

Quick Start Guide

RRL Radio Telemetry

- ① Antenna
- ② External Power Connection
- ③ LED Activity Light
- ④ RS232 Connection
- ⑤ Serial Number
- ⑥ Datalogger Connections



RRL Station

1) Getting Started

Before you start programming your RRL Network, decide if you are going to configure and start all of your hardware in the office, or out in the field. Our recommended method is to set all hardware up in the office to ensure the RRL Stations and connected dataloggers are communicating as programmed, before installation. However, you must remember to keep a record of each RRL Station and the position and serial numbers of each connected datalogger, to ensure, when in the field, you connect all hardware as programmed.

This guide will take you through the recommended steps to set up your RRL Network.

Note: RRL Networks can bridge with an STS Edge Telemetry System. See STS Edge User Guide.

2) Install the Software

The Solinst Telemetry Software includes one main program and two utility programs:



STS/RRL Administrator Software: used to set up new RRL (or STS) Networks, edit existing networks (remote updates), and view data sent from each RRL Station.



STS/RRL Communication Agent: used to view network activity. Communication from each Remote and Relay RRL Station to the Home Station is logged.

Note: The Communication Agent must remain open at all times during RRL Network operation.



RRL Remote Utility: provides a convenient way to communicate with programmed RRL Stations in your office or in the field, as well as perform diagnostic checks and firmware upgrades.

Web Download

Download the newest version of Solinst Telemetry Software and the RRL Remote Utility by visiting <https://www.solinst.com/downloads/>

The STS/RRL Communication Agent automatically installs with the STS/RRL Administrator.

CD Installation

1. Insert the software CD provided.
2. If the installer does not automatically start, to activate the software install click on the 'setup.exe' file located on the software CD.
3. The Software Installation Wizard will guide you through the remaining installation process. The STS/RRL Administrator, STS/RRL Communication Agent, and RRL Remote Utility are all automatically installed.

3) Install RRL Station Batteries (units are shipped with batteries not installed)

1. Use a Phillips screwdriver to undo the four screws from the back of the RRL unit.
2. Carefully remove the back of the RRL unit.
3. Install the batteries in the battery holder. Ensure proper polarity.
4. Replace the back of the RRL unit ensuring all wires are inside. Reinstall the four screws.



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4) Connect Dataloggers to RRL

1. Ensure the pins are lined up, and connect the Reader Cable to the RRL Station.
2. Connect the Reader Cable to a Direct Read Cable with a Levellogger or Barologger connected, or to a LevelVent Wellhead or AquaVent Wellhead Connector Cable.
3. Record the serial number of each unit, as well as the reference position connection to the RRL.

Note: Each RRL Station has connections for two dataloggers. These connections can also be used to connect Splitters. One or two Splitters can be used, each allowing the connection of two dataloggers.



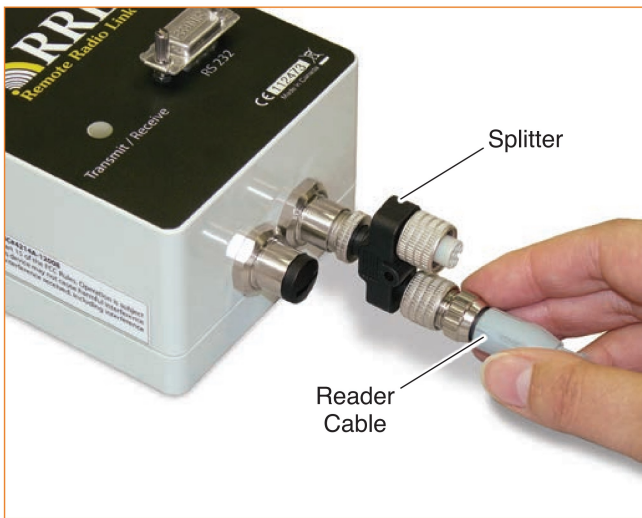
Levellogger Connection to the RRL Station



LevelVent Connection to the RRL Reader Cable



AquaVent Wellhead Connector Cable for Connection to RRL Reader Cable



Position the Splitter as shown in the photo above to accommodate two Splitters on the RRL Station.



Note

The connections for dataloggers on the RRL Stations are identified as Right and Left in the RRL Software. This assumes the RRL Station is facing with the black label towards you. When using a Splitter, the number 1 or 2 will identify the dataloggers. The numbers 1 and 2 are labeled directly on the Splitter.

5) Program RRL Stations

All RRL Stations use the same hardware, and are programmed using a software wizard as a Home Station, Relay Station, or Remote Station. Therefore, stations can be programmed and are interchangeable as required.

1. Connect the RRL Station to be programmed as the Home Station to the PC with an RS232 cable, and start the software.



RRL Station connected to PC using RS232 cable

Network Setup
Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | Step 7

This Wizard will help you setup your STS or RRL telemetry sites. Which type of site would you like to create?

STS Edge Site (GSM)
 STS Gold Site (GSM)
 RRL Site (Radio Network)

Next Cancel

Software Wizard Step 1 - Network Selection

2. Select an RRL Site, and click Next to start the software wizard.
3. Enter the RRL network settings, including number of Remote and Relay Stations, Network Start Time, Radio Frequency and Power settings, Sample and Report Rates, and Report Duration.

Network Setup
Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | Step 7

RRL Network Setup:

Project Identification: Solinst Well Test

Network ID: 1

Radio Frequency: 900 MHz

Radio Power: 100mW

Home Station Connection
 Master Com Port COM1
 STS Edge Station 284,296

RRL Network Settings:

Network Start Time: 10/30/2018 4:45:19 PM

RRL Sample Rate: 10 (1 - 99) Minutes

RRL Report Rate: 15 (1 - 99) Minutes

RRL Report Duration: 5 (1 - 99) Minutes

Number of Home Stations: 1
 Number of Relay Stations: 1
 Number of Remote Stations: 1

Warning: This section of the Wizard allows you to determine when your RRL systems will start in your network, and customize the sampling and reporting frequencies for your RRL Network.

Sample Rate = How often your RRL units record data from the connected sensors.
Report Rate = How often the remote RRL units report or send the data to the Home Station.
Report Duration = Amount of time between RRL units reporting to Home Station.

Back Next Cancel

Software Wizard Step 2 - RRL Network Setup Screen

Sample Rate is the frequency the RRL Remote Stations collect real-time readings from each of the attached dataloggers. The Sample Rate can be set from 10 seconds to 99 hours.

Report Rate is the rate at which stored data is sent from a Remote Station to the Home Station. The Report Rate can be set from 1 minute to 99 hours.

Report Duration is the maximum span of time that a Remote Station will be in contact with the Home Station during the transfer of data. The minimum Report Duration is 1 minute.

Important

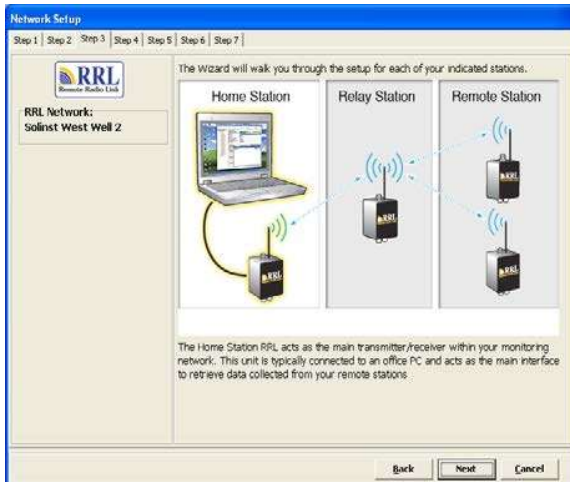
A higher Radio Power setting will increase communication distance between 900 MHz radios, but it will use up the battery power more quickly. (See "Connect Power Supply").

Remember

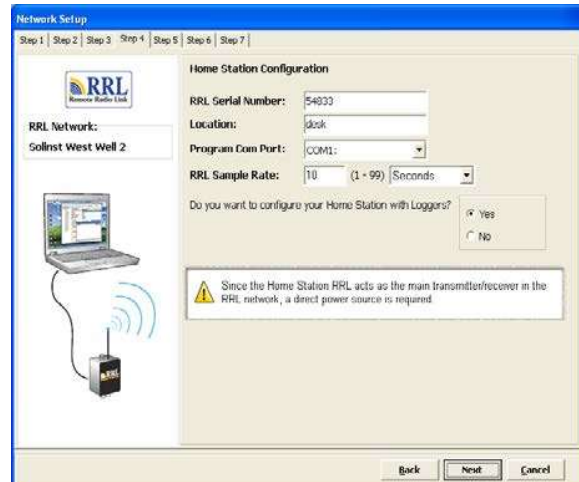
As you are prompted through the software wizard, remember to connect each RRL Station to the PC before entering the settings.

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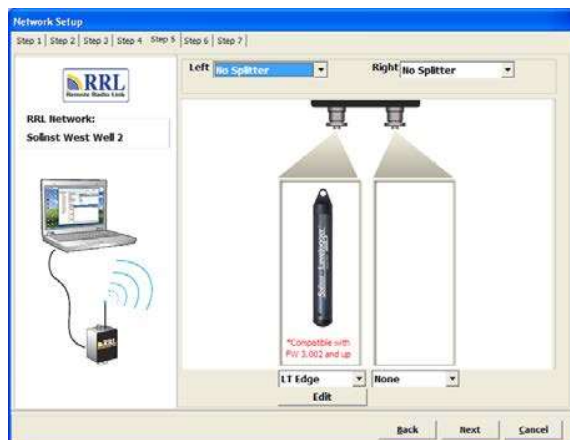
- The software wizard will prompt you through programming each of your RRL Stations. You will enter the number of dataloggers connected to each Station. You will also be given the option to program the dataloggers to record internally on their own schedule.



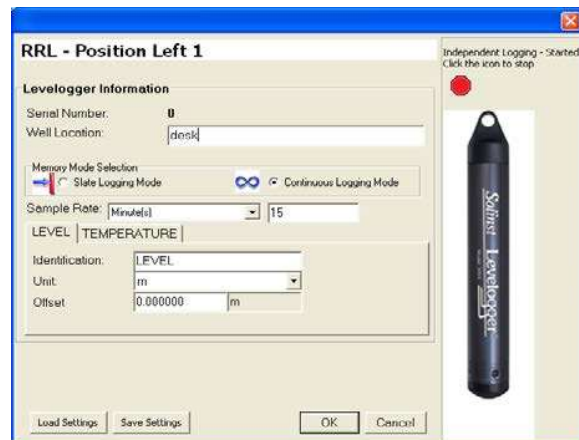
Software Wizard Step 3 - This is a transition screen shown before programming each Station. It will show what Stations have been programmed, and those remaining.



Software Wizard Step 4 - Program Station Settings: Enter the RRL Station serial number and location, and set a sampling rate (if different from one set in Step 2).



Software Wizard Step 5 - Enter datalogger Settings: Select the connected dataloggers from the drop-down menu, and select Edit to enter data collection schedules.



Programming Datalogger Independent Logging: Set an optional sampling rate to record readings in the datalogger's internal memory, independent of RRL Network operation.

- After applying settings to each Station, there will be the option to start your RRL Station with the Network Start Time entered in Step 2 of the Wizard, or use the Remote Utility (See "Start RRL Stations"). After applying all settings, Step 7 of the wizard will provide a network summary.
- The RRL Network will be added to the STS/RRL Administrator window, where you can view all the site information and edit as required.

6) Start RRL Stations

Once all Stations have been programmed, it is recommended you start each RRL Station logging as a test.

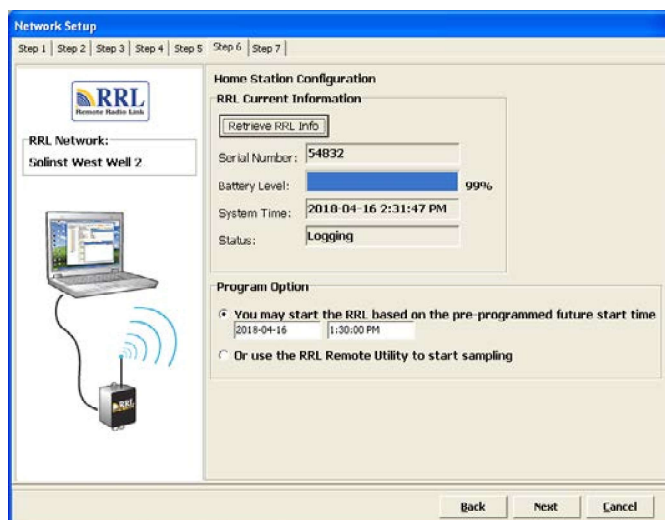
There are two options for starting your RRL Stations:

Start Stations with the Programmed Network Start Time

RRL Stations will begin logging at the date and time entered in Step 2 of the Software Wizard.

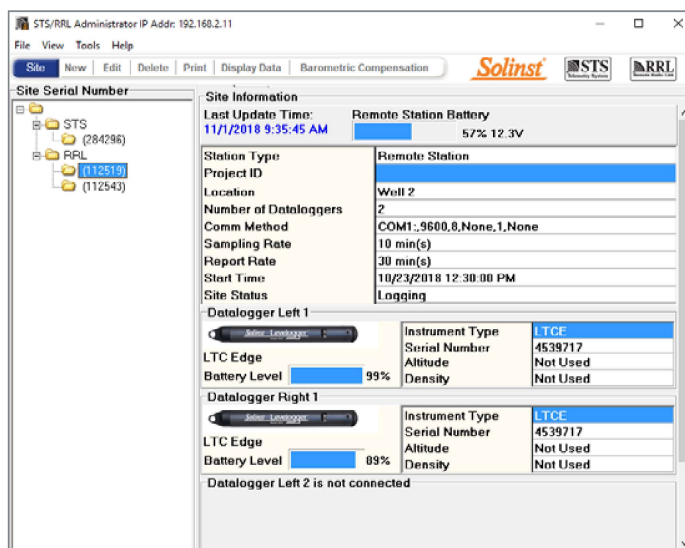
Start the Station with the Remote Utility

RRL Stations will stay in stop mode until they are started with the RRL Remote Utility.



Software Wizard Step 6 - Determine RRL Station Start Time.

After each Station is started, and the first set of data sent, the serial numbers and types of dataloggers connected to the Station will be shown in the STS/RRL Administrator Window. You can print a copy of this screen for each Station, as a record to refer to when installing the Station in the field.



Administrator Window

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7) Connect Power Supply

RRL Home Stations and Relay Stations require an external power supply. External power cables are connected to the RRL Station beside the antenna connection. An AC Power Adaptor comes with a battery charger and cables for connection to an AC power source. A 12 Volt External Power Cable is available for connection to a user-supplied 12 Volt battery or solar panel.



Power Cable Connection

Each RRL Station comes standard with six (6) 3.6V AA replaceable lithium batteries. To help determine if an external power supply is required at a Remote Station, the following are estimates based on the standard lithium batteries with the Radio Power setting at 1 Watt. With the Radio Power set at 100 mW, the battery life increases by about 10% of the estimates below. With six (6) 1.5V AA alkaline batteries, the battery life will be about 40% of the estimates.

Tip

Less frequent Sample and Report rates will extend the battery life of a Remote RRL Station.

Note: If your Report Rate is 3 hours or less, an external power supply is recommended.

Sample Rate	Report Rate	Battery Life
Every 5 Minutes	Every Hour	114 Days
Every 15 Minutes	Every 6 Hours	425 Days
Every Hour	Every 12 Hours	680 Days
Every 12 Hours	Every Day	895 Days
Every 15 Minutes	Every 3 Days	810 days
Every Hour	Every 7 Days	1078 Days
Every 12 Hours	Every 14 Days	1200 Days

Battery Life Estimates (6 3.6V AA lithium batteries at 1 Watt)

Note: It is recommended to replace the batteries when the Remote Station Battery indicator reaches 30%.

8) Install in the Field

RRL Stations are designed to fit inside 4.5" (115 mm) diameter wells for discrete placement.

RRL radios communicate with each other via line-of-sight. They must be able to “see” each other in order to have effective communication. Each Station is site specific, and will require testing and planning to determine ideal placement and settings.

A communication range test can be performed prior to installation between the Home Station and the Remote or Relay Station. Using the RRL Remote Utility, tests can be done using different Radio Power settings to determine the ideal setup for your site. Always start with the lowest Radio Power setting, as this will conserve battery power.

Field tests will allow you to determine if you need an additional power source due to a higher Radio Power setting, or the addition of a higher gain antenna or Relay Station to increase communication distances.

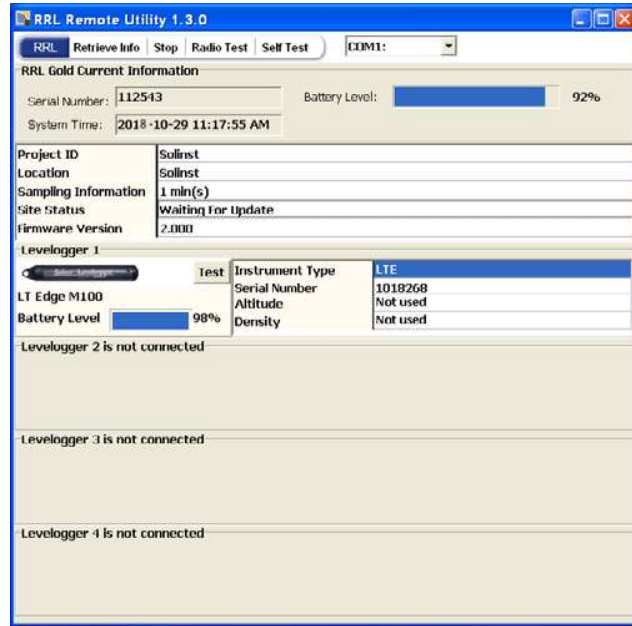
RRL Remote Utility

To use the Remote Utility, connect a RRL Station to the PC with a RS232 cable, select the COM port to which the station is connected, and click “Retrieve Info” to display the settings from the RRL Station.

To start the RRL Station logging, click “Start”. To stop the RRL Station, click “Stop”.

Click “Radio Test” to determine if communication between the Remote Station (or Relay Station) is successful.

Click “Test” beside any of the datalogger icons, to determine if communication between the RRL Station and the logger is successful.



RRL Remote Utility

View Site Data

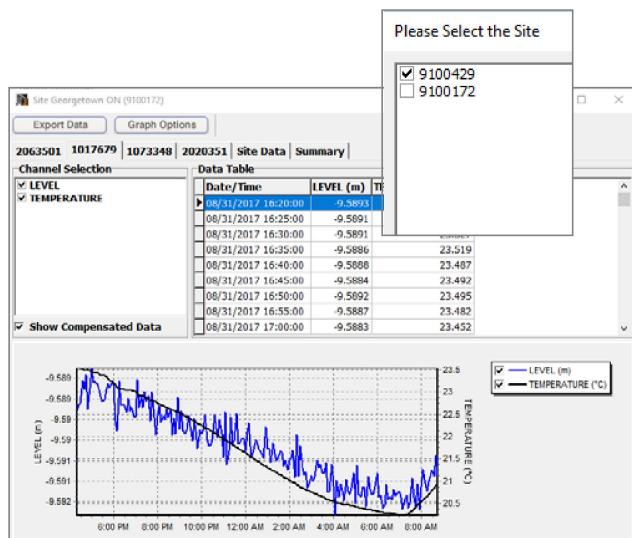
Data received in each report from a RRL Station is placed in a Microsoft® Access® database on the Home Station computer. New data is appended to the existing database. The program will save data downloaded to the following default directory:

<C:\Program Files\Solinst\STS_Gold\db>

Data can be barometrically compensated, and exported using the software as .lev, .xle or .csv files for use in other programs.

To view data from a specific site, open the Administrator Window and select an RRL Network or Station from the list. Click “Display Data”.

Select the RRL Station from the list that opens and click OK.

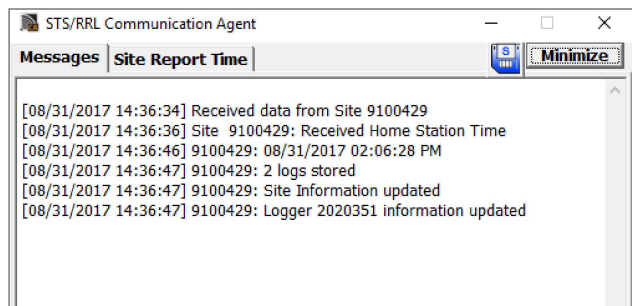


RRL Site Data

Communication Agent

The Communication Agent must be opened before the RRL Network can start sending data to the Home Station PC. The window displays all communication activity occurring in the network. Log files are automatically saved to:

<C:\Program Files\Solinst\STS_Gold\log>



Communication Agent Window