

Operator's Manual

TROLL® Link Telemetry System

Part number 0058310



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For products under the requirement of WEEE directive, please contact your distributor or local In-Situ Inc. office for the proper decontamination information and take back program, which will facilitate the proper collection, treatment, recovery, recycling, and safe disposal of the device.

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Overview

The TROLL Link Telemetry System provides quick and reliable remote communications using a GSM/GPRS or satellite network.

TROLL Link 100 systems require user-configuration of the telemetry, and setting a unique address for each instrument installed in the network. Users must set up a wireless service plan with a cellular service provider or In-Situ Inc.

TROLL Link 101 systems are pre-configured by In-Situ Inc., but still require setting a unique address for each instrument installed in the network. In-Situ Inc. sets up a wireless service plan for the user.

TROLL Link 201 systems pre-configured by In-Situ Inc., but still require setting a unique address for each instrument that is installed in the network. In-Situ Inc. sets up a wireless satellite service plan for the user.

Unpacking and Inspection

All TROLL Link Telemetry Systems contain the following items.

- TROLL Link enclosure with mounting brackets
- Battery (12 V, 7 Ah)
- Antenna
- Solar panel (1W, 10W or 20W), cable with female disconnects (2), and mounting bracket
- U-bolts (3), flat washers (6), split-lock washers (6), and nuts (6), or hex nut hose clamps (2).

You need to supply the following items.

- Mounting pole or tripod with a diameter of 6.032 cm (2.375 in.)
- In-Situ Inc. instruments and appropriate RuggedCable systems
- TROLL Com Communication Device
- TROLL Link Setup Software*
- Win-Situ 5 Plus Software*

* Software can be installed from an In-Situ software CD or downloaded from www.in-situ.com/TelemetrySoftware

For TROLL Link 100 Systems, you need to supply the following additional items.

- SIM card (purchased from In-Situ Inc. or your service provider)
- Cellular service plan
- Email gateway phone number (3-digit number needed to send data to an email address - obtained from your service provider)

Your TROLL Link Telemetry System was carefully inspected before shipping. Inspect the package for any physical damage sustained during shipment. Notify In-Situ Inc. and file a claim with the carriers involved if there is any damage. Do not attempt to operate the instrument when damage has occurred.

Warranty Provisions

In-Situ Inc. warrants the TROLL Link Telemetry System for one year from date of shipment by the end user against defects in materials and workmanship under normal operating conditions. To exercise this warranty contact Technical Support for a Return Material Authorization (RMA) and further instructions. Complete warranty provisions are posted on our website at www.in-situ.com.

Obtaining Repair Service

If you suspect your system is malfunctioning and repair is needed, you can help assure efficient servicing by following these guidelines:

1. Call or email In-Situ Technical Support. Have the product model and serial number available.
2. Be prepared to describe the problem, including how the product was used and the conditions noted at the time of the malfunction.
3. If Technical Support determines that service is needed, they will ask your company to fill out the RMA form and pre-approve a specified monetary amount for repair charges. When the form and pre-approval is received, Technical Support will assign an RMA (Return Material Authorization) number.
4. Clean the product as described in the manual.
5. If the product contains a removable battery, remove and retain it unless you are returning the system for a refund or Technical Support states otherwise.
6. Carefully pack your product in its original shipping box, if possible.
7. Mark the RMA number clearly on the outside of the box.
8. Send the package, shipping prepaid, to:

In-Situ Inc.
ATTN: Repairs
221 East Lincoln Avenue
Fort Collins, CO 80524

The warranty does not cover damage during transit. In-Situ recommends insurance for all shipments. Warranty repairs will be shipped back prepaid.

Outside the U.S.

Contact your international In-Situ distributor for repair and service information.

Systems Offered

In-Situ Inc. offers three TROLL Link Telemetry Systems:

- TROLL Link 100—a GSM/GPRS system that uses SMS (text messages), dial-up, or IP connect modes to access data.
- TROLL Link 101—a GSM/GPRS system that transmits data to the In-Situ Data Center, which can be accessed anywhere you have an internet connection at <http://www.isi-data.com/>.
- TROLL Link 201—a satellite-based system that transmits data to the In-Situ Data Center, which can be accessed anywhere you have an internet connection at <http://www.isi-data.com/>.

SIM Card

TROLL Link Telemetry System 100 and 101 units must have a SIM (subscriber identity module) card to allow communication over the wireless network. TROLL Link 101 units have SIM cards pre-installed by In-Situ Inc.



TROLL Link 100 customers must obtain a SIM card from their service provider, typically when purchasing a service plan. These cards can be configured to have a static IP address. Consider if your application requires a static IP address when purchasing the SIM card.

Once a SIM card has been obtained, install it in the slot at the top of the TROLL Link 100 modem, as shown below.



1. Align the SIM card so the diagonal cut is facing towards the antenna base.
2. Gently insert the card into the slot and push in fully. Hold the card in place with one finger.
3. While holding the card, slide the lock over the edge of the card.



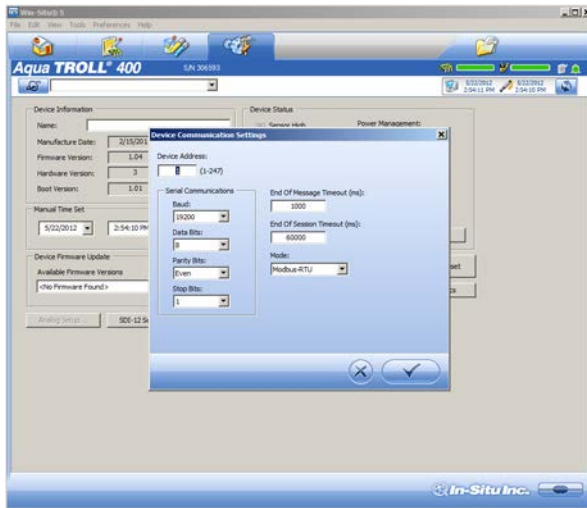
TROLL Link 101 modems are shipped with SIM cards already installed.

Changing the Device Address

When networking multiple Level TROLL, Aqua TROLL, Rugged TROLL, or RDO PRO Instruments, each device requires a unique device address.

Complete the following steps with the instrument connected to the software.

1. Click the **Device Setup** tab.
2. Click the **Modbus Setup...** button.
3. Select the **Device Address** box and change the number to the desired value, making sure to not duplicate an address within the network.



4. Click the **check mark** to save changes. Click **Yes** when asked to proceed.
5. Click **No** when prompted to save the changes as the new default settings.



You must change Win-Situ Software communication settings to match the device address next time you connect the instrument. See page 32.

TROLL Link 100 Setup

This section describes configuring a TROLL Link 100 System. For TROLL Link 101 or 201 Systems, skip to the section **TROLL Link 101 and 201 Setup**.



You **MUST** configure and test your TROLL Link Telemetry System in your home or office prior to installing it in the field.

Changing Modbus Communication Settings in Win-Situ 5

Complete the following steps with the instrument connected to Win-Situ 5 Software. Change Modbus communication settings for each instrument.

1. Click the **Device Setup** tab.
2. Click the **Modbus Setup...** button.
3. Click the **Baud** drop-down menu and select the correct baud rate for your cable length based on the on-screen instructions. The default value is 19200.
4. Click the **Parity Bits** drop-down menu and select **None**.
5. Click the **End of Session Timeout (ms)** box and enter **60000=60secs**.
6. Click the **Mode** drop-down menu and select **Modbus-ASCII**.

-
7. Click the **check mark**. Click **Yes** when asked to proceed.
 8. Click **No** when prompted to save the changes as the new default settings.



You will need to change the Win-Situ communication settings to match these settings the next time you connect your instrument.

Determining Your Service Provider

TROLL Link 100 systems require a wireless service plan provider. Users must obtain their own cellular GSM/GPRS service plan, either from a third party or from In-Situ. In-Situ supports third-party service plans provided by AT&T® and T-Mobile®.

In-Situ Inc. uses AT&T as the service provider for the TROLL Link 100 and 101 in the U.S.A. and Rogers™ Communications in Canada.

Determining SMS Usage

Short Message Service (SMS) is a service that permits devices within a network to send and receive short messages (also known as text messages, or SMSs). Typically, you purchase a certain number of SMS messages from your service provider. Messages sent or received beyond the purchased amount are charged at a different rate (overages).

To purchase the appropriate service plan, you need to know how many SMS messages you will send each month. This is based on your desired data and sample rates from your In-Situ instruments.

- One SMS message holds up to five measured values from a single instrument (i.e., instrument parameters, battery life, etc.).
- Instruments that require more than five values to be transmitted at one time require additional messages.
- Up to 16 messages (80 values) can be transmitted at one time.

Use the following chart to determine what type of plan you need to avoid unexpected overage charges. The chart describes sending a single SMS (5 measured values or less) when sampling a single instrument. Sampling additional instruments increases the number of messages.

Data sampling rate / SMS frequency (minutes between samples / messages)	Messages per day	Messages per month
5	288	8928
10	144	4464
15	96	2976
30	48	1488
60	24	744
120	12	372
180	8	248
240	6	186
360	4	124
480	3	93
720	2	62
1440	1	31

Required Items From Your Service Provider

Before proceeding with setup and configuration, ensure you have obtained the following items from your service provider.

- ☐ A data plan
- ☐ A SIM card
- ☐ A gateway phone number (required when you send SMS messages to an email address).

The items below are only required when you use TCP/IP to connect to the TROLL Link Telemetry System.

- ☐ APN Name
- ☐ APN User ID
- ☐ APN Password

The following settings apply when In-Situ Inc. is your service provider, unless otherwise indicated.

-
- APN Name: ccspsc095.acfes.org or romcomm.apn
 - APN User ID: (blank)
 - APN Password: (blank)

Installing the TROLL Link Software

1. Install the TROLL Link Setup Utility and Win-Situ 5 Plus Software to your local hard drive. The software can be installed using the In-Situ software CD or downloaded from www.in-situ.com/TelemetrySoftware
2. Follow the installation wizard prompts for both programs to complete the installations.
3. When prompted, install the COM drivers at the end of each software installation.
4. Launch the TROLL Link Setup Utility software.
5. Click **Yes** to activate the software. A dialog box opens and displays the hardware key.
6. Send an email to Support@in-situ.com with the hardware key and your sales order number. If you do not have your sales order number you will need to provide additional information.
7. Technical Support will reply to your email with a license key and an activation code. Write these numbers in the space provided below.

TROLL Link Setup Software License Key:

_____—_____—_____—_____

TROLL Link Setup Software Activation Code:

_____—_____

Win-Situ 5 Plus Software License Key:

_____—_____—_____—_____

Win-Situ 5 Plus Software Activation Code:

_____—_____

8. Enter the TROLL Link Setup Software license key and activation code into the software dialog box and click the **check mark**.
9. Launch Win-Situ 5 Plus software.
10. Click **Yes** to activate the software.
11. Enter the Win-Situ 5 Plus license key and activation code into the software dialog box and click the **check mark**.

Connecting Instruments to the TROLL Link Telemetry System

All instruments must be connected to the TROLL Link Telemetry System during configuration to set up messages, alarms, and relays. Instruments are connected using a bulkhead-to-twist-lock connection for a single instrument, or using the TROLL Net Hub for a multiple instrument network.

When configuring a multiple instrument network, you must have all instruments connected at the same time to properly set up the system.

Ensure all instruments have been uniquely addressed prior to connecting them to the TROLL Net Hub.

1. Connect the TROLL Link Telemetry System to the TROLL Net Hub master connector by wiring through the strain relief connector. See the TROLL Net Hub Instruction Sheet.
2. Connect all instruments to the TROLL Net Hub slave connectors.

Installing a Battery

1. Install batteries with the terminals oriented toward the top of the enclosure.
2. Plug the black (negative) leads into the black terminals of the batteries first. Ensure that the terminal does not sit between the lead clip and the plastic sheath, but that the lead clip encompasses the battery terminal.



3. Plug the red (positive) leads into the red battery terminals. Ensure that the terminal does not sit between the lead clip and the plastic sheath, but that the lead clip encompasses the battery terminal.

Connecting the TROLL Link to the PC

1. Ensure the SIM card has been installed in the TROLL Link modem.
2. Connect the 9-pin male-to-female serial cable to the RS-232 port on the front of the modem. Connect the opposite end of the cable to the serial port on your PC.
3. Connect the black (negative) battery terminal to the black lead on the battery. Connect the red (positive) battery terminal to the red lead on the battery.
4. In the TROLL Link Setup Software, click the **Connect** button in the lower-right corner of the window.
5. The **Select Connection** window opens. The default connection settings are displayed.

6. Name the connection if desired. Ensure COM 1 is selected in the Serial Connection drop-down menu.
7. Check all TROLL addresses that are connected to the TROLL Link Telemetry System in the box under the **Other Settings** field.

Other Settings:

TROLL Link Address: Max Packet Size:

Transmission Delay: (ms) Retries:

Password:

TROLL Address List:

- ☒ 1
- ☒ 2
- ☒ 3
- ☒ 4
- ☐ 5
- ☐ 6
- ☐ 7

If the connection fails, follow the steps below.

- Ensure the serial cable connections at the TROLL Link unit and at the PC are tight.
- Check the battery terminal connections. Check the top of the modem to ensure the power light is on.
- If you have more than one serial port connection on your PC, check that the correct COM port is selected in the drop-down menu on the Select Connection window.

Configuring the TROLL Link Telemetry System

Defining the Mode of Operation

1. Click the **Mode** tab.
2. Select the mode you intend the TROLL Link Telemetry System to use*.

Summary **Mode** **Schedule** **Mess**

When TROLL Link turns on, what should it do?

☒ Send current readings using SMS Messages

☐ Wait for a phone call from Win-Situ 5

☐ Wait for an Internet (TCP/IP) connection from Win-Situ

Option	Description
Send current readings using SMS Messages	Sends an SMS (text) message that has been configured in the Messages Tab . You must select the type of TROLL connected to the TROLL Link with the radio buttons below.
Wait for a phone call from Win-Situ 5	Connect to the TROLL Link Telemetry System using Modem Communications (dial-up).
Wait for an Internet (TCP/IP) connection from Win-Situ	Connect to the TROLL Link Telemetry System using IP (internet) Communications.

* If a TROLL 9500 is connected, you must select **Send current readings using SMS Messages**. You will not be able to download data from a TROLL 9500 in dial-up or TCP/IP modes.

If you select **Wait for an Internet (TCP/IP) connection from Win-Situ**, you must determine the TROLL Link Modem IP and Port number. These are displayed on the Summary Tab as **Modem IP** and **Port**. Write these numbers in the space provided below.

Modem IP: _____.

Port: _____ (3001 is default)

3. Select what type of instrument(s) are connected to the TROLL Link. Choose the communication protocol. The protocol for Level TROLL and Aqua TROLL Instruments is ASCII.
4. Leave the Compression Modbus Messages box unchecked.
5. Select an Auto Reset Modem Interval. The reset interval determines how often the modem power supply cycles (turns off and back on). Four hours is typical.
6. Enter a 10-character access password if desired. Write the password in the space provided below. Click the **Set Pswd** button.

TROLL Link Access Password: _____

Configuring the Message/Wake Schedule

The **Schedule** tab determines time periods throughout the day when the TROLL Link Telemetry System turns on to send SMS messages, or turns on and waits to receive a dial-up or TCP/IP connection from Win-Situ 5 Plus. These time periods are called Message/Wake periods. Message periods occur when the TROLL Link is set to SMS mode, while Wake periods occur when the TROLL Link is set to dial-up or TCP/IP mode.

Message/Wake periods may occur several times a day. Scheduling these periods prevents the TROLL Link Telemetry System from draining the battery.

Create a schedule by selecting and clearing Message/Wake periods in the Message/Wake field. Another way to create a schedule is to adjust certain time parameters in the Create a Schedule field. Once the parameters are adjusted, all Message/Wake periods that fall within those parameters are selected.

In-Situ Inc. recommends that you make each Message/Wake period less than two hours.

The screenshot shows the 'Schedule' tab of the TROLL Link Telemetry System configuration. At the top, there are tabs for 'Summary', 'Mode', 'Schedule', 'Messages', 'Alarm', and 'Discrete I/O'. The 'Schedule' tab is active. Below the tabs, there is a section titled 'Turn on and send current readings using SMS Messaging:'. This section contains two main areas: 'Message Schedule' on the left and 'Create A Schedule' on the right. The 'Message Schedule' area has a list of time slots from 12:00:00 AM to 3:45:00 AM in 15-minute increments, each with a checkbox. The 'Create A Schedule' area has four input fields: 'Start Time' (12:00:00 AM), 'End Time' (11:59:00 PM), 'Wake Interval' (15 Minutes), and 'Wake Duration' (15 Minutes). Below these fields is a 'Create' button. At the bottom of the 'Create A Schedule' section are 'Select All' and 'Clear All' buttons.

1. Click the **Schedule** tab.
2. Manually select or clear Message/Wake periods under the **Message/Wake Schedule** section. Use the **Select All** button to select all available Message/Wake periods. Use the **Clear All** button to remove all selected periods.



Select Message/Wake periods based on when you are typically available to receive messages or have the ability to dial-up/connect to the TROLL Link Telemetry System.

-OR-

3. Enter appropriate values for each time parameter under the **Create a Schedule** section.
 - Start Time denotes the time each day that Message/Wake periods begin (e.g., 6:00 AM).
 - End Time denotes the time each day that Message/Wake periods stop (e.g., 9:00 AM).
 - Wake Interval denotes how often Message/Wake periods occur (e.g., a 1-hour interval means periods occur at 6:00 AM, 7:00 AM, 8:00AM, 9:00AM).
 - Wake Duration denotes how long Message/Wake periods last (e.g., a 30-minute duration means periods occur from 6:00 AM - 6:30 AM, 7:00 AM - 7:30 AM, 8:00 AM - 8:30 AM, 9:00 AM - 9:30 AM)
4. Click the **Create** button. All Message/Wake periods that satisfy the parameter values populate the Message/Wake Schedule field.
5. Use the **Select All** button to select all available Message/Wake periods. Use the **Clear All** button to remove all selected periods.



Select Message/Wake periods based on when you are typically available to receive messages or have the ability to dial-up/connect to the TROLL Link Telemetry System.

Configuring the SMS (Text) Message Format

Configure the number of SMS messages sent, SMS message contents, and the SMS message destination (phone or email) from the Messages tab.

Skip this section when connecting to the TROLL Link Telemetry System using dial-up or TCP/IP connections.

1. Click the **Messages** tab.

Summary Mode Schedule **Messages** Alarm Discrete I/O

Send current readings using SMS messaging to:

☒ A phone ☐ An email address

Phone: 1234567890 Retries: 1 (1-10)

Description: Test TimeOut (secs): 30 (30-600)

The text message is sent to a phone. Enter text into the description field to distinguish source of the text message.

Messages:

Message#	Device Type	Address	Parameter 1	Parameter 2	Parameter 3
1	Unknown	-----	Reg 40109		

Add Delete

2. Select the appropriate destination for the SMS messages. SMS messages are only sent to one device. Messages sent to an email address require a gateway phone number. Contact your service provider for their gateway phone number. In-Situ service plans provided by AT&T have a gateway phone number of 121.
- Select **A phone**. Enter the destination mobile phone number, and a description (a site name or other information) if desired.
- OR-
- Select **An email address**. Enter a gateway phone number, and enter the destination email address.
3. In the **Retries** field, enter the number of times the TROLL Link Telemetry System resends a message (1 to 10 times) when communications fail. 3 is the recommended number.
4. In the **TimeOut (secs)** field, enter the amount of time the TROLL Link Telemetry System attempts to send a message before it is considered failed. 30 (the default value) is the recommended value.
5. Click **Add** to set up individual messages.
6. Select an instrument from the **Device** drop-down menu.
7. Select the desired parameters for the SMS message from the Available Parameters window. Click the right arrow button to move the parameters to the Message Parameters window.
- One SMS message holds up to five measured values from a single instrument.
 - Instruments that require more than five values to be transmitted require additional messages.

- Up to 16 messages (80 values) can be transmitted at one time.
- Click the **check mark**.
 - Repeat steps 5 - 8 for all other SMS messages.
 - Delete a message by selecting it and clicking **Delete** to remove it from the list.
 - Click the **Load Configuration** button. 
 - Click **Test**.
 - The TROLL Link Setup Software prompts you to disconnect. Click the **Disconnect** button.
 - Wait for the message to be sent to your phone or email address.

SMS Data Appearance

Each SMS data message contains seven comma-separated values:

-----Original Message-----

From: 9716906987@tmomail.net [mailto:9716906987@tmomail.net]

Sent: Thursday, June 14, 2012 2:46 PM

To: youremail@youremailprovider.com

Subject:

Measurement 21:45,2,3.000,n,n,n,n,b0c0r0



Number	Description
1	21:45 —Time the data were measured
2	2 —SMS message number (set in the Messages tab)
3	3.000, n, n, n, n —Parameter measurement values. • Numeric values equal actual measurements • "n" equals no measurement taken • "e" equals an attempted measurement, but the device did not respond
4	b0c0r0 —TROLL Link system messages • "b" equals battery status, where 1 = battery ok, 0 = low battery (11 V or less) • "c" equals counter status, where 1 = counter on, 0 = counter off • "r" equals relay status, where 1 = relay on, 0 = relay off

Configuring Alarms

Configure device status alarms, TROLL Link Telemetry System alarms, the frequency the device scans for alarm conditions, and how you are notified of alarms using the Alarms tab.

Device alarms (alarms triggered by a pre-set low or high parameter value) are created using Win-Situ 5 Software. You cannot set device alarm parameters using the TROLL Link Setup Software. Device status alarms, such as Device Error and Low TROLL Battery, do not need to be created in Win-Situ 5.

Alarms are based on the device status of the instrument, which is updated when measurements are taken.

1. Click the **Alarms** tab.

The screenshot shows the 'Alarms' tab in the Win-Situ 5 software interface. At the top, there are tabs for 'Summary', 'Mode', 'Schedule', 'Messages', 'Alarm' (selected), and 'Discrete I/O'. The 'Alarm' tab contains several sections: 'Alarm Control' with a 'Per Scan' dropdown and a 'Send All Alarms' checkbox; 'In-Situ Device Status Alarm' with a 'Device' dropdown and a 'Scan Rate' dropdown set to '15 Minutes'; 'Alarm Notification' with radio buttons for 'A phone' (selected) and 'An email address', and fields for 'Phone:' and 'Description:'. On the right, there are two lists of checkboxes: 'In-Situ Device Status Alarms' (Low Alarm, Low Warning, Hi Warning, Hi Alarm, Hardware Reset, Device Error, No External Power, Low TROLL Battery, Low TROLL Memory) and 'TROLL Link Alarms' (Low TROLL Link Battery, Discrete I/O ON). At the bottom, there are two lightbulb icons with explanatory text: 'The alarm scan rate is shared with the discrete scan rate. Changing one will also change the other.' and 'If sending alarm message to another phone, the email field can be used as a site description.' and 'The text message is sent to a phone. Enter text into the description field to distinguish source of the text message.'

2. Select the Alarm Control drop-down menu.
 - **Disabled**—Alarms are disabled. Other options are disabled.
 - **Per Scan**—Sends alarms based on the Scan Rate* (set below)
 - **Per Event**—Sends alarms as they occur
3. Select an instrument from the Device drop-down menu.
4. Select a Scan Rate* (applies only when Per Scan is selected in the Alarm Control drop-down menu).



The Scan Rate is independent of the SMS schedule set up in the Schedule tab, and applies only to Alarms and Discrete I/O.

5. Select the desired device alarms from the In-Situ Device Status Alarms section.
6. Repeat steps 3-5 for remaining instruments.
7. Select the desired TROLL Link Telemetry System alarms from the TROLL Link Alarms section.

-
8. Select where to send alarm messages in the Alarm Notification section.
- Select **A phone**. Enter the destination mobile phone number, and a description if desired (site name or other information).
- OR-
- Select **An email address**. Enter a gateway phone number, and enter the destination email address.

SMS Alarm Messages

The TROLL Link Telemetry System sends alarm messages when an alarm or warning condition is satisfied. The alarm message contains the time stamp, and then a series of codes. Refer to the alarm code descriptions in the table below.

Alarm Code	Description
AH	High alarm
WH	High warning
AL	Low alarm
WL	Low warning
CAL	Sensor out of calibration
SC	Sensor changed
PWRM	Power management disabled
OFLN	Device offline
DRST	Device hardware reset
DMAL	Device malfunction
XPWR	No external power detected
TBATT	Low TROLL instrument battery
LMEM	Low TROLL instrument memory
TLBATT	Low TROLL Link Telemetry System battery

Configuring Discrete I/O

Skip this section when you do not require a discrete I/O relay.

1. Click the **Discrete I/O** tab.

The screenshot shows the 'Discrete I/O' configuration tab. At the top, there are tabs for 'Summary', 'Mode', 'Schedule', 'Messages', 'Alarm', and 'Discrete I/O'. The 'Discrete I/O' tab is active. Below the tabs, there is a section for 'Active Discrete Control' with a dropdown menu set to 'Enabled' and a 'Discrete State' indicator set to 'OFF'. Underneath, there is a 'Trigger Discrete With Device' section with three dropdown menus: 'Device' (set to 'TROLL Link 100 (GSM) (247)'), 'Scan Rate' (set to '15 Minutes'), and 'Parameter' (set to 'Pulse Counter'). Below this, there are two sections: 'Parameter Control Limits' with input fields for 'Discrete On' (set to 0) and 'Discrete Off' (set to 0), and 'Manual Control' with two buttons: 'Set Discrete ON' and 'Set Discrete OFF'. At the bottom, there is a lightbulb icon and a note: 'The discrete control scan rate is shared with the alarm scan rate. Changing one will also change the other. The discrete is ON when the parameter value exceeds the "Discrete On" value. Note: The discrete is ON when the pin is pulled low to DC-.'

2. Select the Active Discrete Control drop-down menu.
 - **Disabled**—Discrete I/O is disabled. Other options are disabled.
 - **Enabled**—The discrete is ON when a selected parameter value (set below) is exceeded.
 - **On RS485**—The discrete is ON when RS485 is active. Other options are disabled.
3. Select the device that triggers the relay.



The Scan Rate is shared with the Alarm Scan Rate. Changing this setting changes the Alarm Scan Rate.

4. Select the parameter that triggers the relay.
5. In the **Discrete On** box, enter the value that once exceeded, turns on the relay.
6. In the **Discrete Off** box, enter the value that once dropped below, turns off the relay.

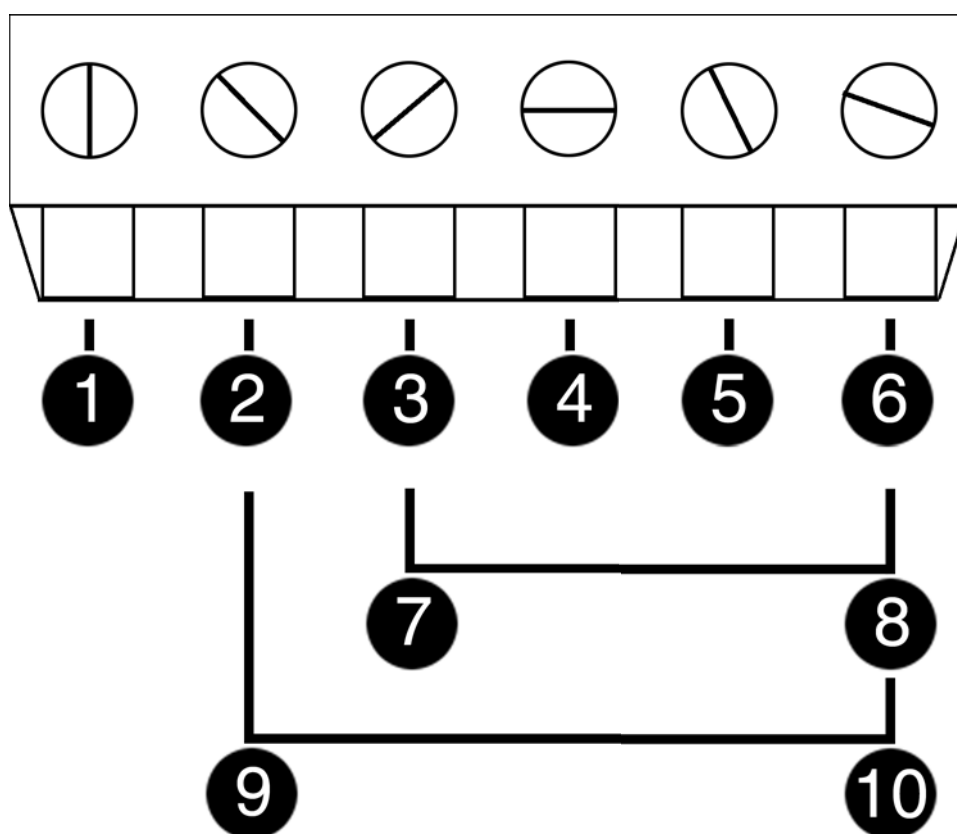


When the Discrete On value is less than the Discrete Off value, the relay is on when the parameter is less than the Discrete On value.

Completing the TROLL Link Configuration

1. Click the **Load Configuration** button  when all settings are configured properly.
2. If the modem is set to TCP/IP mode, enter the APN Name, port number, user ID, and password. This information is obtained from your service provider.
3. To save the current configuration as a template, click **File > Save as Template**.

TROLL Link 100 Wiring Diagram



Number	Function	Wire
1	DC Com (-)	Bulkhead black wire; solar panel black wire
2	Discrete Input	
3	Discrete Counter	
4	RS485 (+)	Bulkhead blue wire
5	RS485 (-)	Bulkhead green wire
6	DC (+)	Bulkhead red wire; fuse blue wire
7	Pulse Count. (-)	
8	Pulse Count. (+)	
9	Relay (-)	
10	Relay (+)	

Retrieving Data from the TROLL Link 100

Receiving SMS Messages

SMS messages are sent according to the Message/Wake schedule.

Connecting to the TROLL Link 100 in Dial-Up Mode

Win-Situ 5 Plus can only establish a connection to the TROLL Link Telemetry System during a scheduled Wake/Message period.

-
1. Open Win-Situ 5 Plus Software.
 2. Click **No** when prompted *Connect to device now?*
 3. Click **Preferences**.
 4. Click **Comm Settings...**
 5. Click the radio button next to **Modem Communications**.
 6. Enter the data phone number.
 7. Enter the **Device Address** of the instrument you intend to connect to (Default 1).
 8. Enter the number of **Retries** (user-defined; 3 is recommended).
 9. Enter a **Transmission Delay** value between 15 and 20.
 10. Enter the TROLL Link password, if applicable.
 11. Ensure the **Mode** is set to **Modbus-ASCII**.
 12. Click the **check mark**.
 13. Click the connect button in the lower-right corner.
 14. Click the **Logging** tab, click the desired log and click **Download**.
 15. Click the disconnect button.

Connecting to the TROLL Link 100 in TCP/IP Mode

Win-Situ 5 Plus can only establish a connection to the TROLL Link Telemetry System during a scheduled Wake/Message period.

1. Open Win-Situ 5 Plus Software.
2. Click **No** when prompted *Connect to device now?*
3. Click **Preferences**.
4. Click **Comm Settings...**
5. Click the radio button next to **IP Communications**.
6. Enter the IP Address and Port Number.



The IP Address and Port Number are available (if you wrote them down when prompted) in the section **Defining the Mode of Operation**. You must reconnect to the TROLL Link Telemetry System using the TROLL Link Setup Software and find the numbers on the Summary Tab if you did not write the numbers down.

7. Enter the **Device Address** of the instrument to connect to (Default 1).
8. Enter the number of **Retries** (user-defined; 3 is recommended).
9. Enter a **Transmission Delay** value between 15 and 20.

-
10. Enter the TROLL Link password, if applicable.
 11. Ensure the **Mode** is set to **Modbus-ASCII**.
 12. Click the **check mark**.
 13. Click the connect button in the lower-right corner.
 14. Click the **Logging** tab, click the desired log and click **Download**
 15. Click the disconnect button in the lower-left corner.

Stopping SMS Messages

The directions below describe turning off SMS messages using a direct serial connection.

1. Follow the steps in the section ***Connecting the TROLL Link to the PC.***
2. On the Schedule tab, click **Clear All**.
3. Click the **Load Configuration** button.



The modem no longer transmits messages, but still draws power from the battery.

The directions below describe turning off SMS messages using a remote IP connection.

1. Open the TROLL Link Setup Software.
2. Click the **Connect** button.
3. Click the radio button next to **IP Connection**.
4. Enter the TROLL Link Telemetry System IP Address and IP Port number. These numbers are listed in the Remote Site Connections window or on the Summary tab.
5. Enter the number of retries (user-defined).
6. Enter the TROLL Link password (if applicable).
7. Click the **check mark**.
8. On the Schedule tab, click **Clear All**.
9. Click the **Load Configuration** button.



The modem no longer transmits messages, but still draws power from the battery.

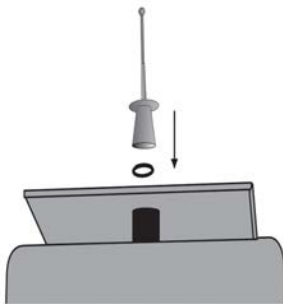
TROLL Link 101 and 201 Setup

The TROLL Link 101 and 201 systems connect to the In-Situ Data Center, and arrive pre-configured to your settings. Access the Data Center to view your site.

To change settings or learn more about the Data Center, see the ***In-Situ Data Center*** section.

Connecting the Antenna - TROLL Link 101 Only

1. Screw the antenna and gasket onto the antenna connector, located on the top of the enclosure mounting bracket.



Installing a Battery

1. Install batteries with the terminals oriented toward the top of the enclosure.
2. Plug the black (negative) leads into the black terminals of the batteries first. Ensure that the terminal does not sit between the lead clip and the plastic sheath, but that the lead clip encompasses the battery terminal.



3. Plug the red (positive) leads into the red battery terminals. Ensure that the terminal does not sit between the lead clip and the plastic sheath, but that the lead clip encompasses the battery terminal.

Accessing the Data Center

Note that it may take up to an hour for data to be transmitted to the Data Center, depending on the data service package you have.

1. Open a Web browser.
2. Enter the URL:
<http://www.isi-data.com>

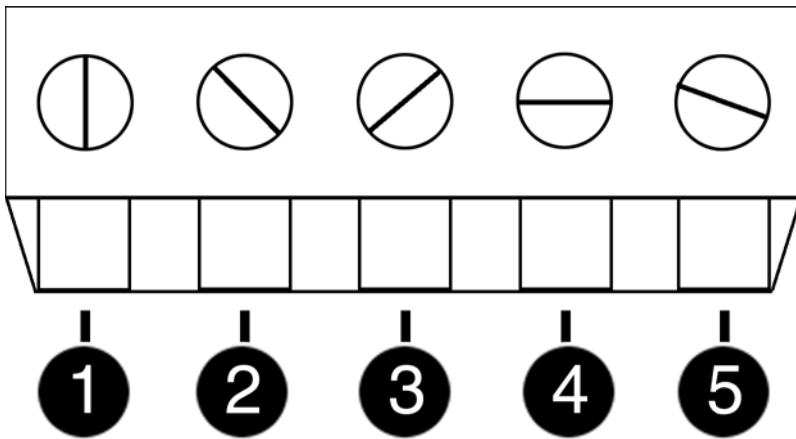
3. Enter your User ID and Password supplied by In-Situ. Click **Login**.
4. The Site Index appears. The Site Index displays the site name, most recent message received date, number of devices at the site, and the alarm status.
5. Click a site name to view more data from that site.
6. Select a Device to view more data from that device.

If the next transmission interval has not occurred, you should confirm that communication from all devices in the network has been successful.

1. Ensure all components of the TROLL Link Telemetry System have power applied.
2. From the Site Index, click the site name.
3. Click the first device listed.
4. Select **Manage Device** under the **Site Management** heading in the left navigation bar.
5. Select **View Config Messages** under the **Device Config** heading in the left navigation bar.

If data does not refresh at the expected rate or the site does not display the network, contact technical support.

TROLL Link 101 and 201 Wiring Diagram



Number	Function	Wire
1	DC Com (-) Pulse (-)	Bulkhead black wire; solar panel black wire
2	RS485 (-)	Bulkhead green wire
3	Pulse (+)	
4	RS485 (+)	Bulkhead blue wire
5	DC (+) 8-24 VDC	Bulkhead red wire; fuse blue wire

Contact In-Situ to configure your counter (pulse) input.

Field Installation

Connecting and Deploying Instruments

Ensure data-logging capable instruments have been programmed with a data log before completing the following steps. Refer to the instrument manual for instructions on programming a data log. Ensure alarm conditions have been programmed (if applicable).

Ensure all instruments have been properly, uniquely addressed in Win-Situ Software with the correct Modbus settings.

Perform the following steps for each instrument. Ensure you are installing the instrument in its proper location.

1. Connect the instrument to the RuggedCable using the twist-lock connector. The twist-lock connector clicks when the connection is tight.
2. Remove the red dust cap from the bulkhead connector of the enclosure.
3. Connect the up-hole end of the cable to the bulkhead connector of the enclosure.
4. Install the instrument in its deployment location. Refer to the instrument Operator's Manual for any questions regarding proper connection or deployment.
5. Ensure the cable does not apply excessive weight on the enclosure by securing the cable grip.

Installing the TROLL Link Telemetry System

To mount the enclosure, you may obtain a mounting tripod or install your own pole. Install the pole before proceeding.

1. Hold the enclosure to the pole at the desired height (be sure to leave room at the top of the pole for the solar panel).
2. Place a hose clamp or U-bolt into the two cutouts of the top bracket of the enclosure and around the pole.
3. For hose clamps tighten the clamp until the enclosure does not move. Attach the second hose clamp to the bottom of the enclosure.
For U-bolts Place the smaller bracket over the open ends of the bolt. Use split-lock washers and nuts to tighten the assembly to the pole.
Repeat for any remaining open brackets.
4. Remove the two yellow caps from the vent tube inside the enclosure. Attach the desiccant tube to the vent tube.

Installing a 1 W Solar Panel

A solar panel must be installed with the communication system. It can be installed on the same pole.

1. Hold the solar panel near the top of the pole. Point the panel towards the equator. Adjust the panel angle for optimum sunlight reception.
2. Thread the U-bolt through the solar panel bracket. Place the smaller bracket over the open ends of the bolt. Use the split-lock washers and nuts to tighten the assembly to the pole. Repeat for any remaining open brackets.

Trim the solar panel wire before inserting it into an enclosure.

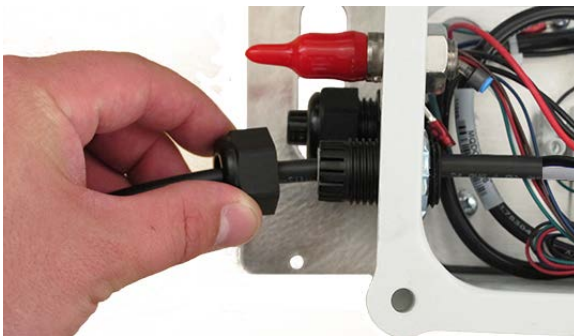


Do not cut through the entire solar panel wire. The blade creates a current loop when in contact with both leads and shorts the solar panel.

Instead, trim off the insulation, then cut one wire at a time.

Connect a solar panel.

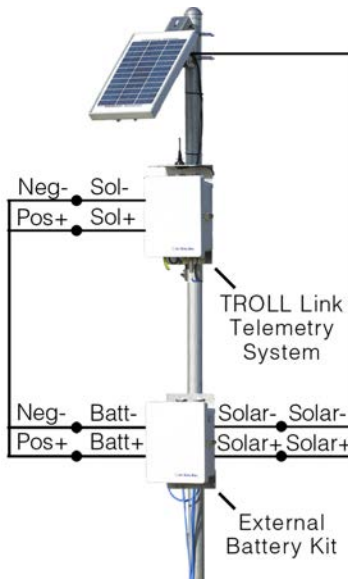
1. Cover the solar panel so it will not receive any sunlight.
2. Remove one of the dome connector caps on the outside of the enclosure. Remove the port plug. Save the plug for later use (you can store the plug inside the enclosure).
3. Insert the solar panel cable into the dome connector cap, and then through the enclosure.



4. Strip the cable ends to 1.3 cm (0.5 inches).
5. Connect the black lead (negative) from the solar panel to open screw terminal SOL-. Tighten the screw terminal.
6. Connect the white lead (positive) from the solar panel to open screw terminal SOL+. Tighten the screw terminal.
7. Tighten the dome connector cap so the port with the cable will be watertight.

Installing a 10 or 20 W Solar Panel and External Battery Kit

Installing the External Battery Kit



Install the External Battery Kit enclosure.

1. Hold the enclosure to the pole at the desired elevation. The external battery kit should be installed below the TROLL Link Telemetry enclosure.
2. Place a hose clamp or U-bolt into the two cutouts of the top bracket of the enclosure and around the pole.
3. For hose clamps tighten the clamp until the enclosure does not move. Attach the second hose clamp to the bottom of the enclosure.
For U-bolts place the smaller bracket over the open ends of the bolt. Use split-lock washers and nuts to tighten the assembly to the pole.

Connect the solar panel to the External Battery Kit enclosure:

1. Cover the solar panel that will connect to the enclosure so it will not receive any sunlight.
2. Remove a dome connector cap on the outside of the enclosure. Remove the port plug. Save the plug for later use.

Trim the solar panel wire before inserting it into an enclosure.



Do not cut through the entire solar panel wire. The blade creates a current loop when in contact with both leads and shorts the solar panel.

Instead, trim off the insulation, then cut one wire at a time.

-
3. Strip the cable ends to 1.3 cm (0.5 inches).
 4. Insert the solar panel cable into the dome connector cap, and then through the enclosure.
 5. Connect the black lead (negative) from the solar panel to the screw terminal labeled "SOLAR-". Tighten the screw terminal.
 6. Connect the white lead (positive) from the solar panel to the screw terminal labeled "SOLAR+". Tighten the screw terminal.
 7. Tighten the dome connector cap to ensure that the port with the cable is watertight.

Connecting the TROLL LINK to the External Battery Kit Enclosure

1. Remove two dome connector caps, one from the outside of the battery kit enclosure, and one from the TROLL Link Telemetry System. Remove the port plugs. Save the plugs for later use.
2. Insert the separate power cable shipped with the external battery kit into one dome connector cap, and then through the battery kit enclosure.
3. Connect the black lead (negative) of the cable to the "BATT-" screw terminal of the battery box.
4. Connect the white lead (positive) of the cable to the "BATT+" screw terminal of the battery box.
5. Insert the other side of the cable through the remaining dome connector cap. There should be two dome connector caps on the cable, oriented in opposite directions.
6. Insert the cable through the dome connector to the inside of the enclosure.
7. Connect the black lead (negative) of the external battery kit cable to the "SOLAR-" screw terminal of the enclosure.
8. Connect the white lead (positive) of the external battery kit cable to the "SOLAR+" screw terminal of the enclosure.
9. Tighten all dome connector caps so the ports with cable are watertight.

Turning Off the Modem

1. Disconnect the white wire from the SOL+ screw terminal.
2. Disconnect the red (positive) lead from the red battery terminal.
3. Disconnect the black (negative) lead from the black battery terminal.

Troubleshooting

Troubleshooting - Common Issues

Most issues are resolved by verifying the following items.

- The telemetry battery is fully charged (greater than 10 volts), and is receiving recharge power from the solar panel.
- The communication settings on each connected instrument are correct. This includes the modbus device address, baud rate, data bits, parity bits, stop bits, communication mode, IP address and port number, and COM port (when connected to a PC).
- The clock on each connected instrument is correct.
- Each instrument is connected to the TROLL Link Telemetry System prior to connecting power.
- Performing a power cycle.

Changing Win-Situ Software Device Address and Communication Settings

If you change an instrument's device address or other communication settings, you must change Win-Situ Software communication settings to reconnect and communicate with the instrument.

1. Connect the instrument to a laptop or PC.
2. Open Win-Situ Software. When it asks "*Connect to device now?*" click **No**.
3. In the top menu bar, click **Preferences**.
4. Click **Comm Settings**.
5. Enter instrument's device address into the **Device Address** box.*
6. Ensure the correct COM port is selected in the **Port Number** box. See page 33.
7. Ensure other communication settings (e. g., Baud, Data Bits, Parity Bits, Stop Bits, Mode) match the device settings.*
8. Click the **check mark**.
9. Click the **Connect** button in the lower right corner.

* If you do not know the device address or communication settings for an instrument, disconnect the instrument from the networking device. Connect the instrument directly to the PC. Click the **Reset All Devices** button in the Comm Settings window. Clicking the **Reset All Devices** button restores device defaults.



If the instrument is connected to a networking device (e.g., a TROLL Net Hub) when **Reset All Devices** is clicked, ALL other instruments connected to the networking device are restored to default settings. Unique addressing for the network is lost.

Any device deployed in a network must have the appropriate device communication settings reapplied.

Selecting the Correct COM Port

If you are using a USB TROLL Com, select the correct COM port by following the steps below. If you are using a serial TROLL Com, the Win-Situ Software should default to the correct COM port, which is usually COM 1.

Steps for Windows 8 systems.

1. Right-click the **Start** screen.
2. Select **All Apps**.
3. Click **Control Panel**.
4. Open the **Device Manager**.
5. Click the arrow next to **Ports (Com and LPT)**, and locate the USB Serial Port listing. The number listed next to this entry is your COM port address.

Steps for Windows 7 systems.

1. Minimize the Win-Situ Software.
2. Click the Windows Start button, and open the **Control Panel**.
3. Click **Hardware and Sound**, and open the **Device Manager**.
4. Click the arrow next to **Ports (COM and LPT)**, and locate the USB Serial Port listing. The number listed next to this entry is your COM port address.

Steps for Windows XP systems.

1. Minimize the Win-Situ Software.
2. Click the Windows Start button, and open the **Control Panel**.
3. Double-click the **System** icon. Click the **Hardware** tab, and open the **Device Manager**.
4. Click the plus sign next to **Ports (COM and LPT)**, and locate the USB Serial Port listing. The number listed next to this entry is your COM port address.

The following steps apply for all Windows operating systems.

1. Once you have determined the correct COM port address in your operating system, reopen Win-Situ 5 Software.
2. Close any open windows in Win-Situ Software.

-
3. Click **Preferences**.
 4. Click **Comm Settings**, and then click the **Port Number** menu.
 5. Scroll down to find the correct COM port address. Click the **check mark** to accept the changes.
 6. Click the yellow **Connect** button in the lower right corner to establish a connection to the instrument.

Performing a Power Cycle (Resetting the Modem) - 1 W Solar



Improperly cycling power may cause electrical issues. Follow the proper procedure step-by-step to avoid damaging equipment. Procedures vary by solar panel type.

1. Disconnect the black (negative) lead from the black battery terminal of the TROLL Link enclosure.
2. Disconnect the white (positive) lead of the solar panel wire from the enclosure screw terminals.
3. Reconnect the white lead of the solar panel wire to the enclosure terminal labeled SOL+.
4. Reconnect the black lead to the black battery terminal.

Performing a Power Cycle (Resetting the Modem) - 10 or 20 W Solar



Improperly cycling power may cause electrical issues. Follow the proper procedure step-by-step to avoid damaging equipment. Procedures vary by solar panel type.

1. Disconnect the black (negative) leads from the black battery terminals of the external battery kit enclosure.
2. Disconnect the black lead from the black battery terminal of the TROLL Link enclosure.
3. Disconnect the white (positive) lead of the solar panel wire from the enclosure screw terminals.
4. Reconnect the white lead of the solar panel wire to the enclosure terminal labeled SOL+.
5. Reconnect the black lead to the black battery terminal of the TROLL Link enclosure.
6. Reconnect the black leads to the black battery terminals of the external battery kit enclosure.

Updating the Firmware - TROLL Link 100 Only

Updating the firmware and cycling the power (turning the system off and then turning it back on) resolves some issues.

1. Connect the TROLL Link Telemetry System to your PC.
2. Connect power to the TROLL Link.
3. Launch the TROLL Link Setup Software.
4. Click **File**, and then click **Update Firmware...**
5. Ensure the COM shown in the **Port** drop-down menu is correct.
6. Follow the onscreen instructions.

Troubleshooting Table

Problem	Possible Solution
Unable to connect to a TROLL Link 100 to the TROLL Link Setup Software.	• Ensure the correct COM port is selected. • Ensure power is connected to the telemetry unit, and then close and reopen the software. • Ensure the serial cable between the PC and the telemetry unit is properly connected. • Ensure the serial cable is functional.
An instrument is not displayed in the TROLL Link Setup Software.	Ensure all communication settings on the instrument are correct. See page 8.
The modem REG light does not illuminate while in dial-up or IP modes.	• The REG light illuminates only during a message/wake interval (dial-up or IP mode) and only illuminates during message transmission (SMS mode). • Ensure the correct SIM card is installed. See page 7. • Ensure the modem is programmed in the correct mode. See page 14.
The modem REG light does not illuminate while in SMS mode.	• Ensure the schedule has been programmed correctly. See page 16. • Ensure power is connected to the telemetry unit. • Cycle the telemetry unit power (turn off and then back on).

Problem	Possible Solution
Unable to connect the TROLL Link Telemetry System to Win-Situ 5 Plus Software in TCP/IP mode.	• Ensure the correct IP Address is entered. See page 24. • Ensure the correct Port Number is entered. See page 24. • Ensure the correct Device Address is entered. See page 24. • Ensure the communication mode is set to ASCII. See page 9. • Ensure the Transmission Delay is set between 15 to 20 seconds. See page 24. • Ensure all communication settings on the instrument are correct. See page 8. • Ensure the APN information is entered correctly using the TROLL Link Setup Software. See page 24.
Unable to connect the TROLL Link Telemetry System to Win-Situ 5 Plus Software in dial-up mode.	• Ensure the correct Modem number is selected. See page 23. • Ensure the correct phone number is entered. See page 23. • Ensure the correct Device Address is entered. See page 23. • Ensure the communication mode is set to ASCII. See page 9. • Ensure the Transmission Delay is set between 15 to 20 seconds. See page 23. • Ensure all communication settings on the instrument are correct. See page 8.
Unable to connect the TROLL Link Telemetry System to Win-Situ 5 Plus Software in SMS mode.	A different mode must be selected when a direct connection to the system is required.

Maintenance

Fuse Replacement

Two fuses are located on the left edge inside of the enclosure. The left fuse connects to the internal battery, the right fuse connects to the charger/external power. The fuses are 2 amp, time-delay, speed-type fuses rated for 250 VAC. Replace as needed.

Enclosure Desiccant

It is **extremely important** to use a properly-sized desiccant for your deployment, and to **change desiccant before the entire volume has turned pink**. Use enough desiccant to effectively keep electronics dry until your next scheduled maintenance. Desiccant life span is dependent on site conditions.

The enclosure contains one tube of desiccant that absorbs moisture as it enters the enclosure through the vent tube. Keep the vent tube clear of obstructions. Replace as needed. An additional desiccant pack may be located at the top of the enclosure. Replace or dry as needed.

Lead-Acid Battery

The battery is a sealed, rechargeable, lead-acid 12V 7 Ahr battery. Replace the battery every 18 to 24 months or if the voltage drops below 10 V to ensure maximum charging capacity and to avoid unexpected power failures.

Remove the battery before short- or long-term storage or during transportation.

Cleaning

Clean the outside of the enclosure with a soft, damp cloth. Do not use ammonia or other harsh chemicals.

Specifications

Enclosure

Materials	Fiberglass
Dimensions	29.21 x 25.40 x 12.7 cm (11.5 x 10 x 5 in.)
Operating Temperature Range	- 40 to 60°C (- 40 to 140°F)
NEMA Rating	4X
Weight (typical)	6.8 kg (15 lbs) with solar panel and battery
Pole Mount	60 mm (2.375 in.) diameter

Power Supply

Solar Panel	1, 10, or 20 W
Battery	12 V, 7 Amp-hour

In-Situ Data Center

In-Situ Data Center

Accessing the Data Center

Note that it may take up to an hour for data to be transmitted to the Data Center, depending on the data service package you have.

1. Open a Web browser.
2. Enter the URL:
http://www.isi-data.com
3. Enter your User ID and Password supplied by In-Situ. Click **Login**.
4. The Site Index appears. The Site Index displays the site name, most recent message received date, number of devices at the site, and the alarm status.
5. Click a site name to view more data from that site.
6. Select a Device to view more data from that device.

If the next transmission interval has not occurred, you should confirm that communication from all devices in the network has been successful.

1. Ensure all components of the TROLL Link Telemetry System have power applied.
2. From the Site Index, click the site name.
3. Click the first device listed.
4. Select **Manage Device** under the **Site Management** heading in the left navigation bar.
5. Select **View Config Messages** under the **Device Config** heading in the left navigation bar.

If data does not refresh at the expected rate or the site does not display the network, contact technical support.

Site Index

The Site Index appears when you first log in to the Data Center.

**In-Situ Inc.**

Company: ISI Demo
User: Support

ISI Data Center
1-970-498-1500 • 1-800-446-7488 • www.in-situ.com

Navigation
[Change Password](#)
[Logout](#)
Master Reports
[Create Report](#)
[Manage Reports](#)
User Management
[Create New User](#)
[Manage Users](#)
Site Management
[Manage Site](#)
[Manage Virtual Units](#)
[Manage Notifications](#)
Alarm Management
[Contacts](#)
[Devices](#)
Quick Help
The Site Index provides a snapshot of your Sites, the date and time of the last reading, the quantity of devices and current alarm status. To view details of a specific site, click on the site name.

Site Index


Site	Received	Units	Status
Fort Collins, CO - ISI Well #2	6-Jul-12 2:00 PM	11	OK
Fort Collins, CO - Poudre River	6-Jul-12 2:00 PM	1	OK

Number	Description
1	Create and manage data reports that include all devices.
2	Create and manage users and user privileges.
3	Configure sites, devices, graphs, and notifications.
4	Configure contact information and device alarms.
5	Click on a site name to retrieve the site summary.
6	View the date and time of the most recent message received.
7	View the number of devices at the site.
8	View the alarm status.
9	View a brief summary of the current page.

Site Summary

The Site Summary screen appears when you click on a specific site.

Navigation

[Site Index](#)

[Logout](#)

User Management

[Create New User](#)

[Manage Users](#)

Site Management

[Manage Site](#)

[Manage Virtual Units](#)

Alarm Management

[Contacts](#)

[Devices](#)

Quick Help

The Device Index provides a snapshot of all devices in a site. The snapshot includes the date and time of the last reading and current alarm status.

To view details of a specific device, click on the device name.

Fort Collins, CO - ISI Well #2



[\(Graph View\)](#)

Device	Received	Pressure PSI	Temp C	DTW ft	Corrected RT200	Corrected AT400	Specific EC	Rain Fall in	TL Signal	TL Battery V	Status
1 - LT700	5-Jul-12 2:00 PM	4.45		11.50				0.00	0	13.22	OK
2 - LT700	5-Jul-12 2:00 PM	4.43		11.56							OK
3 - AT200	5-Jul-12 2:00 PM	4.43		11.47			804.11				OK
4 - AT200	5-Jul-12 2:00 PM	4.44		11.46							OK
5 - Radio AT400 Poudre	5-Jul-12 2:00 PM	7.84		82.45							OK
6 - RT200	5-Jul-12 2:00 PM	16.79		11.37							OK
7 - AT400	5-Jul-12 2:00 PM	-0.07									OK
8 - Baro	5-Jul-12 2:00 PM	12.38									OK
V_Corrected AT400	5-Jul-12 1:00 PM					11.47					OK
V_Corrected RT200	5-Jul-12 1:00 PM				11.41						OK
V_Poudre AT400 Depth	5-Jul-12 1:00 PM										OK

Number	Description
1	Click to view the Site Summary Graph.
2	Click a device to view device details.

Site Management

The Site Management/Configuration screen appears when you click Manage Site.

Configuration

The screenshot shows the 'Site Management' interface. On the left, a navigation tree under 'ISI Demo' includes 'Fort Collins' and 'ISI Well #2'. Under 'ISI Well #2', there are links for 'Site Index' (callout 1), 'Site Graph' (callout 2), and 'Assign Devices' (callout 3). Below 'Assign Devices' is a list of devices: '1 - LT700', '2 - LT700', '3 - AT200', '4 - AT200', '5 - Radio AT400 Poudre', '6 - RT200', '7 - AT400', '8 - Baro', 'V_Corrected AT400', 'V_Corrected RT200', and 'V_Poudre AT400 Depth'. On the right, a 'Site Management' panel (callout 4) contains links and descriptions: 'Add New Site' (Adding sites allows you to divide your devices into logical groups, such as physical location or purpose.), 'Delete Site' (Sites can only be removed if they are empty.), 'Edit Site' (To edit a site, click the site icon on the navigation tree.), and 'Manage Images' (Manage images for use as image maps.).

Number	Description
1	Click to add data points to the top device on the site (see below).
2	Click to assign and update devices on the site (see below).
3	Click a device to manage the device.
4	Add a new site, delete a site, and manage the images displayed.

1 - Site Index (see image below)

- Click **Edit** to edit parameters.
- Click the green arrows to adjust the order of parameters.
- Click the red X to delete parameters.

Configuration

ISI Demo

Fort Collins, CO - ISI Well #2

Site Index

Site Graph

Assign Devices

1 - LT700
2 - LT700
3 - AT200
4 - AT200
5 - Radio AT400 Poudre
6 - RT200
7 - AT400
8 - Baro
V_Corrected AT400
V_Corrected RT200
V_Poudre AT400 Depth

Fort Collins, CO - Poudre River

Add New Summary Data Point

Data points are referenced to the top device on the site

Site:

Fort Collins, CO - ISI Well #2

Data Point:

Pressure

Title:

Format Code:

Add Point

Summary Data Points

	Title	Format			
Edit	Pressure PSI	0.00	↑	↓	×
Edit	Temp C	0.00	↑	↓	×
Edit	DTW ft	0.00	↑	↓	×
Edit	Corrected RT200	0.00	↑	↓	×
Edit	Corrected AT400	0.00	↑	↓	×
Edit	Specific EC	0.00	↑	↓	×
Edit	Rain Fall in	0.00	↑	↓	×
Edit	TL Signal	0	↑	↓	×
Edit	TL Battery V	0.00	↑	↓	×

Click the Add Point button to add a new summary data point.

2 - Assign Devices (not shown)

- Check or clear the box to assign a device.
- Click **Update Site Devices**.

Device Detail

The Device Detail screen appears when you click on a specific device.

Navigation
[Site Index](#)
[Fort Collins, CO - ISI](#)
[Well #2](#)

[Logout](#)

Reporting
[Create new report](#)
[Manage reports](#)

User Management
[Create New User](#)
[Manage Users](#)

Site Management
[Manage Site](#)
[Manage Device](#)
[Configure Graph](#)

Alarm Management
[Contacts](#)
[Devices](#)
[Water Alert Over-Air](#)

Quick Help
The Device Detail page allows you to view historical data for the selected device. You can change the data range by clicking the report time drop down box and

1 - LT700
Device: Level TROLL 700, S/N 118, TROLL Link FW: 1.34-8 XAPN
Report Time: 24 Hrs
Switch to: [Graph View](#) [Date Range View](#) [Export to CSV](#)

Received	Pressure PSI	DTW ft	TL Battery V	Tip Total	Rain Fall in
6-Jul-12 2:00 PM	4.45	11.50	13.22	3	0.00
6-Jul-12 1:00 PM	4.45	11.50	13.22	3	0.00
6-Jul-12 12:00 PM	4.45	11.51	13.12	3	0.00
6-Jul-12 11:00 AM	4.45	11.51	13.24	3	0.00
6-Jul-12 10:00 AM	4.45	11.51	13.27	3	0.00
6-Jul-12 9:00 AM	4.45	11.51	13.34	3	0.00
6-Jul-12 8:00 AM	4.45	11.51	13.36	3	0.00
6-Jul-12 7:00 AM	4.45	11.52	12.93	3	0.00
6-Jul-12 6:00 AM	4.45	11.52	12.79	3	0.00
6-Jul-12 5:00 AM	4.44	11.52	12.74	3	0.00
6-Jul-12 4:00 AM	4.44	11.53	12.74	3	0.00
6-Jul-12 3:00 AM	4.44	11.53	12.62	3	0.00
6-Jul-12 2:00 AM	4.44	11.54	12.79	3	0.00
6-Jul-12 1:00 AM	4.44	11.54	12.79	3	0.00
6-Jul-12 12:00 AM	4.43	11.54	12.81	3	0.00
5-Jul-12 11:00 PM	4.43	11.55	12.93	3	0.00
5-Jul-12 10:00 PM	4.43	11.55	12.93	3	0.00
5-Jul-12 9:00 PM	4.43	11.55	12.96	3	0.00
5-Jul-12 8:00 PM	4.43	11.55	13.00	3	0.00
5-Jul-12 7:00 PM	4.43	11.55	12.93	3	0.02
5-Jul-12 6:00 PM	4.43	11.55	12.91	1	0.01
5-Jul-12 5:00 PM	4.43	11.55	13.15	0	0.00
5-Jul-12 4:00 PM	4.43	11.55	13.12	0	0.00
5-Jul-12 3:00 PM	4.43	11.55	13.17	0	0.00
5-Jul-12 2:00 PM	4.43	11.55	13.22	0	0.00

Number	Description
1	Click to select the data timeframe from the drop-down list.
2	Click the blue labels to select the view or export the data to CSV.
3	Click the link to create and manage device specific reports.

Manage Device

The Manage Device screen appears when you click a specific device from the Site Management screen.

Manage Device

Title

1 - LT700

Description

101-04123/9704981500/080112

Time Offset

-7 ▾

Add +1 in Daylight Saving Time

☒

Enable Calculated Field

☐

Update Device

1

Registers [\(Edit\)](#) [\(Clone\)](#)

Register	Title	Formula	Units	Active	Format Code
Register 37	Pressure	Z	PSI	☒	
Register 45	Temperature	Z	C	☐	
Register 53	DTW	Z	ft	☒	
Register 105	Pressure Reference	Z	PSI	☐	
Register 108	External Voltage	Z	mV	☐	
Register 10001	TL Battery	$Z * ((490/100)*5)/1023$	V	☒	
Register 10002	TL Temp	$((Z - (65544 * (Z \setminus 32768))) \setminus 8) * 0.0625$	C	☐	
Register 10007	Tip Total	Z		☒	0
Register 10009	Counter 2	Z		☐	
Register 10011	TL Signal	Z		☐	0
Register 10012	TL Carrier	Z		☐	0
Register 15007	Rain Fall in	$DELTA(X10007)*0.007874$		☒	0.00

Number	Description
1	Edit device settings. Description is used by In-Situ to identify the system and should not be changed.
2	Click to edit registers or copy existing registers to another device.

Click the **Update Device** button to save changes to the device.

User Management

Create User

Create User

Company:	ISI Demo
Username:	
Real Name:	
Password:	
Confirm Password:	
Options:	☐ Set as site admin
Create User	

1. Click **Create New User**.
2. Enter the new user data in the fields shown.
3. Click the **Set as site admin** check box if the user requires site administration privileges.
4. Click **Create User**.

Manage Users

Manage Users

	Name	Username	Site Admin		
Edit	ISI Demo User	ISIDemo	False	Reset Password	X
Edit	ISI Rep	ISIREp	False	Reset Password	X
Edit	Support	Support	True	Reset Password	X

1. Click **Edit** to edit user settings.
2. Click **Reset Password** to reset a user password.
3. Click the red X to delete a user.

Edit User

Username: ISIDemo

Name:

Permissions:

- ☐ Site Administrator
- ☒ Manage Alarms
- ☒ Manage Reports
- ☒ Run Reports
- ☐ Manage Users
- ☐ Reset User Passwords
- ☐ Reset Admin Passwords
- ☐ Alter User Permissions
- ☐ Site Management
- ☐ Over-Air Polling
- ☐ Over-Air Commands

Configuring the TROLL Link Telemetry System Using Over-Air Commands

TROLL Link Telemetry System 101 and 201 models are pre-configured to the correct instrument types, requested parameters, and transmission interval prior to shipping.

Altering this configuration is possible, but not recommended. Increasing the number of parameters or the transmission interval may result in data overage charges if the increased data transmission exceeds the purchased data plan. Consult In-Situ Inc. prior to altering the original configuration to avoid data overage charges.

The TROLL Link Telemetry System is configured using over-air commands from the Data Center.

Access the Data Center.

1. Open a Web browser.
2. Enter the URL: *http://www.isi-data.com*
3. Enter your User ID and Password.
4. Click **Login**. The Site Index screen appears.

Change transmitted parameters for each instrument.

1. Click **Manage Site**. The Configuration Screen appears.
2. Click the plus sign next to your site name (the name may be Default). The site menu expands and instruments in your site are displayed below the **Assign Devices** entry. Instrument names may be a series of numbers.
3. Click the first instrument listed.
4. Click **Over-Air Commands** under the **Device Config** heading in the left sidebar.
5. Click the **Add** or **Remove** check box next to the parameter name to change the transmitted parameters. All parameters are transmitted under default settings.
6. Click the **Send Config** button. You may need to scroll to view the button.
7. Click the site name in the left navigation window.
8. Click **Manage Site** under the **Site Management** menu in the left navigation window.
9. Repeat steps 2 through 8 for the remaining instruments in your site.

Change the transmission interval for the site.

1. Log in to the Data Center if you have not already done so.
2. Follow steps 1 through 4 of the previous instruction set to access the **Over-Air Commands**.
3. To change the transmission interval, click the arrow button next to **Update transmission interval**, and select **Yes**.
4. Click the arrow button next to **Base message interval** and select the desired interval rate.



Available message intervals are displayed based on your data service plan.

5. Click the arrow next to **Sample Rate/Hyper mode**, and select **None**.
6. Click the arrow next to **Message Holding**, and select **No Holding**.
7. Click the **Send Config** button at the bottom of the parameter list to finalize the configuration. All other instruments are updated to transmit using these settings.