

Quick Start Guide

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 Modbus Communication Settings

Modbus communication settings can be changed in Win-Situ 5 Software or in the TROLL Link Setup Software. Follow the appropriate section below.

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.

Changing Modbus Communication Settings in the TROLL Link Utility Software

Complete the following steps with the instrument connected to the software. You must change Modbus settings for each instrument connected to the TROLL Link system.

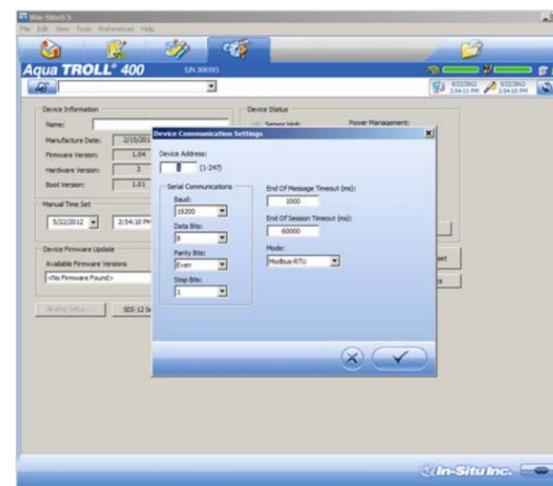
1. Click **File**.
2. Click **Configure TROLL**.
3. Select the **Device Address** drop down menu and change the number to the desired value, making sure to not duplicate an address within the network.
4. Select the correct COM port to which the instrument is connected.
5. Click **Configure**.

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 3.

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.

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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.

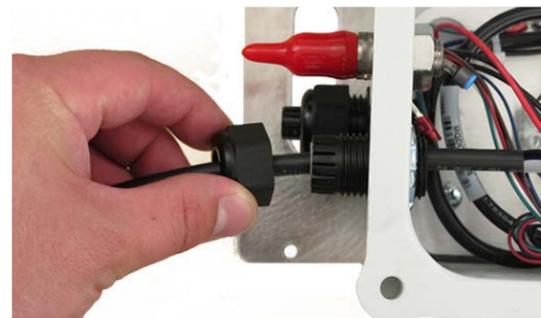
Instead, trim off the insulation, then cut one wire at a time.

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).

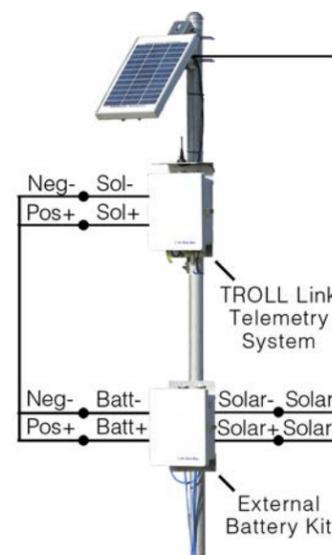
3. Insert the solar panel cable into the dome connector cap, and then through the enclosure.



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.

- Connect the white lead (positive) from the solar panel to the screw terminal labeled "SOLAR+". Tighten the screw terminal.
- 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

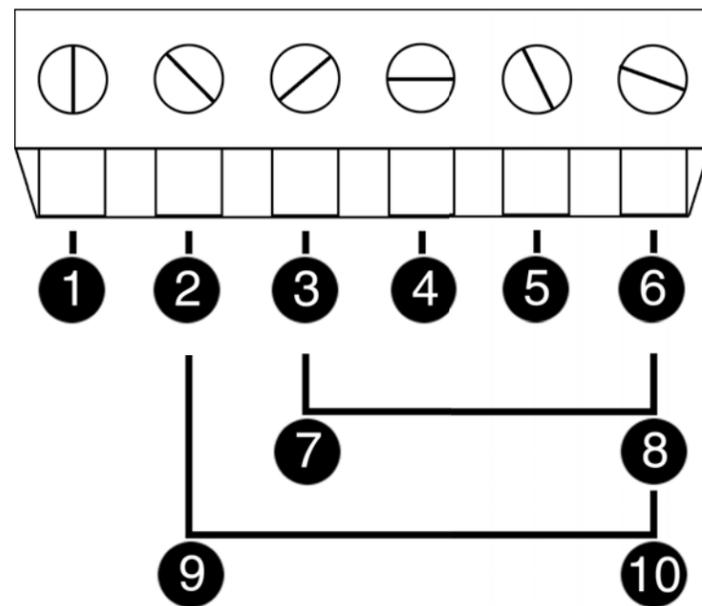
- Remove two dome connector caps, one from the outside of the battery kit enclosure, and one from the TROLL Link Telemetry System. Remove the port plugs. Save the plugs for later use.
- Insert the separate power cable shipped with the external battery kit into one dome connector cap, and then through the battery kit enclosure.
- Connect the black lead (negative) of the cable to the "BATT-" screw terminal of the battery box.
- Connect the white lead (positive) of the cable to the "BATT+" screw terminal of the battery box.
- 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.
- Insert the cable through the dome connector to the inside of the enclosure.
- Connect the black lead (negative) of the external battery kit cable to the "SOLAR-" screw terminal of the enclosure.
- Connect the white lead (positive) of the external battery kit cable to the "SOLAR+" screw terminal of the enclosure.
- Tighten all dome connector caps so the ports with cable are watertight.

Installing a Battery

- Install batteries with the terminals oriented toward the top of the enclosure.
- 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.

- 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.

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 (+)	

Turning Off the Modem

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

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.

Software Appendix

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.

- Connect the instrument to a laptop or PC.
- Open Win-Situ Software. When it asks "Connect to device now?" click **No**.
- In the top menu bar, click **Preferences**.
- Click **Comm Settings**.

- Enter instrument's device address into the **Device Address** box.*
- Ensure the correct COM port is selected in the **Port Number** box. See page 3.
- Ensure other communication settings (e. g., Baud, Data Bits, Parity Bits, Stop Bits, Mode) match the device settings.*
- Click the **check mark**.
- 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® 7 systems.

- Minimize the Win-Situ Software.
- Click the Windows Start button, and open the **Control Panel**.
- Click **Hardware and Sound**, and open the **Device Manager**.
- 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.

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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.

Once you have determined the correct COM port address in your operating system, reopen Win-Situ 5 Software. The following steps apply for all Windows operating systems.
5. Close any open windows in Win-Situ Software.
6. Click **Preferences**.
7. Click **Comm Settings**, and then click the **Port Number** menu.
8. Scroll down to find the correct COM port address. Click the **check mark** to accept the changes.
9. Click the yellow **Connect** button in the lower right corner to establish a connection to the instrument.