Solinst®

Quick Start Guide
LevelVent 5

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5

High Quality Groundwater and Surface Water Monitoring Instrumentation

Getting Started

1. Download the latest version of Solinst Levelogger Software from: www.solinst.com/downloads and install the software on your PC.

Connect the LevelVent Wellhead and logger to the Vented Cable:

Wellhead and logger alignment **pin** Vented Cable alignment **socket**

PC Interface Cable

Line up the socket and pin. Gently push the Wellhead and Vented Cable together and twist slightly until you feel/hear a **small click** when the properly aligned connection is made.

Hold Wellhead Still **Only Turn Coupling**

Hold Vented Cable Still

Only tighten the coupling while holding the Wellhead and Vented Cable still. Tighten the coupling until it seats. **There should be no threads showing at the Wellhead connection. Do not twist the Vented Cable or Wellhead.**

Follow the same procedure when connecting the logger to the Vented Cable.

2. Connect the USB PC Interface Cable to the top of the LevelVent Wellhead. Plug the PC Interface Cable into your computer.

LevelVent Wellhead

Vented Cable

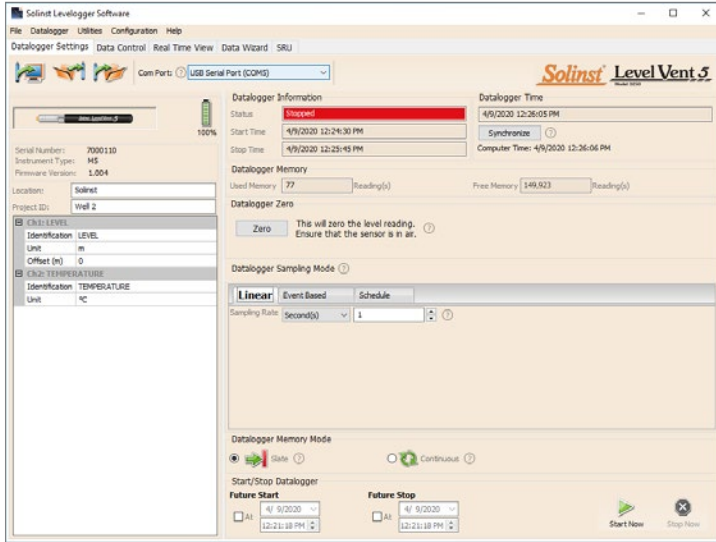LevelVent 5 Logger

Datalogger Settings Window

> **Note:** Clicking on the ⑦ in the software will provide you with a
> short explanation of that feature, e.g. Com Port,
> Datalogger Zero, Slate Mode, Time Synchronization, etc.

Programming the LevelVent 5

> **Note:** Ensure the LevelVent 5 logger is operating with the latest firmware, and that you
> are using the latest software. Visit the Solinst website or use the software update
> feature for assistance.

1. Start the Levelogger Software.
2. Select the appropriate Com Port for the connected device from the centre drop-down menu.
3. Click the 'Retrieve Settings' icon. This will retrieve and display the current programmed settings for the connected LevelVent 5.
4. You can now customize the LevelVent 5 including your Project ID, Location, Sampling Mode and Rate, and Future Stop and Start times.

> **Tip:** If a number of LevelVent 5 dataloggers are to be programmed with identical
> inputs, clicking the 'Save Default Settings' icon will create a template.

Starting and Stopping the LevelVent 5

1. If desired, enter a Future Start and/or Future Stop Time. To start logging immediately, do not fill in a future start time and click the 'Start Now' icon.

   > **Note:** When the 'Start' icon is selected, a window will pop-up to indicate how much memory is available. Selecting "Yes" ignores the message and starts the datalogger immediately. Selecting "No" gives you the chance to access the 'Data Control' tab to download and/or delete data files using the 'Download and Delete Files' option, to free-up memory.

2. When "Yes" is selected, all settings are applied to the LevelVent 5 and it will start logging at the specified time.
3. To stop the LevelVent 5 immediately, click the 'Stop Now' icon.

   > **Tip:** The 'Future Start' and 'Future Stop' options are ideal for synchronizing the data collection of multiple LevelVent 5 dataloggers.

Downloading and Working with Data

1. Click the 'Data Control' tab to access the 'Data Control' window. This window is laid out in three sections: datalogger settings, tabular data, and graphical data.
2. To download the data from a connected LevelVent 5, select the 'Download Data' icon. There are four options for downloading data. They are: All Data, Append Download, Partial Download and Download and Delete Files. The data will be presented in both tabular and graphical format.

   > **Note:** The default directory for downloaded and saved data is in the 'Data' folder: <C:\Program\Files\Solinst\Levelogger 4_6\Data>. Data is saved as a .xle data file.

3. To save data, click the 'Save Data' icon and input desired name for the saved file.
4. To export the file for use in other software, click the 'Export' icon. The file can be exported to a *.csv or *.xml file.

   > **Note:** To change the default directory for downloaded data, use the 'Configuration' menu at the top of the software window. Select 'Application Settings' and input or navigate to a different folder destination. Click 'OK'.
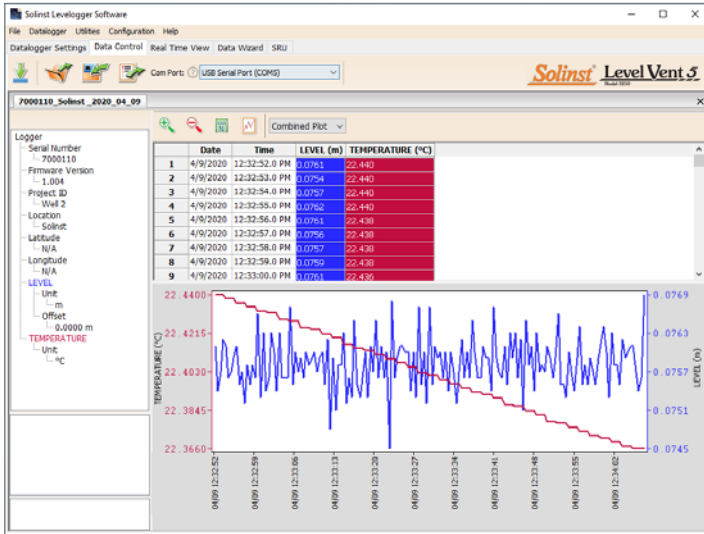
Data Control Window

Tip: The *.csv and *.xml file formats are supported and can be imported by most spreadsheet and database programs.

The data graph can be exported to a *.bmp file or a *.png file by clicking File > Export >Graph.

Real Time View

Real Time View provides on-screen measurement as data is being recorded by the connected datalogger. A view rate is set independently of the logging period of the LevelVent 5 and does not interfere with internal logging taking place. To take a reading at any specific time, click ⏬ and that reading will be added to the displayed data. The data can be exported and saved.

Compensate the Data

Click the 'Data Wizard' tab to open the 'Data Wizard' window. In this window the 'Wizard' will guide you through Manual Data Adjustments (elevation or height of water conversions) and Parameter Adjustments (units, elevation, density adjustments) on your open data files. Multiple LevelVent 5 data files can be compensated at once.

Tip: 'Manual Data Adjustment' allows you to use manual water level measurements to adjust your data to depth to water readings.

LevelVent 5 Field Measurement

LevelVent 5 Ranges

LevelVent 5 Models are rated to a specific submergence depth. The choice of model depends on the accuracy of the level required and the submergence depth. Most important, your selection should be based on the maximum anticipated water level fluctuation.

| LevelVent 5 Model	Submergence Depth	Accuracy
M5	5 m (16.4 ft.)	± 0.3 cm (0.010 ft.)
M10	10 m (32.8 ft.)	± 0.5 cm (0.016 ft.)
M20	20 m (65.6 ft.)	± 1 cm (0.032 ft.)

Measurement Fundamentals

Tip: To adjust all readings in your LevelVent file to depth to water below a well casing **(d)**, record a manual water level measurement using a water level meter. This reading should correspond in date and time with an actual LevelVent recording. Use this as a reference datum in the Manual Data Adjustment option in the Levelogger Software Data Wizard.

LevelVent 5 loggers provide readings **(L)** of the actual pressure of just water above the pressure sensor Zero Point.

Verifying Readings

The best recommendation is to compare LevelVent readings **(L)** with a manually measured depth to water level value **(d)** (using a Water Level Meter).
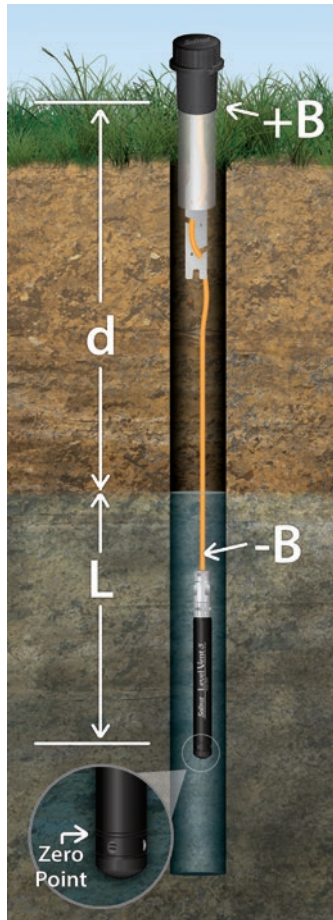
LevelVent 5 loggers detect pressure. A vent tube to surface allows barometric effects **(+B)** on the pressure sensor to be eliminated **(-B)**.

LevelVent 5 Field Notes

Tip: It is recommended to take a manual water level measurement before installing a LevelVent 5, shortly after installation, periodically during your monitoring interval, and at the end of your measurement period. Use these measurements to verify LevelVent 5 readings, and for data adjustments later on. Ensure you take manual readings as close in time as possible to a scheduled LevelVent 5 reading.

Note: The LevelVent 5 logger can withstand over-pressurization of 2 times the intended range, e.g. a Model M10 can accommodate a fluctuation of 20 meters or 60 feet and still record pressure. However, over-range accuracy is not guaranteed.

Before Deployment

Make sure you do the following:

• Program your LevelVent 5, using Levelogger Software, with the correct project identification, memory mode, sampling regime, time, etc.

Note: It is useful to synchronize the times of all LevelVent 5 dataloggers being used for the same project.

• Set a future start time in the office, or start the LevelVent 5 logger in the field using Levelogger PC Software and a laptop, or the Solinst Levelogger 5 App Interface.

• If desired, use the Datalogger Zero feature in the Levelogger Software to zero the logger (see the Vented Dataloggers User Guide for more details).

• Determine borehole depth to ensure the LevelVent 5 logger does not touch the bottom of the well (avoid submergence in sediment).

• Determine the minimum and maximum expected water levels, as LevelVent 5 loggers must remain submerged for the entire monitoring period.

Note: The length of the Vented Cable should not be assumed as the deployment depth, as there may be some slack in the cable, especially when using the Support Hanger Bracket.

• Use a Solinst Model 101 or 102 Water Level Meter to take a manual depth to water measurement that will be used to verify LevelVent readings.

Deployment

- The LevelVent 5 is designed to be conveniently installed using a Solinst 2" Well Cap Assembly (4" well adaptor available). However, other installations are acceptable, if proper precautions and recommendations are followed.

- A Support Hanger Bracket is provided with each 2" Well Cap Assembly to help secure the Vented Cable to the Wellhead.

- The 2" Well Cap Assembly provides access for manual depth to water measurements, without disturbing the LevelVent 5 logger from its down hole position.

- The Wellheads have a rating of IP 64 (dust and splash resistant), so should not be submerged at anytime. They can be secured inside an enclosure, however, it must be vented to equalize atmospheric pressure.

- Do not drop the LevelVent 5 logger into the water, carefully lower it into place. Avoid installing in areas where "water hammer" or hydraulic jump" (very sudden, large increases in pressure) may occur.

- Be careful not to nick or bend the Vented Cable during installation (use a maximum 1" (25 mm) bend radius as a precaution).

> **Note:** For tips, precautions, and more information on installations in different environments and applications, see the latest Vented Dataloggers User Guide.

After Deployment

Make sure you do the following:

- Take a manual depth to water measurement after the well has stabilized (approximately 10 minutes).

- Take another manual depth to water measurement just before removing the LevelVent 5 from the well.

In-field Communication

There are three ways to communicate with a LevelVent 5 in the field:

• A PC Interface Cable connected to the LevelVent Wellhead allows communication with Levelogger PC Software on a field laptop.

• The Levelogger 5 App Interface connects directly to the LevelVent Wellhead allowing communication with your smart device using the Solinst Levelogger App.

• The Solinst Readout Unit (SRU) connects directly to the LevelVent Wellhead allowing you to view instant water level readings, save real-time logs, and download data.

• The DataGrabber 5 connects directly to the LevelVent Wellhead allowing you to download data to a USB flash drive.
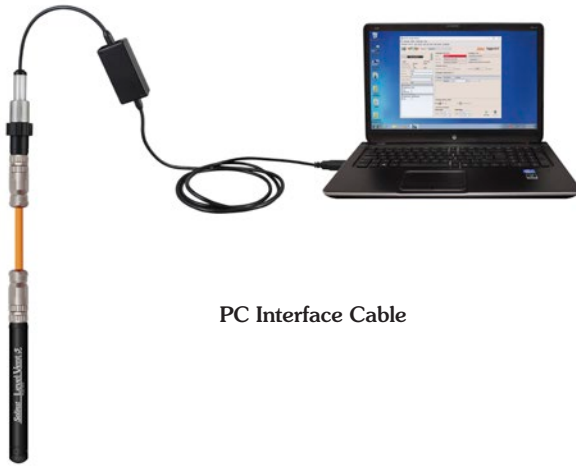
PC Interface Cable

Solinst Levelogger 5 App Interface   **SRU**   **DataGrabber 5**

Remote Monitoring Options

Solinst has options for wireless remote communication using cellular telemetry. See separate User Guides for full details.

- The LevelSender 5 uses 4G cellular communication to send remote LevelVent 5 data to your Home Station PC and smart device using email or SMS. Fits in a 2" well.

- STS 5 Telemetry Systems use 4G cellular communication to send remote water level data from LevelVent 5 loggers to a Home Station PC. Connect up to four loggers.

- RRL 5 (Remote Radio Link) Telemetry uses radio communication to send remote water level data from LevelVent 5 loggers to a Home Station PC or STS 5 Remote Station.

LevelSender 5 Reader Cable

LevelSender 5
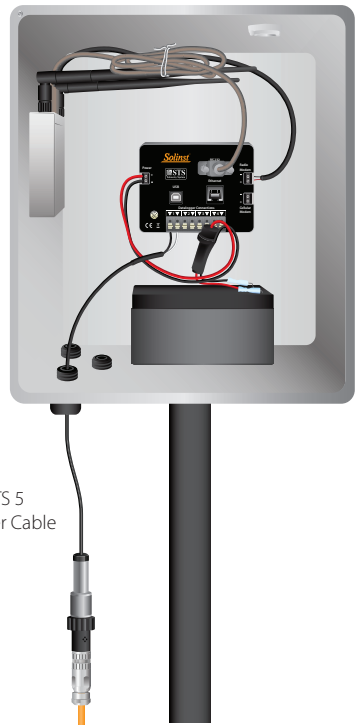
STS 5 Reader Cable

STS 5 Telemetry

Note: To communicate with third party dataloggers or telemetry systems, Solinst offers the AquaVent 5 vented water level datalogger that can communicate using SDI-12 or MODBUS protocols. See Model 3500 Data Sheet.

Maintenance

As with any monitoring project, you should select the proper equipment and determine a maintenance schedule based on the environment specific to your application.

To ensure the vent tube remains dry, the LevelVent 5 loggers and Wellheads contain permanent desiccants and hydrophobic membranes at the connections to the Vented Cable—there is no need to replace them. See our Technical Bulletin on <u>Vented Cable Design, Use, and Maintenance</u> for more details.

Other maintenance tips include:

- Clean the connections to ensure a proper seal. A cotton swab can be used to clear any moisture, or debris from the connectors.
- Keep the dust caps on all of the connections, when not in use.
- Store the LevelVent 5 logger in its case, and the Vented Cable on its spool when not in use.
- Clean the LevelVent 5 logger as required.
- Replace the o-rings at the Vented Cable connections on the LevelVent 5 logger and the Wellhead (newer versions of the logger and Wellhead do not have o-rings on the connections).
- To ensure the vent tube is dry before deployment or storage, Solinst offers a Vented Cable Blowout Fitting that allows you to blow nitrogen gas through the tube.

Note: See the Vented Dataloggers User Guide for more maintenance tips.

Note: A Solinst Biofoul Screen can be used to protect the LevelVent 5 from biofouling on the pressure sensor.

Troubleshooting Guide

Levelogger PC Software:

1. You must have administrator privileges to install software on a computer.
2. The Windows 10 Operating System supports Levelogger Software.

Try the following if your LevelVent 5 is not communicating with Levelogger PC Software, or you are getting a communication error message:

1. Check the Vented Cable connections to the LevelVent 5 logger and Wellhead. Ensure they are lined-up correctly and there is no dirt or debris in the connection.
2. Make sure you are using a USB PC Interface Cable to connect to the PC.
3. Check that the USB PC Interface Cable is connected to the same Com Port that is chosen in the upper middle of the Main Window of the Levelogger Software.
4. Try communicating with another LevelVent 5 logger, Wellhead, Vented Cable or USB PC Interface Cable.
5. Try using a different computer.
6. If problem persists, contact Solinst.

Vented Cable Compatibility

Older style Vented Cables (sold before 4/16/21 with serial numbers lower than 506326) are not compatible with newer style LevelVent 5 Wellheads (sold after 4/14/21 with serial numbers 495959 and up) and loggers (sold after 4/5/21) without a small user modification – contact Solinst for instructions.

Newer style Vented Cables are compatible with all versions of the LevelVent Wellheads and loggers – please note, after the new Vented Cable connector is fully tightened, the external o-ring on an old logger or Wellhead is visible and it is normal not to seat against the connector.

> **Note:** For diagnostic purposes, you may want to install the end of the Vented Cable with the serial number to the surface connection at the Wellhead.

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