



## Solinst Telemetry Systems

Solinst Telemetry Systems are designed for use with the Solinst Levellogger Series of dataloggers. They offer two-way communication and control from your own desktop. You choose the Levellogger, the best communication method to suit your site, access the intuitive software to create sampling and reporting schedules, then view and manage data on your Home Station computer in any way you choose.

STS Systems can be set up using landline, radio, digital cellular, or satellite wireless communications. They are powered by a sealed lead-acid 12V battery, with optional solar trickle charging or direct AC power. RRL Radio Stations use six replaceable lithium batteries, and also have the option of a back-up power source.

STS Telemetry Systems are ideal for large networks. Hundreds of remote stations can report to a single Home Station computer. RRL Radio Telemetry is ideal for small closed loop networks.

## Advantages

- Time and cost savings
- Reliable data transfer direct to your desktop
- Manage the data yourself
- Flexible options to suit site/application conditions
- Low maintenance
- Enhanced power management
- Faster, easier access to data

## Applications

Water level, conductivity and/or rainfall monitoring for:

- Remote or difficult-to-access locations
- Hazardous or critically important sites
- Long-term groundwater monitoring applications
- Longer term pump tests
- Drought and water taking management
- Watershed management
- Landfill and mine water supervision
- Flood and stormwater management

## Benefits of Using Solinst Telemetry

Solinst has created simplified systems with standardized hardware, flexible communication options, and intuitive software that make the system easy to set-up, operate and manage the data.

Solinst Telemetry provides an economical and efficient method to access remote data instantly, saving time and costs by eliminating manual data collection, time spent traveling and costly data hosting.

STS Systems have added features such as alarm notification, remote diagnostic reporting and firmware updating, which makes it easy to maintain your system, while simplifying data collection.

## Communication Options

With the choice of radio, cellular, landline (Ethernet) or satellite, STS Systems provide communication options to suit your site and application. To determine the best method to meet your requirements you need to evaluate the options available in your area i.e. cellular carriers, and the physical conditions of your site, including topography, nearby buildings, trees, etc.

### Radio

If you have no cellular service available, or you are setting up a local network, then radio may be your option. It has the advantage of free airtime and no long distance fees.

### Cellular

If your telemetry network is within an area of good cellular coverage, then GSM or CDMA wireless communication may be your method of choice. Because data is 'pushed' through the system, power requirements to send data are low.

### Landline (Ethernet)

This option is ideal for monitoring water levels on large properties, where Ethernet connections are available at each monitoring well and the Home Station Computer.

### Satellite

Satellite is an option in very remote areas where there is no cellular service available and radio transmission is not possible.

## Internet Connectivity

Choosing to communicate using digital cellular or satellite gives the advantage of IP addressability. IP (Internet Protocol) allows a reliable method of data transfer using an internet connection, which saves you time and money. An IP Network allows all Remote Stations to send data to the Home Station at the same time, without disruptions or time scheduling issues.

## Data Self-Management

STS/RRL Software allows you to always be in control of your own data. Data retrieved from each Levellogger is placed in a Microsoft® Access® database on the Home Station computer. New data is added to the existing database. The STS Software can be used for a convenient quick check of the latest readings. You can export your data as .lev or .csv files for use in your preferred database or modeling package. You can display formatted data on web pages by accessing the database directly with your own software. Data self-management provides flexible options, and ongoing cost savings, without being tied to a proprietary data hosting service.

TELEMETRY SELECTION CHART					
Specifications	RRL Gold Radio	STS Gold Radio	Digital Cellular (CDMA & GSM)	Landline (Ethernet)	Satellite
Why Use?	<ul style="list-style-type: none"> <li>• smaller applications</li> <li>• closed loop network at any location</li> <li>• compact, all-in-one units fit in 4.5" (115 mm) wells</li> </ul>	<ul style="list-style-type: none"> <li>• smaller applications</li> <li>• closed loop network at any location</li> </ul>	<ul style="list-style-type: none"> <li>• cellular coverage available</li> <li>• topography not suitable for radio</li> <li>• send data over the Internet</li> </ul>	<ul style="list-style-type: none"> <li>• on-site facility monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• too remote for cellular</li> <li>• send data over the Internet</li> </ul>
System Differences	<ul style="list-style-type: none"> <li>• free airtime, no long distance fees</li> <li>• you control the network</li> <li>• scheduled data transmission times</li> <li>• low power needs</li> <li>• relay station option</li> </ul>	<ul style="list-style-type: none"> <li>• free airtime, no long distance fees</li> <li>• you control the network</li> <li>• scheduled data transmission times</li> <li>• medium power needs</li> </ul>	<ul style="list-style-type: none"> <li>• monthly carrier fees</li> <li>• no scheduling conflicts for data transmission</li> <li>• low power needs</li> </ul>	<ul style="list-style-type: none"> <li>• uses LAN</li> <li>• no scheduling conflicts</li> <li>• direct power/AC</li> </ul>	<ul style="list-style-type: none"> <li>• satellite service available anywhere</li> <li>• no scheduling conflicts for data transmission</li> <li>• larger power needs</li> </ul>
Suggested Applications	<ul style="list-style-type: none"> <li>• monitoring mine sites</li> <li>• agricultural studies</li> <li>• landfill supervision</li> <li>• golf course management</li> </ul>	<ul style="list-style-type: none"> <li>• monitoring mine sites</li> <li>• agricultural studies</li> <li>• landfill supervision</li> <li>• golf course management</li> </ul>	<ul style="list-style-type: none"> <li>• flood and stormwater management</li> <li>• watershed management</li> <li>• drought monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• on-site water level monitoring</li> <li>• run-off monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• glacial melt monitoring</li> <li>• hard-to-reach, isolated areas</li> </ul>
Remote Station Support	<ul style="list-style-type: none"> <li>• 2.4 GHz or 900 MHz radio</li> <li>• 20 mile (30 km) line of site</li> <li>• 9600 bits/sec</li> </ul>	<ul style="list-style-type: none"> <li>• 900 MHz radio</li> <li>• 20 mile (30 km) line of site</li> <li>• 9600 or 115200 bits/sec</li> </ul>	<ul style="list-style-type: none"> <li>• CDMA or GSM IP enabled modem</li> <li>• dynamic IP Address</li> <li>• 115200 bits/sec</li> </ul>	<ul style="list-style-type: none"> <li>• Ethernet modem</li> <li>• dynamic IP Address</li> <li>• 115200 bits/sec</li> </ul>	<ul style="list-style-type: none"> <li>• IP enabled modem</li> <li>• dynamic IP Address</li> <li>• 115200 bits/sec</li> </ul>
Home Station Support	<ul style="list-style-type: none"> <li>• RRL Home Station with power source</li> <li>• STS/RRL Software</li> </ul>	<ul style="list-style-type: none"> <li>• 2nd Radio required with RS232 connection</li> <li>• STS/RRL Software</li> </ul>	<ul style="list-style-type: none"> <li>• static IP Address</li> <li>• no extra hardware</li> <li>• STS/RRL Software</li> </ul>	<ul style="list-style-type: none"> <li>• static IP Address</li> <li>• no extra hardware</li> <li>• STS/RRL Software</li> </ul>	<ul style="list-style-type: none"> <li>• static IP Address</li> <li>• no extra hardware</li> <li>• STS/RRL Software</li> </ul>
Antenna	6" (15 cm) half wave, (2.1dBi) non-articulating	6" (15 cm) half wave, (2.1dBi) non-articulating	Dual Band Dipole	N/A	Included
Optional Antenna	5 dBi Omni Directional	5 dBi Omni Directional	3 dBi, Dual Band, Omni Directional	N/A	N/A
No Data Hosting Fees	✓	✓	✓	✓	✓
Remote Firmware Upgrades		✓	✓	✓	✓
Remote Diagnostic Reporting	✓ (limited)	✓	✓	✓	✓
Power	6 AA lithium batteries	12V sealed lead-acid battery			
External Power and Charge Accessories	<ul style="list-style-type: none"> <li>• Solar power connection package (for user supplied solar panel)</li> <li>• AC power/battery charger assembly</li> </ul>				

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## STS Remote Telemetry Unit Setup

STS Gold Systems come with standardized equipment configurations, including your choice of communication device to meet the needs of your application. The STS Remote Station consists of an STS Controller, Distribution Box, Battery, and Modem with a connected Antenna, protected within a weatherproof Nema 4X case.



STS NEMA 4X Enclosure

The STS Distribution Box allows the connection of up to 4 data loggers. It controls the modem and manages the power supply.

The STS Controller powers-up the Remote Station for initial set-up and testing. It collects, stores, and sends data from the remote dataloggers to the Home Station.

As the data is 'pushed' from the Remote Station to the Home Station, there are no dial-up or timing issues. Data cannot be lost due to cellular or satellite signal issues, as the STS Controller stores the data in its memory until it has been successfully uploaded by the Home Station. With each communication, system information on battery level, Levellogger status, modem signal strength and status are sent to the Home Station, providing remote diagnostics.

## STS/RRL Gold Software

STS/RRL Gold Software controls both systems, allowing users to manage a project with multiple STS and RRL sites with one program. It is easy to set up the Software with site information, sampling and reporting schedules, and alarm notifications.

A linear 'Sample Rate' is set at which the STS Controller records a real-time reading from each attached datalogger. A 'Report Rate' is set to establish the frequency that the data is sent from the STS Controller to the Home Station.

Each RRL Station is programmed and scheduled using a convenient software wizard.

Levelloggers can be set to record independently of the Telemetry Systems and store the data in their own internal memory, providing a reliable backup, if circumstances require it.

## RRL Systems

The Solinst RRL Gold Remote Radio Link System offers a very simple and inexpensive method of local telemetry. Data is sent from the field via short-distance radio to your PC. The RRL is excellent for small, closed loop networks such as mine sites, golf courses, and landfill monitoring networks. By using free unlicensed radio bands (ISM), the RRL Gold has the advantage of being a lower cost option than cellular or satellite telemetry systems.

## RRL Stations

RRL Stations work with omni-directional antenna line-of-sight transmission, therefore, can communicate over distances of 20 miles (30 km), or more, using some stations as repeaters.

RRL Stations use the same hardware, and are programmed using a wizard in the STS/RRL Gold Software as a Home Station, Remote Station or Relay Station. As such, RRL Stations are interchangeable as required.

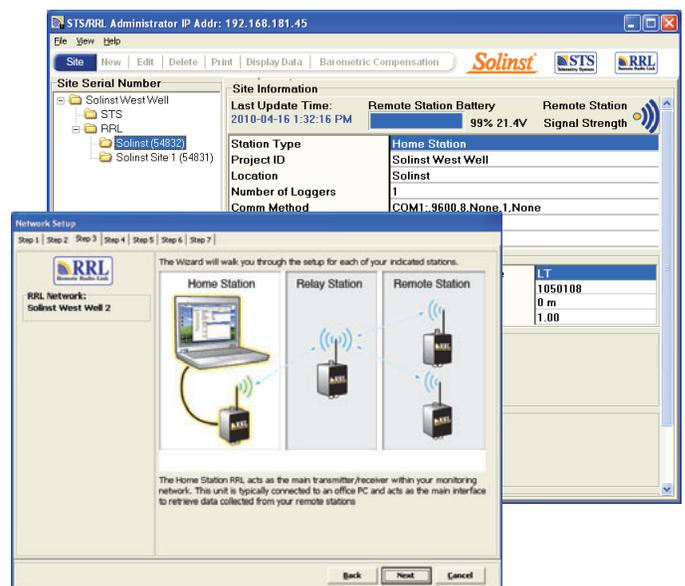


RRL Gold Station

There is the option of a 900 MHz (North American) or 2.4 GHz (Worldwide) radio module for RRL Gold Stations. Stations come standard with six AA replaceable lithium batteries and antenna.

Up to 4 Solinst Levelloggers (using two 'splitters') can be attached to one RRL Station. Stations are designed to fit into 4.5" (115 mm) diameter wells for discrete placement. The case is rugged and waterproof with an IP66 rating.

RRL Stations have a non-volatile internal memory; a Remote Station stores collected data in its memory until the Home Station has been successfully contacted.

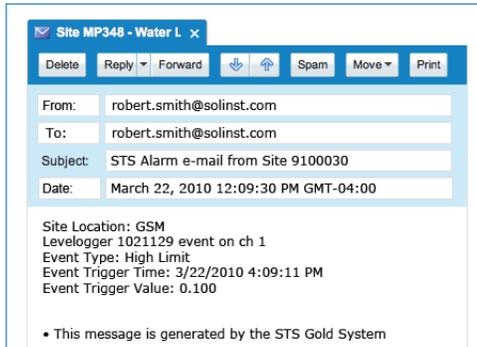


STS/RRL Software Set-up Screens

## Alarm Settings

An e-mail alarm notification will be sent automatically to the Home Station, if a non-communication or low battery condition is detected at an STS Remote Station, when a reading is taken. The Home Station then sends out email alerts, as set up in the software.

High, low and percent change alarms can also be set for any monitored parameter (e.g. water level, temperature, rainfall, or conductivity).



## Power Supply

Solinst Telemetry Systems are designed to avoid power issues. Each STS comes with a 12V battery that can last up to 12 months before replacing or recharging, depending on reporting frequency. The low power electronics of an STS are designed to only use power when there is a scheduled transmission of data, and very little power when it is in standby mode. Power requirements at RRL Remote Stations are also kept to a minimum. Each RRL Station is powered by 6 replaceable lithium batteries. Solinst provides optional cables that enable solar power or direct AC mains connection as a power source, as well as a battery charging kit.

## System Diagnostics

The STS and RRL are very reliable systems, which require minimal maintenance.

To help simplify system diagnostics, each data report to the Home Station includes System information. This information can help prevent data disruptions by providing the battery level, modem operation, signal strength and Levelogger status. A communication test can also be performed between the Home Station and a Remote Station, and Leveloggers.



*Automatically receive remote system diagnostics at your Home Station PC.*

## STS Remote Firmware Updates

If new firmware becomes available, a firmware update can be performed from the Home Station using the update utilities supplied with the STS Software. New firmware is made available free via the Solinst website (<http://www.solinst.com/Downloads/>).

STS Systems also allow modem parameters to be reset remotely from the Home Station and changes made to the report and sampling rates.



## Levelogger Series

STS Telemetry Systems are dedicated to the Levelogger Series of data loggers. This provides the advantage of combining a user-friendly telemetry system with high quality data loggers.

Up to 4 Solinst data loggers can be attached to each remote station, in any combination of the Levelogger Gold, Barologger, Levelogger Junior, LTC Levelogger Junior, or Rainlogger. (See Model 3001 Gold, Junior, LTC Junior and 3002 Data Sheets).

Solinst Leveloggers are ideal for remote monitoring, with independent user-defined logging schedules as a back-up. They have long battery life, power surge protection and a

non-volatile memory. If programmed separately, Leveloggers record regardless of the status of the STS System.

Leveloggers are low maintenance, absolute data loggers. There is no need to deal with vent tubes or cumbersome equipment. One Barologger can typically provide accurate barometric data for a 20 mile (30 km) radius and/or with every 1000 ft (300 m) of change in elevation.

These reliable, durable data loggers have intuitive software with many useful features, such as self-tests and firmware upgrade and diagnostic utilities.