

Technical Note

Configuring In-Situ TROLL Instruments as SDI-12 Sondes for Use with an ISCO 6712 Portable Sampler

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Introduction

In-Situ's TROLL instruments utilize internal data logging to monitor water level, temperature, and other water quality parameters. The Multi-Parameter TROLL 9500 may be configured with a custom suite of water quality sensors, including temperature, dissolved oxygen, conductivity, pH, oxidation-reduction potential, and turbidity. The Level TROLL is a small-diameter (0.72" OD) probe which monitors pressure, water level, and temperature. The AquaTROLL 200 is also a small diameter probe which monitors conductivity in addition to pressure, water level, and temperature.

The ISCO 6712 Portable Sampler is ideal for many applications, including wastewater monitoring, stormwater monitoring, permit compliance, pre-treatment compliance, and combined sewer overflow monitoring. In-Situ's TROLL instruments may be configured to operate as SDI-12 sondes, taking samples on a user-defined schedule and sending the data to the ISCO 6712 Portable Sampler according to the standard SDI-12 communication protocol. Combined with an ISCO 6712 Portable Sampler, the TROLL may be incorporated into an automated water sampling application that monitors water level, temperature, conductivity and other water quality parameters.

The ISCO 6712 may be triggered to take a sample depending upon the input received from the connected TROLL. For example, the user can capture samples during certain events of particular interest, such as a decrease in water level or a spike in conductivity. The user defines a parameter as the "event parameter" and then

sets a threshold value or a defined change in value which would trigger a sample.

For the sake of data redundancy, the TROLL may be programmed with Win-Situ software to sample and record data internally. The TROLL's internal data logging capabilities can be utilized with the ISCO sampler simultaneously when the TROLL is used as an SDI-12 sonde. In the event that the ISCO sampler loses power, the TROLL will revert to its internal battery and continue sampling and recording data internally.

This tech note defines how to configure the TROLL as an SDI-12 sonde that is controlled by the ISCO 6712 Portable Sampler. For further information on programming the portable sampler, contact ISCO or refer to the Operator's Manual.



Configure SDI-12 Settings for Level TROLL or Aqua TROLL

In this section, the words 'TROLL' and 'device' will refer to a Level TROLL or Aqua TROLL sensor.

Win-Situ 5 is the PC control software for the Level TROLL and Aqua TROLL devices. Win-Situ Mobile is the Pocket PC version of software for the RuggedReader. Use Win-Situ 5 or Win-Situ Mobile to communicate with the devices, define test schedules, extract data, and export data to spreadsheet or text format. The latest version of Win-Situ 5 is always available for free download at In-Situ's website, www.in-situ.com. For more information about using Win-Situ 5, install the software, then click the 'Help' menu and choose 'Win-Situ Help.'

Configure SDI-12 parameters using Win-Situ:

1. Connect the PC or Rugged Reader to the device using Win-Situ 5 or Win-Situ Mobile.
2. Navigate to the Setup Tab.
 - a. For Win-Situ 5:
 - i. Click the 'SDI-12 Setup' button.
 - ii. Define the 'Address,' 'Parameters,' and the 'Order' in which those parameters are reported.
 - b. For Win-Situ Mobile:
 - i. Tap the 'Expander' button.
 - ii. Tap the 'SDI-12' button.
 - iii. Select the desired 'Parameters' and tap the right-pointing arrow button to advance.
 - iv. For each parameter, select the desired 'Order' of reporting and the 'Units' and then tap the right-pointing arrow button.
 - v. Define the 'Address' and tap the checkmark button.
3. If the user wishes to log data internally for redundancy purposes, navigate to the Logging Tab and define the new log.
4. Drop the software connection and disconnect the device from the PC or RuggedReader.

Configure the device as an SDI-12 Sonde on the ISCO 6712 Portable Sampler:

1. Physical Connections:
 - a. Connect the device to a submersible cable with Stripped and Tinned leads.
 - b. Connect the submersible cable with Stripped and Tinned leads to the ISCO SDI-12 Adapter Cable with Military connector according to wiring table below:

Signal	In-Situ Inc. Stripped and Tinned	SDI-12 Adapter Cable for ISCO 6712 Sampler
12V+	RED	BLACK
Ground	BLACK	WHITE or GREEN
SDI-12 Data	WHITE	RED

- c. Connect the Military connector to the Rain Gauge Connector on the ISCO 6712 Portable Sampler.
2. Provide power to the ISCO 6712 Portable Sampler.
3. Use Extended Programming Mode to incorporate an SDI-12 device. At the Main Menu, type '6712.2' to show Extended Programming Screens.
4. Select 'Other Functions' then 'Hardware'.
5. Select 'No SDI-12 Sonde' to begin searching for the connected device.
6. Confirm the SDI-12 'Address' of the connected device.
 - a. The factory default 'Address' for the device is ZERO.
 - b. If the user would like to change the device Address, this can be done via Win-Situ 5 or Win-Situ Mobile software.
 - i. Navigate to the Setup Tab and click the 'SDI-12 Setup' button.
 - ii. Define the new Address and click the Checkmark button.
7. The connected TROLL is now ready for use as an SDI-12 Sonde with the ISCO 6712 Portable Sampler.

- a. Refer to the ISCO 6712 Operator's Manual for further details on programming.

Configure SDI-12 Settings for miniTROLL or MPT TROLL 9X00

For this section, the word 'device' will refer to a miniTROLL or MPT TROLL 9000/9500.

Win-Situ 4 is the PC control software for the miniTROLL and MPT TROLL 9000/9500 devices. Pocket-Situ 4 is the Pocket PC version of software for the RuggedReader. Use Win-Situ 4 or Pocket-Situ 4 to communicate with the devices, define test schedules, extract data, and export data to spreadsheet or text format. The latest version of Win-Situ 4 is always available for free download at In-Situ's website, www.in-situ.com. For more information about using Win-Situ 4, refer to the Operator's Manual.

Configure SDI-12 parameters using Win-Situ:

1. Connect the PC or Rugged Reader to the device using Win-Situ 4 or Pocket-Situ 4.
2. Highlight the Device Line, which shows the device's name and serial number, and Click 'Edit'.
 - a. Select 'SDI-12 Settings' and click or tap the 'Next' button.
 - b. Define the 'Device Address' and click or tap the 'Next' button.
 - c. Select 'Fixed Order' and click or tap 'Finish' OR select 'User Selectable Order' and click or tap the 'Next' button.
 - i. For 'User Selectable Order,' the next screen allows the user to choose the included parameters and define the order in which they are reported.
3. If the user wishes to log data internally for redundancy purposes, navigate to the Tests branch and define the new log.
4. Drop the software connection and disconnect the device from the PC or RuggedReader.

Configure the device as an SDI-12 Sonde on the ISCO 6712 Portable Sampler:

1. Physical Connections:

- a. Connect the device to a submersible cable.
 - b. Connect the submersible cable to the SDI-12 Adapter with Military connector for ISCO 6712.
 - i. Part Number 0044780 for MPT9000
 - ii. Part Number 0095210 for MPT9500
 - iii. PartNumber 0029270 for miniTROLL
 - c. Connect the Military connector to the Rain Gauge Connector on the ISCO 6712 Portable Sampler.
2. Provide power to the ISCO 6712 Portable Sampler.
 3. Use Extended Programming Mode to incorporate an SDI-12 device. At the Main Menu, type '6712.2' to show Extended Programming Screens.
 4. Select 'Other Functions' then 'Hardware'.
 5. Select 'No SDI-12 Sonde' to begin searching for the connected sonde.
 6. Confirm the SDI-12 'Address' of the connected device.
 - a. The factory default 'Address' for the device is ZERO.
 - b. If the user would like to change the device Address, this can be done via Win-Situ 4 or Pocket-Situ 4 software.
 - i. In the navigation tree on the left-side of the screen, highlight the device line, which contains the sensor Serial Number. Click the 'Edit' button on the right-side of the screen and choose 'SDI-12 Mode Preferences' and click the 'Next' button.
 - ii. Define the new Address and click 'Next,' then click 'Finish.'
 7. The connected TROLL is now ready for use as an SDI-12 Sonde with the ISCO 6712 Portable Sampler.
 - a. Refer to the ISCO 6712 Operator's Manual for further details on programming.

Conclusion

When used in combination with an ISCO 6712 Portable Sampler, In-Situ's TROLL devices may be incorporated into many various automated water sampling applications. The TROLL may be configured to take samples on a user-defined schedule and send the data to the ISCO 6712 Portable Sampler according to the standard SDI-12 communication protocol. For data redundancy purposes, the TROLL may be programmed with Win-Situ software to record data internally while simultaneously being used as an SDI-12 sonde.

For further reading on In-Situ hardware, refer to the appropriate TROLL Operator's Manual. For more details on software, refer to the Help Menu in Win-Situ 5 or the Operator's Manual for Win-Situ 4.

For further reading on SDI-12 commands and protocols, visit <http://www.sdi-12.org/>, or refer to In-Situ's Tech Notes on SDI-12 Commands and Level TROLL Responses and SDI-12 Commands and Aqua TROLL Responses. TROLL Operator's Manuals and Tech Notes are available at In-Situ's website, www.in-situ.com.

If seeking details about the ISCO 6712 Portable Sampler, please contact ISCO directly at (800) 228-4373 or www.isco.com.

For more information, contact In-Situ Inc.

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