



Communications Device

AL205R/AL205B

ALERT2 Repeater/Base



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1. Overview

This manual is for both the AL205R and AL205B modems. The AL205R (repeater) is a component of an ALERT2 system consisting of LoggerNet ALERT2 Admin, AL205B (base), and AL200 (encoder) or AL205E (encoder). The AL205R can be configured to support repeating of ALERT2 messages and as a backup base and decoder of received ALERT2 messages. The AL205B is configured as a base station for receiving and decoding of ALERT2 messages. Throughout this manual, whenever AL205R/AL205B is mentioned, the information is valid for both the AL205R and AL205R.

The AL205R/AL205B has two radio I/O ports, supporting independent receive and transmit radios. Three serial ports allow for input and output to several devices including ALERT receiver, data logger, computer, and serial server. Local and remote data collection and administration are possible through the micro-USB console and Ethernet ports. The USB host port supports flash drives and peripherals for loading settings and firmware and transferring log files from the microSD flash drive.

The AL205R/AL205B meets the ALERT2 standards maintained by the National Hydrologic Warning Council (NHWC) and the ALERT2 Protocol Technical Working Group (TWG), formally the ALERT Users Group (AUG). The ALERT2 protocol was released by the TWG in September 2010. It is a low bandwidth, reliable protocol for transmitting real-time data over a radio telemetry network. Compared to its predecessor, the ALERT2 protocol provides faster, more reliable data transfer, forward error correction (FEC), and Time Division Multiple Access (TDMA) architecture. These features increase the accuracy and performance of flood warning and other data acquisition systems. For more information about the ALERT2 protocol, refer to: www.hydrologicwarning.org/content.aspx?page_id=22&club_id=617218&module_id=83216.

The AL205R/AL205B includes GPS functionality that provides time-synchronization required for TDMA radio transmissions. The configurable FEC supports 250 millisecond, TDMA time slotting that allows more ALERT2 nodes on a radio network. Campbell Scientific will release firmware as needed to support ALERT2 protocol enhancements and the new firmware can be updated by the user in the field.

1.1 Port functions

The following table describes the functions of the AL205R/AL205B ports.

Table 1-1: I	Port descriptions
Port label	Function
Ethernet	Enables TCP/IP connections to the AL205R/AL205B. Possible uses include: remote configuration of the AL205R/AL205B using the A2Control graphical user interface (GUI), pulling logs of collected ALERT2 data, streaming ALERT2 decoded data to other endpoints, and firmware updates.
SD card	Stores logs of all received ALERT2 traffic and decoder operation.
Console	Micro USB port intended for use with the A2Control GUI, but is available as an ALERT2 Binary API port. This port appears as a serial port when plugged into a computer. Serial port settings are fixed at 115200 8,N,1. When the device is starting, some diagnostic information may be displayed.
USB	USB host port supports plugging in a USB flash drive for copying logs from the AL205R/AL205B, as well as firmware updates. To copy the ALERT2 logs from the device, create a folder called decoder_output on the USB flash drive. If, and only if, the device finds this folder, ALERT2 output will be synchronized to the folder. The USB flash drive is also used to install a firmware update.
GPS	GPS antenna must be connected for proper time sync. GPS is required for the AL205R. NTP can be used instead of GPS in a AL205B, but time will be less accurate due to NTP jitter.
Serial 1	Serial port 1
RX Radio	4-pin connection for receive radio
TX Radio	5-pin connection for transmit radio
Serial 2	Serial port 2
Serial 3	Serial port 3

1.2 Power

The AL205R/AL205B requires an external DC power source. The AL205R/AL205B can accept inputs ranging from 9 to 17 VDC, and includes reverse-polarity protection. Typical installations will provide power using 12 VDC lead-acid batteries.

Once deployed in the field, the current drawn by the AL205R/AL205B depends on the frequency of GPS clock synchronization cycles and the number of message transmissions. Typical applications have an average current draw of less than 4 mA at 12 VDC, making the

AL205R/AL205B suitable for use with a small (5 W or 10 W) solar panel. The AL205R/AL205B can monitor the input voltage level and include it in its regular status reports.

1.3 Status LEDs

The following table describes the LED functions.

Table 1-2: Sta	atus LEDs
LED label	Description
Tx Radio On	Lights up to indicate power is being supplied to the TX radio.
Transmit	Lights up while the AL205R/AL205B is transmitting
Clock Sync	A solid light indicates that the AL205R/AL205B has a reliable clock source, and will transmit in TDMA mode. The clock can maintain synchronization for up to 4 hours without the GPS being on. A slow flashing light indicates that the AL205R/AL205B is configured to use network time protocol (NTP) as its clock source and it has obtained an appropriate time from the NTP server. The AL205R/AL205B will not transmit using TDMA with an NTP time source.
GPS On	Lights up to indicate the GPS is currently powered up. The GPS may require several minutes to initially get a fix, but after that will only require turning on for a brief time to maintain accurate time.
Serial 1	Flashes to indicate input or output serial data is on serial port 1.
Serial 2	Flashes to indicate input or output serial data is on serial port 2.
Serial 3	Flashes to indicate input or output serial data is on serial port 3.
Bit Sync	Lights up to indicate a valid ALERT2 Bit Sync pattern has been found in the data stream from the RX radio. The light will remain lit until the message is fully received or until it has been determined that no message was present.
Frame Sync	Lights up to indicate a valid ALERT2 frame sync has been found. It remains lit while the AL205R/AL205B decodes the message.
Power	Lights up while the device is connected to power.

2. Specifications

Temperature range:	–40 to 80 °C
Power supply:	9 to 17 VDC, reverse polarity protected
Current drain at 12 VDC:	96 mA (normal operation, no external connections) ~1 mA (each serial port) ~25 mA (Ethernet port) ~20 mA (GPS on) 144 mA (all serial ports, USB console, Ethernet connected, GPS on)
RX radio voltage (data out level):	300 to 1200 mV peak-to-peak
TX radio voltage (data in level):	100 to 1200 mV peak-to-peak, configurable in 0.5 dB steps
Clock Synchronization:	GPS or NTP
Clock drift:	2 ppm (0 to 40 °C); 3.5 ppm (-40 to +80 °C)
ALERT2:	Compatible with NHWC ALERT2 AirLink v1.1, MANT v1.1, API v1.0 Supports ALERT2 API input, and ALERT2 API and ASCII output Implements proposed protocol extension for <i>Configurable</i> <i>Forward Error Correction, Encryption and Authorization,</i> and <i>End-to-End Reliable Datagram Service</i>
	Complete address list support: maintain pass or reject lists, based on source or destination address
Interfaces	
Power:	2 pin, screw terminal, polarity protected
RS-232:	3 ports, line-level, custom 3-pin cable, 1200 to 115200 bps
Ethernet:	10/100 MB (fixed or dynamic (DHCP) addresses)
Storage:	microSD expandable storage that records all ALERT2 traffic in ASCII format (N, P, S, C messages); ships with at least 8 GB USD card
LEDs:	Power, Bit Sync, Frame Sync, GPS On, Clock Sync, Tx Radio Power, Transmit, Serial 1, Serial 2, Serial 3

Active GPS antenna:	SMA female
RX radio:	4-pin spring clip (power, ground, data, channel select)
TX radio:	5-pin spring clip (power, ground, PTT, data, channel select)
Dimensions:	19.0 x 10.0 x 3.2 cm (7.5 x 4 x 1.25 in)
Weight:	600 g (1.3 lb)

3. Configuration

A2Control software allows users to view received messages, configure the AL205R/AL205B, and transmit messages. The software is available for download from www.campbellsci.com/downloads?term=A2Control&b=4.

CAUTION:

The A2Control version must match the AL205R/AL205B firmware version. For example, use the A2Control-1.4.0.exe version with an AL205R/AL205B using firmware version 1.4.0. Previous and current versions of A2Control are available at

www.campbellsci.com/downloads?term=A2Control&b=4. Both the AL205R/AL205B firmware update and A2Control are provided on the product webpages (www.campbellsci.com/al205r or www.campbellsci.com/al205b).

- 1. Connect your computer to the console port on the AL205R/AL205B using a USB cable.
- 2. Apply power to the AL205R/AL205B.
- 3. Launch A2Control. The following warning is displayed if the versions do not match.



4. If there is only one attached serial port, A2Control will select it by default. Otherwise, select the appropriate serial port from the **Serial Port** drop down menu and click **Connect**.



When A2Control begins communicating with the AL205R/AL205B, it will display the firmware type and version, and, if the AL205R/AL205B is connected to the network, the device IP address.

NOTE:

A2Control also can connect to the AL205R/AL205B remotely using TCP/IP by choosing network connection in the serial port drop down menu instead of a port number. Remote access to the AL205R/AL205B is disabled by default. To enable it, launch A2Control software, click the gear icon, click the **IP Settings** tab, and set the **Network Password**.

5. Click the gear icon to access the configuration window. Table 3-1 (p. 7) describes the settings that need to be changed for the initial configuration.

ID Settings IP Settings Address Lists Serial Port Settings IND Configuration Agercy ID CAMSCI Add Path Service Source Address 1000 Concentration Test Flags Radio Configuration Status Interval (min) 50 ID Concentration Test Flags Status Offset (min) 0 ID ID Low Power Mode Full Power TDMA ToMA Frame Length (ms) Network Services TDMA Slot Length (ms) 1000	ue > 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Indext Status Operation Agency ID CAMSCI Source Address 1000 Destination Address 1 Status Interval (min) Status Frail DMD Frame Length (ms) 1500 Network Services ToMA Stot Length (ms) Network Services ToMA Stot Length (ms)	iue v i0 v i5 v ikse v gh (More Reliable) v ikse v
Agency ID CAMSCI Add Path Service Enabled Tx Always On True Source Address 1000 Concentration Test Flag False Tx Wary Up (ms) 750 Destination Address 1 Concentration PDU ID Enabled CO Time (ms) 10 Status Interval (min) 60 IND Timestamp Service Enabled AGC Time (ms) 55 Status Offset (min) 0 TDMA TDMA RF Tail Time (ms) 5 Network Services TDMA Slot Length (ms) 15000 Invert Modulaton False Network Services TDMA Slot Length (ms) 1000 False Figh (More Reliable)	so
Source Address 1000 Concentration Test Flag False Tx Warm Up (ms) 750 Destination Address 1 Concentration POU ID Enabled CO Time (ms) 10 Status Interval (min) 60 IND Timestamp Service Enabled AGC Time (ms) 55 Status Offset (min) 0 TDMA RF Tail Time (ms) 55 Network Services TDMA Slot Length (ms) 15000 Invert Modulaton	50
Destination Address 1 Concentration PDU ID Enabled CO Time (ms) 10 Status Interval (min) 60 IND Timestamp Service Enabled AGC Time (ms) 55 Status Offset (min) 0 TDMA RF Tail Time (ms) 55 Low Power Mode Full Power TDMA Frame Length (ms) 15000 Invert Modulation Network Services TDMA Slot Length (ms) 1000 False	j
Status Interval (min) 60 IND Timestamp Service Enabled AGC Time (ms) 55 Status Offset (min) 0 TDMA RF Tail Time (ms) 55 Low Power Mode Full Power TDMA Frame Length (ms) IS000 Invert Modulaton False Network Services TDMA Slot Length (ms) 1000 FeC Level High (More Reliable)	s slase v gh (More Reliable) v
Status Offset (min) TDMA RF Tail Time (ms) 5 Low Power Mode Full Power TDMA Frame Length (ms) 15000 Invert Modulaton False Network Services TDMA Slot Length (ms) 1000 FEC Level High (More Reliable)	alse v gh (More Reliable) v alse v
Low Power Mode Full Power TDMA Frame Length (ms) [5000 Invert Modulation False Network Services TDMA Slot Length (ms) 1000 FEC Level High (More Reliable)	alse v gh (More Reliable) v Ilse v
Network Services TDMA Slot Length (ms) 1000 FEC Level High (More Reliable)	igh (More Reliable) ~
	alse 🗸 🗸
Include Destination False V TDMA Slot Offset (ms) 0 One Radio Tx/Rx False	
Echo Suppression Enabled V Transmission Delay (ms) 25 Tx Voltage (p2p) 400	0
Repeater Add Path Override Disabled V Center Transmission False V Tx Radio Channel One	ne v
Hop Limit 1 V Slot Overrun Handling Buffer (LIFO) Rx Radio Channel One	ne 🗸
Time Services	
GPS Interval (min) 29 Force Reboot	

Table 3-1: Initial configuration settings					
Setting	Tab	Description			
Agency ID	IND Settings	Unique string describing your agency (for example CSI for Campbell Scientific).			
Source Address	IND Settings	Unique address of this device. Addresses may be managed through the source address management system (SAMS) at http://alert2.org.			
Destination Address	IND Settings	Source address of the remote device in which the ALERT2 packet are directed.			
Status Interval	IND Settings	Sets when (in minutes) the device sends a status message.			
TDMA Frame Length	IND Settings	Sets the TDMA frame length (in milliseconds) for the ALERT2 network. The frame needs to be long enough to accommodate all remote stations, repeaters, and possible future stations transmitting on the same frequency.			
TDMA Slot Length	IND Settings	Sets the TDMA slot length (in milliseconds). The slot length must be able to accommodate all the values included in a transmission. Shorter slot lengths allow more slots in a given frame. However, short slots contain fewer values.			
TDMA Slot Offset	IND Settings	Sets the amount of time (in milliseconds) into the TDMA frame that the station-transmission slot will begin. Each station in the network must have a unique slot offset to prevent multiple stations from transmitting at the same time. Range is 0 to length of the frame minus the slot length. Default is 0 .			

Table 3-1: Initi	al config	uration settings
Setting	Tab	Description
Transmission Delay	IND Settings	Delay into TDMA slot (set to 12 ms for 250 ms slot).
TX Always On	IND Settings	Controls when the attached radio is powered up. The radio can be powered up every TX frame or it can be powered up all the time. For maximum power savings set to False .
TX Warmup	IND Settings	Sets the amount of time power is applied to the radio before starting the transmission slot. Power is applied according to the TX Always On settings. The value is in milliseconds with a resolution of 10 milliseconds.
CO Time	IND Settings	Carrier Only Time. The amount of unmodulated carrier used in the Airlink preamble. The value is in milliseconds.
AGC Time	IND Settings	The amount of tone-modulate carrier used in the Airlink preamble. The value is in milliseconds.
RF Tail Time	IND Settings	The amount of unmodulated carrier to follow after the transmitted frame. The value is in milliseconds.
Invert Modulation	IND Settings	Sets the modulation polarity.
TX Voltage (p2p)	IND Settings	Set to 400 (Ritron) or 425 (Maxon) depending on the transmit radio being used.
Network Password	IP Settings	Password used to connect to this device remotely.
ASCII IP Forward	IP Settings	Comma separated list of hosts to which received ALERT2 messages, in ASCII format, will be streamed.
BinarylP Forward	IP Settings	Comma separated list of hosts to which received ALERT2 messages, in binary format, will be streamed.
Serial Port Input/Output Mode	Serial Port Settings	Configure serial ports for API or Concentration input, ASCII/Binary/No output.

6. When changes are complete, click **Write To Device** to save them. Settings may also be loaded or saved to a local file.

3.1 Transmitting data

The AL205R is a fully-functional ALERT2 transmitter. When configured with the GPS as its clock source and the GPS signal is strong, the AL205R/AL205B uses the assigned time-division multiple access (TDMA) slot for transmission.

The AL205R can transmit ALERT2 data using the ALERT2 IND API over a serial port or using A2Control on the **Transmit Data** window. Additionally, the AL205R sends status messages at user-configurable intervals and upon acquisition and loss of the GPS clock sync.

3.2 Receiving data

The AL205R/AL205B receives and decodes ALERT2 data when powered. When the AL205R/AL205B finds a valid Bit Sync pattern in the incoming audio, it turns on the Bit Sync LED and begins listening for a valid Frame Sync pattern (which should immediately follow the Bit Sync). If a valid Frame Sync pattern is found, the Frame Sync LED is turned and both LEDs will remain lit for the duration of the incoming message. If a valid frame sync is not found, the Bit Sync LED is turned off.

The AL205R/AL205B is a full-duplex modem. It decodes ALERT2 messages while the transmitter is active and the radio has a full-duplex radio configuration. To view incoming messages, connect to the device using A2Control, then select <a>. Messages are displayed as they are received.

¢ 1	Device:	a2x-rpt-1.3.2 4-182	235001	IP:				USB Serial Po	rt (COM15)	Disconnect
Addr	Time	Length	^ 1	Message Time	[2000-01-01 17:00:02.960	1	AirLink Size	0	
9621	2000-01-01 17:10:24.701	12	F	EC Mode	[local		AirLink Symbols Corrected Per Block		
9621	2000-01-01 17:09:33.701	20	5	Source Address	. [1000		Noise Level		0
9622	2000-01-01 17:09:33.701	24		Destination Add	tress [Time Service Request	1	
9621	2000-01-01 17:07:21.203	12		Add Path	[1		Hop Limit	1	
9622	2000-01-01 17:07:21.203	24	F	Path	[Payload Length	13	
9621	2000-01-01 17:05:33.454	16	,	App PDU ID	[7		App Test Flag	0	
9622	2000-01-01 17:05:33.454	24			[70:05:0A:3F:03:84:01:25	5:03:E6:03:F7:00			
9621	2000-01-01 17:03:36.455	16	F	Payload						
9622	2000-01-01 17:03:36.455	24								
9621	2000-01-01 17:01:35.956	16		Туре	2000	Time	Sensor I	D Sensor D	escription	Value
9622	2000-01-01 17:01:35.956	24		Status	2000	-01-01 17:00:02	128	GPS CIOCK St	atus	3 (Never Locked)
9621	2000-01-01 17:00:21.457	16	2	Status	2000	-01-01 17:00:02	8	Battery Voltag	ge .	13.200 V
9622	2000-01-01 17:00:21.457	24	3	Status	2000	-01-01 17:00:02	132	internai lemp	perature	29.300 deg C
1000	2000-01-01 17:00:02.960	20	4	Status	2000	-01-01-17:00:02	129	Massages Re	ceivea	398
9621	2000-01-01 16:58:14.958	20	5	status	2000	-01-01 17:00:02	130	Messages Ser	nt .	1015
9622	2000-01-01 16:58:14.958	24	6	Status	2000	-01-0117:00:02	131	warnings and	a Errors	U (UK)
9622	2000-01-01 16:58:14.958	24								

FIGURE 3-1. Messages displayed on A2Control

3.3 Pass reject list

The AL205R repeater firmware supports up to two different pass or reject lists for determining the messages to repeat. Before a message is repeated, it is checked against all active address lists. Lists can be either a pass list, where only listed entries are repeated, or a reject list where messages are repeated by default, but dropped if they are in the list. Messages can be filtered by Source Address, Destination Address, or the path list added by other repeaters. Messages can either be reported locally in the ALERT2 logs or dropped silently. These lists can be configured on the address lists tab in the A2Control software, or they can be configured via the ALERT2 IND API.

4. Firmware updates

Update the AL205R/AL205B firmware either locally by using a USB drive or remotely by using SFTP. Download the latest firmware from:

- AL205R—www.campbellsci.com/al205r
- AL205B—www.campbellsci.com/al205b

CAUTION:

The AL205B and AL205R use different firmware; the AL205B must use a2x-ind-update-*.tar.gpg and the AL205R must use a2x-rpt-update-*.tar.gpg.

CAUTION:

The AL205R/AL205B firmware files end in a double extension (.tar.gpg). When downloading, some browsers rename the files with one extension (.tar). If this happens, the user must rename the file to restore both extension or the AL205R/AL205B will not read the files.

CAUTION:

Do not unzip the firmware files on your computer. They need to remain intact to be uploaded to the device.

4.1 Local update

To perform a firmware upgrade using this method, the user must have physical access to the AL205R/AL205B and have a USB thumb drive.

- 1. Copy the new firmware to the root directory of the USB thumb drive.
- 2. Connect the AL205R/AL205B to power.
- 3. Insert the USB thumb drive into the USB port of the AL205R/AL205B.
- 4. Wait more than two minutes for the AL205R/AL205B to recognize the USB thumb drive and start the firmware update.

The **Bit Sync** LED flashes rapidly while the system logs are copied from the AL205R/AL205B (see Downloading ALERT2 data (p. 12)). When that process is complete, the AL205R/AL205B searches the USB thumb drive for firmware updates. When the update is found, the status LEDs, starting with **Clock Sync**, slowly flashes indicating the firmware is updating. After the update is complete, the LEDs remain on for a few seconds then the AL205R/AL205B automatically reboots.

If the **Serial 1** LED blinks quickly, the update has failed. Redo the upgrade process . If the update process continues to fail, contact Campbell Scientific for support.

CAUTION:

The USB Thumb drive must be format using the FAT file system format. The AL205R/AL205B is unable to read USB thumb drives that are formatted using other file system formats.

4.2 Remote update

Update the AL205R/AL205B remotely over a TCP/IP networks using the SFTP protocol. Campbell Scientific recommends using FileZilla as an SFTP client (https://filezilla-project.org).

Remote access to the AL205R/AL205B is disabled by default. To enable it, launch A2Control software, click the gear icon, click the **IP Settings** tab, and set the **Network Password**.

Connect to the AL205R/AL205B with the following parameters:

```
TCP/IP Address: [as configured or setup using DHCP]
Port: 4422
Username: alert2 [all lower case]
Password: [as configured in the AL205R/AL205B]
```



FIGURE 4-1. AL205B firmware upload

After successfully connecting to the AL205R/AL205B, upload the firmware file to the root folder of the device. After the upload is completed, the AL205R/AL205B automatically installs the updated firmware and reboots.

5. Downloading ALERT2 data

The AL205R/AL205B ships with a microSD card that stores all received ALERT2 traffic. The microSD card is intended to be left in the device during normal operation. It is not necessary to remove the microSD card to obtain logs from the AL205R/AL205B. Remove power before removing the microSD card. ALERT2 data can be retrieved from the AL205R/AL205B in three

different ways: remotely, using SFTP; locally, using a USB flash drive, or by removing the microSD card and copying data off of it directly.

5.1 Remote download

Remote access to the AL205R/AL205B is disabled by default. To enable it, launch A2Control software, click the gear icon, click the **IP Settings** tab, and set the **Network Password**.

Connect to the AL205R/AL205B with the following parameters:

```
TCP/IP Address: [as configured or setup using DHCP]
Port: 4422
Username: alert2 [all lower case]
Password: [as configured in the AL205R/AL205B]
```

Received ALERT2 data is stored in the decoder_output folder. Files are named [AGENCY_ID]_ [DATE].gz and are compressed with gzip.

System logs are stored in the logs folder. Each subsystem has its own folder with the most recent logs stored in it. These logs are not intended to contain useful information for day-to-day use of the system, but may be helpful for troubleshooting.

5.2 Local download—USB flash drive or microSD card

When a USB flash drive is inserted in the USB port, the AL205R/AL205B automatically copies system logs onto the USB flash drive in a folder named [AGENCY_ID]-[SOURCE_ADDRESS]-[DATE]. To copy the received ALERT2 data from the device, create a folder called decoder_output in the root folder of the USB flash drive. The AL205R/AL205B copies ALERT2 output files to that folder if it fined it. The AL205R/AL205B must be powered for at least two minutes for it to register the USB flash drive.

CAUTION:

The AL205R/AL205B is not compatible with the exFAT file system. Therefore, USB flash drives using the exFAT file system must be reformatted to the FAT file system.

To copy data directly from the microSD card, remove power from the AL205R/AL205B then remove the card from the device. Reinsert the card after copying the data before connecting to power.

CAUTION:

The AL205R/AL205B automatically reformats the microSD card if it is using the exFAT file

system. Therefore, ensure that the microSD card is using the FAT file system before inserting it in the card slot.

5.3 LoggerNet ALERT2 Administration Utility

LoggerNet can access the AL205R/AL205B ALERT2 and ALERT concentration data by using the LoggerNet ALERT2 Administration Utility in LoggerNet Admin. Usually, the AL205R/AL205B connects to the computer using TCP/IP and the LoggerNet call-back functionality, but the AL205R/AL205B can connect directly to a computer serial port.

NOTE:

LoggerNet Admin software is required to use LoggerNet ALERT2 Administration Utility.

- 1. Start ALERT2 Administrator.
- Log into the LoggerNet Admin server. For the Server Address, select localhost if LoggerNet and the ALERT2 Administrator are installed on the same computer, and select a DNS name or IP address if LoggerNet and the ALERT2 Administrator are installed on different computers. Type the correct Username and Password, then click Ok.

Server Address	localhost		~
Username	gtroberts		
Password	•••••		
	Remember userna	ame and password	
	Automatically log	into this server	
	Note: If security is no and password are no	ot enabled, usernam t required.	e

3. Select the ALERT2 Bases tab.

LoggerNet ALERT2 Administration Utility



- 4. Click 🔤 to add a new base.
- 5. If using TCP/IP, do the following:
 - a. Type a base name and select TCP/IP for the Link Type. Click OK.

Add ALERT2 B	Base		×
Base Name:	Mt. Namoi Base		
Link Type:	TCP/IP ~		
		Ok	Cancel

b. In the TCP Callback Port field, enter an open TCP/IP port number.

TIP:
Remote access to this port may require opening a port in the server firewall.
Contact your IT administrator for help.

LoggerNet ALERT2 Administration	n Utility — [×
ALERT2 Stations ALERT2 Bases			
ALERT2 Bases Gary's Office Repeater Gary's Test Bed Base Gary's Test Bed Repeater Mt. Namoi Base	Base Name: Mt. Namoi Base TCP Address TCP Callback Port 62531 Message Log File Size 120000		
	ALERT_CONCENTRATION_ID_3067 has no sensor report areas.		^
Apply Cancel	TCP Callback Port Specify the TCP port on which LoggerNet will listen in order for the ALERT2 receiver to make in incoming TC connection. If this value is non-zero, the link will only work for inbound connections.	P	~

- c. Click **Apply**. ALERT2 administrator is now ready to receive data from the AL205R/AL205B using a callback TCP/IP connection.
- 6. If using a serial port, do the following:
 - a. Type a base name and select Serial Port for the Link Type. Click OK.

Add ALERT2 I	Base		×
Base Name:	Mt. Naomi Base		
Link Type:	Serial Port V		
		Ok	Cancel

b. Select the Serial Port to which the AL205R/AL205B is connected and select 115,200 for the Baud Rate.

LoggerNet ALERT2 Administration Utility		- 🗆	×
ALERT2 Stations ALERT2 Bases			
ALERIZ Bases Gary's Office Repeater Gary's Test Bed Base Gary's Test Bed Repeater Mt. Naomi Base Message Log	se Name: Mt. Naomi Base serial Port COM28 aud Rate 115,200 g File Size 1200000		
ALERT_CO	NCENTRATION_ID_3067 has no sensor report areas.		- ^
Apply Cancel Specify display	Port the name of the serial port to which the ALERT2 receiver is attached. Clicking on the but the list of serial ports on the LoggerNet server host.	ton will	~

- c. Click the **Apply**button. ALERT2 administrator is now ready to receive data from the serial port of the AL205R/AL205B.
- 7. Start A2Control and connect to your AL205R/AL205B (see Configuration (p. 5)).
- 8. Click the gear icon to access the configuration settings.
- 9. If using TCP/IP, do the following:
 - a. Click the IP Settings tab.
 - b. In the ASCII IP Forward field, type the DNS or IP address of the LoggerNet Admin server, followed by a colon, then the TCP Callback Port. For example, in the following screen, 192.168.91.130 is the IP address for the LoggerNet Admin server and 62531 is the TCP Callback Port.

DHCP IP Address Netmask Gateway	Disabled 192.168.91.10
IP Address Netmask Gateway	192.168.91.10 255.255.255.0
Netmask Gateway	255.255.2
Gateway	
	192.168.91.1
DNS Serve	s 192.168.93.30,192.168.92.30
IP Whitelis	
Clock Sour	e GPS v
NTP Serve	192.168.100.25,192.168.92.25,192.168.93.25
ASCII IP F	rward 192.168.91.130:62531
Binary IP F	nward
Network P	ssword

- c. Click Write To Device to write the new setting to the AL205R/AL205B
- 10. If using a serial port, do the following:
 - a. Click the Serial Port Settings tab.
 - b. For the serial port that the AL205R/AL205B is connected, set the **Output Mode** to **ASCII** and the **Baud Rate** to **115200**.

Settings	IP Settings Address Serial Port 1	s Lists Serial Port Settings	Encryption Settings Serial Port 2		Serial Port 3			
	Input Mode	ALERT2 API V	Input Mode	ALERT2 API	Input Mode	ALERT2 API	~	
	Output Mode	ASCII ~	Output Mode	ASCII ~	Output Mode	ASCII	~	
	Baud Rate	9600 ~	Baud Rate	9600 ~	Baud Rate	115200	~	
	Parity	None ~	Parity	None 🗸	Parity	None	~	
	Stop Bits	1	Stop Bits	1	Stop Bits	1		
	Flow Control	None ~	Flow Control	None	Flow Control	None	~	
	Timeout (ms)	250	Timeout (ms)	250	Timeout (ms)	250		
	Independent Addr	False ~	Independent Addr	False ~	Independent Addr	False	~	
	Address (If Enabled)	9000	Address (If Enabled)	9000	Address (If Enable	d) 9000		

- c. Click Write To Device to write the new setting to the AL205R/AL205B.
- 11. Return to ALERT2 Administrator and setup new ALERT2 stations and Sensor reports (see ALERT2 Administrator Help for more information).

6. Port descriptions

The AL205R/AL205B has three serial ports with configurable functionality. The serial ports operate at RS-232 line levels.

Table 6-1: Serial port pinout (from left, facing the AL205R/AL205B)		
Pin number	Pin function	
1	TX (data output from the AL205R/AL205B)	
2	RX (data input from the AL205R/AL205B)	
3	Ground	

Serial port settings can be configured using the ALERT2 IND API or by using the AL205R/AL205B configuration menu. The AL205R/AL205B implements version 1.0 of the ALERT2 IND API. Default serial port settings are the following:

Table 6-2: Default serial port settings			
Setting name	Setting value		
Input Mode	API		
Output Mode	ASCII		
Baud Rate	9600		
Parity	None		
Stop Bits	1		
Flow Control	None		
Independent Addressing	False/Off		
Address	9000 (not enabled by default)		

Table 6-3 (p. 20) provides the pinout for the RX port. Table 6-4 (p. 21) provides the pinout for the TX port.

NOTE:

The RX radio connector can handle a maximum of 1.5 A of continuous current. The TX radio connector can handle up to 2.5 A of continuous current. Half-duplex repeater configurations with a single radio should use the TX power path to power the radio.

Table 6-3: RX pinout (from left, facing the AL205R/AL205B)				
Pin number	Label	Pin function		
1	12V	12 V power (provided by the AL205R/AL205B)		
2	G	Ground		
3	AI	RF data (input to the AL205R/AL205B		
4	CS	Channel select		

Table 6-4: TX pinout (from left, facing the AL205R/AL205B)				
Pin number	Label	Pin function		
1	AO	RF data (output from the AL205R/AL205B)		
2	G	Ground		
3	PTT	Push to talk		
4	12V	12 V power (provided by the AL205R/AL205B)		
5	CS	Channel select		

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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.
- 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.

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.

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.

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.



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