

Quick Start Guide

Rugged TROLL® 100 and 200 and Rugged BaroTROLL Instruments



The Rugged TROLL 100 and 200 instruments are designed to measure pressure, level, and temperature in natural groundwater and surface water. They also can be used at industrial sites, landfills, and other installations.

Both instruments have completely sealed housings that contain an absolute (non-vented) pressure sensor, temperature sensor, real-time clock, microprocessor, lithium battery, and internal memory.

The Rugged TROLL 100 is designed to hang by a backshell hanger from a suspension wire. The Rugged TROLL 200 can utilize the backshell hanger or can connect to a cable for easy top-of-well RS485 communications via RuggedReader Handheld PC or laptop PC. Additionally, Rugged TROLL 200 cables with stripped-and-tinned cable ends can communicate with data loggers, TROLL Link Telemetry Systems, or PLC devices via RS485 or SDI-12.

Rugged BaroTROLL Overview

The Rugged BaroTROLL measures and logs barometric pressure and temperature in air. This data is used to correct the Rugged TROLL 100 and 200 data by compensating for barometric pressure effects during the course of a log.

Communication Accessories

- USB or RS232 docking station for the Rugged TROLL 100, 200, and Rugged BaroTROLL Instruments.

- USB or RS232 Rugged TROLL Com for the Rugged TROLL 200 and Rugged BaroTROLL Instruments
- Win-Situ 5 Software for programming and downloading
- Optional software: Win-Situ Baro Merge for barometric compensation; Win-Situ Mobile for the RuggedReader Handheld PC; Win-Situ Sync to transfer downloaded data logs from a RuggedReader to a laptop or desktop PC; Software Manager to check for updates

Other Accessories

Rugged TROLL 100

- Suspension cable
- RuggedReader Handheld PC
- Rugged BaroTROLL for logging barometric pressure data

Rugged TROLL 200

- Suspension cable
- RuggedReader Handheld PC
- Rugged BaroTROLL for logging barometric pressure data
- SDI-12 compatible cable with stripped-and-tinned uphole termination
- RS485 compatible cable with stripped-and-tinned uphole termination
- RS485 top-of-well cable
- Rugged TROLL 200 cable suspension kit (Use this kit to create a weight-bearing loop capable of suspending up to 45.5 kg (100 lbs.) of cable and instrument.)

Getting Started

You will need the following items.

- Rugged TROLL 100 or 200 instrument
- Rugged BaroTROLL (optional)

- USB or RS232 docking station (The RS232 model is needed for connection to a RuggedReader Handheld PC and the Rugged BaroTROLL.)
- Rugged TROLL Com (for Rugged TROLL 200 and Rugged BaroTROLL).

Install Software

Install the following software from the In-Situ Software CD or from www.in-situ.com.

Win-Situ 5 Software

1. Click the Win-Situ 5 link and follow the installation instructions.
2. Make sure that you select the option to "Install USB Drivers."

Win-Situ Mobile Software for the RuggedReader Handheld PC

1. Click the Win-Situ Mobile link and follow the instructions to install Win-Situ Software Manager, which checks for software updates and transfers data.
2. If you are using Windows XP operating system, install ActiveSync 4.5 or higher. If you are using Windows Vista, Windows 7, or Windows 8, install Windows Mobile Device Center software in order to communicate with the RuggedReader Handheld PC.
3. Win-Situ Mobile is probably already installed on the RuggedReader. If you need to install Win-Situ Mobile, connect the RuggedReader to the PC via USB to serial cable, establish a connection via ActiveSync, open the Win-Situ Software Manager, click Win-Situ Mobile, click Install. Make sure you have your In-Situ Software License Certificate available.

Win-Situ Baro Merge Software

Install Baro Merge Software if you plan to post-correct level data to compensate for barometric pressure.

Win-Situ Sync Software

Install Win-Situ Sync if you want to automatically transfer downloaded log files from a RuggedReader to a PC.

Connect to the Rugged TROLL Docking Station

The docking station is intended for use with the Rugged TROLL 100, 200 and Rugged BaroTROLL Instruments that are not deployed with a communication cable. Once connected, you can program the instrument, view readings, and download the data.

1. Unscrew and remove the hanger from the instrument.

✓ The hanger is the only removable part of the instrument. Do not attempt to take the instrument apart. There are no user-serviceable parts in the instrument.

2. Invert the instrument. Align the notch on the instrument with the tab on the rim of the docking station. This will ensure that the pins are aligned to enable communication.
3. Place the instrument into the docking station.
4. Connect the docking station to a computer.

Connect to the Rugged TROLL Com

The Rugged TROLL Com is used as a communication interface between a Rugged TROLL 200 or a Rugged BaroTROLL instrument, the Rugged TROLL 200 cable, and a computer or a RuggedReader Handheld PC.

An internal 9 volt battery powers the Rugged TROLL Com, but it does not provide power to the instrument. The Rugged TROLL Com connects to the uphole end of the Rugged TROLL 200 cable. Once connected, you can program the instrument, view real-time readings, and download the data.



Do not submerge the Rugged TROLL Com Device.

Rugged TROLL Com Battery Installation

1. Open the battery compartment door.
2. Attach the battery leads to the battery terminals.

3. Push the battery into the compartment.
4. Close the battery compartment door.

Connections

1. Attach the Rugged TROLL Com to the Rugged TROLL 200 cable via snap-on connection to the uphole end of the cable.
2. Connect the communication cable to the PC or RuggedReader Handheld PC.
3. The Rugged TROLL Com requires a minimum of 8 VDC. If you lose connection to the instrument, particularly when using a long cable, replace the 9 V battery on the TROLL Com.
4. Release the connection to the uphole cable end by pushing in the white tab on the TROLL Com.

Win-Situ 5 Software


Use Win-Situ 5 with a laptop or a PC and the Aqua TROLL, Level TROLL and Rugged TROLL Instruments. To learn more about Win-Situ 5, refer to the **Help** menu. Training videos are available on the In-Situ Inc. website www.in-situ.com under Tech Resources.


Install Win-Situ 5

Insert the software CD that came with your product or download Win-Situ 5 from the In-Situ website at www.in-situ.com/software. Follow the on-screen prompts of the Installation Wizard to complete installation.

IMPORTANT: Install COM drivers when prompted.

Connecting an Instrument to the Software

When you open Win-Situ 5 Software, you are asked if you want to connect to your device. Click **Yes**. Synchronize the instrument clock to the PC clock. 

Parameters and measurements are displayed in light gray on the home screen if a connection is established. Click the **Play** button  to view live readings.

The software displays an error message if a connection cannot be established.

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.

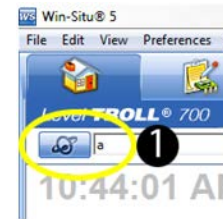
1. Minimize the Win-Situ Software.
2. Click the Windows Start button, and open the **Control Panel**.
3. Double-click the **System** icon. Click the **Hardware** tab, and open the **Device Manager**.
4. Click the plus sign next to **Ports (COM and LPT)**, and locate the USB Serial Port listing. The number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

Set Up a Data Site

1. Click the **Site** button.



2. Select either **Default Site** or click the **New** button to set up a custom site.
3. Enter a **Site Name**. Entering coordinates and uploading a picture are optional.
4. Click the **check mark** to save the data site.

Set up a Data Log

1. Click the **Logging** tab.



2. Click the **New** button.
3. Select your site, and name the new log.
4. Select the parameters you intend to monitor. You can rearrange their order and select different units.
5. Select a logging method appropriate for your deployment.
6. Configure the logging method.
7. Select a start condition.



8. Select a level reference type.

IMPORTANT: When an instrument is deployed on a wire, rather than a cable, you will not be able to communicate with it after installation. Select a Scheduled start if you are deploying an instrument on a wire.

9. Configure the level reference. Select “Set First Logged Reading To” if you are using a scheduled start, or “Remind Me to Set Reference Later” if you are using a manual start and are NOT deploying the instrument on a wire.

IMPORTANT: Your instrument **MUST** be installed in its final location to set the level reference correctly. If you are setting up a data log before installing your instrument in its final location, you will need to select either “Set First Logged Reading To” or “Remind Me to Set Reference Later.”

10. Enter a specific gravity value for the deployment.
11. The software displays a summary. Review your selections carefully before clicking the check mark.
12. Start the log. A Scheduled Start log will start automatically at its programmed time. To start a Manual log, go to the Logging tab, highlight the log name, and tap the **Start** button.



Real-Time Data Readings

To view real-time data readings, click the **Start** button on the **Home** screen. The parameter readings will turn black and update periodically. Click the **Start** button again to stop reading in real time.

IMPORTANT: You cannot create a new log if you have real-time readings enabled.

Downloading Data to a PC

This procedure copies the data log from the instrument to a PC. It does not remove the data log from the instrument. After a log is downloaded, it can be exported to a CSV file format that can be used by spreadsheet programs. The time shown in the log name is the time the log was downloaded.

1. With an instrument connected, select the **Logging** tab .
2. Select the log you intend to download.
3. Choose a Running, Suspended, Stopped, or Deleted log.
4. Click the **Download**  button.
5. In the next screen, select one of the three download options.

Quick Start Guide

- All data
- New data (data logged since the last download)
- Time interval to download

✓ New data is downloaded by default to a new log file. To append new data to the last download of this log, be sure the option "Append logs on download" is selected in the **General Settings** dialog (**Preferences > General Settings**).

- The log is copied to the connected PC into your Win-Situ working directory folder. View or change the working directory using **File > Settings**.
- At the end of the download, Win-Situ gives you the option of viewing the data.
 - Select **Yes** and the log is displayed in the **Data** screen.
 - Select **No** and the **Logging** screen appears. You can view the data at any time by selecting it in the **Data** tab.

Win-Situ Mobile Software

Use Win-Situ Mobile with a RuggedReader Handheld PC and Aqua TROLL, Level TROLL, and Rugged TROLL Instruments. Training videos are available on the In-Situ Inc. website www.in-situ.com under Tech Resources.

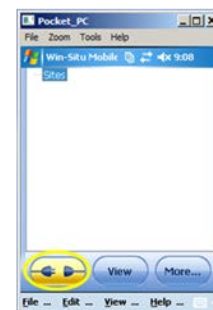
Connect an Instrument to the Rugged Reader Serial Port



1. Rugged Reader
2. Communication Cable
3. RuggedCable System
4. In-Situ instrument

Connect to the Software

With an instrument connected, tap the **Start** button on the RuggedReader. Tap Win-Situ Mobile. Tap the **Connect** button, and tap the **check mark**.



Set up a Data Site

1. Tap the **Sites** button. Select an existing site or tap the **New** button to create a new site.



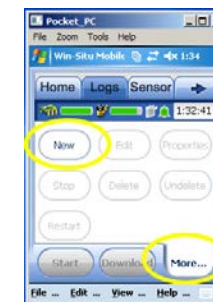
2. Enter information on the subsequent screens and continue by tapping the **right arrow** button. Tap the **check mark** button when finished.

Set up a Data Log

1. Tap the **View** menu and select **Logging**.



2. Tap the **More** button, and then tap the **New** button.



3. Add the log name and tap the right arrow button.
4. Select the parameters you want.
5. Rearrange parameter order if desired. Tap **Edit** to change units.
6. Select a logging method appropriate for your deployment.
7. Configure the logging method.

8. Select a start condition.

✓ When an instrument is deployed on a wire, rather than a cable, you will not be able to communicate with it after installation. Select a **Scheduled start** if you are deploying the instrument on a wire.

9. Select log wrap condition.
10. Select a level reference type.
11. Enter a specific gravity value for the deployment.
12. Configure the level reference. Your instrument **MUST** be installed in its final location to set the level reference correctly. If you are setting up a data log before installing your instrument in its final location, you will need to select either "Set First Logged Reading To" or "Remind Me to Set Reference Later".

✓ Select "Set First Logged Reading To" if you are using a scheduled start, or "Remind Me to Set Reference Later" if you are using a manual start and are NOT deploying the instrument on a wire.

13. The software displays a summary. Look over your selections carefully before clicking the **check mark**.
14. Start the log. A Scheduled Start log will start automatically at its programmed time. To start a Manual log, go to the **Logging** tab, highlight the log name, and tap the **Start** button.

View or Download the Log

1. To download data, tap the **Logging** tab, and tap the **Download** button. Select the desired download options and tap the check mark when finished.
2. To view the data, tap the **View** button. Use the View drop-down menu to select the data channel you want to view. Select the date and time interval you want and tap

the **check mark**.



Stop a Log

After you stop a log you cannot restart it.

1. To permanently stop a log that has no scheduled stop, go to the **Logging** tab, and select the log.
2. Tap the **More** button, and then tap the **Stop** button.
3. Make sure that you download the data after you stop a log.

Drop the Connection and Exit Win-Situ Mobile Software


Prior to physically disconnecting the RuggedReader from the communication cable, tap the **Connect** button. The button changes from blue to yellow and appears disconnected.

To exit Win-Situ Mobile Software, tap the **File** menu and select **Exit**.

Deploying the Instruments

You can deploy a Rugged TROLL Instrument with or without a Rugged BaroTROLL Instrument. Use the Rugged BaroTROLL Instrument when you want to compensate water level measurements for atmospheric pressure.


Use the following steps for each instrument.

1. Connect the instrument to a computer with Win-Situ 5 Software installed.
2. Make sure that you sync the clock .
3. Program a log. See the Win-Situ 5 or Win-Situ Mobile section of this document for more details.

The BaroTROLL measurements can be taken far apart as long as they cover the general time period as the Rugged TROLL log.

- ✓ If the Rugged TROLL log uses the reference "Set first logged reading to," the Rugged BaroTROLL log should start before the Rugged TROLL log to ensure that barometric pressure is measured when the first level reading is captured.

4. Disconnect the BaroTROLL, attach the hanger, and deploy it suspended or lying in a protected location above water level near the submerged Rugged TROLL 100 or 200. One possibility is shown in Figure 1.1 .

 Do not submerge the Rugged BaroTROLL Instrument.

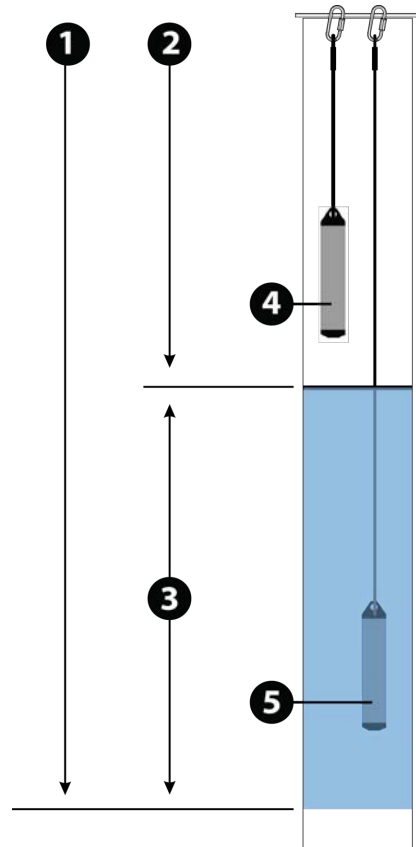


Figure 1.1 Rugged BaroTROLL and Rugged TROLL deployment

1	Pressure due to atmosphere + water column (measured by Rugged TROLL)
2	Pressure due to atmosphere (measured by Rugged BaroTROLL)
3	Pressure due to water column (calculated by subtracting Rugged BaroTROLL data from Rugged TROLL data)
4	Rugged BaroTROLL Instrument
5	Rugged TROLL Instrument

Wiring Connections for Stripped-and-Tinned Cable

The Rugged TROLL 200 Cable can be ordered with stripped-and-tinned wires that can be connected to an SDI-12 or RS485 data recorder or controller.

SDI-12 Connections

- Blue = serial data
- Red = 12 V power supply
- Black = ground

Terminate remaining wires at the data recorder.

RS485 Connections

- Red = 12 V power supply
- Black = ground
- Green = RS485 (-)
- Blue = RS485 (+)

Terminate remaining wires at the data recorder.

Safety and Regulatory

The instrument is in compliance with the following directives.

- 89/336/EEC for Electromagnetic Compatibility (EMC) Directive
- 73/23/EEC for Safety Directive

The instrument meets or exceeds the following international requirements and compliance standards.

- Immunity—EN 61326:1997, including amendments A1:1998, A2:2001, A3:2003
- Emissions—Class A requirements of EN 61326:1997, Electric Equipment for Measurement, Control and Laboratory Use.

The device complies with the requirements of the EU Directives 89/336/EEC and 73/23/EEC, and the CE mark is affixed accordingly.

Declarations of conformity and WEEE certification can be found in the Operator's Manual.

