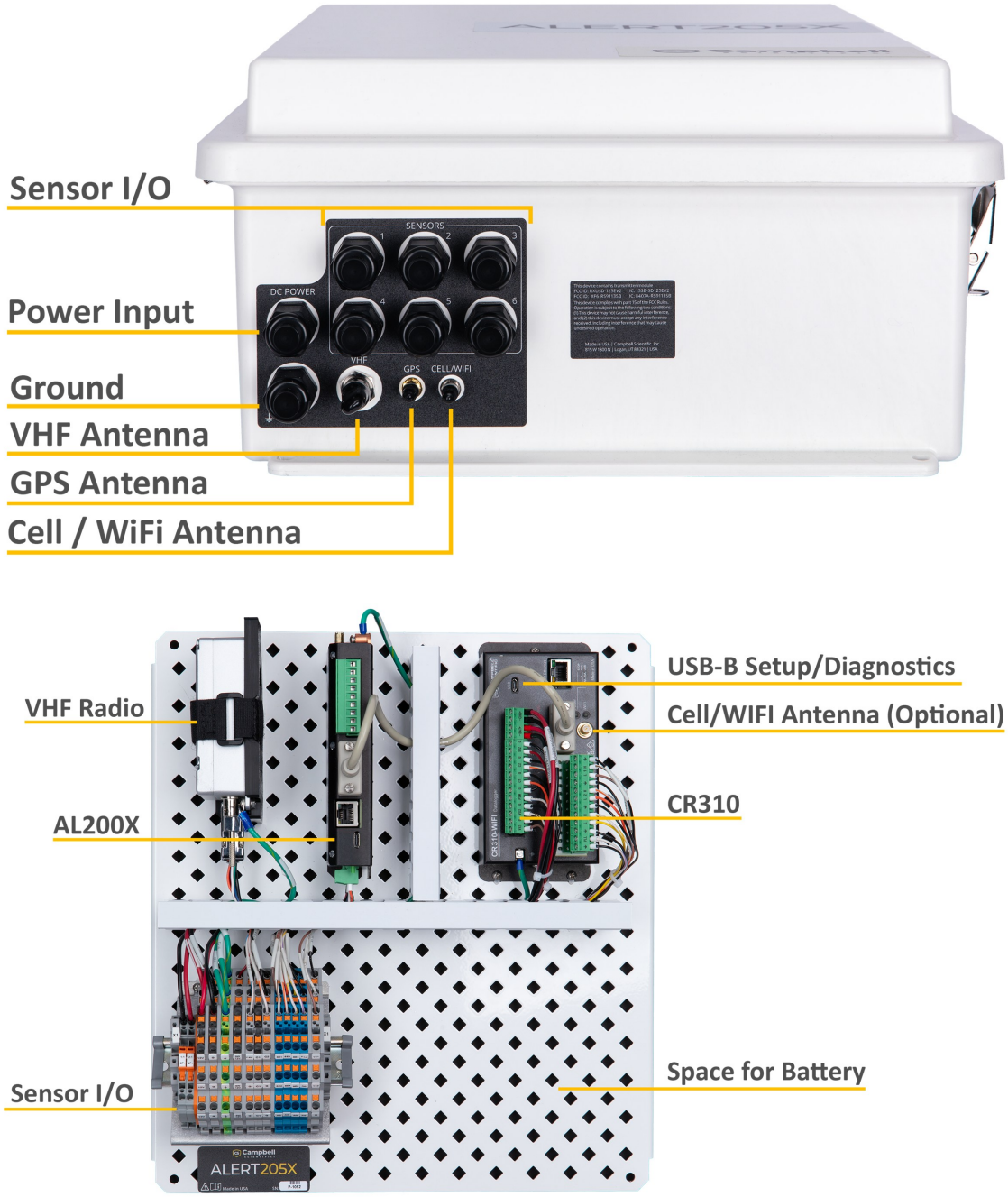


Figure 4-2. ALERT205X enclosure and panel configurations

4.3 VHF radio

The ALERT205X systems include a Maxon SD-125EL V2 radio with a frequency range of 148 to 174 MHz. This is a licensed frequency that requires registration with the appropriate authority. It is the customer's responsibility to license the frequency being used. The radios are programmed to the

customer supplied frequencies during the manufacturing process. The customer frequencies should be communicated at the time of order. Up to 16 frequencies can be programmed on a single radio.

The recommended VHF antenna kit is Campbell Scientific part number 35539. The VHF antenna kit includes all the necessary cables, mounts, connectors, and antenna for typical VHF radio applications. The whip-style omni antenna and ground radials are field-tunable for a specific frequency, and the stainless-steel mounting hardware allows for easy installation atop a mast. Coaxial cables are included to connect the VHF radio to the surge suppressor, and the surge suppressor to the antenna.

4.4 GPS

The GPS interface is built directly into the AL200X. It requires an active GPS antenna connected to the SMA port typically through a surge protector. A GPS antenna is required for ALERT2 installations.

It is recommended to install a surge suppressor in-line with the GPS antenna. Refer to Radio and GPS antenna (p. 36) for the recommended parts for your installation.

5. Specifications

Operating temperature:	-30 to 60°C (-22 to 140°F)
Sensor I/O connection	
Canister:	6x M12 8-pin
Enclosure:	6x strain relief plugs, DIN rail terminals
Panel:	DIN rail terminals
GPS connector:	SMA
VHF antenna connector:	BNC
Power connector	
Canister:	MS connector 3-pin
Enclosure:	Compression fitting, DIN rail terminals
Panel:	DIN rail terminals
Power input:	16 to 32 VDC (Connected to CHG port of CR310)

Radio:	Maxon SD-125EL V2 VHF Radio 148-174MHz
Dimensions	
Canister:	20.3 x 20.3 x 57.2 cm (8.0 x 8.0 x 22.5 in)
Enclosure:	40.6 x 45.7 x 20.3 cm (16.0 x 18.0 x 8.0 in)
Panel*:	34.3 x 38.1 x 12.7 cm (13.5 x 15.0 x 5.0 in)
Weight	
Canister:	5.3 kg (11.7 lbs)
Enclosure:	6.5 kg (14.25 lbs)
Panel:	2.1 kg (4.6 lbs)

*Panel part number 18823 Universal Backplate for ENC14/16 Enclosure; for panel dimensions please reference the product webpage for drawings.

See CR310, AL200X, and 44566 Maxon Radio specifications for more detailed specifications.

6. Installation

This section describes the physical installation of the ALERT205X at a field site. The physical attachment of power, antennas, and sensors will depend on the form factor of the system ordered. It is good practice to connect all components, configure the system, and test in the office before deploying the system in the field.

The following installation instructions will assume the use of a backup battery in the system. This is the typical configuration in the field. It is possible to connect the system to AC mains by using an appropriate AC to DC converter.

6.1 Canister 9
6.2 Enclosure 11
6.2.1 Enclosure connections 12
6.2.2 Attaching an enclosure to a tripod mast 14
6.2.3 UT6, UT10, UT20, and UT30 tower installation 16
6.2.4 Pole mount 19
6.3 Panel 22

6.1 Canister

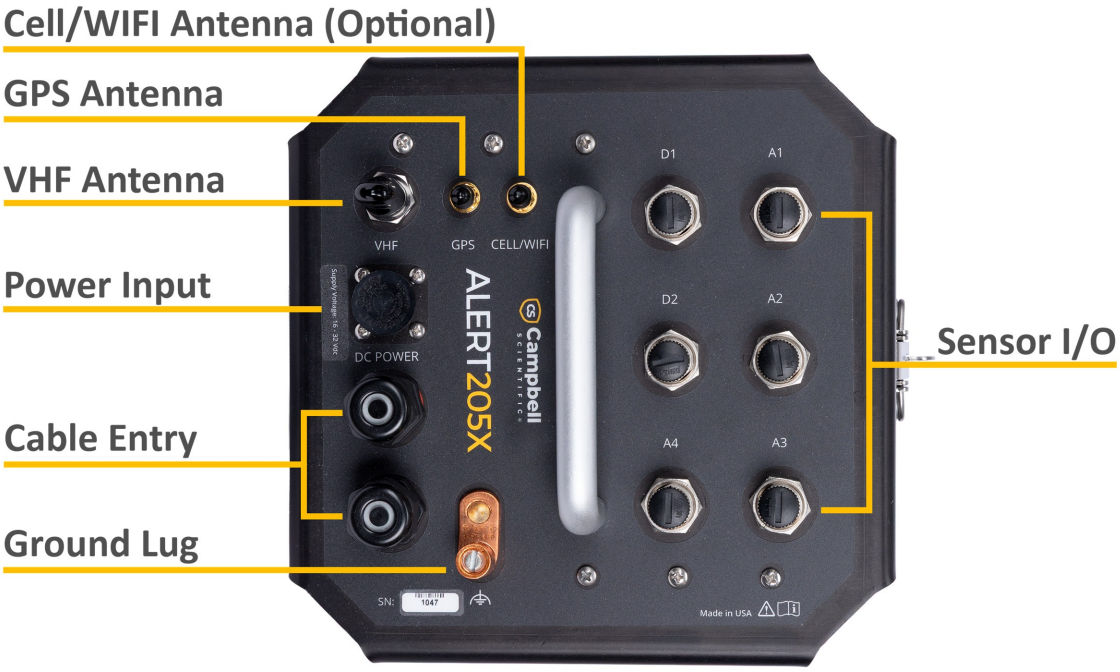
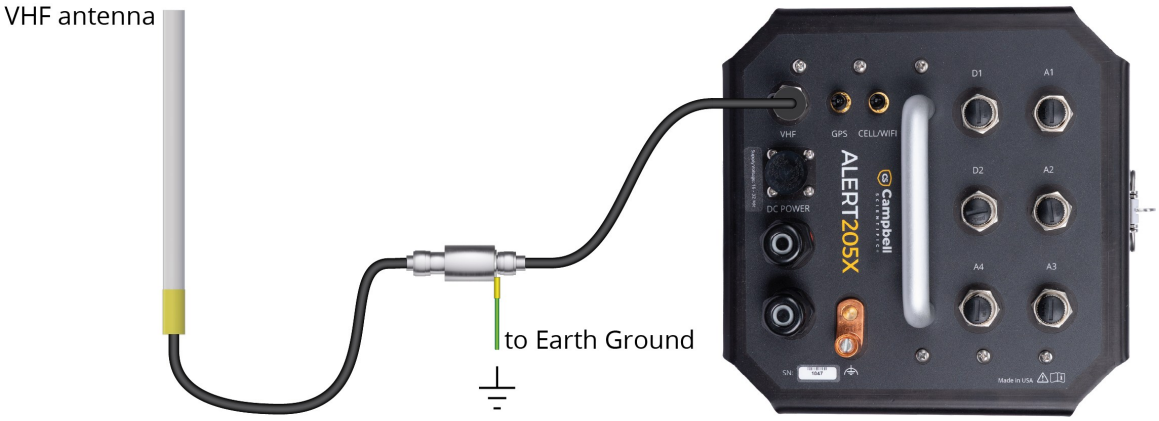


Figure 6-1. ALERT205X canister lid connectors

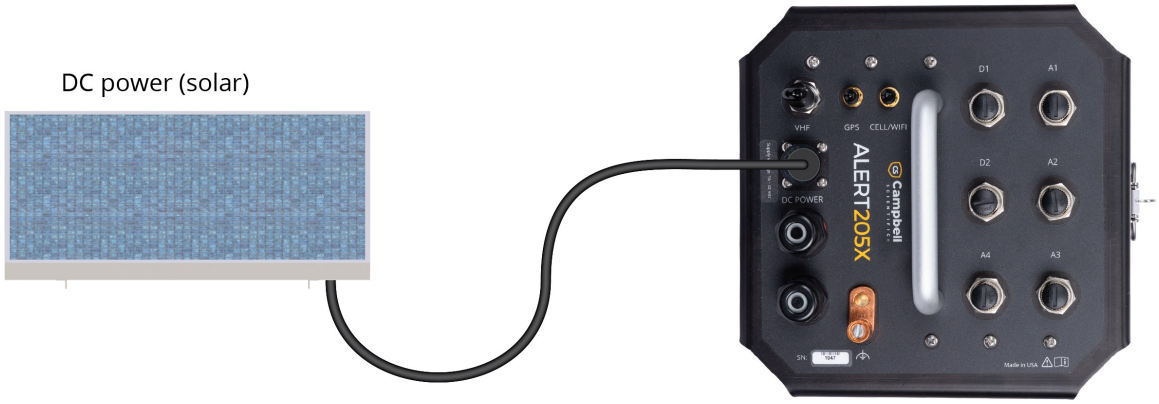
1. Attach a GPS antenna to the GPS SMA connector located at the top of the canister lid. It is recommended to connect the GPS antenna with appropriate surge suppression. Reference Radio and GPS antenna for options.



2. Attach a VHF antenna to the VHF BNC connector located at the top of the canister lid. It is advisable to connect a 50-ohm dummy load if powering the system without a VHF antenna. It is recommended to connect the VHF antenna with appropriate surge suppression. Reference Radio and GPS antenna for options.



3. Attach the desired sensors to the appropriate M12 connector port located at the top of the canister lid. See System connections (p. 38) for more details on the connector requirements and pinouts.
4. Attach an Earth ground to the ground lug located at the top of the canister lid.
5. Install an appropriately sized 12 VDC battery. Use the hook and loop strap around the battery to secure. Attach the black wire to the negative terminal of the battery using the spade connector. Attach the red wire to the positive terminal of the battery using the spade connector.
6. Attach DC power cable to a 16 to 32 VDC source. This connection typically comes from a solar panel up to 20 watts.



6.2 Enclosure

The ALERT205X enclosure option is ideal for installations that require a weatherproof solution for an ALERT2 field station. It uses the same internal layout as the panel option, with DIN rail terminals for sensor, ground, and power connections, six sensor strain relief plugs, and separate fittings for the ground and DC power cables. The GPS (SMA) and VHF antenna (BNC) connectors are located on the bottom of the enclosure. The system accepts 16 to 32 VDC from an external power supply or solar panel up to 20 watts.

The enclosure can be mounted to a tripod mast or small vertical pole, a lattice tower, or a large vertical pole. Mounting brackets are ordered separately and are selected by mounting structure.

The ALERT205X enclosure option requires purchasing mounting brackets for the intended mounting structure. The following part will outline what to order for your installation.

Table 6-1: Mounting bracket options for ALERT205X enclosure

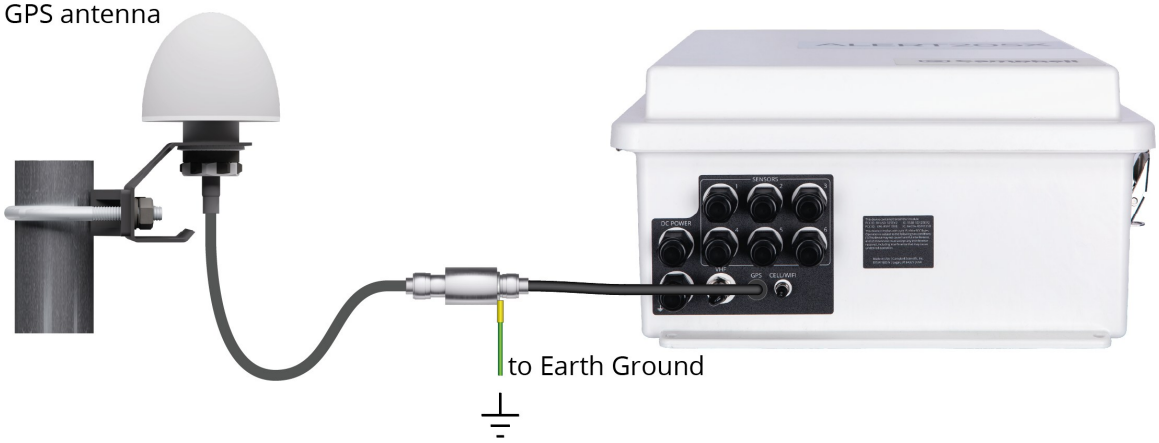
Part	Part number	Description
Small pole	19002	The 19002 is used to mount an enclosure to a tripod mast or to a user-supplied pole with a 1.25" to 2.1" outer diameter
UT tower	19017	The 19017 is used to mount an enclosure to a UT6, UT10, UT20, or UT30 tower
Large pole	27390	The 27390 provides mounting hardware for attaching an enclosure to a pole with a 4" to 10" outer diameter

6.2.1 Enclosure connections

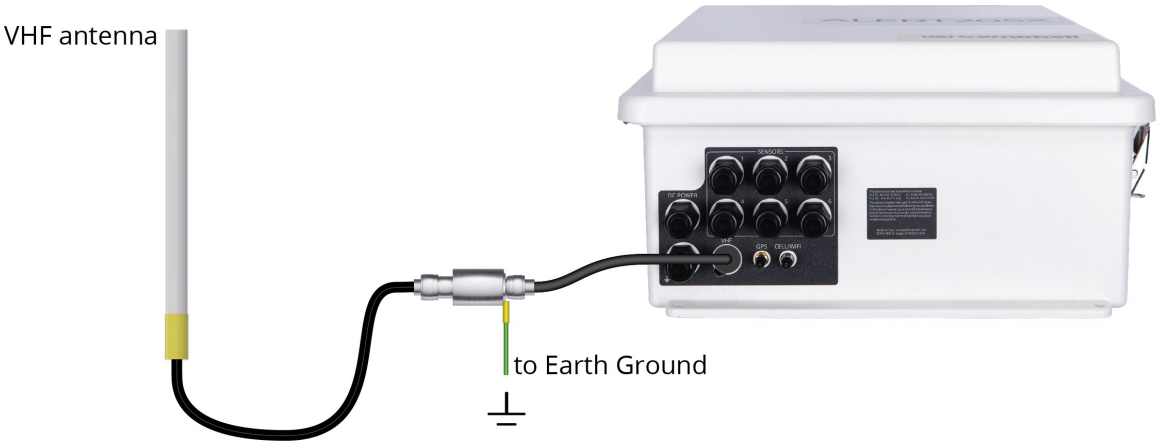


Figure 6-2. ALERT205X enclosure connectors

1. Attach a GPS antenna to the GPS SMA connector located at the bottom of the enclosure. It is recommended to connect the GPS antenna with appropriate surge suppression. Reference Radio and GPS antenna for options.



2. Attach a VHF antenna to the VHF BNC connector located at the bottom of the enclosure. It is advisable to connect a 50-ohm dummy load if powering the system without a VHF antenna. It is recommended to connect the VHF antenna with appropriate surge suppression. Reference Radio and GPS antenna for options.



3. Route the cable inside the enclosure using the available sensor wire compression fittings on the bottom side of the enclosure. Terminate the sensor wire to the appropriate port on the DIN rail termination block. The enclosure and panel share the same panel layout. See Sensors for more details on the sensor termination requirements.

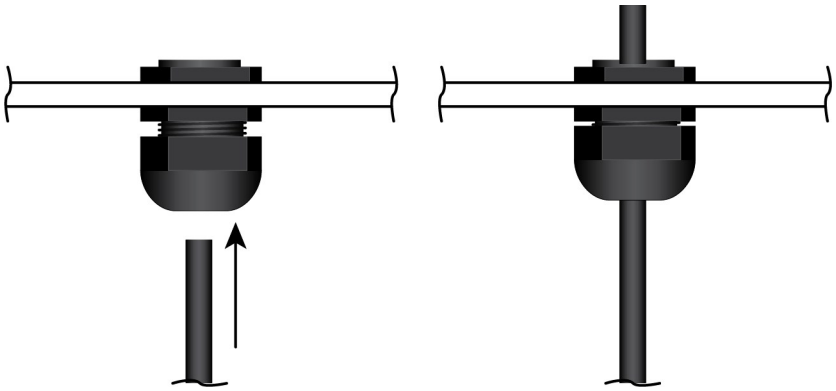


Figure 6-3. Cable inserted into compression fitting

4. Route an Earth ground cable inside the enclosure using the ground wire compression fitting and terminate in the appropriate port on the DIN rail termination block. See Sensors for more details on the termination requirements.

5. Route the DC power cable from a 16 to 32 VDC source inside the enclosure using the DC POWER wire compression fitting and terminate in the appropriate port on the DIN rail termination block. This connection typically comes from a solar panel up to 20 watts.



WARNING:
The radio can be damaged if it transmits without a proper dummy load or antenna.

6.2.2 Attaching an enclosure to a tripod mast

The mast mount part is intended for mounting the ALERT205X enclosure to the mast of a tripod. The mounting bracket will be shipped with a three-piece bracket that will need to be mounted to the top and bottom of the enclosure (see Figure 6-4 [p. 15], Figure 6-5 [p. 15], and Figure 6-6 [p. 16]).

Attach the enclosure to the mast as follows:

1. Position the enclosure on a side of the mast facing away from the equator.
2. Place the enclosure at the desired height, typically 1-2 m (3-6 ft) from the ground.
3. Use the furnished 2-inch U-bolts to secure the enclosure to the tripod mast.
4. Route the 14 AWG wire from the brass tripod ground clamp to the enclosure ground terminal. Strip 2.5 cm (1 in) of insulation from each end of the wire and insert the end of the wire into the ground terminal.



Figure 6-4. An enclosure with the "–MM" mounting option attaches to a tripod mast via U-bolts



Figure 6-5. This exploded view shows the components of a "–MM" bracket



Figure 6-6. An enclosure attached to a tripod mast

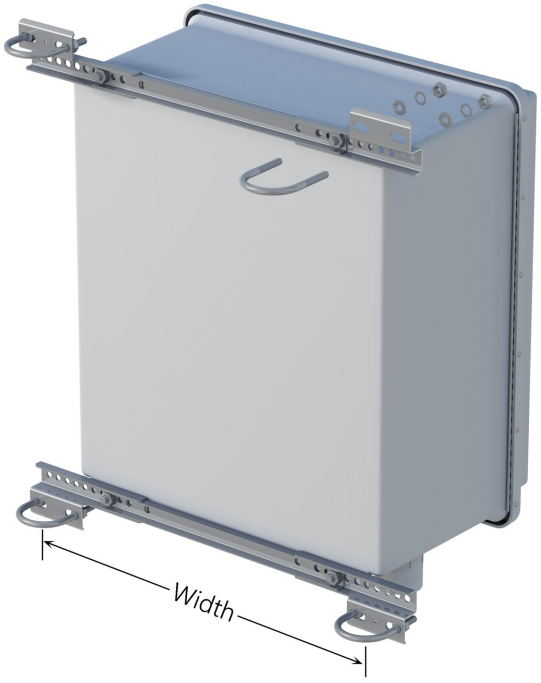
6.2.3 UT6, UT10, UT20, and UT30 tower installation

The tower mount bracket is used to attach the ALERT205X enclosure to a tower. The mounting bracket will be shipped with a three-piece bracket that needs to be mounted to the top and bottom of the enclosure. This mounting bracket option uses the same three-piece brackets as the mast mount bracket, except the pieces are rearranged so that the flanges are on the side of the bracket instead of in the middle. The distance between the centers of each flange needs to be 26 cm (10.25 in) for the UT6 and UT10, or 43 cm (17 in) for the UT20 and UT30 (see Figure 6-7 [p. 17], Figure 6-8 [p. 18], and Figure 6-9 [p. 18]).

Attach the enclosure to the tower legs as follows:

1. Remove the bolts and nuts connecting the bracket to the enclosure.
2. Slide out the flange sections so the distance between the centers of each flange is set for the correct tower (see Figure 6-7 [p. 17]).
3. Reattach the bracket to the enclosure using the original bolts and nuts.
4. Position the enclosure on a side of the tower facing away from the equator.
5. Place the enclosure at the desired height, typically 1 m (3 ft) from the ground.

6. Use the furnished 1.5-inch U-bolts to secure the enclosure to the tower legs.
7. Route the 14 AWG wire from the brass tower ground clamp to the enclosure ground terminal. Strip 2.5 cm (1 in) of insulation from each end of the wire and insert the end of the wire into the ground terminal.



Tower	Width
UT6	26 cm (10.25 in)
UT10	26 cm (10.25 in)
UT20	43 cm (17 in)
UT30	43 cm (17 in)

Figure 6-7. Enclosure brackets configured for a tower mount



Figure 6-8. This exploded view shows the components of a "–TM" bracket option



Figure 6-9. An enclosure attached to two tower legs

6.2.4 Pole mount

The pole mount bracket is intended for mounting an enclosure to a vertical pole. An ALERT205X enclosure ordered with this option will be shipped with brackets, metal bands, and mounting hardware needed to secure the enclosure. The metal bands are routed through the brackets, and then around a vertical pole. They are anchored in place using screw clamps.

Attach the enclosure to a vertical tube as follows:

1. Position a bracket at the top of the enclosure as shown in Figure 6-10 (p. 19). Secure it with a bolt, washer, and locknut at each end. Attach the lower bracket in the same manner, rotating the bracket so it extends below the enclosure.

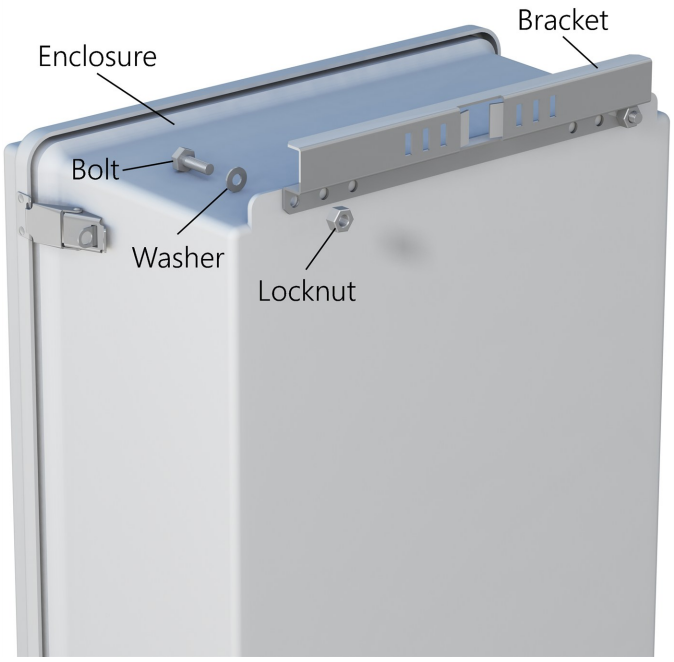


Figure 6-10. Attaching the pole mount bracket

2. Feed a metal band through the openings in each bracket as shown in Figure 6-11 (p. 20). Use the closest set of holes for smaller poles and the farthest set of holes for larger poles.

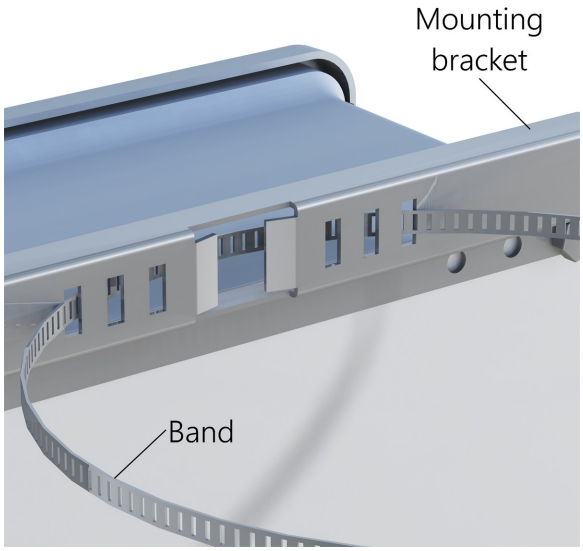


Figure 6-11. Inserting the metal band

3. Position the enclosure on the side of the pole facing away from the equator.
4. Place the enclosure at the desired height. Please note that the recommended cable lengths for the sensors assume the bottom of the enclosure is mounted 1 m (3 ft) from the ground.

5. Insert the tab on the end of the screw threads (Figure 6-12 [p. 21]) into the hole at one end of the upper strap.

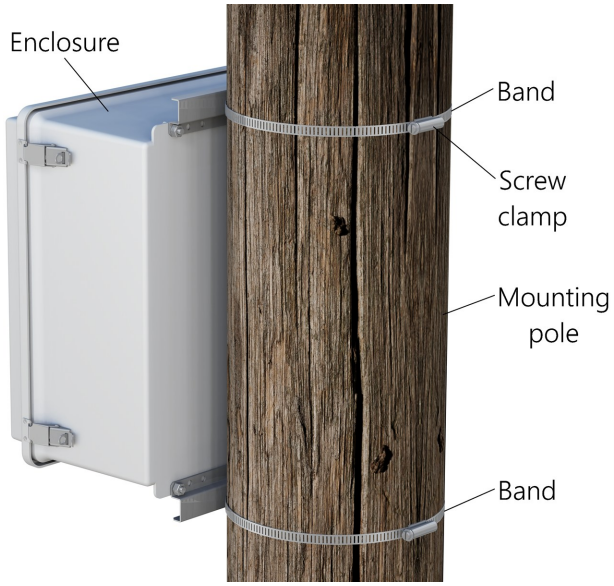


Figure 6-12. Securing the enclosure to a pole

6. Pull the strap tight around the pole to determine which hole to insert the screw clamp at the other end of the strap. Insert the clamp into this hole.
7. Use metal shears to remove any excess strap, leaving a small amount for adjustments.
8. Insert the screw threads into the screw clamp and tighten, using a flathead screwdriver or nut driver.
9. Repeat steps 5–8 for the lower strap.
10. Ensure the enclosure is properly grounded through the use of a ground rod or similar device.

6.3 Panel

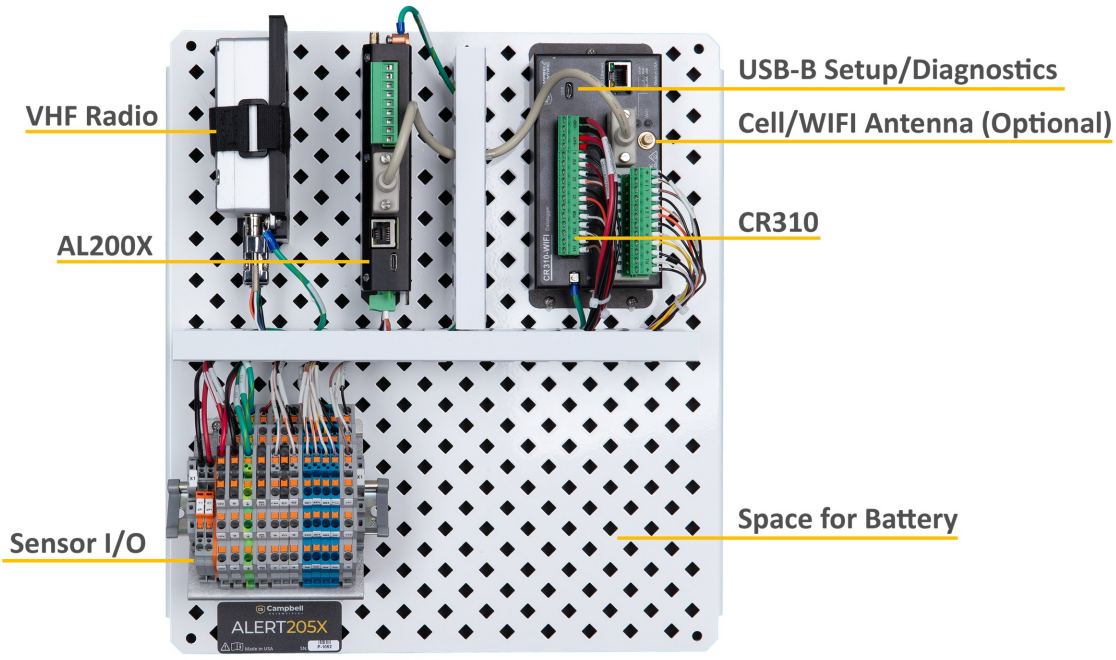
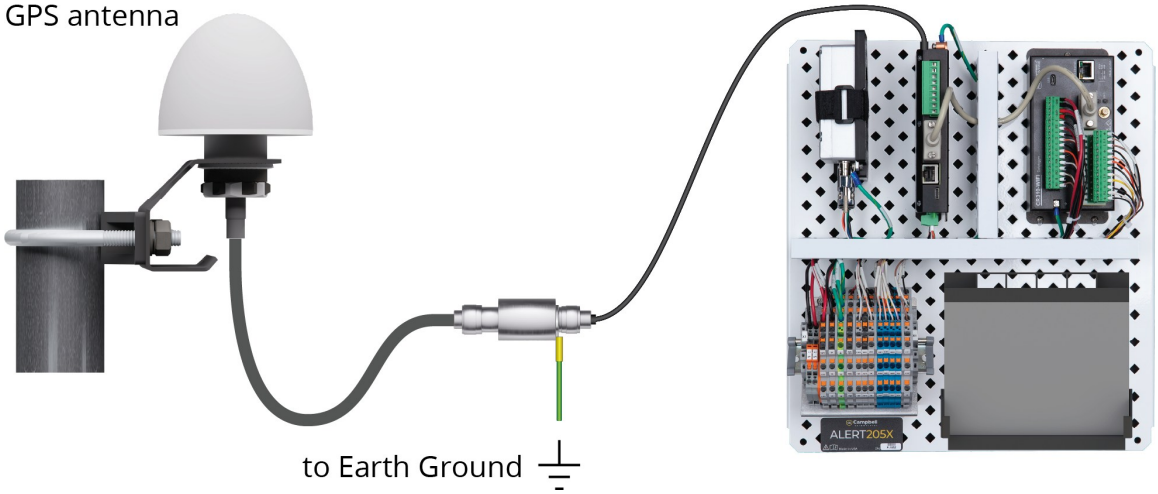
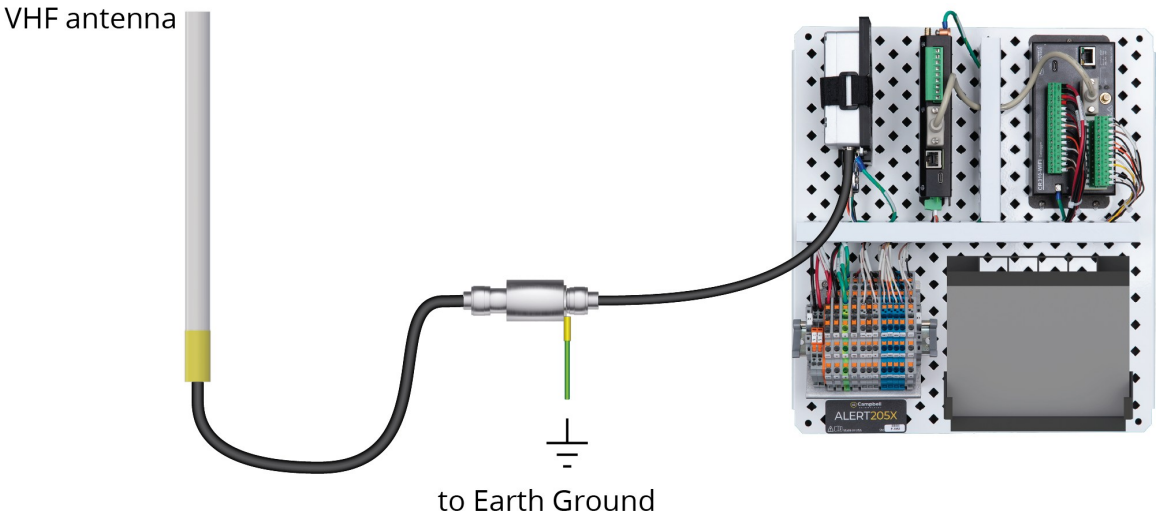


Figure 6-13. ALERT205X panel connectors

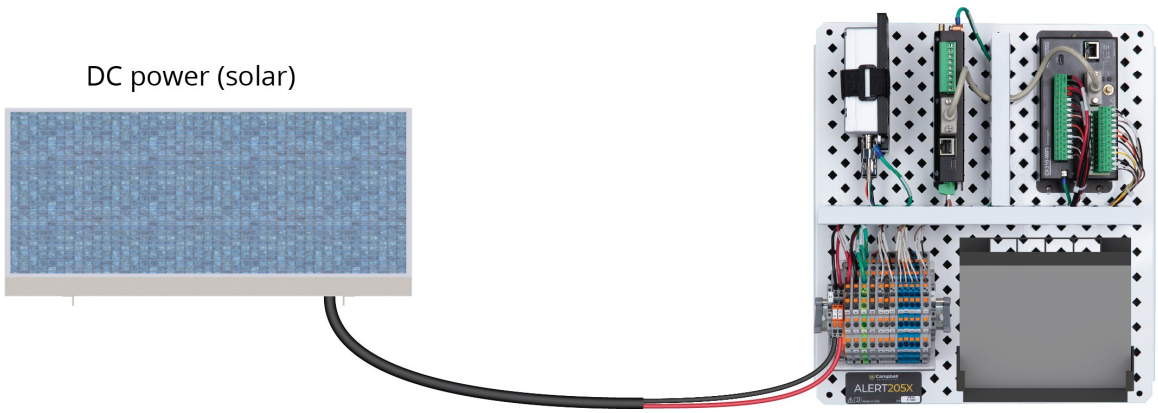
1. Attach a GPS antenna to the GPS SMA connector located on the AL200X GPS port. It is recommended to connect the GPS antenna with appropriate surge suppression. Reference Radio and GPS antenna for options.



2. Attach a VHF antenna to the VHF BNC connector located on the VHF radio. It is advisable to connect a 50-ohm dummy load if powering the system without a VHF antenna. It is recommended to connect the VHF antenna with appropriate surge suppression. Reference Radio and GPS antenna for options.



3. Terminate the sensor wire to the appropriate port on the DIN rail termination block. The enclosure and panel share the same panel layout. See Sensors (p. 44) for more details on the sensor termination requirements.
4. Terminate a wire from Earth ground to the appropriate port on the DIN rail termination block. See Enclosure and panel terminals (p. 43) section for more details on the termination requirements.
5. Route the DC power cable from a 16 to 32 VDC source and terminate in the appropriate port on the DIN rail termination block. This connection typically comes from a solar panel up to 20 watts.



7. Operation

The operation and configuration of the ALERT205X is done through the browser-based ALERT205X User Interface (UI) that is hosted on the CR310. This section will provide steps to getting your ALERT205X operational.

WARNING:
Do not update the CR310 operating system or any settings using device configuration utility. These updates and settings are handled by the ALERT205X UI.

WARNING:
Do not update or change any settings on the AL200X. Settings are changed by the serial interface from the CR310.

7.1 ALERT205X UI 25
7.1.1 Connecting to the ALERT205X 26
7.1.2 Apply to station 26
7.2 ALERT2 and AL200X settings 27
7.2.1 Ethernet settings 28
7.2.2 Wifi and cellular (optional communications) 29
7.2.3 Add measurements 29
7.2.4 Restoring factory defaults 31
7.2.5 Creating accounts and password 31
7.2.6 Monitor data 33
7.2.7 Diagnostics 34
7.2.8 Change the address of an SDI-12 sensor 34
7.2.9 Update the software 35
7.3 Radio and GPS antenna 36
7.4 System connections 38
7.4.1 Canister field wirable connector 38
7.4.2 Enclosure and panel terminals 43

7.5 Sensors 44
7.5.1 LevelVue B10 bubbler water level 45
7.5.2 RangeVue 15/30 radar water level sensors 47
7.5.3 CS451 and CS456 pressure transducers 48
7.5.4 RainVue series rain gauges 48
7.5.5 Tipping bucket rain gauges 49

7.1 ALERT205X UI

The ALERT205X UI or Web UI is a program running on the ALERT205X data logger that simplifies the configuration of the ALERT2 field station. It automatically builds a data logger program that controls the communication between the AL200X and field sensors and devices. Knowledge of CRBasic is not needed because the program is automatically created.

> NOTE:
> There are a lot of information bubbles ⓘ with detailed information and instructions about each setting. Use these as additional information that may not be found in this manual.

The ALERT205X UI has the following main menus:

- **Dashboard** provides real time data about the system status and connected sensors.
- **Configuration** enables quick and easy configuration of the system. After the configuration is complete, click **Apply** to automatically create the data logger program. You can click **Config Report** to display and print the configuration and wiring information for the sensors. The configuration can be saved to be used to automatically recover the station information or to configure other stations with the same configuration. Communications information is included in the saved file and will need to be changed when used on the same ALERT2 network. **User Accounts** can be managed to control access to the user interface.
- **Monitor Data** displays the data tables and contents. The data can be collected and downloaded, displayed, and graphed.
- **Diagnostics** accesses the data logger status table, which contains valuable troubleshooting and system performance information. Updates to the data logger operating system, programs and web pages are made using the **Updates** tab. The Watch tab provides a terminal window with a serial (SDI-12 and RS-232) talkthrough and watch mode for viewing raw communications data and setting up sensors.

7.1.1 Connecting to the ALERT205X

> **NOTE:**
> The device driver for the CR310 must be installed on your computer before you can connect to the CR310.

Connecting to the ALERT205X for the first time requires a direct connection using the USB port on the data logger.

1. Connect the supplied USB cable between the USB-A port on your computer and the USB-microB port on the CR310. Alternatively, the UI can be accessed over the Ethernet port. The default behavior of the Ethernet port is DHCP.

   > **NOTE:**
   > The CR310 can be powered for configuration over the USB port. It will not power the sensors.

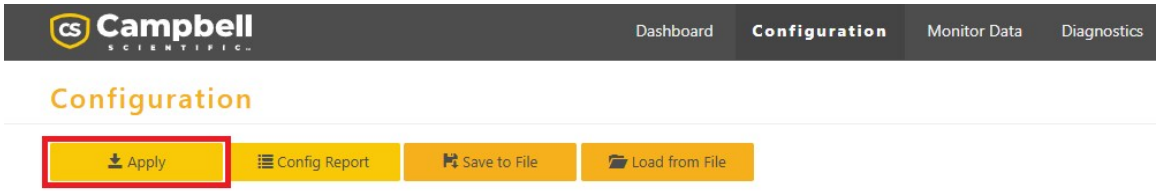
2. Open a browser on your computer and type **www.linktodevice.com** or **192.168.66.1** (default IP) in the URL.
3. The dashboard will be the main screen. Click on **Getting Started** for instructions or go to the **Configuration** page to start setting up the system.

   Once you are connected to the system with a web browser, navigate to the **Configuration** page. Enter the **Station Parameters**, setup **Communications Options**, and **Add Sensors**.

   If you would like to be able to configure the ALERT205X remotely, you will need to set up an account with Administrator privileges. See Creating accounts and password (p. 31) for help setting up user accounts.

7.1.2 Apply to station

Navigate to the **Configuration** window and select **Apply**. In the pop up window, click to confirm the Apply and submit the configuration to the ALERT205X.



> **NOTE:**
> Apply to Station can be used at any time to apply the settings to the data logger. Single or multiple additions, changes or deletions of configuration can be applied at any time. Apply to

Station compiles the settings into a new CRBasic program. This new program creates new data tables thus all previous data is lost. The data logger program is updating and may take a few minutes to complete before new data is displayed.

7.2 ALERT2 and AL200X settings

This section covers the ALERT2 and AL200X settings that determine how the station reports on your ALERT2 network.

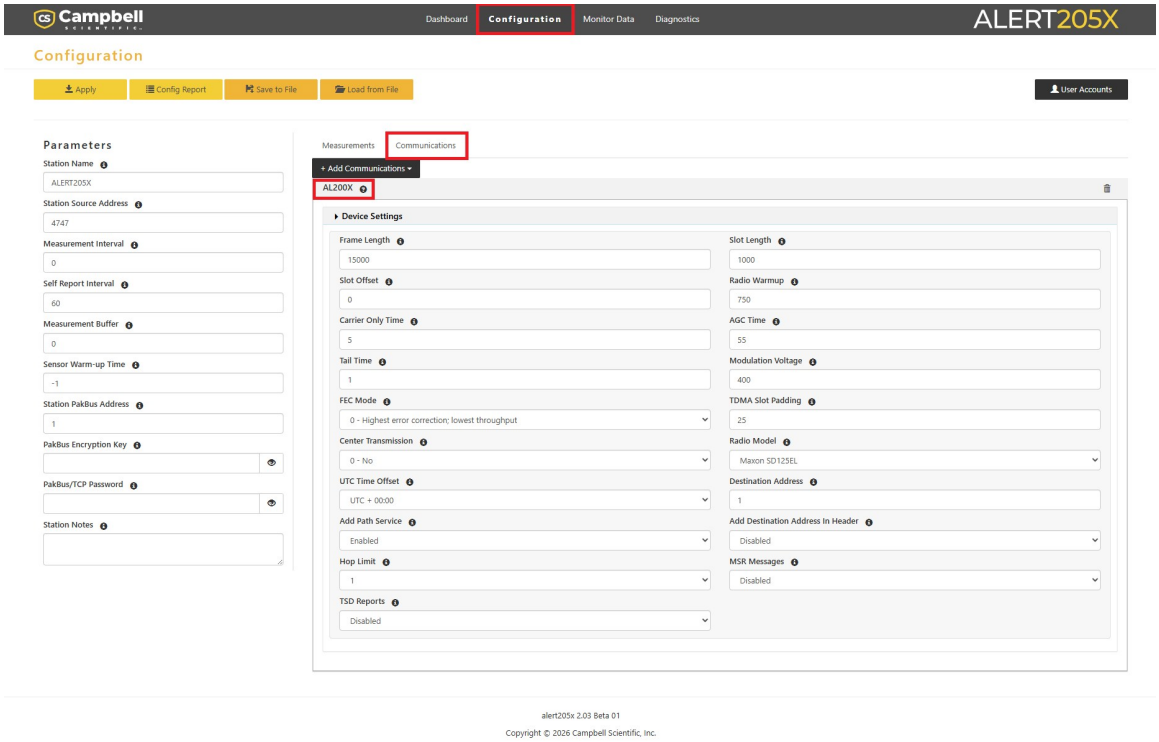
Have your ALERT2 system information ready before you begin:

- Station ID or Source Address assigned by your network administrator
- Frame length
- Slot length
- Offset
- Any requirements for the network.

Values that do not match the network design can prevent the station from reporting or can interfere with other stations on the network. Confirm the information with the person who maintains your ALERT2 network before applying the configuration.

1. Click on the **Configuration** tab at the bar on the top of the screen. This will load a screen with station **Parameters** on the left with **Measurements** and **Communications** settings to the right.
2. Set the station **Parameters** as required and mapped out by your system design.

3. Select the **Communications** tab and click on **AL200X** to expand the settings.

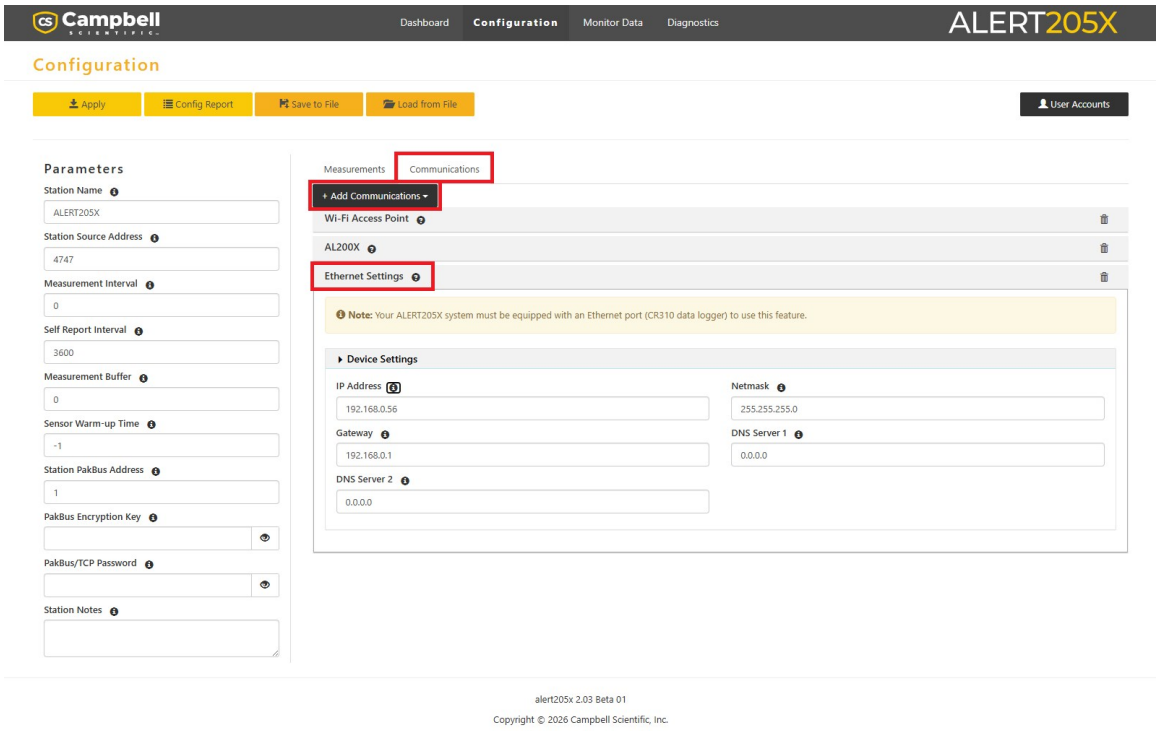


4. Modify the settings as needed for your system.
5. Once all the settings and sensors are added, click on **Apply** to save the settings and automatically create the program on the system.

7.2.1 Ethernet settings

1. Click the **Communication** tab and select **+Add Communications**. Click **Ethernet Settings** to expand the selection.

2. Configure the Ethernet interface by entering the IP Address, Netmask, and Gateway that the data collection system is expecting to use to communicate with the ALERT205X. Use the inline context help in the UI for additional information.



7.2.2 Wifi and cellular (optional communications)

The ALERT205X can be configured to include WiFi and cellular options for additional flexibility. The WiFi option is useful for connecting to the system locally for setup over a WiFi connection on a WiFi enabled device such as a cellular phone or tablet. The cellular option allows remote connection over a cellular network for system diagnostics and stored data collection.

1. Click the **Communication** tab and select **+Add Communications**. Click on your Communication option to expand the selection.
2. Configure the WiFi or cellular interface, filling in the settings as needed. Use the inline context help in the UI for additional information.

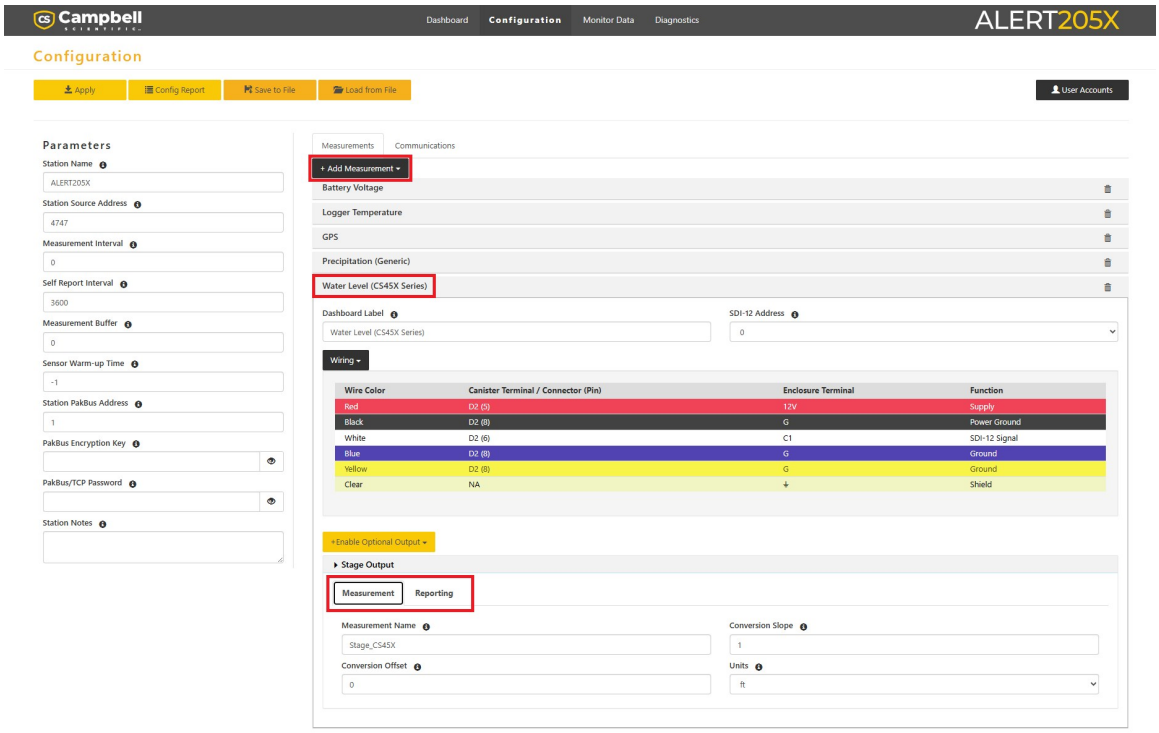
7.2.3 Add measurements

Measurement devices or sensors can be added within the **Configuration** screen. It is important to design the system around the desired sensors and the available ports. The sensor menus are grouped by general output type, functional type, and manufacture model. Generic options are available for analog and SDI-12 sensors if a specific sensor is not supported. Only one sensor can

be added at a time. Clicking on the sensor title will open the submenu. Clicking it again will close the submenu.

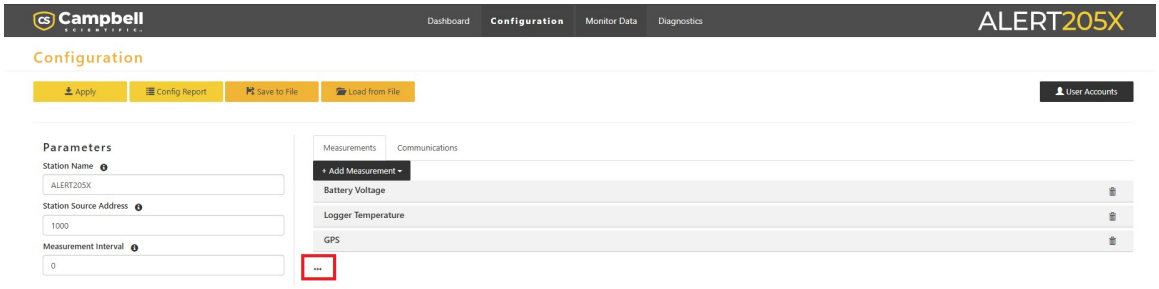
1. Click on the **Measurements** tab. The battery voltage, data logger temperature, and GPS are loaded by default.
2. Click **+Add Measurement** to see a list of available sensors.
3. Select on the general output type, the functional type, and the manufacture model.
4. After adding the sensor to the list, type the parameters for that sensor to customize it for your application:
    a. **Sensor Description** is used as the title of the measurements on the **Dashboard**. Although editable, Campbell Scientific suggests using the default sensor description for most circumstances.
    b. Sensor addresses must match what is set on the sensor. Many of the sensors used on the ALERT205X are SDI-12. The default communication address is set to 0. Some configurations allow multiple sensors on a single port. In this case the sensor will need to be set to an address that does not conflict with another sensor. Some SDI-12 sensors have multiple parameters beyond the default that load when adding a measurement. Click the **+Enable Optional Output** button to include the additional parameters you would like to include.
    c. Each measurement for a sensor includes a **Measurement** name. This can be modified as needed. The options included in the **Measurement** tab is dependent on the sensor that was added. Many have the option to change the units and provide a slope and offset as required.
    d. The reporting tab includes the ALERT2 sensor ID. Measurements will default to the recommended ALERT2 value where applicable. The sensor IDs used by a station must be unique. Also set the change to trigger a transmission, ALERT2 via IND, TSD Report, and TSD Sample Count from this tab. Use the inline context help in the UI for additional information.
5. View the wiring diagram for the sensor by clicking on **Wiring**. The wiring table is also available in the **Config Report**.
6. If you selected a sensor by mistake or no longer wish to read data from it, remove it from the running configuration by clicking the trash can icon next to the sensor heading.

7. Once you have added all the sensors, click **Apply to Station** and the ALERT205X will start reading your sensors. The data logger program automatically updates, which may take a few minutes to complete before new data is displayed.



7.2.4 Restoring factory defaults

1. In the **Configuration** tab, click on the ellipsis below the **+Add Measurement** section of the **Measurements** tab.
2. Click on the **Reset Factory Defaults** popup button and confirm **Yes** in the pop up window.



7.2.5 Creating accounts and password

The ALERT205X allows the user to setup accounts to secure the system. The system is protected by password access. If you are connected by using the USB connection, all access is granted. If you want to control how the system is accessed remotely, you can set up user accounts. If you

want to be able to configure the system remotely, you will need to set up a user account with Administrator permission level.

To manage user accounts, click **User Accounts** on the **Configuration** page to access the **User Account Setup** dialog.

> **TIP:**
> You must be connected over USB or logged in under a previously created account with Administrator access.

The following table explains what permission levels are available:

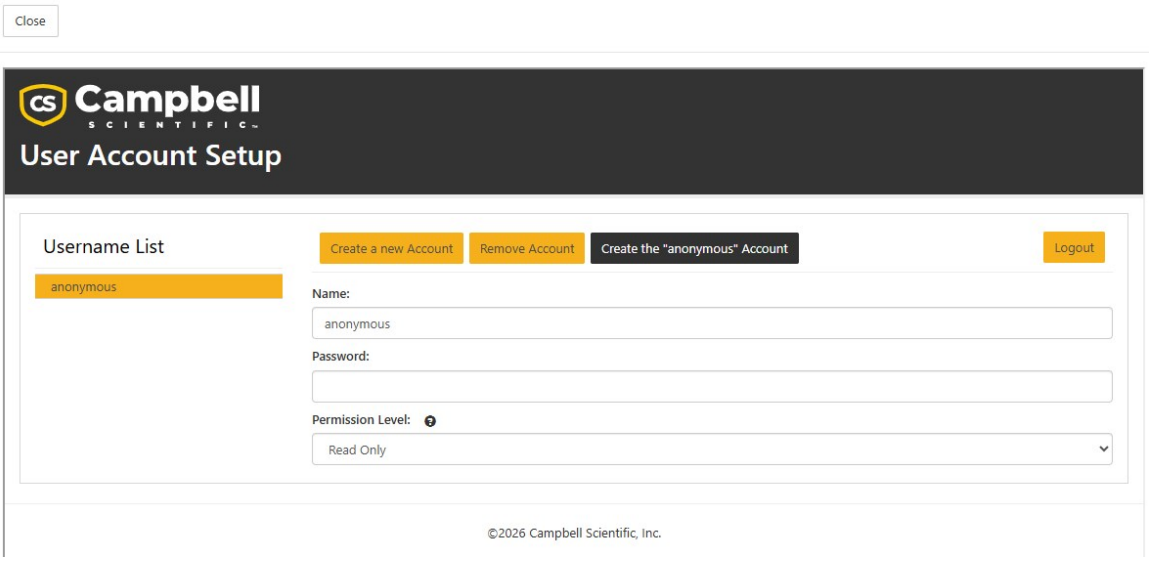
Table 7-1: User account permissions

Permission level	Access
None	Disable an account without deleting it
Read Only	Permission to view the system values
Administrator	Permission to view the system values, to edit the system configuration, and to create and edit accounts

> **NOTE:**
> Creating an account with the user name "**anonymous**", without a password, will allow the specified access to anyone that connects to the system without having to enter a user name. A default **anonymous** account exists with read-only access. This allows anyone to see the **Dashboard** and the **Monitor Data** pages without having to enter a user name.

> **NOTE:**
> The **anonymous** account without password must exist to properly access the system using the Apple Safari browser.

Once the account is created, click on close and **Apply** the settings.



7.2.6 Monitor data

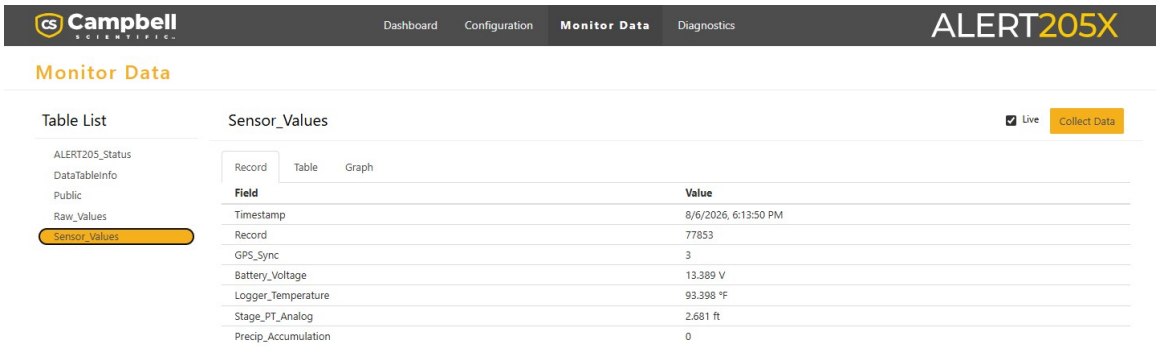
The **Monitor Data** tab allows the user to view the raw data tables from the system and can provide valuable information about the health of the system and sensor measurements. The **Dashboard** provides a quick glance of the system, while the **Monitor Data** tab can provide more information.

There is a list of the data tables on the left hand side of the page.

- The **Record** tab shows the most recent values in tabular format of the selected table.
- The **Table** tab provides historical data of the selected table.
- The **Graph** tab allows you to plot values of the selected table.

  Enter the number of records you would like to see in the graph and then select the value to graph. A gear icon next to the graph allows you to use auto scaling by default or set the Y axis min and max value.

  Live data can be displayed by the checkbox in the upper right of the interface. A **Collect Data** button allows the user to download data by selecting the table to collect, the file format, and the data filter for how much data to download.



7.2.7 Diagnostics

The **Diagnostics** tab allows the user to view detailed status information in real time, use the terminal for setting SDI-12 sensors, and update the software to the system.

The **Status** tab can provide insight into the health of the system. If there are issues, tech support may want to review this tab.

The **Watch** tab provides serial talk through for tasks such as setting the communications ID of an SDI-12 sensor.

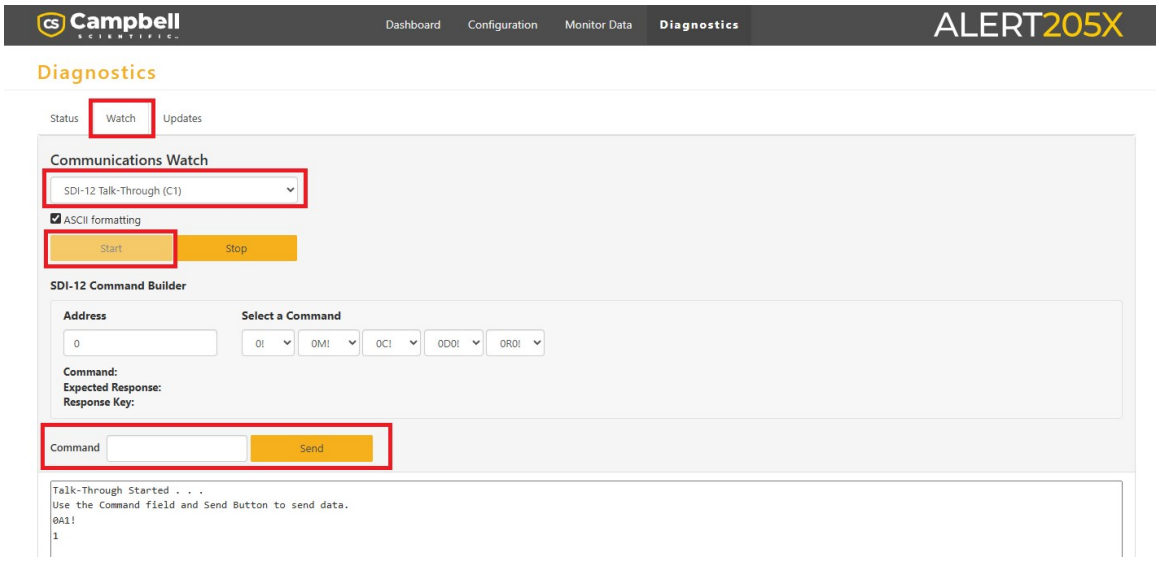
The **Updates** tab allows for updating the software of the system.

7.2.8 Change the address of an SDI-12 sensor

When changing the ID of a sensor on a port, there should not be any other sensors with the same ID connected to that port.

1. In the **Diagnostics** window, click on the **Watch** tab.
2. Under **Communications Watch**, select **SDI-12 Talk-Through** for either channel **C1** or **C2** depending on what port the SDI-12 sensor is connected to.
3. Keep ASCII formatting selected and click **Start**. This will open the communication line from the data logger to the sensor.
4. In the **SDI-12 Command Builder**, enter the address of the sensor. Default is typically 0 from the factory. To query the sensor for its current SDI-12 address, type **?!** in the **Command** window and press **Send**.

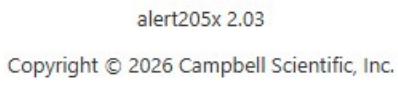
5. To change the SDI-12 address, type **aAb!** into the command window, where **a** is the current address and **b** is the new address. Press **Send**. The sensor changes its address and responds with the new address. In the following example, the sensor address is changed from 0 to 1.



7.2.9 Update the software

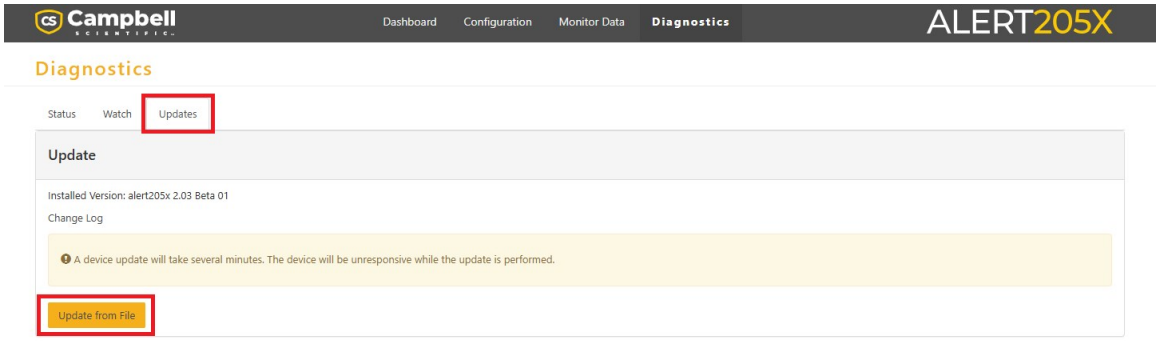
Occasionally Campbell Scientific will release software updates for the ALERT205X. These software updates can contain added features or bug fixes. It is good practice to update your software as new releases are provided.

1. It is good practice to save your configuration before applying the update. Navigate to the **Configuration** page and click **Save to File** and save the file to a known location on your computer.
2. It is also good practice to save any logged data. See Monitor data (p. 33) section for instructions on downloading data.
3. From any screen, scroll to the bottom of the page and determine the current version of the system.



4. New software versions can be accessed from the product web page or on the Campbell Scientific website. Download the latest version to a known location on your computer.
5. In the **Diagnostics** window, click on **Updates**.

6. Click on **Update from File**.



7. A pop up window will appear. Click on **Begin** and navigate to the software update file you saved onto your computer. The file will be labeled **alert205x_X.XX.web.obj.gz**. Select this file (do not unzip). Click **Open** in the file browser and the system will immediately start updating. A couple of progress bars will appear while updating. The USB connection will disconnect and reconnect during this process. This can take a few minutes.
8. Once the update has been applied, the system will automatically navigate to the **Configuration** tab with a window saying that you need to apply the configuration. Click on **Apply** and click to confirm **Apply** in the pop up window to submit the configuration. The system should retain the settings previously applied.

7.3 Radio and GPS antenna

There are two types of antennas that are needed for proper operation of the ALERT205X system. A VHF radio antenna is used to broadcast data over the VHF radio network and a GPS antenna is used to keep accurate time.

It is important to attach an appropriate antenna to properly communicate over the VHF network. The ALERT series of systems all come standard with the Maxon model SD-125EL V2 VHF modem. The frequency range of the Maxon VHF radio is between 148 to 174 MHz. The radios can be programmed by Campbell Scientific with customer supplied frequencies. Up to 16 frequencies can be programmed with channel one selected unless otherwise specified. Once multiple frequencies are programmed, the frequency can be changed by removing the lid of the radio via four Phillips screws and then changing the dip switches to the desired channel.

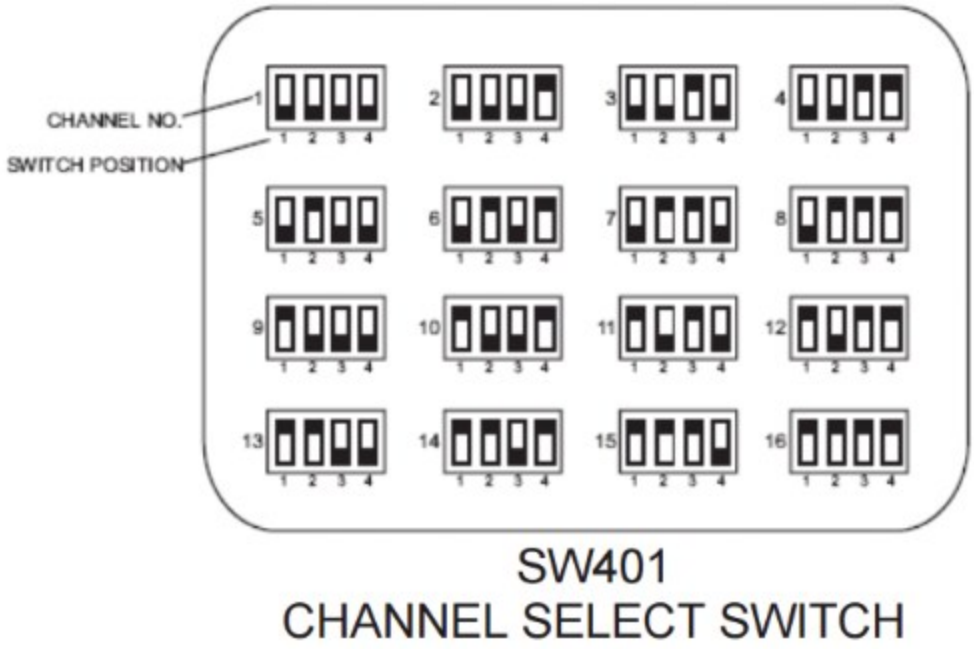


Figure 7-1. Channel select switch

When connecting an antenna, it is recommended to include surge suppression. The recommended GPS and VHF antenna kits come with appropriate surge suppression devices and all the required cables for making the connections.

GPS antenna parts

Table 7-2: Recommended GPS antenna parts for order

Part	Part #	Description
GPS Antenna	17992	28 dBi 3.3 V active GPS Antenna without Cable
Surge Protection Kit	31326	Includes: • 31180 surge suppressor • 29553 bulkhead grounding cable • 31316 antenna cable type N pin (male) to SMA pin (male) • 43529 surge suppressor mounting bracket • 14464 nylon grommet and 15763 screws
GPS Antenna Cable	45040	COAX3NT antenna cable Type N Pin (Male) and TNC Pin (Male) Connectors, various lengths

VHF antenna parts

Table 7-3: Recommended VHF antenna parts for order		
Part	Part #	Description
VHF Omni Antenna Kit	35539	Includes: • 29549 Surge suppressor type N • 35535 Cable type N to type N • 35536 Cable type N to BNC • 35534 VHF/UHF antenna base • 35533 VHF 5/8 wave screw on whip antenna

Antenna mounting options

Table 7-4: Mounting options for antenna		
Part	Part #	Description
GPS antenna mounting stand	30626	3/4 in. IPS or GPS Antenna Mounting Stand
Pipe mount	7623	3/4 IPS 10 in. Aluminum Pipe with Threads

7.4 System connections

System connections differ depending on which ALERT205X option you have. Canister systems have M12 8-pin connectors for sensor I/O, while panel and enclosure systems land them on DIN rail terminals. The sections below cover the M12 connector and pin assignments, then the wiring, power, and sensor connection details specific to each configuration. Follow the section that matches your system.

7.4.1 Canister field wirable connector 38
7.4.2 Enclosure and panel terminals 43

7.4.1 Canister field wirable connector

Traditionally ALERT-style canisters have used Mil-spec (MS) connectors for interfacing with sensors in the field. The ALERT205X canister uses the Campbell Scientific standard M12 8-Pin A-coded connector for ease of use with new and existing sensors, better weather protection, and the ability to use field wirable connectors.

This section will go over the installation of existing sensors in the field using the 44328 field wirable connector.

For more information, see this field wirable connector installation video. Note this video is for another product line and uses a slightly different connector.

Wiring an existing sensor in the field or a sensor with bare leads to the canister M12 connector:

1. Route the cable through the pressing screw, followed by the clamping basket, seal, and then coupling sleeve.
2. Strip the main cable jacket 20 mm exposing the individual sensor wires.
3. Strip the individual sensor wires 5 mm exposing the conductors.
4. Wire each sensor conductor to the corresponding port to the plug insert. See Campbell Scientific M12 8-pin standard pin assignments (p. 40) table for the pin assignment locations. A 2 mm flat blade screwdriver is required (CSI part # 31608). Take care not to back out the set screw all the way.
5. Attach the coupling sleeve to the main connector housing by aligning the notch or key and screwing together. Screw in the pressing screw. Hand tighten all connections.

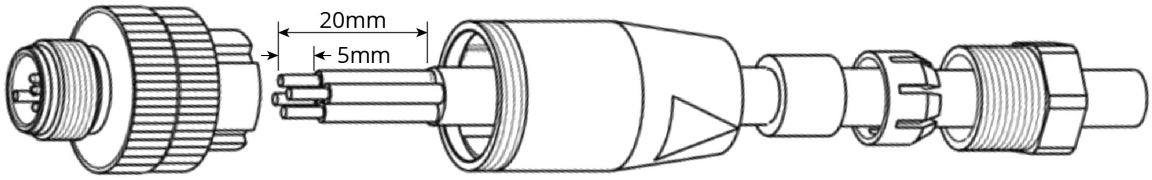


Figure 7-2. Wiring bare leads to an M12 connector



Figure 7-3. M12 connector as viewed from wire end of adapter

Table 7-5: Campbell Scientific M12 8-pin standard pin assignments		
M12 pin #	Signal	Color (CSI typical)
1	Universal 2	Blue
2	Analog 1 (or Universal 3)	Orange
3	Analog 2 (or Universal 4)	Purple
4	Detect	Gray
5	Power	Brown
6	SDI-12 / Identify	White
7	Universal 1	Yellow
8	Ground	Black

7.4.1.1 Sensor interface M12 8-pin connector pin assignments

This section provides the pin assignments for the M12 8-pin connectors of the sensor I/O on the top of the canister. The pinout follows a standard set by Campbell Scientific using a standard M12 8-pin A coded connector. The tables below also list the matching Mil-spec connector pin assignments, which are standard across many vendors. Use these when converting an existing installation to M12 connectors.

Table 7-6: D1

Pin #	Description	Standard wire color	Termination CR310	Mil-spec connector pin*
1	Universal 2 even	Blue	P_SW	A
8	Ground/shield	Black	G	D

*Mil-spec connector 5-pin precipitation

Table 7-7: D2

Pin #	Description	Standard wire color	Termination AL200X	Mil-spec connector pin*
1	Universal 2 even	Blue	P_SW	A
4	Ground/Detect	Gray	C2	C
5	Power (12VDC)	Brown	12V	B
6	SDI-12/Identify	White	C1	E
8	Ground/shield	Black	G	D

*Mil-spec connector 5-pin-R

Table 7-8: A1

Pin #	Description	Standard wire color	Termination AL200X	Mil-spec connector pin*
2	Analog1	Orange	SE1	A
3	Analog2	Purple	SE2	B
5	Power (12VDC)	Brown	SW12	C
8	Ground/shield	Black	G	D

*Mil-spec connector 4-pin-R

Table 7-9: A2

Pin #	Description	Standard wire color	Termination AL200X	Mil-spec connector pin*
1	Universal 2 Even	Blue	VX1	B
5	Power (12VDC)	Brown	SW12	C
7	Universal 1 Odd	Yellow	SE3	A
8	Ground/shield	Black	G	D
*Mil-spec connector 4-pin				

Table 7-10: A3

Pin #	Description	Standard wire color	Termination AL200X	Mil-spec connector pin*
1	Universal 2 Even	Blue	VX1	E
2	Analog 1	Orange	P_LL	A
7	Universal 1 Odd	Yellow	SE4	C
8	Ground/shield	Black	G	B/D
*Mil-spec connector 6-pin				

Table 7-11: A4

Pin #	Description	Standard wire color	Termination AL200X	Mil-spec connector pin*
1	Universal 2 Even	Blue	VX1	E
2	Analog 1	Orange	SE5	A
3	Analog 2	Purple	SE6	B
5	Power (12VDC)	Brown	SW12	C
8	Ground/shield	Black	G	D
*Mil-spec connector 6-pin-R				

Power to ALERT205X canister sensor connectors	
Connector	Pin 5 powered from
D1	N/A
D2	+12V
A1	SW12V
A2	SW12V
A3	+12V
A4	SW12V

7.4.2 Enclosure and panel terminals

The enclosure and panel share the same power and sensor I/O termination on a terminal block that is DIN rail mounted to an angle bracket, which makes the port labels easier to see. The port labels match the CR310 with an additional 12V port which is powered directly from the battery.

The SW12V port allows a sensor to be powered for a time to take a measurement and then powered back down to conserve power. The setting can be found in the **Configuration** window on the left side in the **Parameters** called **Sensor Warm-up Time**.

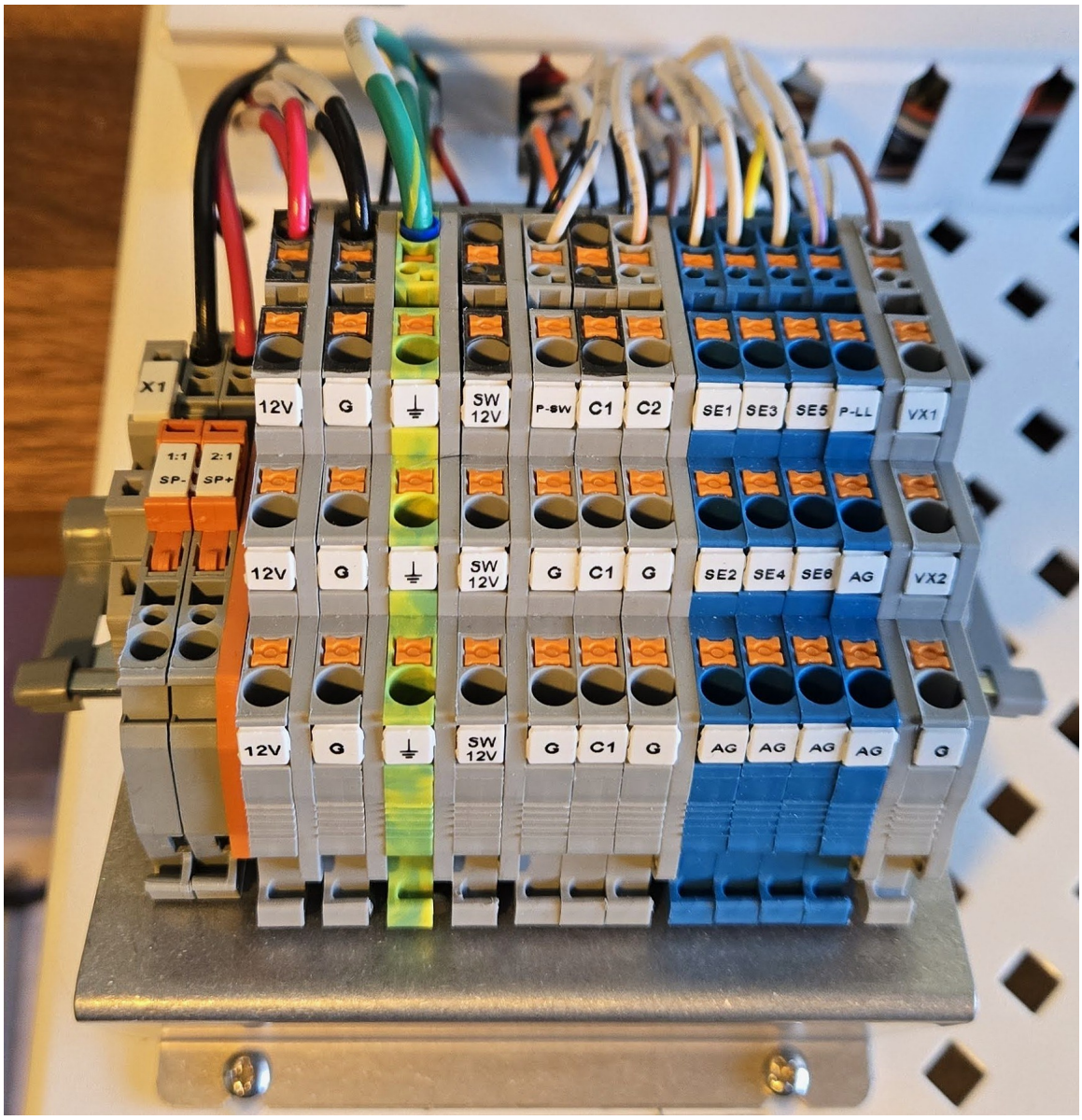


Figure 7-4. ALERT205X terminal block

7.5 Sensors

The following sections highlight recommended sensors for the ALERT205X system deployment and considerations for installation. Refer to the respective sensor manuals for detailed information about the sensors.

For details on wiring diagrams and sensor port connections, please refer to the ALERT205X user interface. Details can be found while adding a sensor and in the Config Report.

NOTE:
The sensors should be configured for the ALERT205X system prior to installation. The SDI-12 addresses and communications protocol settings must match the configuration settings in the user interface.

7.5.1 LevelVue B10 bubbler water level 45
7.5.2 RangeVue 15/30 radar water level sensors 47
7.5.3 CS451 and CS456 pressure transducers 48
7.5.4 RainVue series rain gauges 48
7.5.5 Tipping bucket rain gauges 49

7.5.1 LevelVue B10 bubbler water level

The LevelVue B10 is a bubbler water-level measurement sensor based on a non-submersible pressure transducer system. Bubblers accurately measure the pressure it takes to create a continuous airflow in an airline submerged in water. The LevelVue B10 is designed for ease of use while providing long-term performance and accuracy. With a built-in keypad and display, you can complete your setup and site visit tasks using the LevelVue B10. The LevelVue B10 interfaces with the ALERT205X using SDI-12.

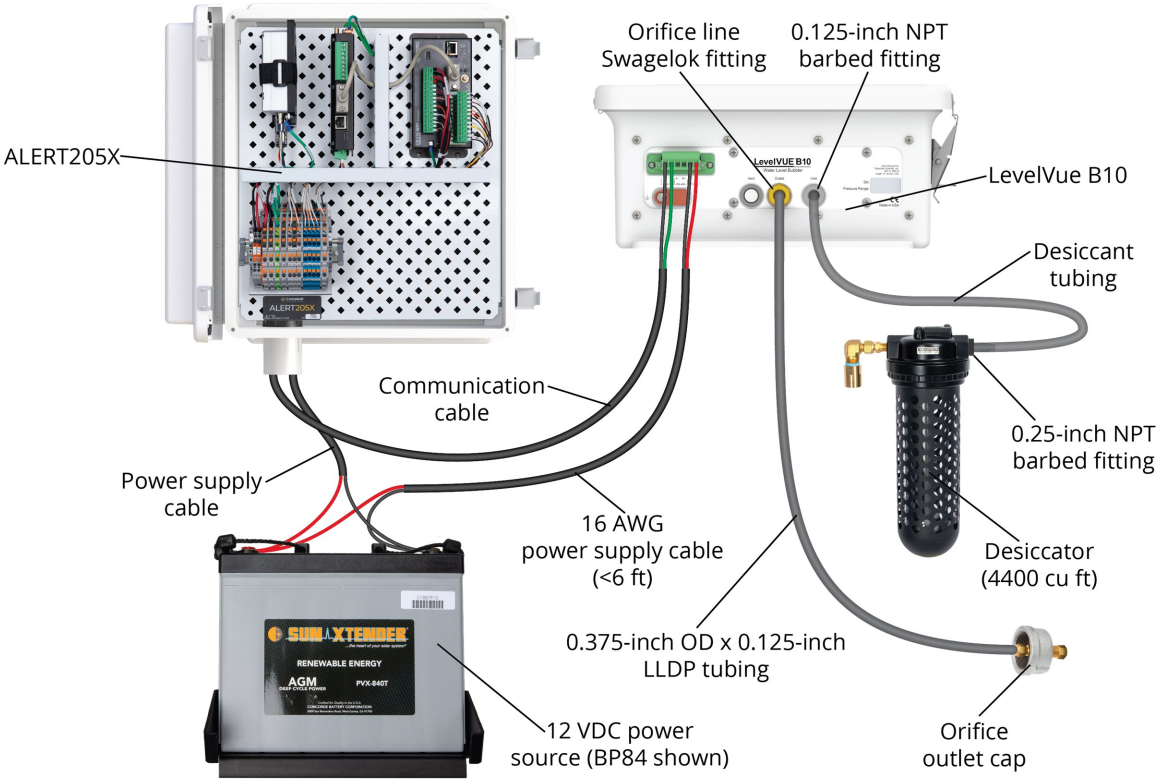


Figure 7-5. Example of LevelVue B10-based system using an ALERT205X panel or enclosure configuration

As shown in the above image, the LevelVue B10 needs to be powered directly from a high capacity 12 V battery. This battery may also supply power to the ALERT205X through separate power wires connected at the battery terminals. However, the ALERT205X SDI-12 connections should not include power from the ALERT205X sensor port on a canister, or from any connection on the DIN rail on a panel or enclosure.

Table 7-12: Recommended cable

Option	Recommended cable
Canister	CABLE8PIN-LITE (SDI-12) CABLEPCBL (Power)
Enclosure / Panel	VueCBL1 CABLEPCBL (Power)

7.5.2 RangeVue 15/30 radar water level sensors



Figure 7-6. RangeVue 15/30 radar water level sensors

The recommended radar water level sensor for the ALERT205X is the RangeVue 15 or RangeVue 30. As a non-contact, radar water-level sensor, you can use the RangeVue™15/30 to monitor the water level of rivers, lakes, and reservoirs. With 80 GHz radar technology, the RangeVue 30 directly measures the distance between the sensor face and the water surface. This distance can be used to determine water level or stage. The sensor is ideal for areas where submersible sensors can be damaged due to corrosion, contamination, flood-related debris, or lightning.

The RangeVue line of sensors uses SDI-12 for communication with the ALERT205X. It is recommended to use a switched 12 volt source using the **Sensor Warm-up Time** setting for the input power with a warmup period of at least 7 seconds, with 10 seconds recommended. Cycling power can conserve power and allows the system to respond to extremely rapid water level changes like those occurring during flash flood conditions. See Focus window section in the RangeVue 15/30 manual for more information about the focus window.

Table 7-13: Recommended cable

Option	Recommended cable
Canister	VueCBL2
Enclosure / Panel	VueCBL1

7.5.3 CS451 and CS456 pressure transducers



Figure 7-7. CS451 Stainless-Steel Pressure Transducer

The CS451/CS456 Submersible Pressure Transducer provides pressure and temperature measurements for determining water level or stage height. The CS451/CS456 consist of a piezoresistive sensor and a temperature sensor housed in a 316L stainless-steel or titanium case. The cable incorporates a vent tube to compensate for atmospheric pressure fluctuations. The vent tube terminates inside a desiccant tube or the A151 vented termination case, which prevents water vapor from entering the inner cavity of the transducer.

Table 7-14: ALERT205X connections

Option	Recommended Cable
Canister	A151
Enclosure / Panel	Included cable with desiccant tube

7.5.4 RainVue series rain gauges

The RainVue-series rain sensors are an ideal solution for many hydrological or meteorological applications, such as weather stations and flood warning systems.

Advanced algorithms and digital processing within the sensor compensate for errors caused by high-intensity rain and provide accurate precipitation and intensity measurements. Constructed of an aerodynamic funnel, the RainVue is robust and minimizes the amount of liquid precipitation that is lost due to the effects of wind.

The models differ in their body material:

- The RainVue™10 has a molded UV-stabilized plastic body
- The RainVue™20 has a rugged aluminum body

Each model can be ordered in 0.01 inch or 0.1 mm options.



Figure 7-8. RainVue-series rain sensors

Table 7-15: ALERT205X connections	
Option	Recommended Cable
Canister	CABLE8T8PIN
Enclosure / Panel	CABLE8PIN-LITE

7.5.5 Tipping bucket rain gauges

There are many options for tipping bucket rain gauges that are compatible with the ALERT series of systems. Each system includes a pulse input port that records tips from tipping bucket rain sensors using a variety of mechanisms such as a magnetic reed switch or dual reed switch. A few choices include the TE525, TE525WS, TE525MM, CS700, TB4, TB4MM, CS700H. More information can be found on their respective webpages.



Figure 7-9. TE525, CS700, and TB4 rain gauges

Table 7-16: ALERT205X connections	
Option	Recommended Cable
Canister	44328 Field Wirable Connector
Enclosure / Panel	Use included cable

8. Maintenance and troubleshooting

NOTE:
The ALERT205X is designed to provide years of trouble-free service with reasonable care. However, if factory repair is needed, first contact a Campbell Scientific application engineer to obtain an RMA (Return Materials Authorization) number. An RMA number and product-safety documents are required prior to any repair shipments being accepted at Campbell Scientific. See Assistance for more information.

8.1 Maintenance

Periodically check the sensor inputs against known values to ensure that the device is still within the specified accuracy ranges. The CR310 within the ALERT205X will normally scan each sensor every frame. This can be changed in the **Measurement Interval** in the **Parameters** section of the

Configuration window. Setting this to zero (0) will cause the ALERT205X to make its measurements as close to its slot offset as possible (measurement time is calculated when the transmitter first powers up). Otherwise, the value will be the measurement interval starting at a base time of midnight. For most applications, leaving this parameter set to 0 is sufficient.

Clicking on the **Test Button** in the **Dashboard** window of the UI, or pressing the physical green test button on the AL200X, for one to five seconds will trigger a test transmission containing the latest data available from the ALERT205X. Pressing the button for 5 to 10 seconds will cause the AL200X within the ALERT205X to generate a test tone and sustain it for five seconds. This test tone can be used to check the forward and reflected power of the radio, as well as channel frequency error and proper deviation level. Always confirm that a dummy load or properly tuned antenna is connected to the radio when transmissions may occur.

> TIP:
> When pressing the **Test Button**, the green serial LED flashes once per second. Counting the LED flashes is a good method to know how many seconds you have pressed the button.

Consult your sensor and radio manufacturer manuals for recommended maintenance of these devices.

8.1.1 When to replace desiccant

The humidity indicator card or optional CS211 Smart Enclosure Sensor indicates when the desiccant needs to be replaced.

> CAUTION:
> Because desiccant is inexpensive, Campbell Scientific recommends replacing desiccant packets rather than attempting to reactivate the desiccant.

8.1.1.1 Humidity indicator card

The humidity indicator card has three colored circles that indicate the percentage of humidity. Desiccant packets inside the enclosure should be replaced with fresh packets when the upper dot on the indicator begins to turn pink. The indicator card does not need to be replaced unless the colored circles overrun.

8.1.1.2 Optional CS211 smart enclosure sensor

The CS211 Smart Enclosure Sensor monitors temperature and humidity levels inside enclosures. The CS211 includes an LED indicator to signal enclosure wetness and when desiccant

needs to be replaced. Refer to the CS211 manual for sensor specifications, installation procedures, and programming information.

> NOTE:
> The CS211 Smart Enclosure Sensor is compatible with enclosure or panel configurations only.

8.2 Troubleshooting

Cannot connect to the station

Verify the data logger has sufficient power by connecting to it and checking the battery voltage in the **Status** table. A healthy voltage typically reads slightly over 12 V. See a video on Measuring Data Logger Output Voltage With a Multimeter for more information.

Sensor not reporting

- Check the cable for signs of damage and possible moisture intrusion.
- Check sensor connections to ensure they are connected to the correct terminal.
- Check the voltage to the sensors with a digital voltage meter.

Web interface appears locked up

1. Try to refresh the browser.
2. If the page does not recover, then power cycle the data logger.

Web interface recovery

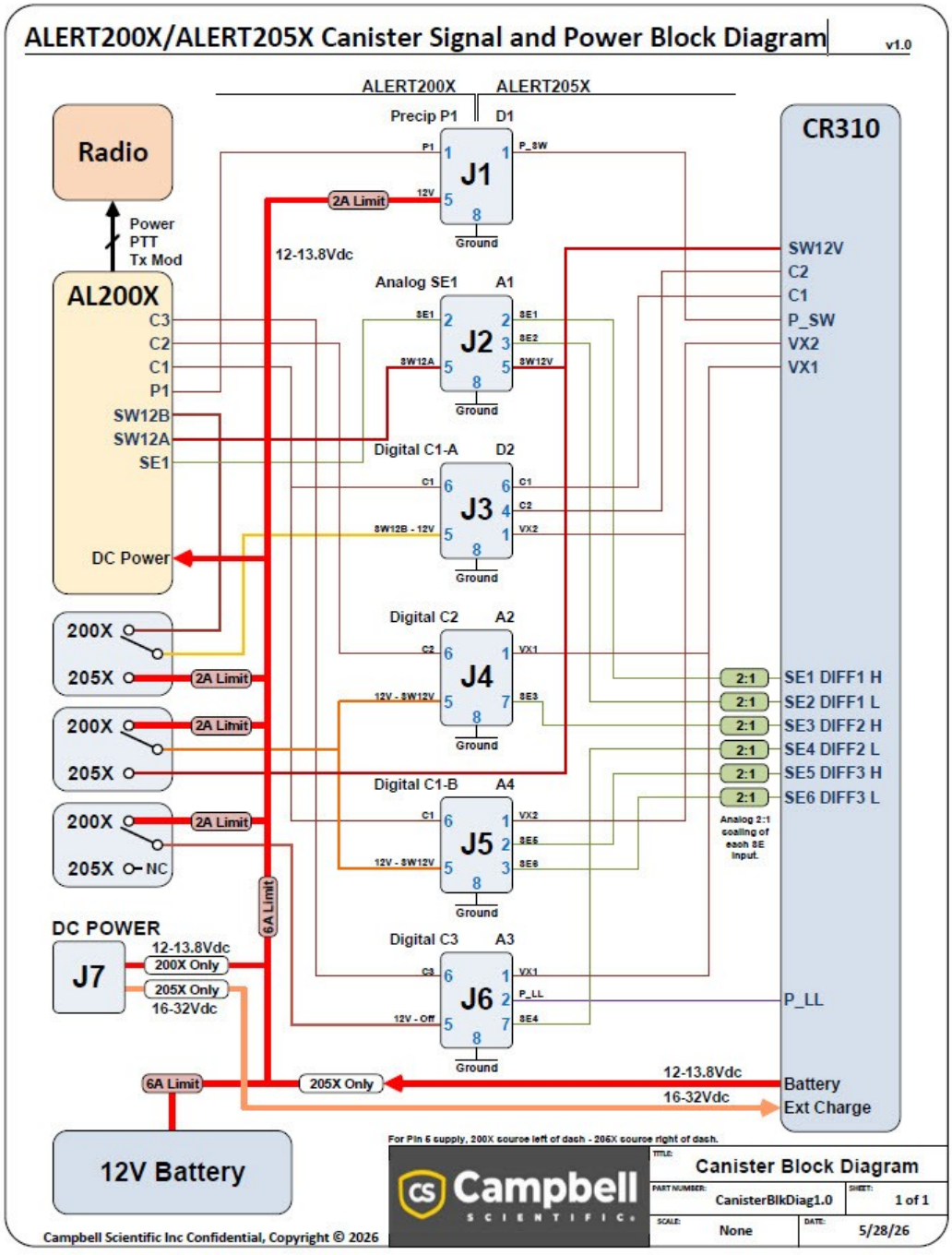
In the unlikely event that web interface files are lost or corrupted, a data logger-hosted recovery page can be used to restore the web interface. This page can also be used to update the web interface when new versions are available.

The recovery page is accessed by navigating to: data logger IP Address/recovery (for example: 111.222.333.444/recovery). This will open a **Recovery** page in the browser.



The **Send File** button on the **Recovery** web page allows users to upload .obj or web.obj.gz files to restore web interface files on the data logger. The upload process may take several minutes.

Appendix A. Canister signal and power block diagram



Limited warranty

Covered equipment is warranted/guaranteed against defects in materials and workmanship under normal use and service for the period listed on your sales invoice or the product order information web page. The covered period begins on the date of shipment unless otherwise specified. For a repair to be covered under warranty, the following criteria must be met:

1. There must be a defect in materials or workmanship that affects form, fit, or function of the device.

2. The defect cannot be the result of misuse.

3. The defect must have occurred within a specified period of time; and

4. The determination must be made by a qualified technician at a Campbell Scientific Service Center/ repair facility.

The following is not covered:

1. Equipment which has been modified or altered in any way without the written permission of Campbell Scientific.

2. Batteries; and

3. Any equipment which has been subjected to misuse, neglect, acts of God or damage in transit.

Campbell Scientific regional offices handle repairs for customers within their territories. Please see the back page of the manual for a list of regional offices or visit www.campbellsci.com/contact to determine which Campbell Scientific office serves your country. For directions on how to return equipment, see Assistance.

Other manufacturer's products, that are resold by Campbell Scientific, are warranted only to the limits extended by the original manufacturer.

CAMPBELL SCIENTIFIC EXPRESSLY DISCLAIMS AND EXCLUDES ANY IMPLIED WARRANTIES OF

MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Campbell Scientific hereby disclaims, to the fullest extent allowed by applicable law, any and all warranties and conditions with respect to the products, whether express, implied, or statutory, other than those expressly provided herein.

Campbell Scientific will, as a default, return warranted equipment by surface carrier prepaid. However, the method of return shipment is at Campbell Scientific's sole discretion. Campbell Scientific will not reimburse the claimant for costs incurred in removing and/or reinstalling equipment. This warranty and the Company's obligation thereunder is in lieu of all other

warranties, expressed or implied, including those of suitability and fitness for a particular purpose. Campbell Scientific is not liable for consequential damage.

In the event of any conflict or inconsistency between the provisions of this Warranty and the provisions of Campbell Scientific's Terms, the provisions of Campbell Scientific's Terms shall prevail. Furthermore, Campbell Scientific's Terms are hereby incorporated by reference into this Warranty. To view Terms and conditions that apply to Campbell Scientific, Logan, UT, USA, see Terms and Conditions. To view terms and conditions that apply to Campbell Scientific offices outside of the United States, contact the regional office that serves your country.

Assistance

Products may not be returned without prior authorization. Please inform us before returning equipment and obtain a **return material authorization (RMA) number** whether the repair is under warranty/guarantee or not. See Limited warranty for information on covered equipment.

Campbell Scientific regional offices handle repairs for customers within their territories. Please see the back page of the manual for a list of regional offices or visit www.campbellsci.com/contact to determine which Campbell Scientific office serves your country.

When returning equipment, a RMA number must be clearly marked on the outside of the package. Please state the faults as clearly as possible. Quotations for repairs can be given on request.

It is the policy of Campbell Scientific to protect the health of its employees and provide a safe working environment. In support of this policy, when equipment is returned to Campbell Scientific, Logan, UT, USA, it is mandatory that a "Declaration of Hazardous Material and Decontamination" form be received before the return can be processed. If the form is not received within 5 working days of product receipt or is incomplete, the product will be returned to the customer at the customer's expense. For details on decontamination standards specific to your country, please reach out to your regional Campbell Scientific office.

> NOTE:
> All goods that cross trade boundaries may be subject to some form of fee (customs clearance, duties or import tax). Also, some regional offices require a purchase order upfront if a product is out of the warranty period. Please contact your regional Campbell Scientific office for details.

Safety

DANGER — MANY HAZARDS ARE ASSOCIATED WITH INSTALLING, USING, MAINTAINING, AND WORKING ON OR AROUND TRIPODS, TOWERS, AND ANY ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC. FAILURE TO PROPERLY AND COMPLETELY ASSEMBLE, INSTALL, OPERATE, USE, AND MAINTAIN TRIPODS, TOWERS, AND ATTACHMENTS, AND FAILURE TO HEED WARNINGS, INCREASES THE RISK OF DEATH, ACCIDENT, SERIOUS INJURY, PROPERTY DAMAGE, AND PRODUCT FAILURE. TAKE ALL REASONABLE PRECAUTIONS TO AVOID THESE HAZARDS. CHECK WITH YOUR ORGANIZATION'S SAFETY COORDINATOR (OR POLICY) FOR PROCEDURES AND REQUIRED PROTECTIVE EQUIPMENT PRIOR TO PERFORMING ANY WORK.

Use tripods, towers, and attachments to tripods and towers only for purposes for which they are designed. Do not exceed design limits. Be familiar and comply with all instructions provided in product manuals. Manuals are available at www.campbellsci.com You are responsible for conformance with governing codes and regulations, including safety regulations, and the integrity and location of structures or land to which towers, tripods, and any attachments are attached. Installation sites should be evaluated and approved by a qualified engineer. If questions or concerns arise regarding installation, use, or maintenance of tripods, towers, attachments, or electrical connections, consult with a licensed and qualified engineer or electrician.

General

- Protect from over-voltage.
- Protect electrical equipment from water.
- Protect from electrostatic discharge (ESD).
- Protect from lightning.
- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a hardhat and eye protection, and take other appropriate safety precautions while working on or around tripods and towers.
- Do not climb tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

Utility and Electrical

- You can be killed or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in contact with overhead or underground utility lines.
- Maintain a distance of at least one-and-one-half times structure height, 6 meters (20 feet), or the distance required by applicable law, whichever is greater, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.
- Only use power sources approved for use in the country of installation to power Campbell Scientific devices.

Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

Internal Battery

- Be aware of fire, explosion, and severe-burn hazards.
- Misuse or improper installation of the internal lithium battery can cause severe injury.

- Do not recharge, disassemble, heat above 100 °C (212 °F), solder directly to the cell, incinerate, or expose contents to water. Dispose of spent batteries properly.

Use and disposal of batteries

- Where batteries need to be transported to the installation site, ensure they are packed to prevent the battery terminals shorting which could cause a fire or explosion. Especially in the case of lithium batteries, ensure they are packed and transported in a way that complies with local shipping regulations and the safety requirements of the carriers involved.
- When installing the batteries follow the installation instructions very carefully. This is to avoid risk of damage to the equipment caused by installing the wrong type of battery or reverse connections.
- When disposing of used batteries, it is still important to avoid the risk of shorting. Do not dispose of the batteries in a fire as there is risk of explosion and leakage of harmful chemicals into the environment. Batteries should be disposed of at registered recycling facilities.

Avoiding unnecessary exposure to radio transmitter radiation

- Where the equipment includes a radio transmitter, precautions should be taken to avoid unnecessary exposure to radiation from the antenna. The degree of caution required varies with the power of the transmitter, but as a rule it is best to avoid getting closer to the antenna than 20 cm (8 inches) when the antenna is active. In particular keep your head away from the antenna. For higher power radios (in excess of 1 W ERP) turn the radio off when servicing the system, unless the antenna is installed away from the station, e.g. it is mounted above the system on an arm or pole.

Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

WHILE EVERY ATTEMPT IS MADE TO EMBODY THE HIGHEST DEGREE OF SAFETY IN ALL CAMPBELL SCIENTIFIC PRODUCTS, THE CUSTOMER ASSUMES ALL RISK FROM ANY INJURY RESULTING FROM IMPROPER INSTALLATION, USE, OR MAINTENANCE OF TRIPODS, TOWERS, OR ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.

Global Sales and Support Network

A worldwide network to help meet your needs



Campbell Scientific Regional Offices

Australia

Location:	Garbutt, QLD Australia
Phone:	61.7.4401.7700
Email:	info@campbellsci.com.au
Website:	www.campbellsci.com.au

Brazil

Location:	São Paulo, SP Brazil
Phone:	11.3732.3399
Email:	vendas@campbellsci.com.br
Website:	www.campbellsci.com.br

Canada

Location:	Edmonton, AB Canada
Phone:	780.454.2505
Email:	dataloggers@campbellsci.ca
Website:	www.campbellsci.ca

China

Location:	Beijing, P. R. China
Phone:	86.10.6561.0080
Email:	info@campbellsci.com.cn
Website:	www.campbellsci.com.cn

Costa Rica

Location:	San Pedro, Costa Rica
Phone:	506.2280.1564
Email:	info@campbellsci.cc
Website:	www.campbellsci.cc

France

Location:	Montrouge, France
Phone:	0033.0.1.56.45.15.20
Email:	info@campbellsci.fr
Website:	www.campbellsci.fr

Germany

Location:	Bremen, Germany
Phone:	49.0.421.460974.0
Email:	info@campbellsci.de
Website:	www.campbellsci.de

India

Location:	New Delhi, DL India
Phone:	91.11.46500481.482
Email:	info@campbellsci.in
Website:	www.campbellsci.in

Japan

Location:	Kawagishi, Toda City, Japan
Phone:	048.400.5001
Email:	jp-info@campbellsci.com
Website:	www.campbellsci.co.jp

South Africa

Location:	Stellenbosch, South Africa
Phone:	27.21.8809960
Email:	sales@campbellsci.co.za
Website:	www.campbellsci.co.za

Spain

Location:	Barcelona, Spain
Phone:	34.93.2323938
Email:	info@campbellsci.es
Website:	www.campbellsci.es

Thailand

Location:	Bangkok, Thailand
Phone:	66.2.719.3399
Email:	info@campbellsci.asia
Website:	www.campbellsci.asia

UK

Location:	Shepshed, Loughborough, UK
Phone:	44.0.1509.601141
Email:	sales@campbellsci.co.uk
Website:	www.campbellsci.co.uk

USA

Location:	Logan, UT USA
Phone:	435.227.9120
Email:	info@campbellsci.com
Website:	www.campbellsci.com