



Starlog V4

**Datalogger Management
Software
V 4.00**

Model 6308A/AUE

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1 Introduction

Starlog Version 4.0 (Starlog V4) is a software package designed for the management of Unidata loggers. It is a standalone software application designed to replace existing Starlog or Starflow software, and provide the advantages of a 100% Windows interface.

Features:

- Powerful Scheme Creation Wizard.
- Comprehensive Instrument Library and Editor.
- Multi User Profiles - Basic - Technical - System Developer.
- Multi Buffer Support.
- Telemetry Support Features.
- Backward Compatibility with Starlog Version 3 Schemes.
- Fully Windows XP Compliant.
- Unloads data and converts automatically to a CSV (Comma Separated Value) for easy data manipulation and viewing in Excel, Hydstra, or Magpie.
- View unloaded data in a graphical and textual format with the internal data viewer.
- View real-time reading from the logger in a graphical or textual format.
- Connect to remote sites via a standard phone or cellular modem.
- Manage multiple sites from a single PC.
- Configure basic parameters of the logger "Scheme".

Note that at present StarLog V4 is unable to:

- Receive alarms from logger.
- Program / unload from PCMCIA card loggers.

System Requirements

- Pentium Processor 233Mhz.
- 64 MB RAM.
- 32 MB hard drive space.
- Windows 2000 or XP.
- SVGA Monitor.
- Mouse.

What is Data Logging?

DATA LOGGING is the process of collecting and retrieving data. It is not new. Humans have collected data for millennia, for example, the ancient Egyptians recorded astronomical data using the instruments of their day. Such data collection was labor intensive and became difficult if an experiment lasted over a long period or required very high sampling rates.

Automated data logging is a product of the Industrial Age. The first type of automated equipment was the chart recorder. An instrument was connected to a pen that continuously left marks on a piece of paper, eventually resulting in a graph over time. The advent of microprocessors in the early 1970's enabled fully automated data logging. It also meant that it became possible to keep collected data in a form suitable for further processing. At this time the Data Logger was born. A Data Logger is a battery-powered computer with specialized input/output, power and memory systems.

In the late 1980's, there was a move toward telemetric data logging where data was collected via a dial-up satellite or PSTN link however regulations and cost prohibited wide spread use. In the 1990s cheap cellular phones and modems, and the introduction of GSM and CDMA, made widespread telemetric logging possible however the problems of scaling such systems into large automated data collection networks became apparent.

Most recently, the Internet, combined with GPRS, Ethernet, wireless and fibre has become a form of networked data logging system. GPRS and Ethernet are the focus of a number of development projects at Unidata.

Starlog's Data Logging Advantage

STARLOG was specifically designed to log data in remote locations. Remote locations can be geographically remote or just an inconvenient distance from common amenities and services.

Starlog's advantages in geographically remote locations can be seen when considering a task like monitoring weather conditions in some remote location in Siberia. You could install a Starlog Data Logger in a weatherproof enclosure and connect temperature, humidity, and wind speed and direction sensors. Once installed you can retrieve the acquired data using satellite, CDMA or GSM telemetry making site visits exceedingly rare.

The high cost of making services such as electricity and telephone lines available can have the affect of making the conditions at a nearby location effectively the same as those in a remote location. Since the data logger has its own power supply, Starlog is ideal in these circumstances.

Data logging is a valuable tool for researchers, resource managers and industry.

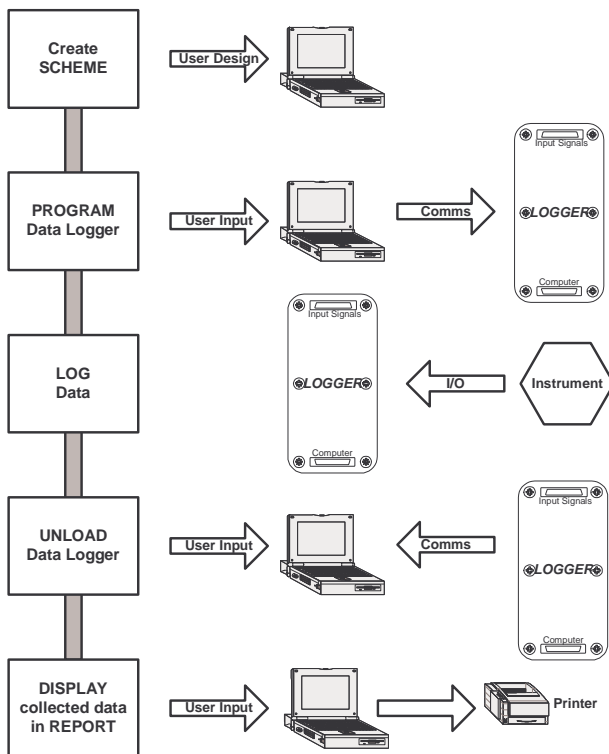
Applications include:

- Water Resource management;
- Environmental Protection;
- Agricultural Studies;
- Alternative energy research;
- Salinity Control;
- Drainage and Storm Water Monitoring;
- Forestry Management;
- Ground Water Research;
- Resource Development; and
- Meteorology.

What is this software package for?

Unidata loggers can be described as small computers with specialized I/O (Inputs and Outputs). Just as your desktop PC is not much use without an application (such as Microsoft Office™ or Adobe Acrobat™) a Unidata data logger is not much use without a running program or project. We refer to this program as a scheme.

Once you have selected the hardware for a data logging system, five steps are required to make it operational. These are shown in the illustration that follows.



What is a Scheme?

Using STARLOG Data Logging systems, a data logging project is called a scheme. Elements of a scheme are grouped into the following categories.

General Details

Scheme title used for reports and printouts.

Hardware Details

Which Unidata Data logger is being used.

Communications Settings

Logger to computer communications port and speed.

Modem setup strings and phone number.

Program Details

Program type (event-triggered?).

How to store data (linear or circular buffer).

Scan rate.

When to log.

Log Buffer details

Average, minimum, maximum, total or raw data.

Which channels to log.

Instruments

Instruments connected, channels used, input scaling & advanced on-board data processing

Events

Definition of events to trigger an output pulse or to log.

A Scheme combines these elements to generate a working program to operate the logger. The program instructs the logger, for instance, to “log the average hourly temperature measured by a thermistor probe connected to analog channel 1.

2 Starlog V4 Package Overview

Starlog software is specially designed to manage a data logging scheme and data unloads.

It is intended to be installed onto a computer where you may use it to create new schemes, load, unload and process data and test logger operation.

The software has a Windows style user interface, complete with drop down and pop menus and help messages, as well as easy access to Unidata's extensive support documentation.

The easy-to-use menus are especially helpful in setting up your data logging project. You use the Scheme Editor to define what kind of data to collect and how and when it will be logged. Then, using the Navigator Control bar, you can load the scheme into the logger.

Once data has been acquired by and stored in the logger, you can use the Starlog software to unload it - again using the Navigator Control bar. Logged data is transferred to your computer in Comma Separated Value (CSV) file format. This format allows easy importing of your data into 3rd Party data management and manipulation software such as Hydstra, Tideda and Magpie.

To check logger operation, the software includes a test mode. In test mode the logger displays data as it is acquired. It also displays the logger status and other important information.

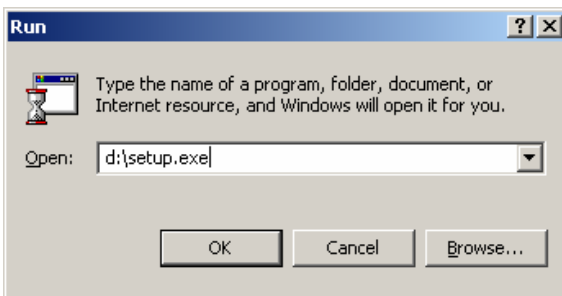
Installing Starlog V4 Software

Starlog Version 4.0 is easy to install, and simple and intuitive to use. While it retains many similarities to Starlog Version 3.0, it also contains many new and powerful features that will assist you in the management of your data logging applications.

Starlog V4 is supplied with an automatic set-up program to simplify the installation of the program files. Please follow this simple guide to install and begin using your software.

2.1 Installation from CD-ROM

Starlog V4 is supplied on a single CD. To install it, place the CD into the CDROM drive then select Start/Run and type in the root directory of the CDROM followed by Setup.EXE.



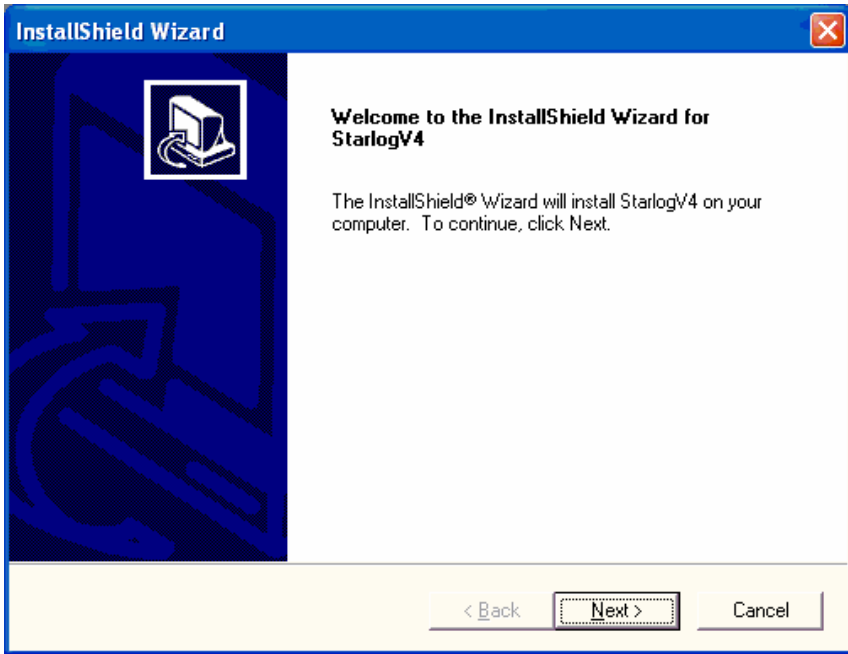
Alternatively:

1. Insert the CD-ROM
2. From Windows Explorer or My Computer open the CD-ROM drive folder.
3. Double click on the SETUP.EXE program to start the installation.

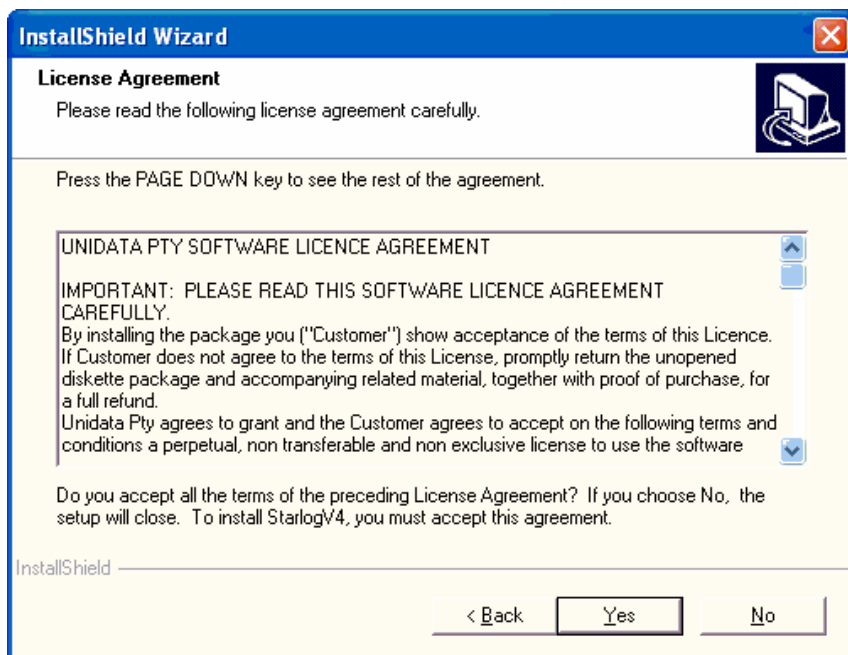
2.2 Installation from Internet Downloaded Files

You can download the latest version of Starlog V4 from the Unidata web-site <http://www.unidata.com.au>.

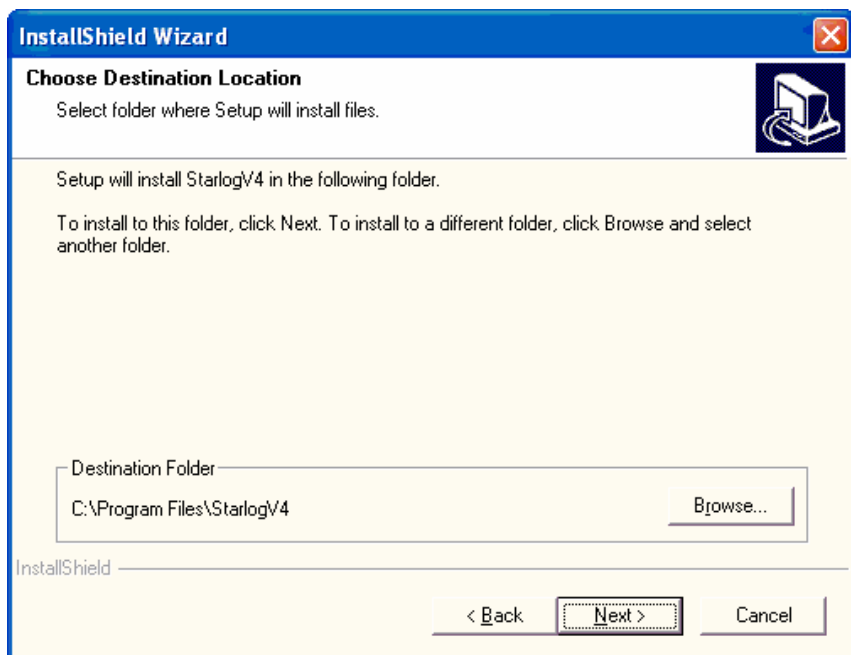
Follow all instructions and make alterations to install directories as required.



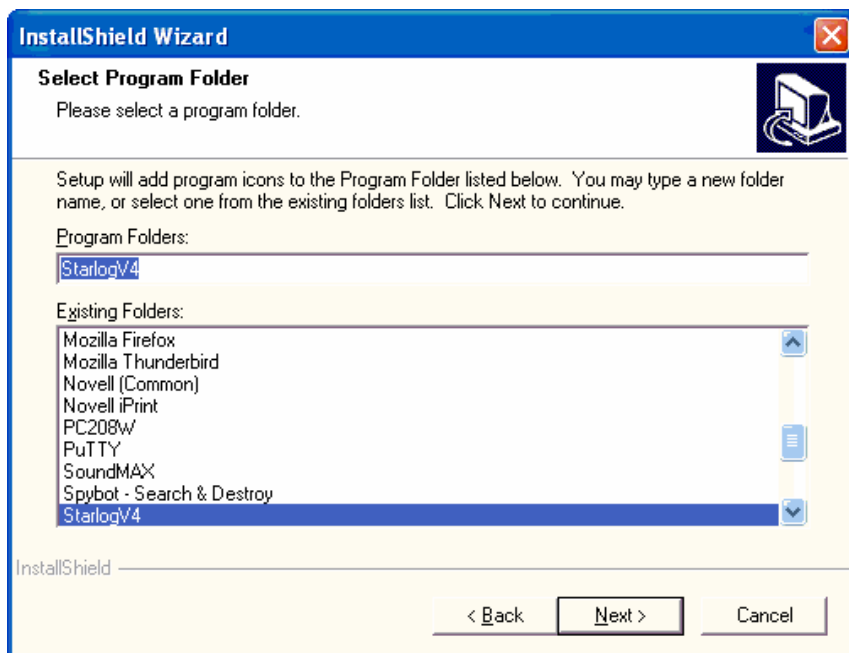
Click 'Next'.



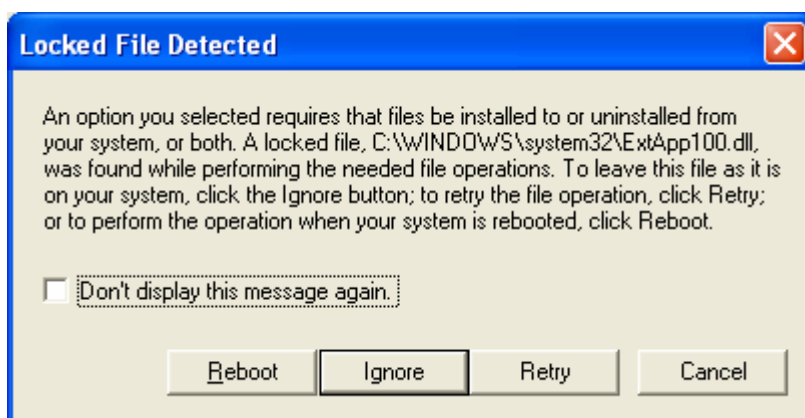
Click 'Yes' to accept the license agreement, no to exit program installation



Unlike StarlogV3, StarlogV4 installs in the Program Files folder



Starlog Version 4 will enter a shortcut to the program executable in the Start Menu under the Starlog V4 menu.



If a file being installed is already on the computer and is in use by another program then click 'Reboot'. This will ensure that the correct files are installed onto the PC

Once setup is complete, select: Start/Programs/Starlog V4/Starlog V4.exe

This will start the Starlog program.

A support files window will then be displayed, click the 'Extract' button.



On completion the Compatibility options for your existing Version 3 will startup.

Configure StarlogV4

Unidata

Starlog V3 Compatibility

StarlogV4 can automatically link to the StarlogV3 scheme editor so that you can still edit your V3 schemes. Select the path to the STARLOG.EXE

C:\Starlog\STARLOG.EXE

Select the path to unload data from StarlogV3 schemes. The data will be stored in StarlogV4 format (CSV) in a separate sub directory for each scheme

C:\Starlog\DATA\

StarlogV4 can unload and reprogram dataloggers using StarlogV3 schemes. Select the path to your StarlogV3 schemes

C:\Starlog\SCHEMES\

Defining these paths will allow V4 to access V3 schemes and enable V3 scheme editor to be opened within V4. This allows you to access/modify V3 Scheme information.

The first path directs Starlog Version 4.0 to the executable file for Starlog Version 3.0.

The second path is the directory to save data from the Version 3 schemes unloaded using Starlog Version 4.

The third option is the path where your Version 3 schemes are held (C:\Starlog\Schemes).

Please note that modifying V3.0 schemes is limited in V4.0. Please read below for more information.

While you can re-program data loggers and unload data from data loggers programmed with a Version 3 scheme, schemes created in Starlog Version 3 can not be edited using Starlog Version 4.0.

You can however run the version 3.0 scheme editor within version 4.0 and make changes to scheme settings directly. Any changes to your Version 3 scheme will be available to Version 4.

The next window prompts you to enter a user name and code key. Please note if you do not have a user name or code key, you will need to call your nearest Unidata Representative.

Configure StarlogV4



If you have purchased a user name and key from Unidata, then you can enter these below to register the program. If you don't have a key click on Next to evaluate StarlogV4

User Name

Code key - - - -

Exit Back Next

Visit the Unidata Web site for more information.

www.Unidata.com.au

If you are simply trialing the product, click 'Next' to start the 30 day trial.

Note – If during your evaluation you require a trial period of greater than 30 days please contact Unidata for assistance.

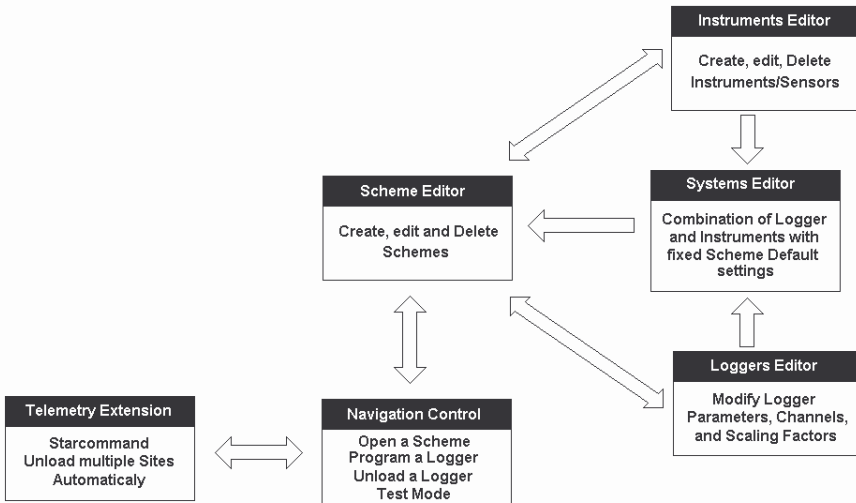


Click 'Finish' to begin using the Starlog Software.

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3 Using Starlog V4

Starlog Version 4 has the following program structure.



The most common logger operations are simple to start from the main StarlogV4 window. They are available from the quick start Navigation Control bar on the left-hand side of the User Display.

When you first begin your new Version 4 software, only three options will appear in the Navigation Control bar - more options will become available once you have created a scheme.

The three options are:



Select



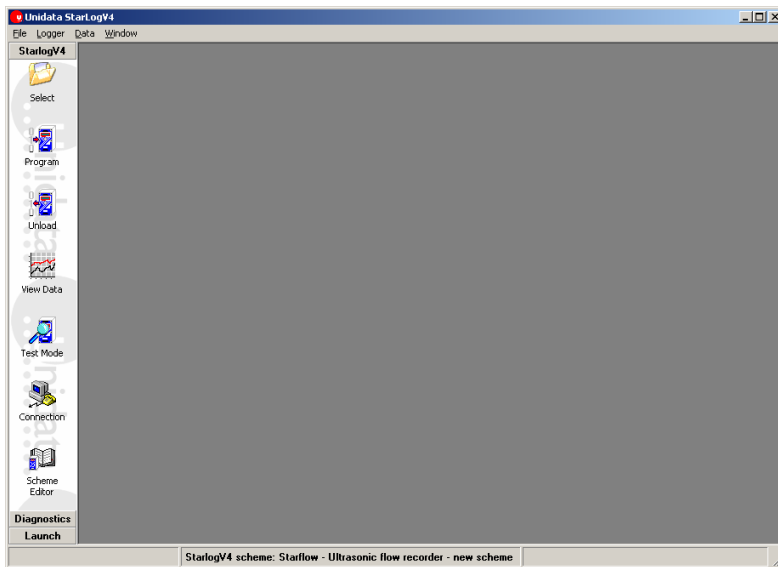
View Data



Scheme
Editor

To begin, select the Scheme Editor button and go to the Scheme Editor section of this manual.

4 V4.0 User Display



This is the new User Window Display for the V4 software. Control is initiated through the Navigator Control bar. This has the following options:

To open existing schemes select the 'Select' icon.



Select

To program the logger with a scheme select the 'Program' icon.



Program

To unload data from a logger select the 'Unload' icon.



Unload

To view previous unloads select the 'View Data' icon.



View Data

To view real time data and logger status select the 'Test Mode' icon.



Test Mode

To establish or check a connection select the 'Connection' icon.



Connection

To create a new scheme, select the 'Scheme Editor' icon.



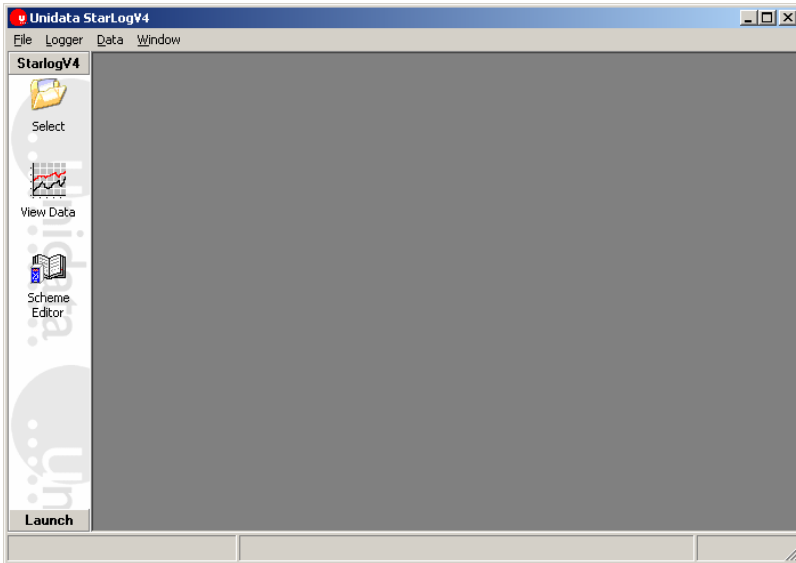
Scheme Editor



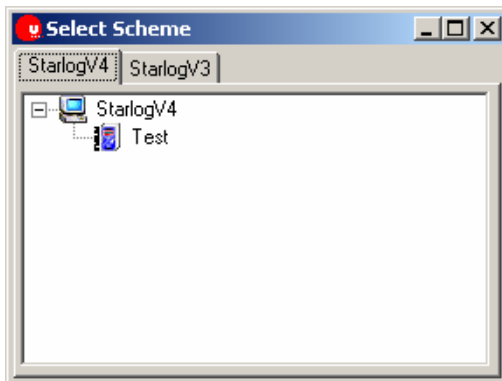
Select

Open a Scheme

Select the 'Select' icon in the Navigation control bar to open a scheme.



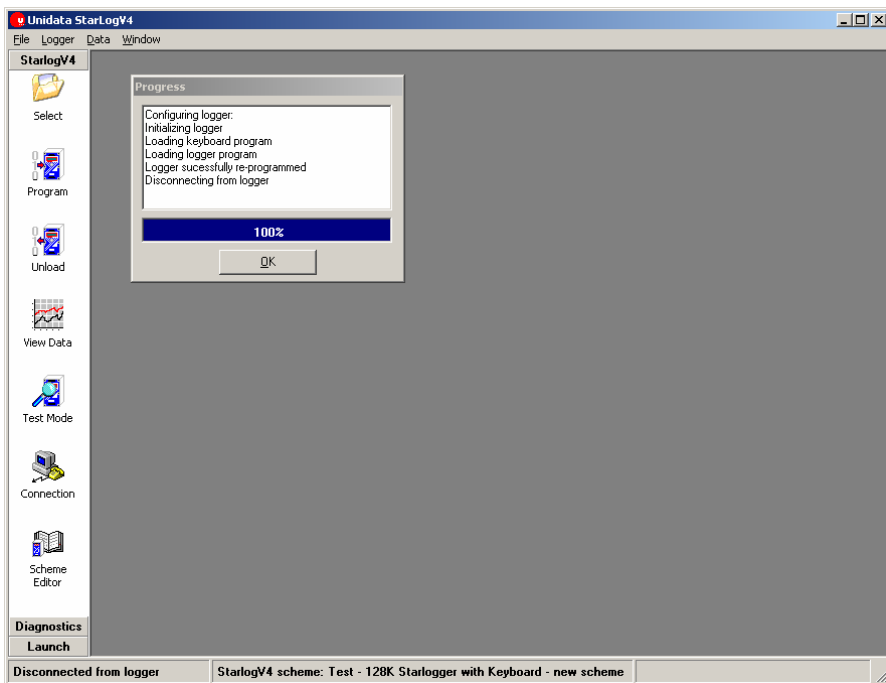
This will open a window. Double-click on the desired scheme.





Program a logger

Select the 'Program' Option in the Scheme Editor Navigation Control bar to program a data logger with an open scheme.



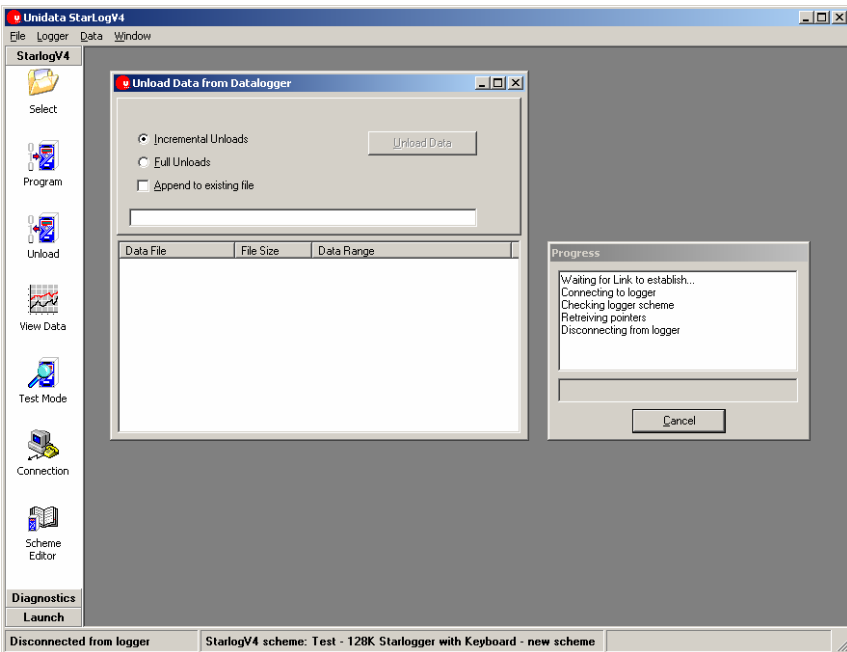
With the logger attached and the correct connection settings as defined in your scheme, click the 'OK' button to load the data logger with the scheme.

A progress Window will open identifying the status of the scheme load.



Unload data from logger

To unload data stored on the data logger, open the scheme that is on the data logger and select 'Unload'.



Incremental unloads and full unloads are still available in V4. Unlike V3 however the unloads are not saved as .UXX files. They are now comma-separated values to allow easier uploading into Excel, Tideda or Hydsys.

With the data logger attached and the correct connection settings as defined in the scheme click the 'Unload Data' button to begin unloading.

A progress Window will open identifying the status of the scheme unload.

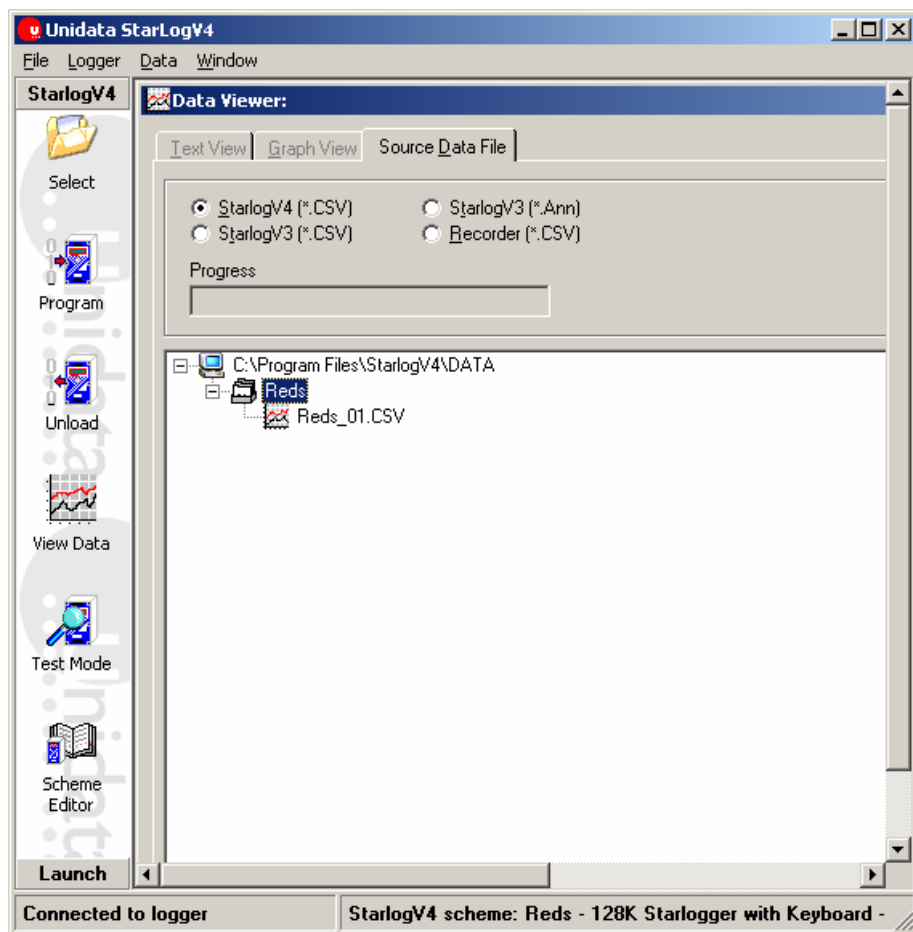
If your scheme utilises multiple log buffers, then others tabs will be visible. You will need to initiate a separate unload for each log buffer.



View Data

View Data

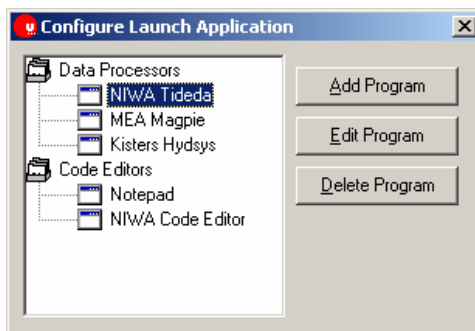
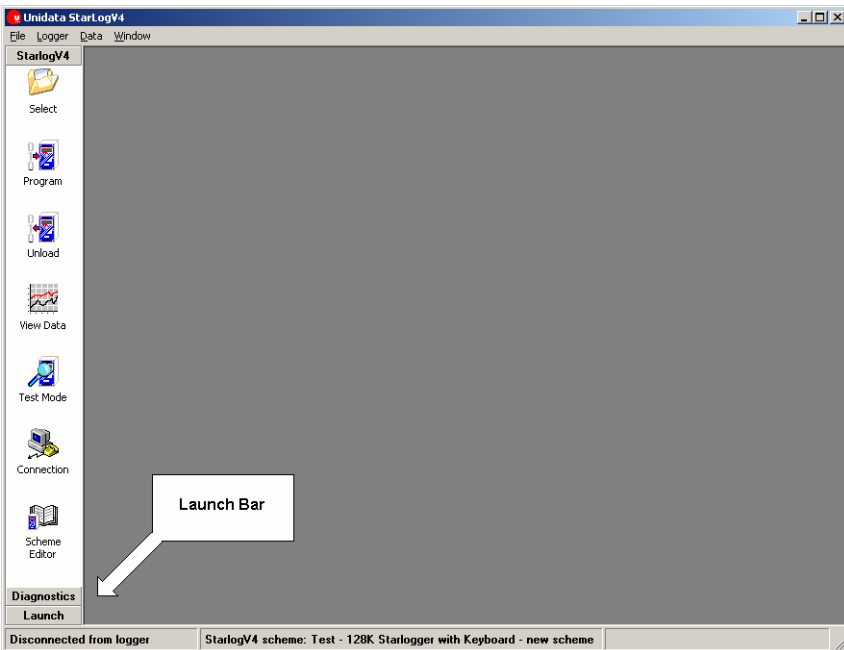
Select 'View Data' in the Navigation Control bar to view the data that has been unload from a data logger.





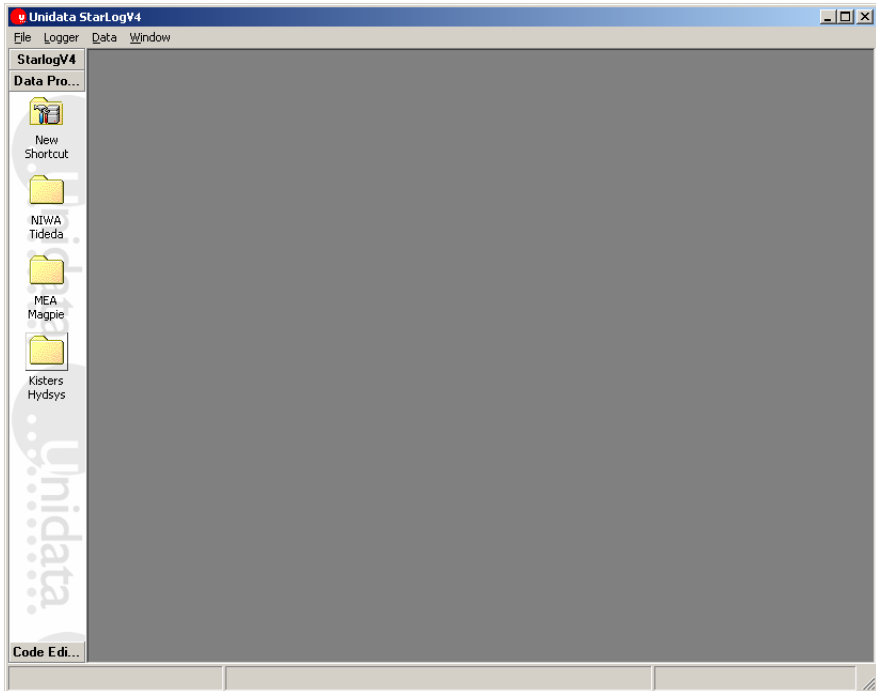
Launch programs Navigator

At the bottom of the Navigator Control Bar a Launch button can be programmed to allow shortcuts to your most used applications.



To add a shortcut that will launch an application, select the 'New Shortcut', then the Add Program button. Enter the Group name, either Data Processors or Code Editors, the Shortcut EXE location, and the name that you want displayed (see previous page)

Once complete click the  button to exit the window.

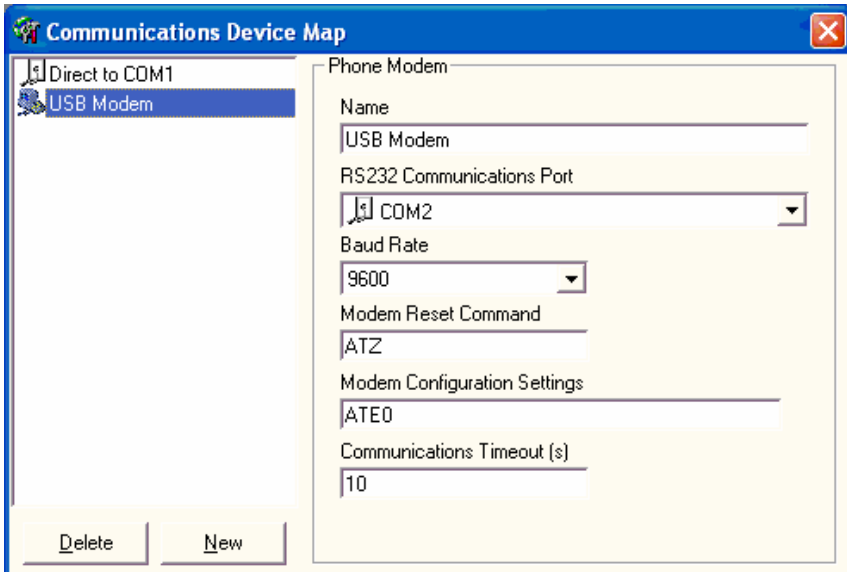


Selecting Launch will then display the Shortcuts that you have entered.

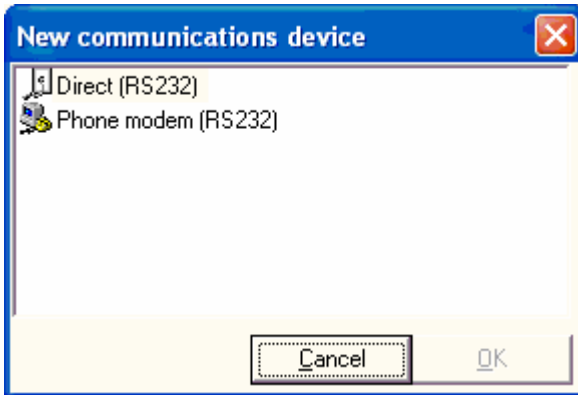


Communications Mapping

Select File/Options/Communications Map in the User Window Display to modify the Communication port mapping. This Map allows you to pre-define any communications devices on your PC



You can add new devices to you map by clicking on the 'New' button. A list of available devices will be displayed



Select a device to edit the parameters, click on New to add a new device, click on Delete to remove the currently selected device



Test Mode

Test Mode

Select 'Test Mode' in the Navigation control bar to view the logger's real-time display.

Connected to site: Test

Logger Information		Log Parameters	
Scheme Name	Test	Log Rate	5 s
Logger Time	13/06/2005 2:29:05 PM	Log Size	12 bytes
Logger State	Logging	First Log Time	13/06/2005 1:12:00 PM
Scan Rate	5 s	Last Log Time	13/06/2005 2:29:05 PM
		Memory	93 days 19.00 remaining [104.4 Kb]

Logger Channels					
Voltage	307.692	mV	Voltage	924.297	mV
Voltage	616.605	mV	Voltage	1230.768	mV
Voltage			Voltage	1537.239	mV
Voltage			Voltage	1844.931	mV

Main Buffer

Time	Voltage(RAW)	Voltage(RAW)	Voltage(RAW)	Voltage(RAW)	Voltage(RAW)	Voltage(RAW)
13/06/2005 10:29:05 AM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 10:44:05 AM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 10:59:05 AM	307.692	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 11:14:05 AM	307.692	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 11:29:05 AM	307.692	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 11:44:05 AM	307.692	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 11:59:05 AM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 12:14:05 PM	307.692	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 12:29:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 12:44:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 12:59:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 1:14:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 1:29:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 1:44:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 1:59:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 2:14:05 PM	310.134	616.605	924.297	1230.768	1537.239	1844.931
13/06/2005 2:29:05 PM	307.692	616.605	924.297	1230.768	1537.239	1844.931

Logger Information: The logger information display shows the unit that you are attached to and the status of the unit.

Log Parameters: This information shows the scan rate of the logger as well as the size of the log and the amount of memory left until the logger's buffer is full.

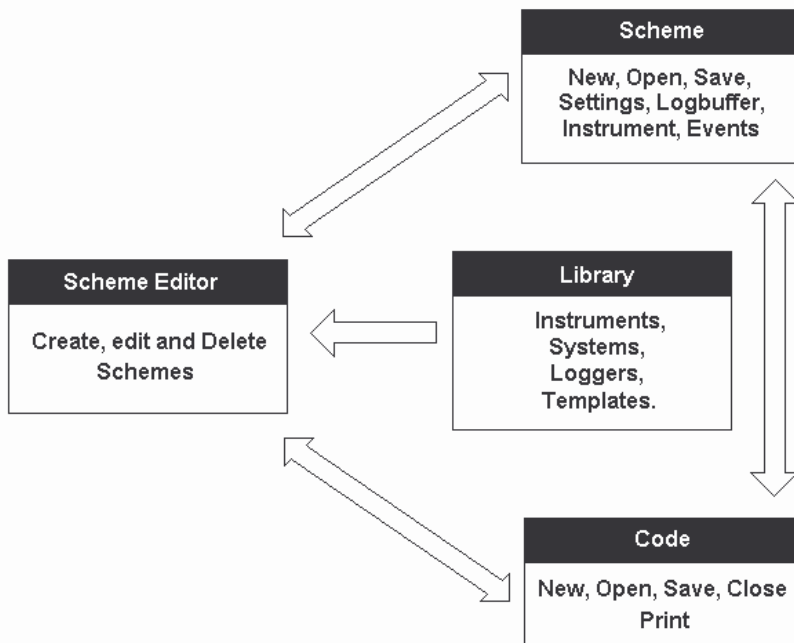
Logger channels: These logger channels are the processed data from the attached sensors. If you have attached a thermistor, the display will show the result in Degrees C or, in the case of a tipping bucket, in ml of water.

Main Buffer: This is the display of what the logger is currently recording and the time and date it recorded the data.

If you have selected multiple buffers, other tabs are displayed.

5 Scheme Editor

The Scheme Editor is used to create, edit, and delete schemes, and also to create templates and data logging systems. The program structure is shown in the illustration that follows.



The Scheme section is mainly used for creating and editing schemes with standard functionality.

The Library section is used for modifying the available libraries. Organisations with standard logging systems can create templates to suit those systems. There is essentially no limit to the systems that can be built.

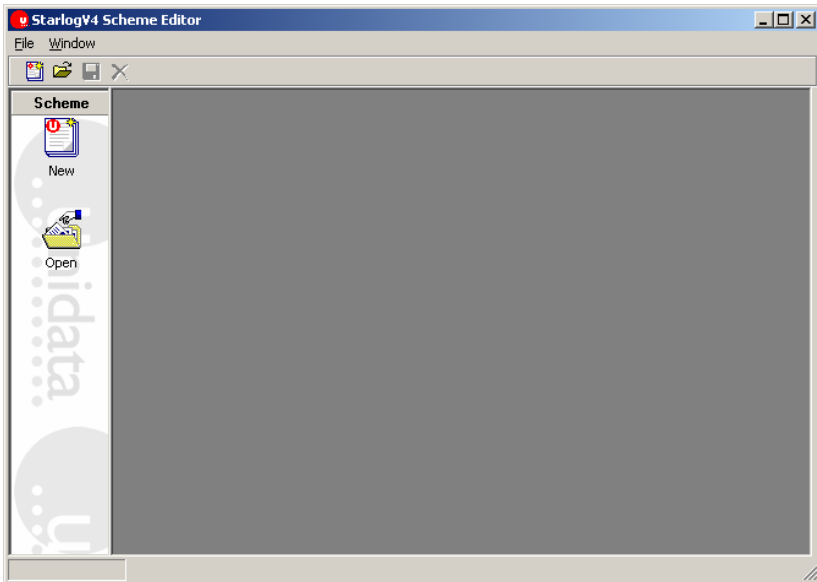
The Code section is for those schemes with extended functionality that require custom code. It contains a Code editor with tools that assist layout and increase readability.



Scheme
Editor

Scheme Editor

Select the Scheme Editor option in the User Task Bar.



To create a new scheme, select the 'New' option



New

To edit an existing scheme, select the 'Open' option



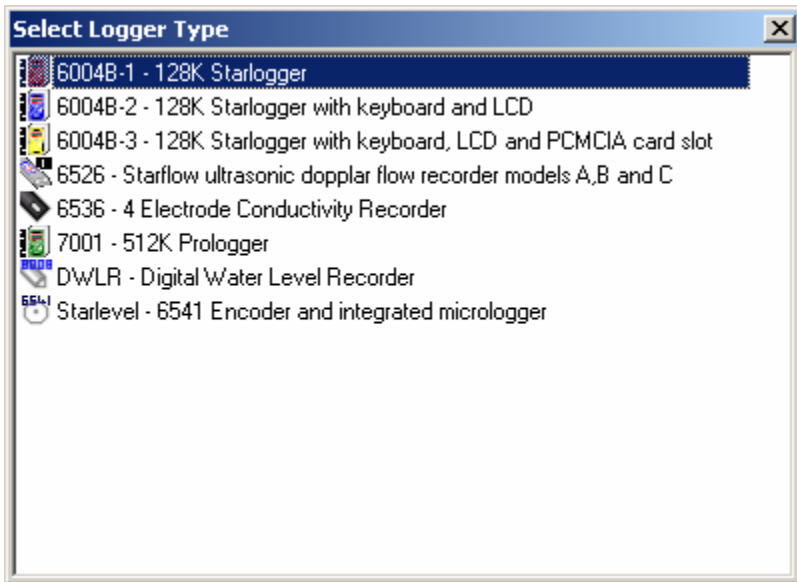
Open



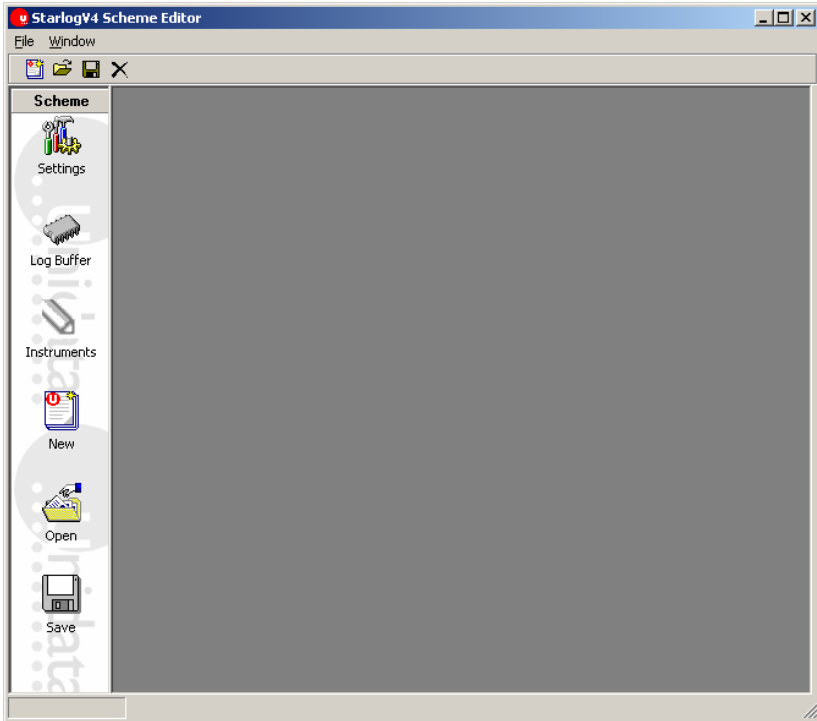
New

Creating a new Scheme

Select 'New' in the Scheme Editor Navigation Control bar.



When creating a new scheme select the logger type from the list displayed. This is the logger that will store the data in the logging system. If you are unsure of the logger you have, check the front of the unit; a display label will indicate the model and serial numbers.



The scheme Editor is very similar to V3. It is made up of a number of windows each having a specific function in configuring the logging system.

For information on what a scheme is please see 'What is a Scheme?' (Page 11)

Each of the Available options is outlined in the preceding pages.



Settings Window

Select 'Settings' in the Scheme Editor Navigation Control bar.

The screenshot shows the 'Scheme' window with the following details:

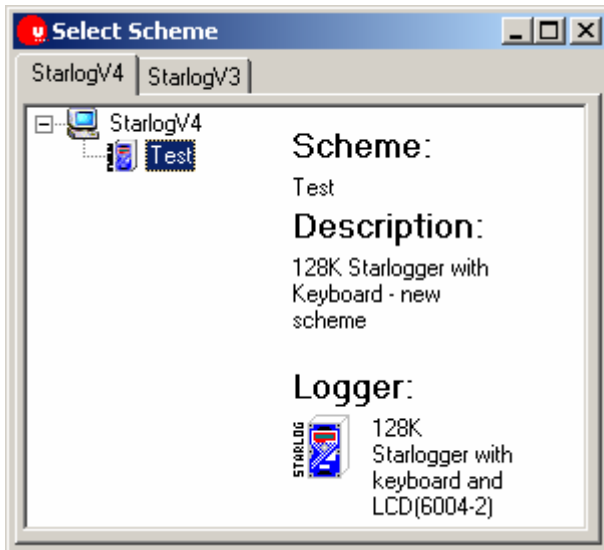
- Scheme:** Ultrasonic flow recorder
- Scan Rate:** 15 s
- Logger Serial Number:** [Empty field]
- Scheme Description:** Wandalup Point D Gull Rd Flow Monitoring
- Date/Time format:** <Windows default>
- Communications:**
 - Direct to COM1 [Default connection]
 - USB Modem
- Phone Modem Configuration:**
 - Phone Number: [Empty field]
 - RS232 Communications Port: COM2
 - Baud Rate: 9600
 - Modem Reset Command: ATZ
 - Modem Configuration Settings: ATE0
 - Communications Timeout (s): 10

The Settings Window is the general scheme information and communications parameters input area.

Scan Rate: The frequency of scanning transducer/sensor signals is called the scan rate (sometimes known as the “sampling rate”). The data logger has a wide range as listed in the drop down menu; the default is 5 seconds. The scan rate and log interval are independent. If the scan rate is very fast then the log interval is limited. {65,000 x scan rate = max log interval (sec)}

Logger serial number: Use this to make the scheme logger specific. That is, a scheme identified by logger serial number will only be able to be programmed into the data logger bearing that serial number.

Scheme Description: You can attach a brief description (up to 70 characters) to identify schemes. The description appears on the right-hand side of 'open' scheme window to help you identify your schemes.



Date and Time format: This is the date and time format that will be used to store and display dates and times (e.g. Test mode and Unloaded data)

Each scheme can store multiple communications “Profiles”. Each Profile defines how to connect to the data logger.

Select “Add” to add a new communications device to your scheme – a list of available devices will be displayed. If the device you require is not available then you can add new devices from the Communications Map

Comm. port: Select the computer port you are using to load and unload the data logger. On startup Starlog V4 will detect available communication ports. If a port is unavailable it will not appear in the list of Comm. Ports. For more communications port settings in Starlog see ‘Communications Map’.

Baud Rate: The speed at which data travels to and from a computer is known as the baud rate. For a direct RS232 connection, the baud rate is usually 9600 (default). If a Remote telemetry unit is used, choose it’s fastest speed. Please read your hardware manual for baud rate settings.

Dial Number: If you are interrogating the data logger via a modem, enter the phone number you are dialing here.

Modem Reset Command: Enter any settings required to reset the modem. Leave blank if none required.

Modem Settings: Enter the modem setup string, leave blank if not required.

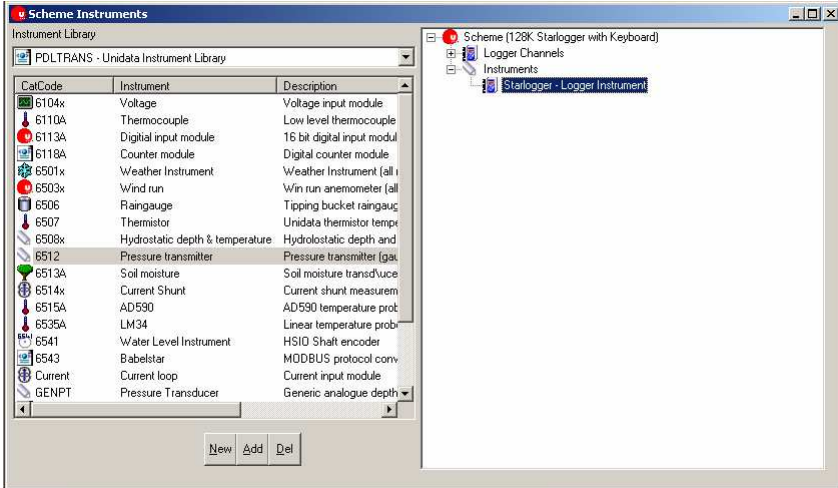
Communications Timeout: Enter the time in seconds to wait for a response from the data logger.



Instruments Window

Instruments

Select 'Instruments' in the Scheme Editor Navigation Control bar.



The Unidata Instruments library (PDLTRANS.MET) has a number of modifiable standard instruments/sensors that can be used by a Unidata logger. Each instrument/sensor is categorised by the Unidata catalog number and includes an Instrument name and description.

To add an instrument/sensor to your scheme, double-click on its row or drag it across to the right-hand box. Alternatively, click the 'Add' button.

To remove the instrument/sensor from your scheme, drag it from the right-hand box back to the instrument window on the left. Alternatively, select the item then click the 'Del' (Delete) button.

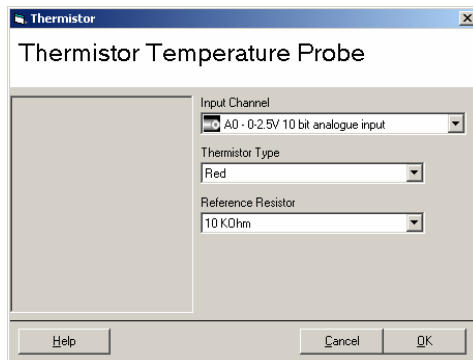
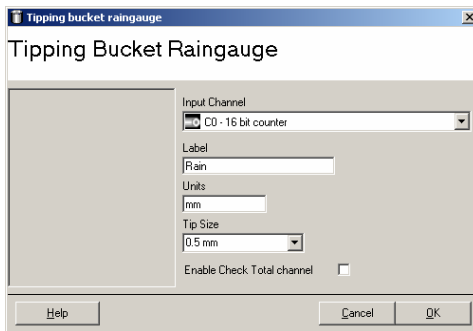
To add a new user defined instrument to your scheme that you can edit to your requirements, click 'New'.

As it is added to your scheme each instrument/sensor will be allocated the next available channel. These can be modified in the Instrument properties. Double click on the instrument to modify its individual settings. The Starlog

program will tell you when you have run out of channels. You can view the channel allocation by expanding the 'Logger Channels' branch

Modifying a Unidata Instrument/Sensor

Double-click on the Instrument that you wish to modify. An Instrument configuration window will appear in which you can modify the instrument settings. Many of the instruments in the PDLTRANS.MET instrument list such as the tipping bucket rain gauge and thermistor temperature probe have specialized configuration windows to editing of sensor settings



These instruments usually have the same outputs and standard settings but they may have different ranges. For example, you may have a 75ml tipping bucket with maximum flow rate of 3 litres per minute or a 125ml tipping bucket with a maximum flow rate of 4.5 litres per minute This Tip size is an example of what can be modified.

Some Instruments such as the Wind run anemometer have a specialized setup window and by default display the full customisation window. All options available to the instrument are accessible from this window.

The screenshot shows the 'Instrument Setup' dialog box with the following fields and values:

Field	Value
Catalogue Code	6503x
Name	Wind run #1
Description	Win run anemometer (all speeds)
Instrument family	Climate
Search Keywords	Wind, speed, run
Icon	UNIDATA (with a 'Browse' button)
Loader Class	
Setup Form	GenInstLib2.DefaultSetupForm
Read Only	<input type="checkbox"/>
Single Use	<input type="checkbox"/>
Source	System\PDLTRANS.SIL\6503x
Version	1
Visibility	-1
Base Class	GenInstLib2.clsStdInstrument

Main: From this tab you can access basic instrument properties

- Catalogue Code – Unique code to identify the instrument within the library.
- Name – Name to display for the instrument.
- Description – Description of the instrument to display.
- Instrument Family – Identifier to simplify searching through instrument libraries, e.g. all water level sensors can be assigned the family Depth.
- Search Keywords – keywords to enable searching through a library for all possible matches e.g. search for all Temperature sensors.
- Icon – Select a system icon to use when displaying the instrument, select browse to use an icon from file (*.ICO).
- Loader Class (Advanced feature) - Class to create and bind to the instrument to extend instrument functionality.
- Setup Form (Advanced feature) – Class to create to use for the instrument setup window. Select a predefined window, or enter a customized window class.
- Read-only – Select to make the instrument read-only when inserted into a scheme.
- Single Use – Select to ensure that you can only have one instance of the instrument in a scheme.
- Source (Read-only) – Library and key where the instrument originated.
- Version – Version of the instrument (use format 1.00.0000).
- Visibility – Set the visibility of the instrument within StarlogV4 (not yet available).
- Base Class – Name of class to create when recreating the instrument from the scheme file.

Channels: From the Channels tab you can edit the channels within the instrument. Each channel represents a parameter to display / log

CDT (advanced): From the CDT tab you can enter any additional CDT settings required to configure the logger for the instrument.

INP Code: From the INP Code tab you can enter any custom code to be used with the instrument. Custom coding lets you greatly extended the functionality of the data logger.

Outputs (advanced): From the Outputs tab you can create new outputs. An output can be used to control a hardware channel e.g. open collector output, or it may be an action such as sending an SMS. The output can be made Public, so that it's visible to in the Events window, or it can be Private so that the functionality is only available to the instrument.

Events (advanced): From the Events tab you can create user defined events. These events are the same as the Events window in the scheme editor, but are hidden from the main event list. You can use events within instruments to add functionality to the instrument without any user intervention.

Resources (advanced): From the Resources tab you can create a list of resources required by the instrument for correct operation. If the resources are not available when the instrument is added to a scheme, then the user will be warned. You can also "Lock" resources so that they are hidden from other instruments.

Buddies (advanced): From the Buddies tab you can create a list of instruments that are required by the current instrument. If the buddy instrument isn't in the scheme, then it will be automatically added for you.

Files (advanced): From the Files tabs you can create a list of files that are required by the instrument. These can be grouped as a Document file, a dependency file, or a Code file. Document files are automatically displayed in the Help Document window (if the instrument supports this).

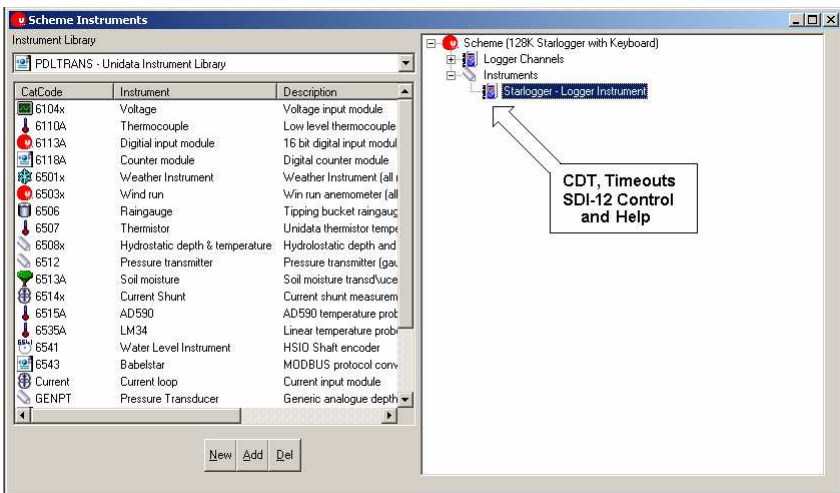
Loggers (Advanced): From the Advanced tab you can select which loggers the instrument can be used with. If the logger type doesn't support the instrument then the instrument will be hidden within the instrument library.

Advanced Settings and CDT Options

Return to the Scheme Editor – Instruments window.

Unlike V3 the CDT is now an Instrument called the ‘Logger Instrument’. This decreases the chance that by altering a logger at a site the user will forget to alter things like SDI-12 settings or RS232 Timeouts.

To alter the CDT, double-click the logger type in the Instruments list.



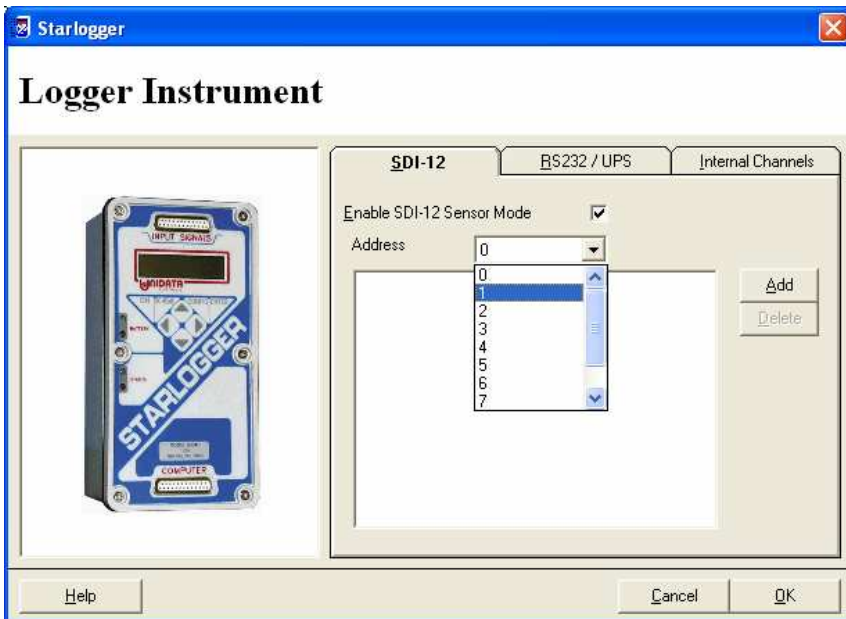
SDI-12

Unlike V3, an SDI-12 Recorder does not need to be selected in the CDT. When an SDI-12 Instrument is added to the Scheme the logger is automatically selected as the SDI-12 Recorder.

For more information on the SDI-12 Protocol please see your Hardware Manual.

To make the logger an SDI-12 sensor, select 'Enable SDI-12 Sensor Mode' in the Logger Instrument window.

Choose the address that will be used by the logger.



To add channels to send using SDI-12, click on 'Add'



All available channels to send via SDI-12 will be displayed. Simply select the ones you want to send.



You will need to configure your recorder to log these SDI-12 readings.



RS232/UPS CDT Settings

Select the RS232/UPS tab in the Scheme Editor – Instruments – Logger Instrument window.



RS232 Timeouts and UPS prescan can be modified from this window.

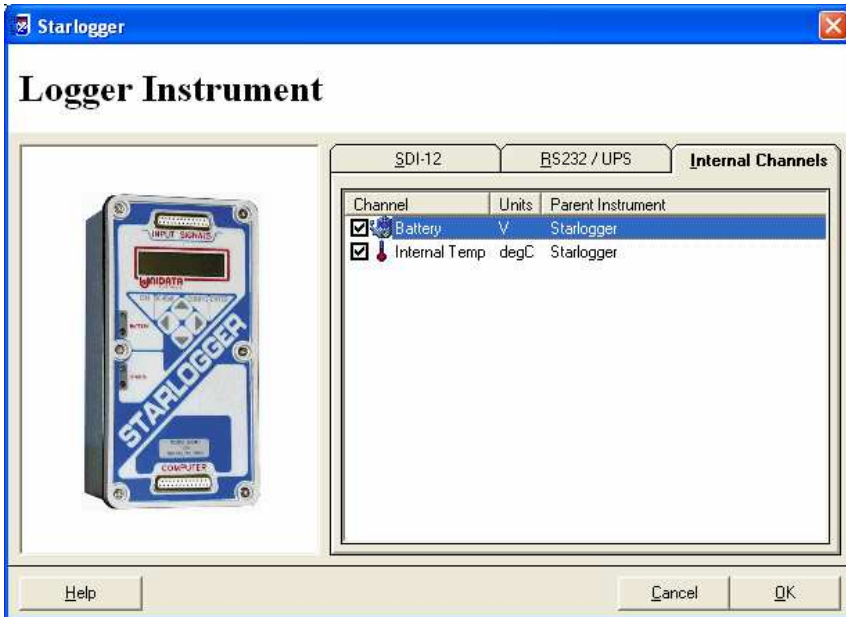
RS232 Timeout: The RS232 Timeout is set to 1 second for direct connect communications. When a Modem site is used, this setting should be changed according to the delay the unit will experience over the Telemetry link. A typical GSM/CDMA site should have a 3-4 second timeout.

UPS Prescan: UPS is the User Power supply, this is in the form of +5V from a Starlogger and +5V, +10V, +12V and -12V on a Prologger. Some third party instruments may have a settling time for a reading to be accurate from a sensor. The prescan can be used to switch the power to these instruments a set amount of time before the logger records the sensor

output. Increasing this time will significantly increase power consumption and ultimately decrease battery life.

Internal Channels

Select the Internal Channels tab to access which predefined logger channels are visible to the user.

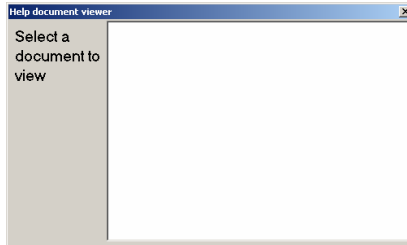


Select the channel to ensure that the channel is visible in the Scheme Editor.



Help

Click the 'Help' button in the bottom left hand corner of the logger instrument settings window (referred to also as CDT).

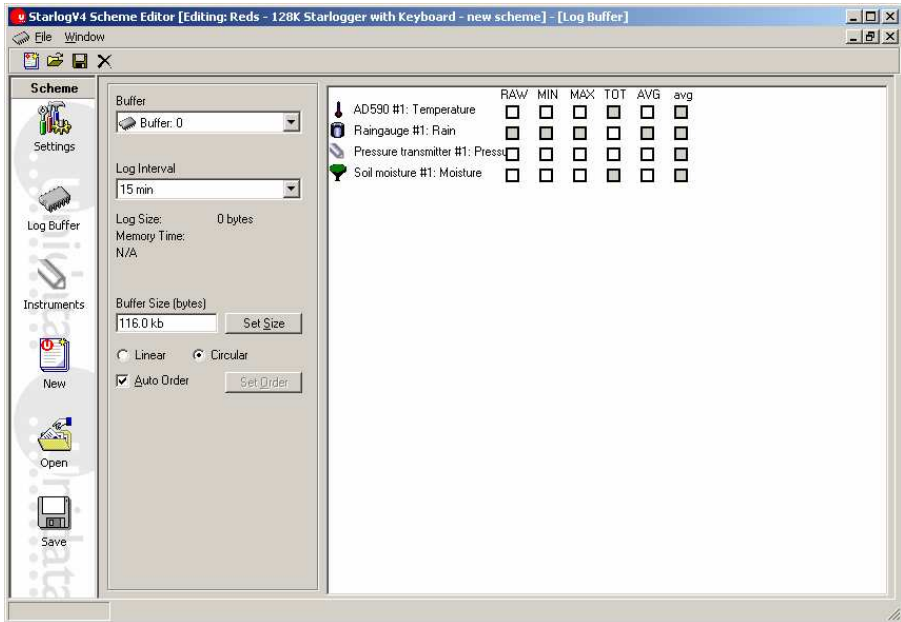


The Help option at the bottom of the logger CDT is the PDF Support Document library for the Unidata range of products. The documents will outline Hardware specifications and usage.



Log Buffer

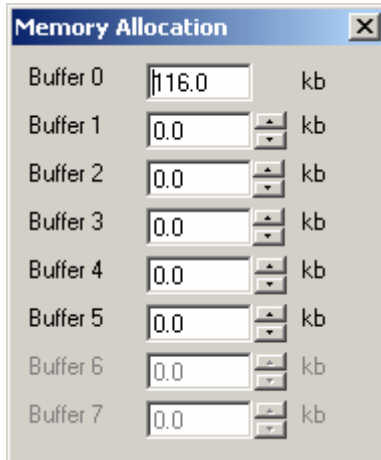
Select the 'Log Buffer' option in the Scheme Editor Navigation Control bar.



The Log Buffer also bears a slight resemblance to V3. A function not often used in V3 because of its complexity is the ability to divide the 128K or 512K buffer into a number of smaller buffers. These smaller buffers can be used to store specific event data or instrument data that the user designates.

Each buffer can be modified by clicking the 'Set Size' button. It will display an allocation table – pictured below. There are

116Kb to work with (on 128K loggers) that can be allocated in whatever way you wish.







Each buffer can be set to store data in a linear or circular fashion and they are independent of each other.

Linear Buffer: A linear data buffer stores data until it is full. Any data scanned after a buffer is full will not be stored.

Circular Buffer: When a circular buffer becomes full, new data is written over already stored data. The most recent data is always stored - if necessary at the expense of the earlier data.

Each buffer can also have an independently set log interval.

Once Instruments are added to the scheme the Log buffer displays a number of selectable logging options.

	RAW	MIN	MAX	TOT	AVG	avg
 AD590 #1: Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
 Raingauge #1: Rain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 Pressure transmitter #1: Pressu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
 Soil moisture #1: Moisture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

As illustrated above each instrument type has a number of disabled (grey) and enabled (white) check boxes, each beneath a logging type. Enabled check boxes can be selected while disabled checkboxes cannot. This is done to minimize confusion. For example, it is very rare to log totalised temperature or even totalized soil temperature.

Note that it is possible to perform the types of logging listed as disabled for a particular instrument, however, to do so you must alter the settings for the instrument.

Each Instrument on a channel has the options to log the following:

RAW: Value read at the log interval.

MAX: Maximum value of scanned data, at the log interval.

MIN: Minimum value of scanned data, at the log Interval.

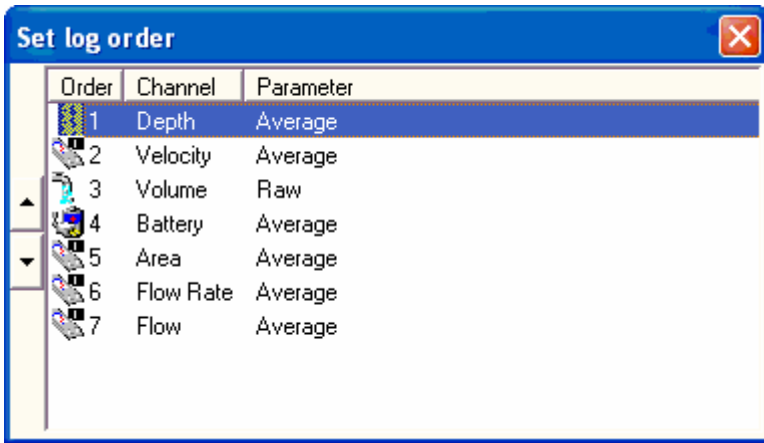
TOT: The sum of all scanned values read this log interval.

AVG: The average of all scanned values read during the log interval.

avg: Average of all scanned values read during sub interval.

By default the order that the data is stored is left to right, then down, i.e Raw, Max, Min etc of Channel 1 then Raw, Max, Min etc of channel 2. Often the user may want to store the data in a specific order. In this case you can deselect the 'auto order' option and click on the 'Set Order' button.

This will open the Set Order window.



Select the instrument to move and use the Bump Up / Bump Down buttons to change the logged data order.

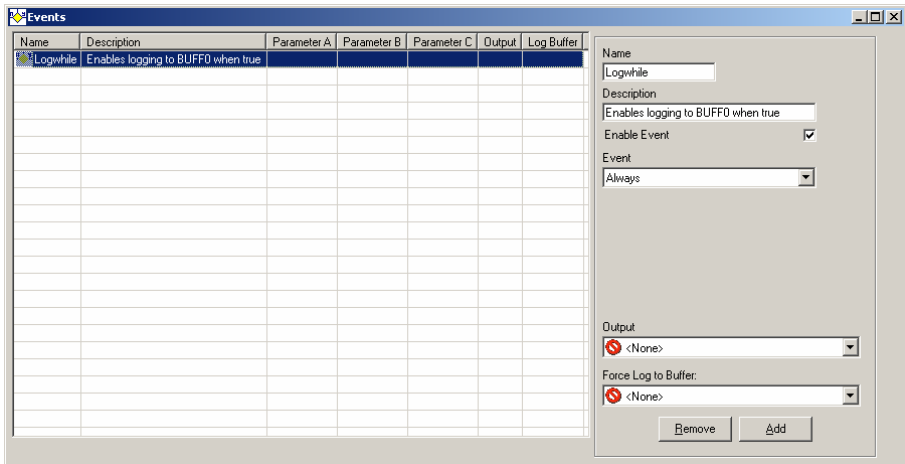


Events

Events

Select the “Events” option in the Scheme Editor Navigation Control bar.

If this option is unavailable see the “Profiles” section – your permissions may be set to Basic User.



An Event is a defined condition that can be used to initiate logging and/or send a pulse from the data logger to another device, or log to a separate buffer.

For instance, this feature can be used to switch on an air conditioner when the logger detects that the air temperature has exceeded 26°C, and then force a log to buffer 3 to keep track of times when the event condition is true.

An Event can also be used to trigger automatic water samplers, activate lights and sirens, switch on pumps, and switch power to external instruments and activate solenoids.

The Events Window lists all events. You can define a total of 31 events. Where nothing has been defined, the word “None” appears.

Name: Enter a name for the event up to a maximum of 72 characters.

Description: A description of the event. It should describe what the event does.

Enable Event: Selecting this checkbox will enable the event. The event will become active after three scans from the time the scheme is loaded into the data logger. Disabled events remain in the scheme, but do not require any resources from the logger, and do not count towards the maximum of 31 events.

Event: Choose the type of event you wish to use out of the pre-defined list of expressions.

Output: The output option defines the operation of the logger outputs (if any). The Outputs can be switched on for 50ms, 100ms, or switched on until a second event switches it off.

Force log to buffer: Lets you log at each scan interval that the event is set to true in a buffer that you define. This overrides the log interval set in the Program Window.

The purpose of an event is to conserve memory in circumstances where critical data is only required when a certain condition has occurred.

An example of using events: Site X

Discharge from a sedimentation pond is passed through a constructed wetland before being discharged through a “V” notch weir into a fresh water brook. It is necessary to assess the loads of nutrients and other potential pollutants associated with water flowing from the nutrient-stripping pond to off-site watercourses.

A Unidata Water level and Starlogger samples the height in the stilling well every 15 seconds and logs every 15 minutes. Water quality samples are collected automatically from the discharge location every time a discharge occurs at the V-notch weir and analysed for nutrients and heavy metals.

This discharge event will only occur when it is raining or there is a form of water runoff into the pond.

When the event occurs, a water sample is taken and the automatic water sampler (activated by an Output) is filled. An SMS (requires telemetry) or alarm (also activated by an Output) must be emitted to alert a field technician that the samples need to be collected from the site.

A Unidata Conductivity Instrument need only log the salt content of the pond 15 minutes before, during and 1 hour after the water discharge occurs. During the event data logging must occur every second as this information is crucial.

Continuous logging in this case would be wasteful of memory as the event rarely occurs.

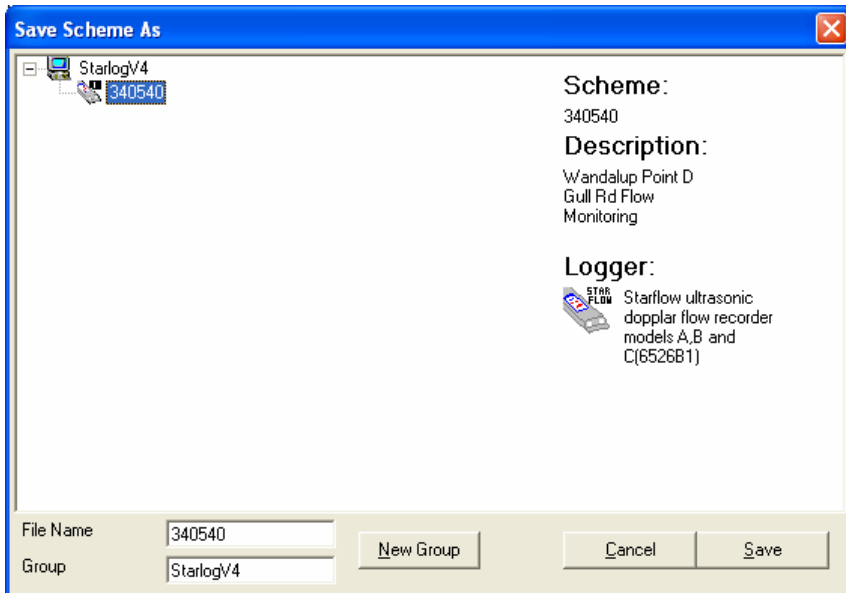
This is a rather complex example, yet is probably suited to a large number of Unidata product users, and is very simple using the events in the software.



Save

Saving the Scheme

When the scheme is complete click the 'Save' button.



Enter the name of the scheme. The scheme name must be 8 characters or less.

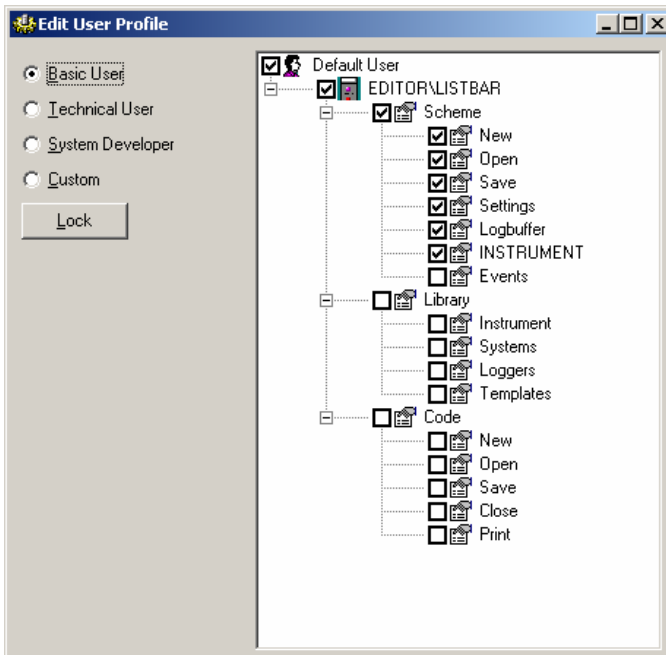
Version 4 has the ability to structure sub-directories (Groups), allowing better organisation of the schemes – click on 'New Group' to add a new folder to the selected current group.

After the scheme is saved return to the main User Window.

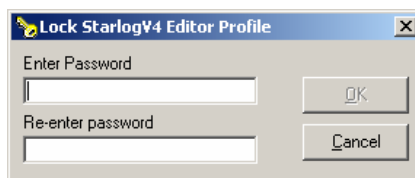


User Profiles

User Profiles are a new addition to Starlog allowing the user to set profiles that restrict the user from seeing the many options available within Starlog. The option is available in the Scheme Editor Window by selecting File\Setup\Profiles.



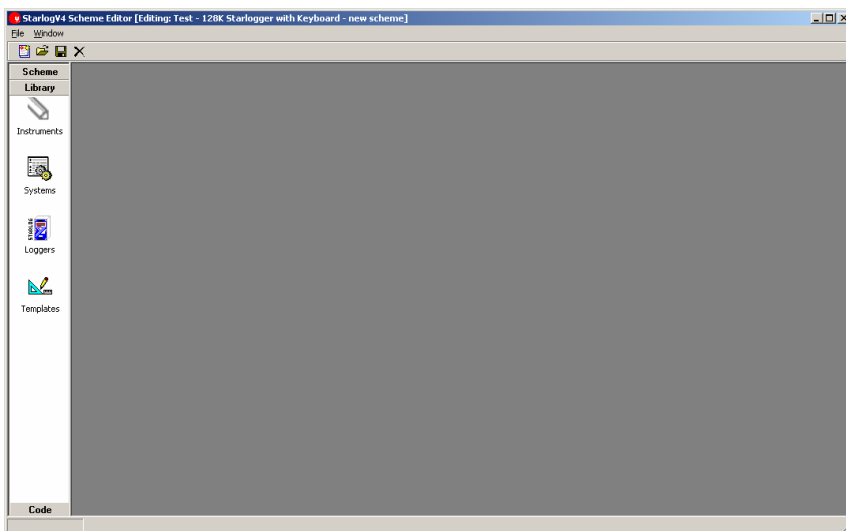
Simply select or deselect the options that require access by each level of user. The Lock option allows the user (System Administrator) to set Passwords. The Password must be confirmed twice to enable.



Library Editor

The Library Editor can be used by Technical Users or System Developers provided they have been given access in the User Profiles.

The Library Editor is a Separate Navigation Control Bar in the Scheme Editor Window. Select the 'Library' tab in the Scheme Editor Navigation bar.



The Library Editor allows customisation of the V4 Software package default Instruments, Loggers and Systems.

The Systems are what you see when you select 'New Scheme'. A system is a predefined logger / instrument setup. This includes for example a new Starlogger, but could also be New Climate Station where a Prologger + climate sensors are automatically loaded.

A System is a template of a scheme - when you create a new scheme, the system definition is loaded and the Scheme Editor will get the information it

requires (logger type, instruments required, any channel to automatically select in the log buffer, scan rates supported, and anything else that can be stored in a scheme).

The Library Editor consists of the following options.

Altering these libraries is not recommended for novice users so the process of alteration is not discussed in detail in this manual. If you require more information on these features please contact Unidata.

Select 'Instruments' in the Library Navigation Control bar to alter the PDLTRANS.MET default instruments or create a company specific instrument library.

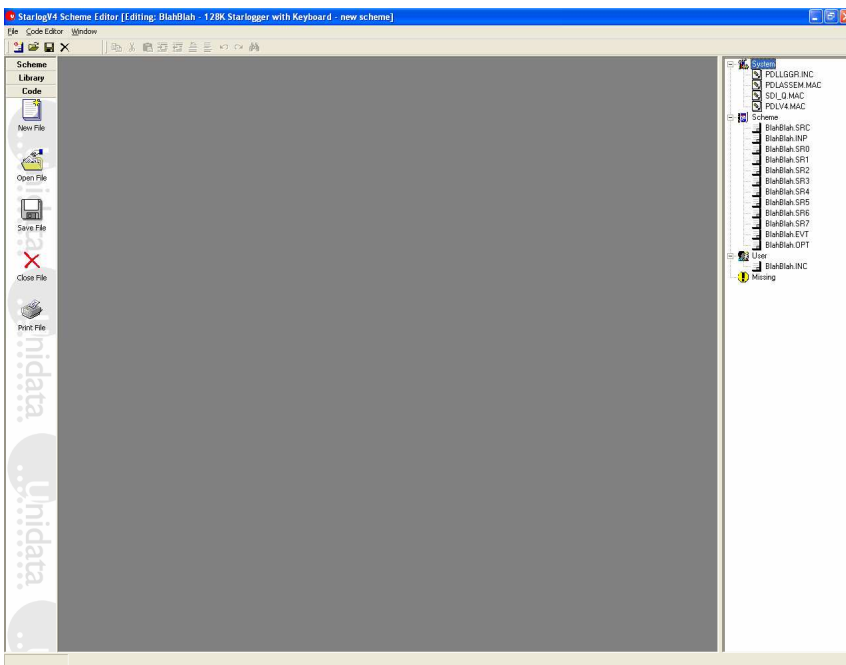
Select 'Systems' in the Library Navigation Control bar to create your own default logging systems.

Select 'Loggers' in the Library Navigation Control bar to create loggers, alter default input multipliers, and make other detailed software changes for controlling the hardware.

Code Editor

The Code Editor is used to modify a scheme for more advanced functionality. This is a programmer's environment and is not for general use, if you are an advanced user and require more detailed information please contact your nearest Unidata office.

Select the Code Navigation Control tab to open the Code Editor.



For more information, you will need the V3 Programmer's Supplement.

This concludes the “Quick Start User Guide”. We trust that the above instructions are useful and you can now navigate through the main features of the software. Please explore the power and versatility of Starlog Version 4.0 as you create new and complicated schemes for evaluation with your Unidata data logging systems. Feel free to contact Unidata at anytime if you require further assistance.

6 Troubleshooting

Listed below is a table of common errors and possible solutions:

PROBLEM	POSSIBLE REASON	SOLUTION
1. Error - "Unable to import scheme"	1.1 The scheme is for a Macrologger. Starlog V4 doesn't support Macrologgers.	Upgrade site to a Prologger or Starlogger and re-write scheme for new logger type
	1.2 The scheme files are corrupted.	Try re-saving the scheme file from the Starlog / Starflow Scheme Editor. This will refresh all the scheme files.
	1.3 The file is not a valid scheme	Ignore as there is nothing to import
2. No Loggers available in the 'Select Logger' window	2.1 There are no Logger files available in the Starlog V4 sites folder.	Run Starlog V4 Setup, ensure that you select 'Import All Schemes' to import all available schemes into StarlogV4. Alternatively start the Starlog V4 Scheme Editor and create a new logger file.
	2.2 The default Starlog / Starflow directory is incorrect	Run Starlog V4 Setup, ensure that the path to Starflow or Starlog is correct for the schemes you want to use.

PROBLEM	POSSIBLE REASON	SOLUTION
	2.3 There are no Starlog / Starflow schemes	Run Starlog V4 Setup, ensure that the path to Starflow or Starlog is correct.
3. No schemes available in the 'Select Starlog Scheme' window	3.1 The default Starlog / Starflow directory is incorrect	Run Starlog V4 Setup, ensure that the path to Starflow or Starlog is correct for the schemes you want to use.
	3.2 There are no Starlog / Starflow schemes	Run Starlog V4 Setup, ensure that the path to Starflow or Starlog is correct.
4. 'Save as' dialog box in Scheme Editor only accepts capital letters	4.1 Incorrect identification of lower case letters	Use upper case letters for scheme names

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