

## What do you need to consider before setting up a LevelSender Telemetry System?

### The equipment needed:

1. A LevelSender (pt#111513) for each monitoring site (includes an antenna, 3 x 1.5V AA lithium batteries, well cap assembly for 2" OD pipe, and a support hanger bracket).
2. Up to two Solinst dataloggers (Levellogger or Barologger sold after January 2006, LevelVent, or AquaVent) with current firmware.

**Note:** One Barologger is suggested for each 30 km (20 mile) radius and 300 m (1000 ft) change in elevation.

3. A Splitter (pt#109700) if you are planning to connect two dataloggers to the same LevelSender.
4. A Reader Cable (pt#112867) to connect each datalogger.
5. A Direct Read Cable connected to each Levellogger/Barologger (as an option, an Optical Adaptor (pt#112123) can be used instead for deploying a Barologger), or a Wellhead Connector Cable (pt#111644) for each AquaVent. The Reader Cable connects directly to a LevelVent Wellhead. See the LevelSender User Guide for LevelVent and AquaVent installation diagrams.
6. A Mini USB Programming Cable (pt#112868) for use with LevelSender PC Software – the software is a free download at [www.solinst.com/downloads/](http://www.solinst.com/downloads/)
7. A 4" Well Adaptor (pt#110235), if you are planning to install in a well larger than 2" OD.

### A cellular service plan:

The LevelSender uses a GSM 3G cellular quad-band modem (850/900/1800/1900 MHz), using GPRS class 10 (**not** CDMA compatible). The LevelSender system uses dynamic IPs.

Data reports are sent from the LevelSender via email, and optionally SMS; therefore, you will need a monthly data plan with text messaging. You do not need voice access or features.

Here are some estimates to help determine the data plan you need:

Sample Rate	Report Rate	# Loggers	Daily Reports	Monthly Reports	Report Data Size (KB)	Total Monthly Data
1 minute	1 hour	2	24	744	23	<b>20 MB</b>
5 minutes	12 hours	1	2	62	23	<b>5 MB</b>
15 minutes	1 day	1	1	30	20	<b>1 MB</b>

Other data usage: Diagnostic Report: 14 KB, Test Email: 4 KB, Battery Voltage: 4 KB

**Note:** Sample Rate is the frequency data is collected from the Levelloggers and Report Rate is how often the data is sent from the LevelSender to the Home Station; 1 minute is the maximum Sample Rate and 5 minutes is the maximum Report Rate.

**Data:** based on the table above, the maximum expected data usage can be rounded up to 100 MB a month, with two dataloggers connected.

**Texting:** if you plan on sending SMS reports, you will also need to make sure your cellular plan includes enough text messages to cover the number of reports you will be sending each month.

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## The signal strength at your monitoring site:

To test if there is adequate cellular signal strength at your monitoring site, use your cell phone.

3 to 4 bars on your phone is excellent; you should not expect any communication issues.

A signal strength less than 3 bars might require moving the LevelSender to a location with a better signal. You can also consider using an alternate antenna, or adding an antenna extension cable to capture a better signal.

**Note:** The type of enclosure planned for the LevelSender could affect the signal strength, e.g. a steel protective well casing can cause signal interference. Mounting an optional antenna on the outside of the enclosure could resolve this.

## How often you need to replace LevelSender batteries:

You should replace the LevelSender batteries when the reported battery information is showing 60% or less. Battery percentage is sent with each report. Here are some typical battery life estimates:

Sample Rate	Report Rate	Battery Life Estimates	
		1 Logger Connected	2 Loggers Connected
1 hour	24 hours	4 years	3.3 years
1 hour	6 hours	1 year	11 months
15 minutes	1 hour	2 months	1.8 months

## Setting up unique, dedicated email addresses:

You will require a unique email address for each LevelSender, and one for your Home Station PC.

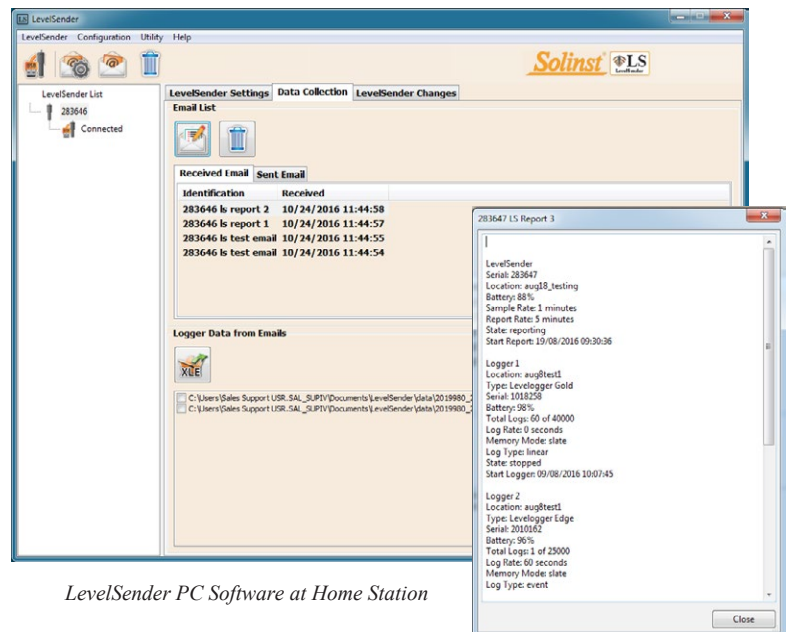
Multiple LevelSender remote stations can report to one Home Station.

**Tip:** Set up a unique gmail account for each LevelSender, using the serial number of the LevelSender in the email address; e.g. LevelSender283047@gmail.com.

## How data is received and organized:

Data can be accessed in these ways:

- LevelSender PC Software – email reports to the Home Station can be viewed and data exported as .xle file
- .xle files for each Levellogger are automatically created and appended on the Home Station PC
- SQLite database automatically created and appended on the Home Station PC. The SQLite database can be queried by your own macros or applications to automatically check for updates and display the data in your own website or other application of your choosing
- Email – up to 5 recipients can be programmed
- Text message – 1 recipient can be programmed



LevelSender PC Software at Home Station

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