

Model 4001 Solinst Readout Unit (SRU) User Guide

September 15, 2021

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1.0 Introduction

1.1 Solinst Readout Unit (SRU)

The Solinst Readout Unit (SRU) is an in-field device designed to take and display instant water level readings from a deployed Solinst datalogger.

When connected, you can also select a real-time sampling rate and start a real-time monitoring session independent of the datalogger's internal logging mode. Real-time logs can be saved in the SRU memory.

The SRU has a built-in barometer, which provides the option of showing and saving real-time water level readings corrected to ambient air pressure.

The SRU also functions as a data download and storage device. It has a robust internal flash memory allowing you to download and save multiple log files from a number of dataloggers. Saved log files can be viewed on the SRU and transferred to a PC using Levelogger Software.

The SRU provides access to useful information about the connected datalogger's status, including battery level, memory, serial number, firmware version, and logging mode. You can also access information about the SRU status.



Figure 1-1 Solinst Readout Unit (SRU)

1.2 SRU Specifications

SRU Specifications	
Materials:	ABS enclosure, 316 stainless steel connector, silicone rubber cover
Operating Temperature:	-20°C to +50°C
IP Rating:	IP64 (dust and splash resistant)
Battery:	Standard 9V replaceable battery
Battery Life:	Up to 2 years
Memory:	20 full LTC logs or 18 full LT logs (~1.8 million LTC readings or 2.7 million LT readings)
Size and Weight:	8.9 cm x 3.2 cm x 14.5 cm (3.5" x 1.3" x 5.7") 351 grams (12.4 ounces)
Internal Barometer Accuracy:	± 0.2 kPa
Compatible With:	5 Series and Edge Series Solinst dataloggers

1.3 Compatibility

The SRU is compatible with Solinst dataloggers using the following minimum firmware versions, or higher:

Datalogger	Firmware Version
Levellogger 5	1.004
Barologger 5	1.004
Levellogger 5 Junior	1.004
Levellogger 5 LTC	1.004
Rainlogger 5	1.004
LevelVent 5	1.004
AquaVent 5	1.004
Levellogger Edge	3.004
Barologger Edge	3.004
Levellogger Junior Edge	3.004
LTC Levellogger Edge	1.003
Rainlogger Edge	3.001
LevelVent	1.000
AquaVent	1.000

It is also important to ensure you are using the most recent SRU firmware version. To check this, go to www.solinst.com/downloads/

To determine what firmware version your SRU is using see Section 2.5.

To delete and transfer data files from the SRU to a PC, you will need to use Levellogger Software version 4.6.1, or higher.

2.0 SRU Operation

2.1 Start Up

Press and hold any arrow button for two seconds to turn the SRU on. When starting, the SRU will perform a self-test. The start-up screen is shown first; following a short pause the main menu will be displayed. The SRU has an auto-off after 2 minutes of inactivity.



Figure 2-1 Start-up Screen

2.2 LCD Display and Navigation

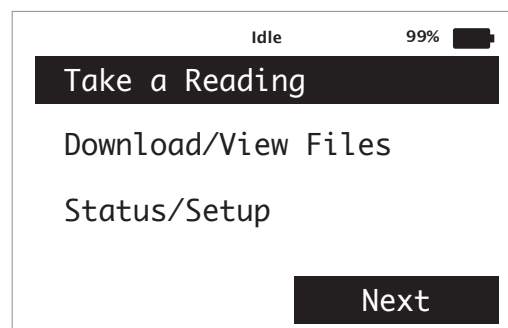


Figure 2-2 SRU LCD Display

Status: indicates whether the SRU is idle, logging, or downloading/viewing data logs.

Battery icon: represents the battery life remaining for the SRU. Battery life is also numerically displayed as a percentage to the left of the icon.

Note: It is recommended to replace the battery when the level falls below 20%.

Arrows: are used to navigate through and select the SRU menu items. Pressing and holding any of the arrow buttons for two seconds, turns the SRU on/off.

Use the up/down arrows to scroll through menu items.

Use the left/right arrows to select the menu actions shown at the bottom left/right of the LCD (e.g. Next, Back, etc.)

2.3 Main Menu

There are three main menu items for the SRU.

Take a Reading: allows you to display an instant reading from the connected datalogger, turn on/off barometric compensation, and start and save a real-time logging session.

Download/View Files: allows you to download and save the data from the connected datalogger's current internal logging session, and view all data files saved in the SRU.

Status/Setup: allows you to view information about the SRU and connected datalogger, including battery level, memory, serial number, firmware version and logging mode. You can also adjust the contrast of the LCD screen.

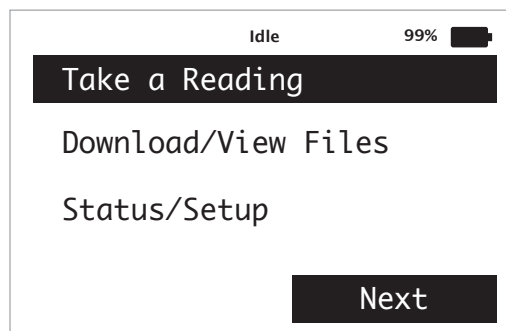


Figure 2-3 SRU Main Menu

2.4 LCD Contrast

To adjust the contrast of the LCD display, use the arrows to navigate to the **Status/Setup** menu, then select **LCD Contrast**. Use the up and down arrows to adjust the contrast.

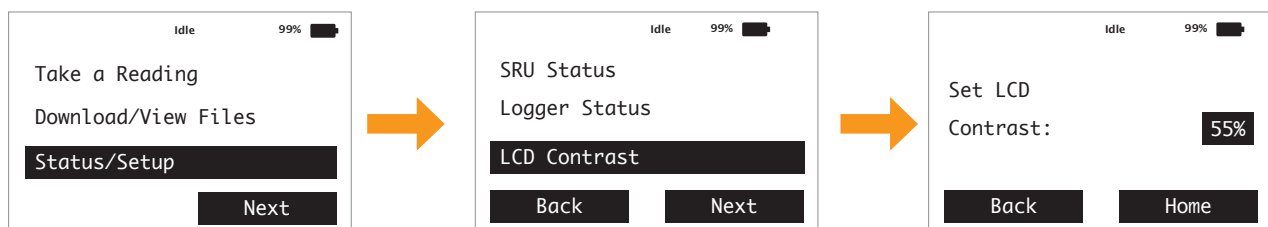


Figure 2-4 LCD Contrast

2.5 SRU Status

To view information on the SRU status use the arrows to navigate to the **Status/Setup** menu, then select **SRU Status**. The SRU's serial number, memory status, and firmware version will be displayed.

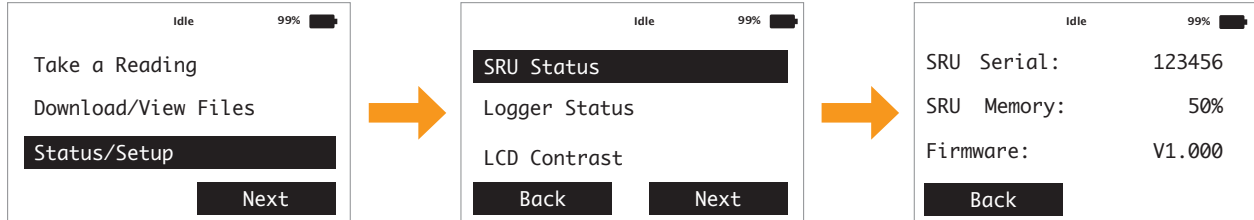


Figure 2-5 SRU Status

Note: An error message on the SRU screen will indicate when the memory is full.

3.0 Connecting Dataloggers

3.1 Levellogger Connection

The SRU cable connects to the top of a Levellogger's Direct Read Cable. Hold the Direct Read Cable connection and thread the SRU cable connector onto the Direct Read Cable.



Figure 3-1 Levellogger Connection

Note: An L5 Threaded or Slip Fit Adaptor can also be used to connect a Levellogger to the SRU cable.

3.2 LevelVent Connection

The SRU cable connects to a LevelVent's Wellhead. Hold the Wellhead and thread the SRU cable connector onto the Wellhead.



Figure 3-2 LevelVent Connection

3.3 AquaVent Connection

The SRU cable connects to an AquaVent's (App/DataGrabber) Wellhead Connector Cable. Hold the AquaVent cable and thread the SRU cable connector onto the AquaVent cable.



Figure 3-3 AquaVent Connection

4.0 Real-Time Readings

4.1 Take a Reading

Select **Take a Reading** to instantly display the current water level (water column height above the pressure sensor), temperature, and conductivity being detected by the connected datalogger.

Note: Only LTC Levelloggers will display conductivity readings.

Note: See the Levellogger User Guide (Section 1.2) and Vented Dataloggers User Guide (Section 1.2) for an explanation of the pressure sensor measurement fundamentals.

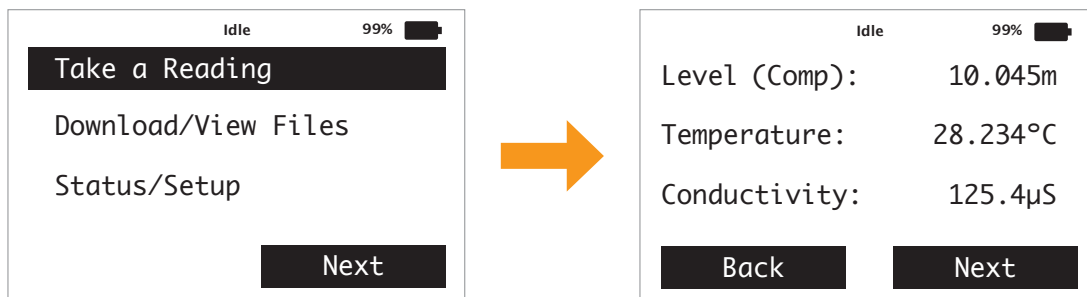


Figure 4-1 Take a Reading

The water level reading will indicate "Comp" as it is a compensated level reading. See Section 4.2 for more details.

4.2 Barometric Compensation

Levellogger 5 dataloggers use an absolute pressure sensor, therefore, detect total pressure above the sensor (water plus barometric pressure).

To eliminate barometric pressure and display water level only, select Next after taking a reading (Section 4.1). Select to turn barometric compensation on. The SRU contains an internal barometer that barometrically compensates the level readings. The barometer reading will be displayed on this screen.

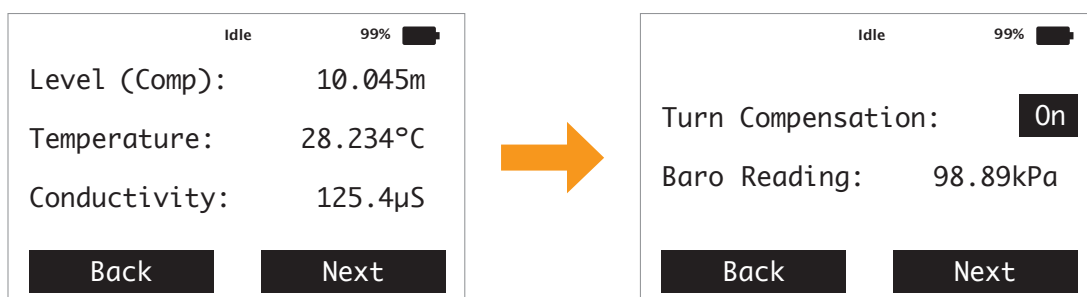


Figure 4-2 Turn Barometric Compensation On/Off

LevelVent 5 and AquaVent 5 vented water level dataloggers use gauged pressure sensors, therefore, barometric effects are already eliminated from the level reading through the vented cable.

Barometric compensation can be turned off in the same screen.

4.3 Real-Time Logging

The SRU allows you to select a real-time sampling rate and start a real-time logging session independent of the datalogger's internal logging mode.

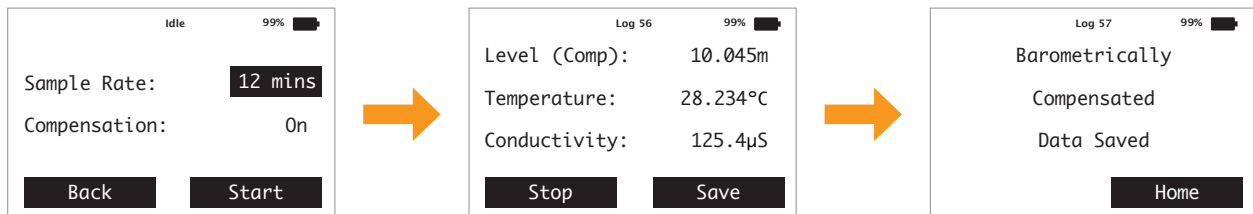


Figure 4-3 Real-Time Logging – Compensation On

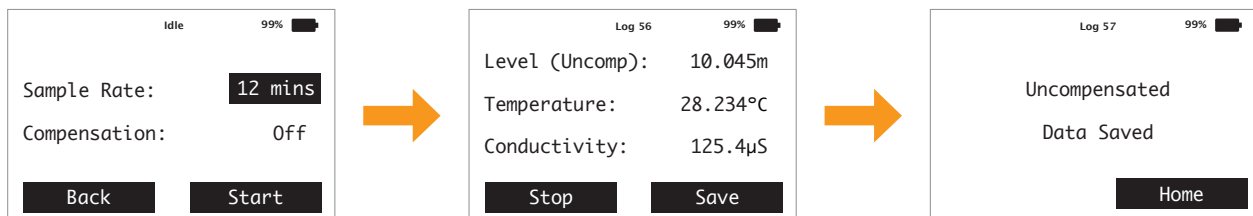


Figure 4-4 Real-Time Logging – Compensation Off

To set up real-time logging, after you have turned barometric compensation on/off (Section 4.2), select Next to select the Sample Rate. The Sample Rate can be set from 2 seconds to 99 hours.

Select Start to begin logging. The level, temperature and conductivity readings will update at the specified sampling interval.

Note: Only LTC Levelloggers will display conductivity readings.

At any time you can select to Stop and/or Save the real-time logging session. The real-time logs will be saved in the SRU memory. See Section 5.2 to view the saved log files list and Section 7.2 to transfer files to a PC.

5.0 Downloading and Viewing Data Files

5.1 Download Logger

To download a datalogger's current internal logging session, select **Download/View Files** from the main menu, scroll to **Download Logger** and select Next.

The download progress will be displayed at a percentage. All data from the current logging session will be saved in the SRU memory as a *.xle data file.

Note: An error message on the SRU screen will indicate when the memory is full. You can also view the status of the SRU memory using the Statu/Status menu (see Section 2.5).

The file will be identified using the datalogger's serial number and the date and time of the download.

Note: Downloading the data will not stop/interrupt the datalogger from logging. Datalogger memory will not be erased.

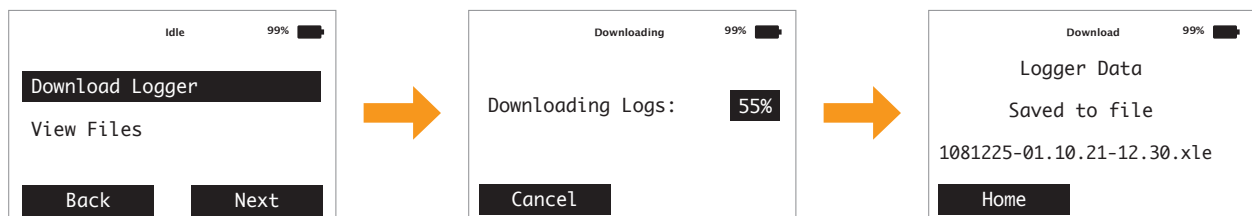


Figure 5-1 Download Logger

Note: *.xle files can be opened using Levelogger Software for further analysis and exported for use in other programs.

5.2 View Data Files

After downloading data from the connected datalogger, you can view a list of all the saved files on the SRU, including real-time logging sessions, by selecting **Download/View Files** from the main menu then **View Files**.

The files will be identified as follows:

- D = Downloaded Data File
- C = Compensated Real-Time Data File
- U = Uncompensated Real-Time Data File

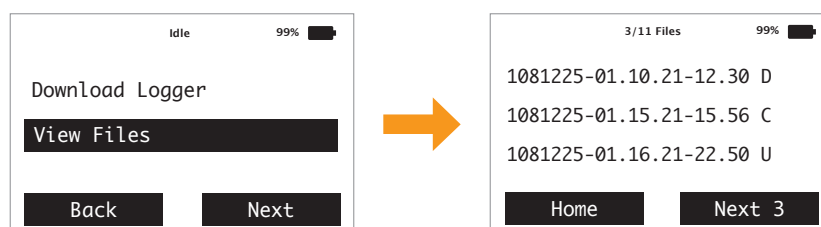


Figure 5-2 View Files

6.0 Datalogger Status

To view information about the connected datalogger, scroll to **Status/Setup**, select Next, then **Logger Status**.

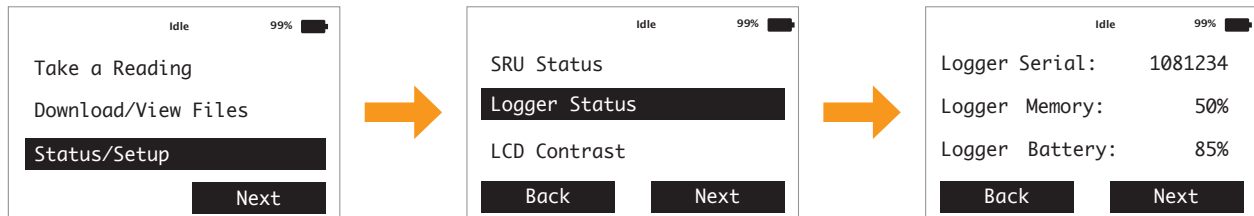


Figure 6-1 Logger Status

Select Next to continue viewing information including serial number, battery level, memory, logging mode and status, project information, and firmware version.

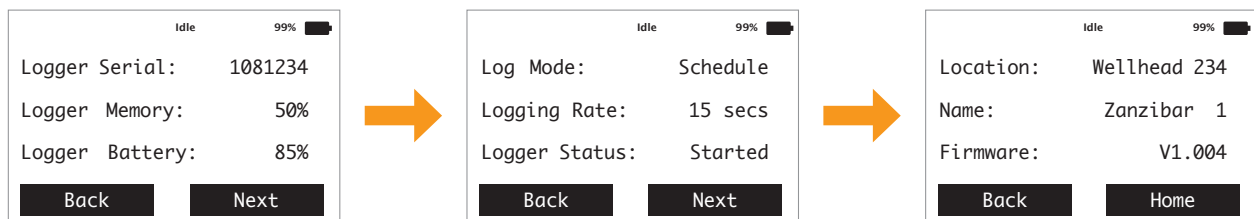


Figure 6-2 Logger Information

7.0 Levellogger Software and Data Management

7.1 Software Requirements and Installation

The minimal hardware and software requirements for software installation and operation are:

Hardware	Software
Processor: 1 GHz or faster processor or SoC	OS: Windows 10
RAM: 1 GB for 32-bit or 2 GB for 64-bit	
Hard disk space: 128 MB	
Display: 800 x 600	
Ports: USB or RS-232	

Web Download

- 1) Download the newest version of Levellogger Software by visiting: <https://www.solinst.com/downloads/>
- 2) If the installer does not automatically start, to activate the software install click on the 'setup.exe' file.
- 3) The Software Installation Wizard will guide you through the remaining installation process. Figure 7-1 shows the Levellogger Installation Wizard.
- 4) Restart the computer after installation is completed. Default Directory is C:\Program Files\Solinst\Levellogger4_6

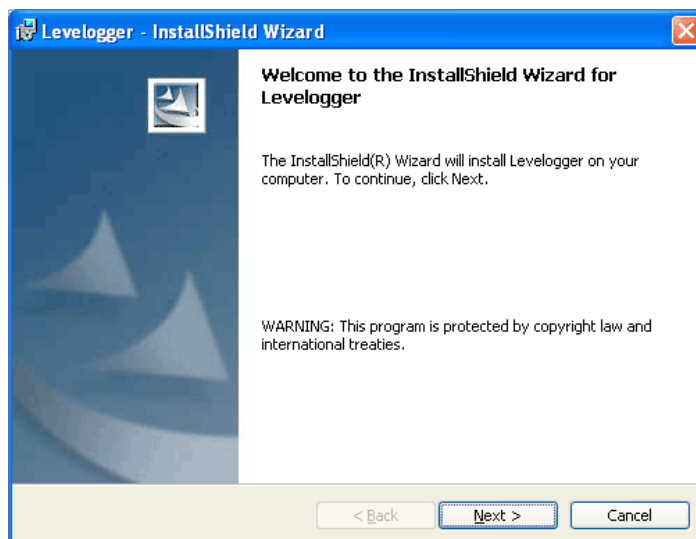


Figure 7-1 Software Installation Wizard

7.2 Transfer Data

To transfer data files from the SRU to a PC, Connect the SRU to the PC using a USB cable. The SRU will automatically turn on and the LCD screen will show a message indicating the SRU is connected to the PC.



Figure 7-2 SRU to PC Connection

To start the Levelogger Software, click  , or click the Start button and select:

Programs > Solinst > Levelogger 4 > Levelogger 4.6.1

Go to the SRU tab and select the appropriate Com Port for the connected SRU from the centre drop-down menu and Click the 'Retrieve SRU Settings' icon  .

A destination folder window will open where you can choose the location your log files will be saved.

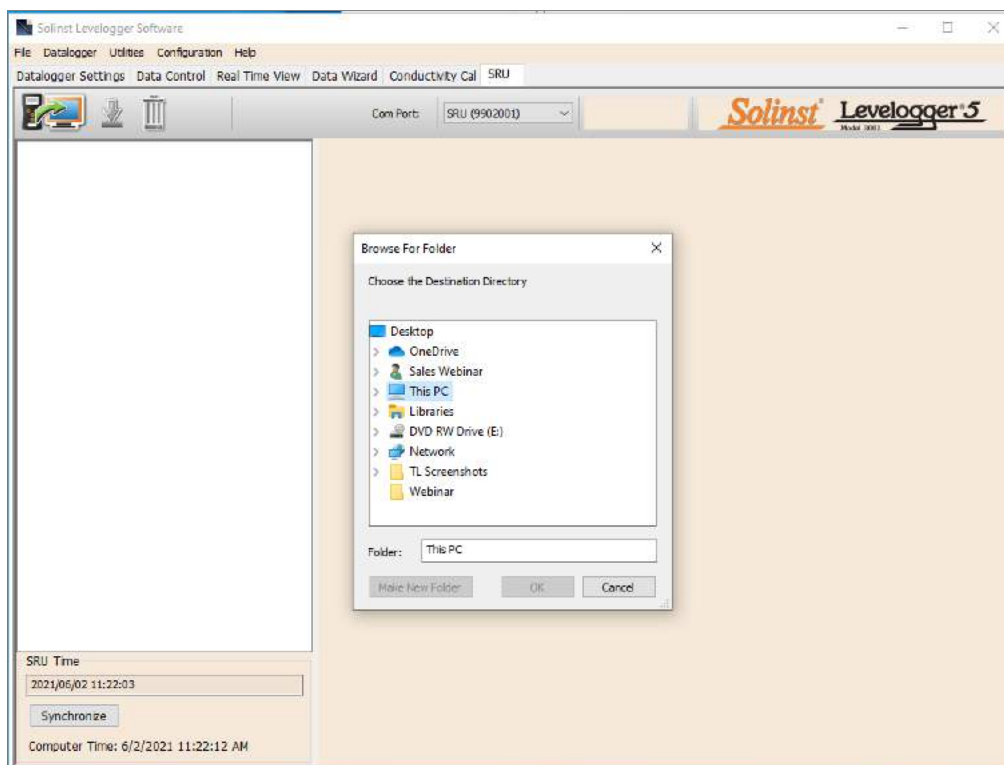


Figure 7-3 Levelogger Software SRU Tab – Select Data File Location

Select the file(s) from the list that you want to download, and click the 'Download Data' icon

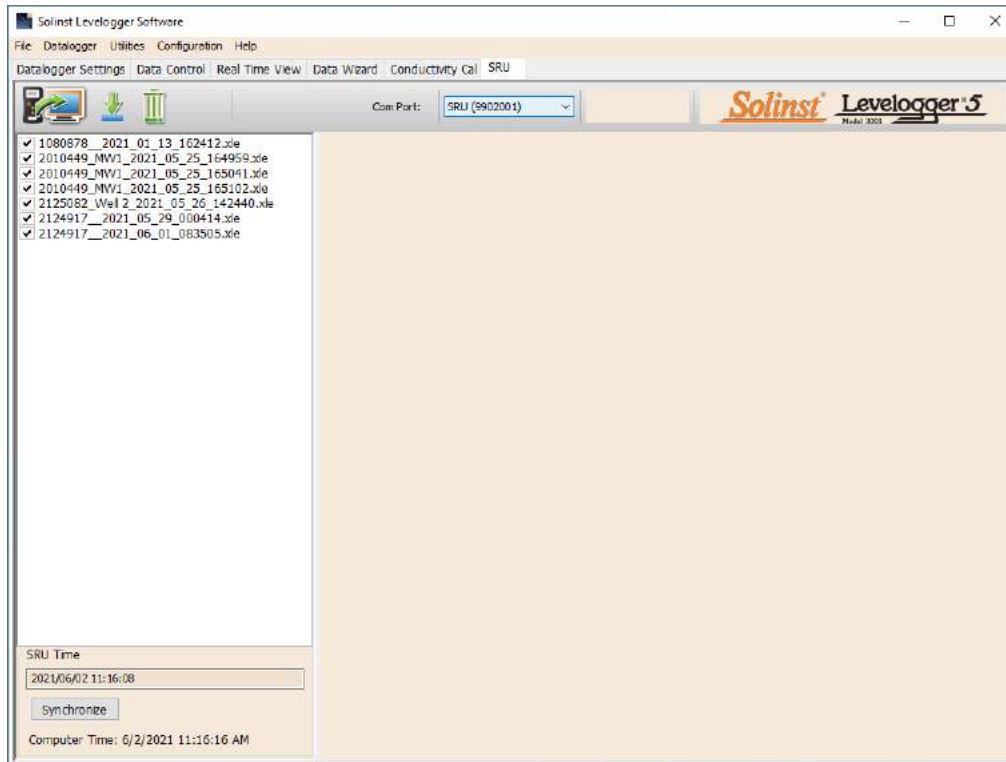


Figure 7-4 Levelogger Software SRU Tab

7.3 View Data

Data files can be viewed in the Data Control tab by selecting Finish and Open all, or select Finish if you do not need to view the data right away.

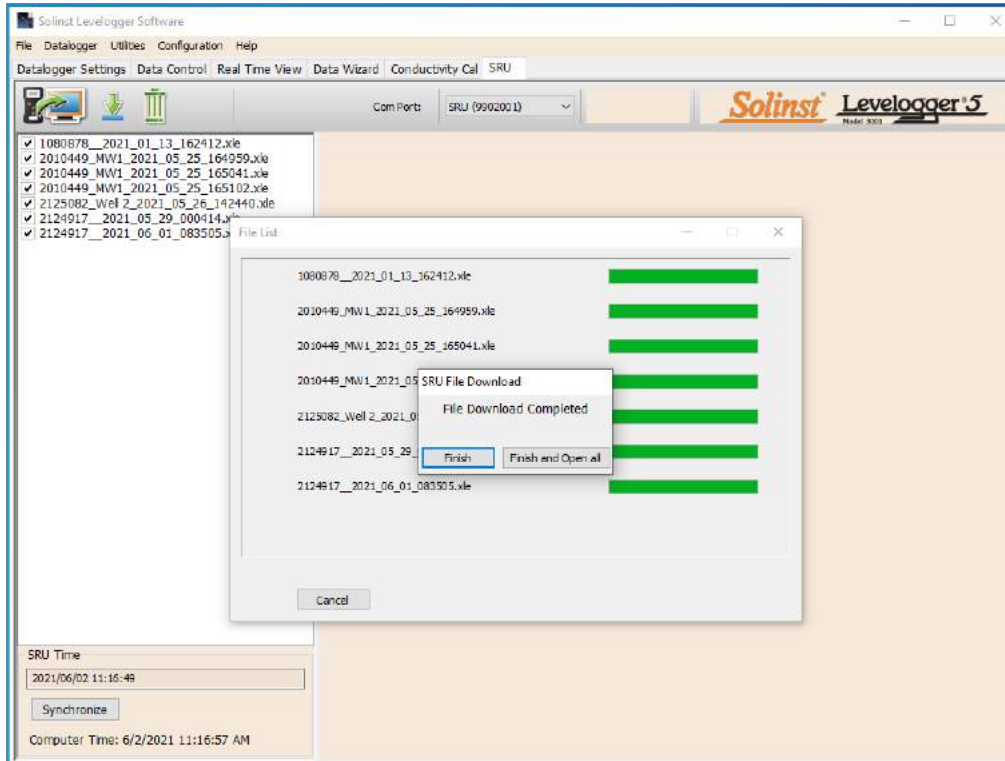


Figure 7-5 Finish Data Download

Data can be viewed later by going to the Data Control tab and selecting the ‘Open Files’ icon. From here, you can also print data or export data to a .csv or .xml file.

Note: For more information on the Data Control tab, see the Levellogger Series or Vented Dataloggers User Guides.

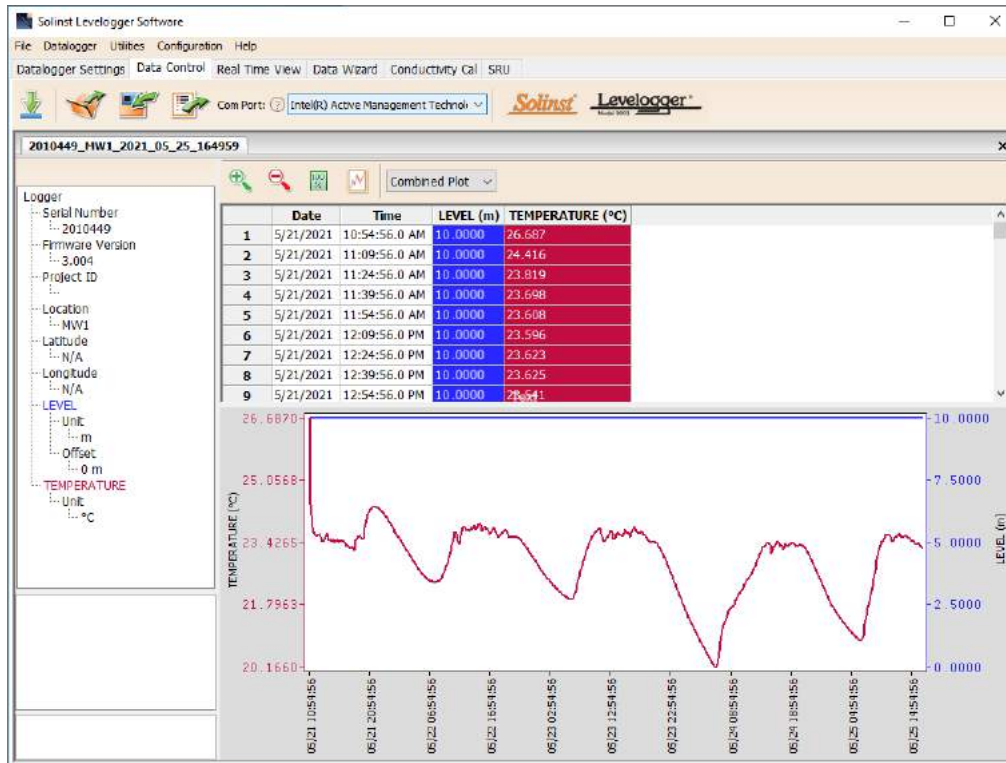


Figure 7-6 Data Control Tab

7.4 Erase Data

All data files can be erased from the SRU by selecting the ‘Erase Files’ icon  in the SRU tab.

Note: An error message on the SRU screen will indicate when its memory is full. You can also view the status of the SRU memory using the Statu/Status menu (see Section 2.5).

7.5 Synchronize SRU Time

The attached SRU system time is displayed in the bottom left corner of the SRU tab. To synchronize the SRU to the PC clock, simply click Synchronize.

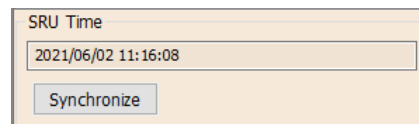


Figure 7-7 Clock Synchronization

Note: To synchronize to a different time/ time zone you first must adjust the computer time using the Windows Operating System Date and Time Settings menu. Then re-start the Solinst Levellogger Software and synchronize your SRU to the new time.

8.0 Maintenance

8.1 Battery Installation

The SRU uses one 9V replaceable alkaline or lithium battery. To install or replace the battery, remove the SRU from the protective outer case. Push up to remove the battery enclosure door from the back of the SRU. Connect the battery lead to the 9V battery and install the battery in the housing. Replace the battery enclosure door and the protective outer case of the SRU.

Note: It is recommended to replace the battery when the level falls below 20%.



Figure 8-1 SRU Battery Installation

8.2 Software and Firmware Updates

Each time the software is opened, it automatically checks on-line for software updates. If there is an update, “[Software Update Available](#)” will appear in the top right of the menu bar. When you click the message, it will open a web page where you can download the software update.

Note: Your PC must have an Internet connection to check for software and firmware updates.

The Software also checks for firmware updates once you have retrieved settings from a connected SRU. “[Firmware Update Available](#)” will appear in the top right menu bar. Clicking the message will open a web page where you can download the firmware update. See Section 8.3 for firmware update instructions.



8.3 Firmware Upgrade Utility

Note: It is important that the communication between the PC and the SRU is not interrupted during a firmware upload so make sure to close any other running programs, including screen savers, and do not disconnect the SRU before the upload is finished.

The Firmware Upgrade Utility is used to upload new firmware files to an SRU. The zipped firmware file can be obtained from: <https://www.solinst.com/downloads/>

Make sure to unzip the firmware file after you have downloaded it, so you can access the *.ssf file.

To upload new firmware to a SRU, follow these steps:

- 1) Open the Solinst Firmware Upgrade Utility from the Utilities menu in the main Levellogger Software. Select the Com Port that the SRU is connected from the drop-down menu.
- 2) Click the 'Open' button , which should open a file dialog asking for the firmware file (*.ssf) to upload. Navigate to the directory where the firmware file was saved on your PC, then click on the file and click 'Open'.
- 3) Check the 'File Information' box to make sure that the opened file is the right one.
- 4) Click the 'Upload Firmware' button , to start the firmware upload process.
- 5) If a communication error occurs and is indicated in the 'Datalogger Status' box either before or after the "Verifying Firmware" and "Loading Firmware to Datalogger" messages, then restart the upgrade process.
- 6) If, however, a communication error occurs between the "Verifying Firmware" and the "Loading Firmware to Datalogger" messages, then please contact Solinst. You will need to give the SRU Serial Number and explain the exact positioning of the error message.

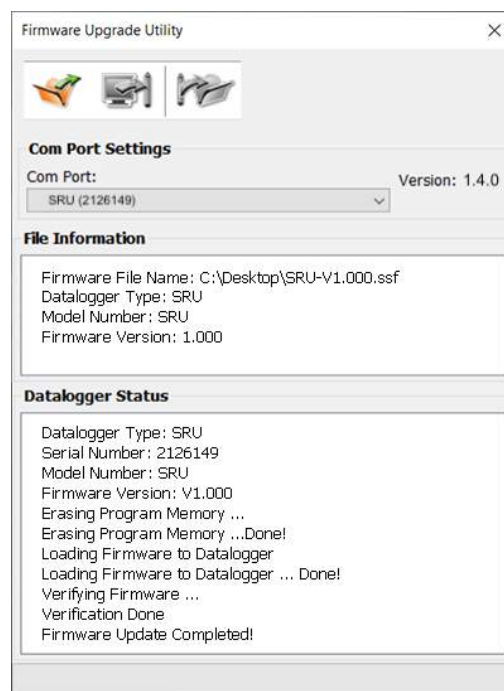


Figure 8-2 SRU Firmware Update

Appendix 1: Full SRU Menu Sequence





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