

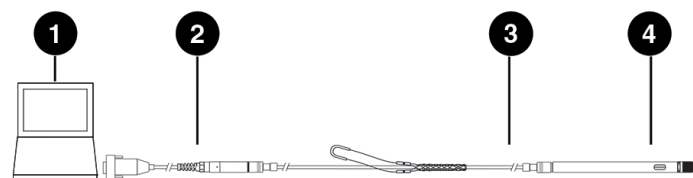
Cube 300S Telemetry System

Part No. 0062090, 0062100, 0062110, 0062210, 0062220, 0062230, 0034390, 0034400, 0034410




Never connect power to the Cube without the antenna attached.

Connecting an In-Situ Instrument to the Computer



Changing Instrument Communication Settings

Complete the following steps for each instrument you want to connect to the Cube.

1. Connect to the instrument using Win-Situ 5 software.
2. Click the Device Setup tab .
3. Click **Modbus Setup...**
4. Select the following options:
 - Baud: 9600**
 - Data Bits: 8**
 - Parity Bits: None**
 - Stop Bits: 1**
 - End Of Message Timeout (ms): 1000**
 - End of Session Timeout (ms): 5000**
 - Mode: Modbus-ASCII**
5. Enter a unique number in the device address for each instrument you want to connect to the Cube. No instrument should have the same device address. Record these addresses for future reference.

6. Click the checkmark. Click Yes to change the communication settings. Click Yes or No to save these settings as the default for Win-Situ 5.



You must change Win-Situ Software communication settings to match the device address and instrument communication settings next time you connect the instrument. Change this under **Preferences > Comm Settings**.

Set up and start a log in the instrument if you require data redundancy and your instrument supports internal data logging.

Changing Instrument Communication Settings - TROLL 9500 Only

1. Open Win-Situ 4 software and follow the steps in the Connection Wizard.
2. Set the baud rate to 9600 and connect to instrument.
3. Right click the TROLL 9500 device in the tree on the left, and select **Edit**.
4. Select **ASCII Mode Preferences**, and click **Next**.
5. Select the following options:
 - Comma delimited**
 - Enable ASCII mode of linear tests**
6. Click **Finish**.
7. For the TROLL 9500 to function, you must set up a log in Win-Situ and choose the same logging interval you have selected in the ANT Tool for the Cube.
8. Use the TROLL 9500's serial number as the device address when configuring this system with the ANT Tool.

Opening the Unit

1. Place the unit on a flat surface.
2. Remove the four screws from the cover of the unit and remove the cover.
3. Remove the four screws from the top panel.

Battery

Batteries are installed but not connected prior to shipping.

1. Ensure an antenna is attached to the unit.



Never connect or disconnect power to the unit without an antenna attached.

2. Plug in or unplug the battery pack from the board.

Connecting the Cube to the Computer

1. Connect the setup cable to the communication port of the Cube and to the computer.
2. Download the ANT Tube Tool software from www.in-situ.com/support
3. Install and open the ANT Tube Tool software.
4. Select the correct serial port. A serial-to-serial adapter is typically COM1. A USB-to-serial adapter is typically a different COM number.

Select Connected Probes

1. Connect your instruments to the Cube.
2. Click **Probe and set-point configuration**.
3. Click the **Connected probes** tab.
4. Select the appropriate probe names from the drop down menus, and enter the correct device addresses as set in Win-Situ 5.



If you have a Cube with a barometric sensor installed inside it, Probe 1 will automatically be listed as "Barometer" and the address will be listed as 100. Do not change this setting.

5. Click **Write probes and set-points**.
6. Close the window.

Select Probe Parameters for Alarming

1. Click **Probe and set-point configuration**.
2. Click the **Parameters monitoring** tab.
3. Select a connected probe from the drop-down menu, and then select a parameter to monitor. Cube units monitor up to eight total parameters for alarms from the connected probes.
4. Enter the minimum and maximum values to trigger warnings and alarms. If a parameter is measured outside the Warning levels, the measurement is stored in the log memory even if the Cube is not designated to save that reading. If a parameter is outside the Alarm levels, the reading is stored and an alarm message is sent if the corresponding alarm has been enabled and configured.



Use the same units for Warning and Alarm levels as the probe was set to use in Win-Situ 5.

5. Select the monitoring mode for Warnings/Alarms.

Absolute mode: Warning or Alarm occurs when a single reading is higher or lower than the maximum or minimum level.

Incremental mode: Warning or Alarm occurs when the change between two consecutive readings is greater than the Maximum value or less than the Minimum value. The alarm threshold is a slope instead of a fixed value.

6. Click **Write probes and set-points**.
7. Close the window.

Set the Site Name and Clock

1. Click **General information, parameters and functional options**.
2. Click the **Information** tab.
3. Enter a site name for your deployment area and click **Set the Site Name**.
4. Click **Set clock** to synchronize the Cube clock with your computer clock.
5. Close the window.

Configure Options

1. Click **General information, parameters and functional options**.
2. Click the **Options** tab.
3. "Barometric compensation for level readings" is only changeable if you have a Cube with an internal barometric sensor. Enter a manual value for the density of water if needed.
4. Select "Power supply to the probes" if you are deploying an Aqua TROLL 400, RDO PRO-X probe, or Rugged TROLL 200.
5. Select whether to send data to an email address or to an FTP site.



Do not alter the settings in the data file settings.

6. Click the **Write options and parameters** button.
7. Close the window.

Modem Parameters

1. Click **General information, parameters and functional options**.
2. Click the **Communication (1)** tab.
3. Enter the Access point name (APN) in the field under "Access Point". If you purchased a SIM card and data plan through In-Situ, your access point name is:

For KORE SIM cards:

c2.korem2m.com (U.S.A.)

vfd1.korem2m.com (outside U.S.A.)

For EMnify SIM cards:

em

✓ If you are using a third-party cellular service provider, you must contact them for your APN.

4. If your cellular service provider requires a user name and password, enter those in the fields under the access point name. In-Situ USA SIM cards do not require a user name or password. In-Situ International SIM cards require a user name and password:
Username: **KORE**
Password: **1234**
5. Enter up to 2 phone numbers in the fields under "SMS" to receive Cube status updates and alerts via text messages.
6. If you are using FTP to receive data, fill in all the fields of the FTP parameters section. "CSV" and "TXT" are the only options for file type.

FTP site must support ASCII and PASV data transfer modes.

✓ The FTP filename **MUST** be unique if you are setting up multiple telemetry units. In-Situ recommends using the telemetry unit serial number for each unit set up.

7. To receive data or alerts using email, click the **Communication (2) tab**. Enter the SMTP server for your email or internet service provider. If your provider requires a user name and password, enter those in the fields under the SMTP server. In-Situ **SIM cards do not provide an SMTP server**.

✓ Email (SMTP) communications can only be achieved by sending data without SSL encryption.

8. Enter the email address you'd like to receive the email from (must be a valid address), the address to receive email, and a carbon copy address if desired.
9. Click **Write options and parameters**.

10. Close the window.

Activate Alarms

1. Click **General information, parameters and functional options**.
2. Click the **Alarms** tab.
3. Select the alarms you wish to activate. To activate alarms that are dependent on probe parameter readings, select "Reading from probe out of range."
4. Under the "Alarm options" heading, select whether to send alarms using SMS (text) messages when they occur, then select whether to send alarm statuses each time the Cube sends measurement values. Email alarms require an SMTP server that allows login without authentication.
5. Enter the number of consecutive times a parameter in Absolute alarm mode can exceed its threshold before an SMS message is generated. A value of 1 means an SMS message is generated every time.
6. Enter the number of consecutive times a parameter in Incremental alarm mode can exceed its threshold before an SMS message is generated. A value of 1 means an SMS message is generated every time.
7. Enter the maximum number of text messages to be sent for the same Alarm episode.
8. Enter the maximum number of alarms that can be sent per day.
9. Click **Write alarm parameters**.
10. Close the window.

Set Probe Reading Schedule

1. Click **Frequency of wake-up events**.
2. Click **Frequency of probe readings and options**.
3. Select how often in minutes the Cube reads the probes. A value of 0 means the Cube never reads the probes, a value of 60 means every hour, and a value of 1440 means a reading every 24 hours.
4. Select how often the Cube saves the readings. A value of 1 means every reading.
5. Select how often the Cube transmits the readings. A value of 1 means every reading.

6. Select the significant digits to be included in the data.
7. Click **Write frequency and options**.
8. Close the window.

Set Wake Up Events

The Cube can be programmed with up to 8 different wake up periods. A wake up period is when the Cube sends data, sends a status text message, or waits for an external connection.

✓ Wake Up events are not necessary for most use cases.

1. **wake up events**.
2. Click the **Wake up events** tab.
3. Under "Wake up no. 1," select the amount of time for the Cube to wake up.
4. Select the day of the week for the wake up event.
5. Select the starting time. The Cube cannot be programmed for 12:00:00 AM.
6. Select the type of task for this wake up event. If "Wait for phone connections" is selected, additional options become available.
7. Scroll down to program additional wake up events.
8. When all events are programmed, click **Write frequency and options**.
9. Close the window.

Activate the Modem

Activate the modem if the Test FTP functionality returns an error.

1. Click **Functional mode and test**.
2. Click the **Modem, settings, and tests** tab.
3. Click the **Activate modem** button.
4. Select the GSM band for your geographical area and click the **Set GSM band** button.
5. Select whether your network is 2G or 3G and click the **Set network** button.
6. Click the **Verify SIM and PIN** button.

7. Click the **Show signal quality** button if you are near your deployment area.
8. Click the **Deactivate modem** button.
9. Close the window.

Restart Device and Test Communications

1. Click **Functional mode and test**.
2. Click the **Probes, real time reading** tab.
3. Press the **Immediate reading probes** button. Ensure all values are appropriate for the current conditions of the instruments. If the readings are all zeros there is a connection issue with your instruments. [See "Changing Instrument Communication Settings" on page 1.](#)
4. Click the **Test** tab.
5. Click the **FTP test** button to have a sample data file sent to the FTP site you specified in the previous setup.
6. Click the **Test data email** button to have a sample data file sent to the email addresses you specified in the previous setup.

✓ If either the FTP test or email test return error codes refer to the Troubleshooting section.

7. Click the **Status** tab.
8. Click the **Stop device** button.
9. Click the **Start device** button.
10. Close the window.

Deploy the Cube

Deploy your In-Situ Instruments as described in the Owner's Manual.

The Cube must be deployed in an area that receives direct sunlight for most of the day. In the northern hemisphere, deploy the Cube with the solar panel facing south. In the southern hemisphere, deploy the Cube with the solar panel facing north.

The Cube includes four plastic mounting adapters that can be attached to the pre-drilled holes on the back of the enclosure using the provided screws. In-Situ recommends using bolts to secure the plastic mounting brackets to your deployment location.

If you are deploying the Cube using the Wall Mounting Adapter (PN 0062330), use appropriate hardware to attach the Cube to the adapter using the pre-drilled holes.

If you are deploying the Cube using a different method, use the guidelines on the back of the Cube enclosure for appropriate mounting hardware dimensions. Always screw mounting hardware into the pre-drilled holes on the back of the enclosure. Never drill directly into the enclosure. This will void the warranty.

Improving Signal Quality

Cellular signal depends on several factors, including coverage area, antenna type, and objects in the area that may cause interference.

If your Cube is receiving poor signal or frequently misses transmissions, you can check the following to help determine the cause.

- The well casing may prevent the Tube from sending or receiving transmissions. Consider using an external antenna (PN 0062240) that can be mounted on the top of the well to prevent casing interference.
- Check the cellular provider's coverage area map. Your deployment area may be in a non-coverage area.
- Check the area surrounding your equipment. Objects like trees, electrical wires, and cement walls can affect cell reception. Consider moving the Cube to a different area to test reception.
- If your system cannot be moved, consider using a different type of antenna that can be mounted away from potential interference.