Southern Cross
Software Solutions

PsiLog

User Guide

PsiLog

User Guide

Current release Version 1.27F Revision A 15 July 2003
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Table of Contents

Preface

Southern Cross Software Solutions

Southern Cross Software Solutions (SCSS) is a software development/consultancy business based in Perth, Western Australia, Australia. SCSS has experience in the following areas:

- C++ and Java application development.
- Websites developed using the latest XHTML, Perl CGI scripts, JavaScript, and Java technologies, particularly using the Apache web server.
- Developing software for the Psion series of handheld computers.
- Developing software for the Unidata range of data loggers.

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Unidata Australia Pty Ltd

Unidata Australia Pty Ltd is an Australian company specialising in the manufacture of electronic data loggers and related environmental monitoring equipment and is part of the global Unidata Group.

Tailored to operate in remote areas, their equipment is designed to be battery powered (with solar power options), often for up to one or two years. Unidata also manufacture various sensors for measuring temperature, humidity, rainfall, water flow, water depth, evaporation, solar radiation, water conductivity, water turbidity, dissolved oxygen, water acidity, wind speed, wind direction, barometric pressure, soil moisture, and others.

Unidata have no connection with PsiLog apart from being the manufacturer of the equipment with which PsiLog is designed to work. Please contact Southern Cross Software Solutions for any queries you may have regarding PsiLog.

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Acknowledgements

SCSS could not have developed PsiLog without the help of many people whose in-depth knowledge of Psions made possible the many user-friendly features provided by PsiLog. These people include, but are not limited to (sorry if you're one of those forgotten): Andy Clarkson, Tom Dolbilin, Martin N Dunstan, Mark Filipiak, Allen I Holub, Jezar, Alasdair Manson, Colly Meyers, Jochen Siegenthaler, and David Wood. Most of these people have had no direct contact with SCSS, but have made their knowledge available for free to everyone via the Internet. Thank you all very much.

Thanks also to Jordan Russell for his free Inno Setup installation program.

Introduction

Overview of PsiLog

The PsiLog software package allows the unloading, programming and testing of Unidata loggers on site via Psion handheld computers. It is an easy to use package that is compatible with your existing Starlog software system and provides robust and reliable support of your dataloggers while in the field. It does not replace the Unidata Starlog software that needs to be installed on your PC for PsiLog to function.

Items supplied

Items supplied with PsiLog are:

- User Guide (this book).
- A floppy disk or CD with the PsiLog software and electronic copy of this User Guide.
- A registration card.

Requirements

PsiLog requires:

- A PC computer with a 3½" floppy disk drive and running Windows 95, 98, NT 4.x, ME, 2000 or XP.
- 1.4MB of storage space on your PC computer.
- An RS-232 serial communications port on your PC for connecting to the Psion computer. The same port you have been using to communicate with your data logger would be suitable.
- A Workabout, Workabout mx, Series 3a, Series 3c, Series 3mx, or Siena Psion computer. Southern Cross Software Solutions is an authorised reseller of the Psion Workabout computer.
- An RS-232 serial communications port on the Psion for connecting to Unidata data loggers and to your PC. Unidata Model 6003 data loggers will require a Model 6800 Level Converter that is available from Unidata.
- Serial cables for connecting your Psion to your PC, and your Psion to your data loggers. See *Serial connections* on page 9. Southern Cross Software Solutions can supply appropriate cables on request.
- 194K of storage space in the Psion for PsiLog program files. This can be on the internal RAM disk or on Flash/RAM SSDs.
- 70K additional RAM memory on the Psion to run PsiLog.

- Familiarity with the procedures and terms used by the Unidata Starlog software package.

In addition, PsiLog will require storage space for:

- Previously created scheme files required to program data loggers.
- Data unloaded from data loggers.
- Test display screens.
- Formulas.

These files may be located on the internal RAM disk or on Flash/RAM SSDs.

Data unloaded from data loggers may consume considerable space – a large capacity Flash SSD is recommended. Sizes up to 8MB are available.

The Workabout computer

The Psion Workabout (shown on the right) is a handheld industrial computer manufactured by the Psion Teklogix division of Psion Plc, a UK based company. It is tough and weather-resistant, as are the Unidata data loggers with which PsiLog is designed to work.

Each Workabout comes with 2MB of memory as standard, enough to unload 13 full Starloggers! The memory can be expanded by a further 16MB.

Workabout computers can come in many different configurations. PsiLog requires that the Workabout have at least one RS-232 level serial port. Depending on the model of the Workabout, the port can be located at the top or the bottom of the computer. In either case, there will be a small label near the port that reads "RS232". For example, the picture below shows the top of a Workabout, with the RS-232 port to the right. The port on the left is a TTL-level port, and is not used by PsiLog.

On all Workabout computers sold by Southern Cross Software Solutions, the RS-232 port is the "A" port, and by default that is the port that PsiLog will use.

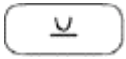
The port is a "DB9 male" connector, and is functionally identical to the DB9 serial port on your desktop or laptop PC.

The Keyboard

The Workabout keyboard is an alpha-numeric style, there being not enough space for a conventional QWERTY-style keyboard.

The keys all work as expected, most parallel those found on a regular computer keyboard. Some of the keys are unique to the Workabout or have special uses. They are explained below:

On/Esc	Turns the Workabout on, and doubles as the `Esc`ape key. As usual on PCs, the `Esc`ape key is used to cancel dialog boxes. `Shift-Esc` displays the online help.
Tab	The same as the `Tab` key on a PC. The Workabout uses the `Tab` key to expand choice lists in dialog boxes for easier selection, and to open sub-dialog boxes with extra options.

	The `Menu` key displays the application's menus. To make the most of the limited screen space, menus are hidden until they are needed. The combination `Psion-Menu` temporarily displays the full-size status bar. `Ctrl-Menu` changes the permanent status bar between off, half-width and full-width.
	The `Contrast` key. Press to increase the screen contrast. Hold down the `Shift` key and press to decrease the contrast. The Workabout has a temperature compensating display and the contrast will need only minor (if any) changes when moving between an air-conditioned office or car and the outdoors.
	The `Backlight` key. Press to toggle the screen backlight on and off.
	Turns the Workabout off. The Workabout may be switched off at any time without loss of data. Turn the Workabout back on and everything will be as it was before it was turned off. The Workabout does not have a 'shutdown' procedure, and in fact it is not expected to ever need to be reset.
	Deletes the character to the left of the cursor, the same as the `Backspace` key on PCs. If the `Shift` key is held down it deletes the character to the right of the cursor, the same as the `Delete` key on PCs.
	The same as the `Enter` key on PCs. It is the key used to accept menu selections and to OK dialog boxes.
	The `Psion` key. This corresponds to the `Alt` key on PCs. Holding this key down at the same time as pressing a letter key activates many functions. Some functions require the `Shift` key to be held down as well.

Special Key Combinations

The `Psion` key has many special combinations. Some of the more important ones are outlined below:

`Psion-Up Arrow`	The Page Up (`PgUp`) key.
`Psion-Down Arrow`	The Page Down (`PgDn`) key.
`Psion-Left Arrow`	The `Home` key.
`Psion-Right Arrow`	The `End` key.

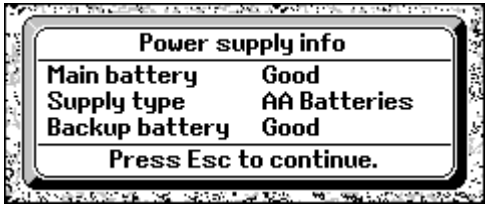
Psion-Menu	Temporarily displays the full-size status bar. Has no effect if the full-size status bar is already visible.
Psion-Space	Toggles Caps Lock.
Psion-Ctrl-Shift-K	Kills (exits) the currently running program without saving any data.
Psion-Ctrl-Del	Soft reset. Exits all running programs (without them saving any data) and restarts the Workabout **without** clearing the Internal RAM disk.
Psion-Ctrl-Shift-Del	Hard reset. Clears all memory. This includes all running programs and the entire Internal RAM disk.

The Psion and Ctrl keys have a coloured line above them. Other keys have a similarly coloured character or function above them. Pressing the Psion or Ctrl key at the same time as pressing one of these labelled keys, will result in the corresponding character or function being pressed.

For example, the English language (UK model) Workabout has a yellow line above the Psion key. The 8 and 9 keys have yellow square brackets ([and] respectively). Pressing Psion-8 will cause the [character to be entered, Psion-9 the] character.

Battery Status

The Workabout is able to display the state of its batteries at all times. Press Ctrl-Shift-B at any time to display the Power Supply Info dialog:



Serial connections

To connect the Workabout computer to your data loggers, you need the same cable as used to connect your PC to your data loggers.

Connecting to Starloggers

To connect to Starlogger-type data loggers that have a "DB25 female" connector, you will need to use a cable that looks like the one to the right.

Connecting to Starflows

To connect to Starflow-type data loggers that have a "DB9 female" connector, you will need to use a cable that looks like the one to the right.

This type of cable is also known as a "serial extension cable", "mouse extension cable" or "CGA/EGA video extension cable".

Connecting to various data loggers

If you need to connect to a mix of data loggers, then the best solution is to use the cable for connecting to Starflows ("DB9 female" to "DB9 male"), and use a "DB9 male" to "DB25 female" adapter to allow the same cable to connect to your Starlogger-type data loggers. Such an adapter is shown to the right.

Simply use the cable by itself to connect to Starflows, then plug on the adapter to connect to Starloggers.

Starlogger speed switch

While Starflow-type loggers are able to have their baud rate set via a firmware configuration option, Starlogger-type loggers require that their baud rates be set in hardware, by connecting specific pins on their Computer connector together.

The SCSS Speed Switch is a simple adapter that allows you to easily select the fastest baud rate supported by both your Psion computer and your data logger(s). Obviously, the faster the baud rate, the faster you can do an unload and move on.

Set the switch to 19200 for non-mx Workabout computers and to 38400 for Workabout-mx computers. Remember to configure PsiLog to use the same baud rate. See *Communications preferences* on page 41.

The switch must plug directly into the Starlogger Computer connector; the serial cable from the Workabout then plugs into the switch.

Connecting to your PC

To connect to your PC, you need to use a "null modem" or "laplink" serial cable. It is the same cable you would use to connect two desktop/laptop computers together.

A suitable cable is shown to the right. Each end has both "DB25 female" and "DB9 female" connectors, allowing it to work with either type of connector your desktop PC may have. The Workabout will always use the "DB9 female" connector at the other end.

Note that you cannot use the two connectors at the same end of the cable simultaneously.

Setting up the Workabout

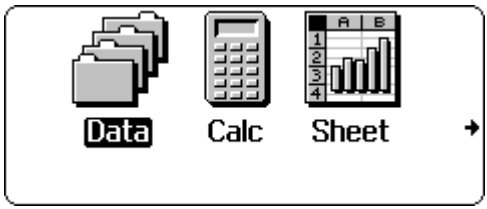
When programming data loggers, the date/time of your Psion computer is used to set the date/time of the logger. Make sure your Psion computer is set to the correct date/time before programming any data loggers. See below for more information

If you purchased your Workabout computer from Southern Cross Software Solutions, then it will have already been set up, with the date/time set and PsiLog installed and configured. However, if the Workabout ever completely loses power (for example, if you remove both the main and backup batteries at the same time) or resets in some other fashion, then you will have to re-configure its settings yourself.

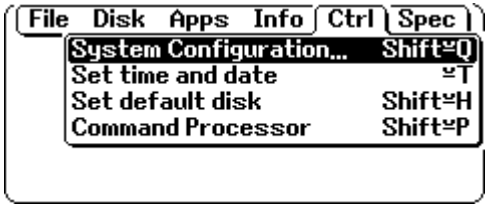
When the Workabout is switched on for the first time, you will see the following screen:

Press the `Menu` key then use the arrow keys to select `System screen` and press `Enter`:

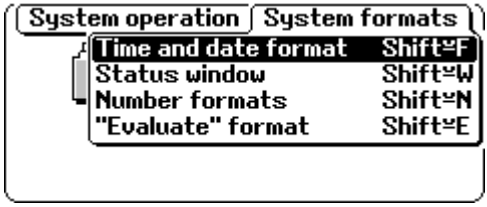
The System program will appear:



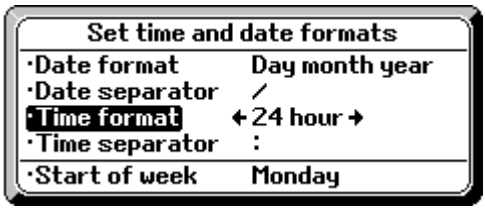
Select `System Configuration` from the `Ctrl` menu:



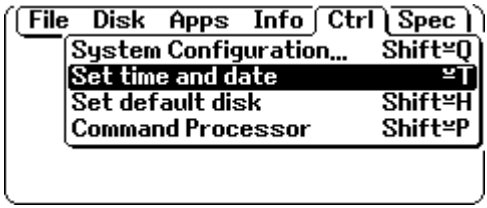
Select `Time and date format` from the `System formats` menu:



Change the settings to what you want, but Southern Cross Software Solutions recommends changing the `Time format` to "24 hour" as that is the convention used by Unidata data loggers and the Unidata Starlog software.



Press `Enter` to accept the settings. Next, select `Set time and date` from the `Ctrl` menu:



Enter the `GMT Offset` first and then set the correct local `Time` and `Date`. Setting the time on your Psion computer is very important as when data loggers are programmed, their internal clocks are set to the same time as your Psion.

Press `Enter` to accept the time and date settings. You have now finished setting up your Psion computer and can proceed with installing PsiLog. Remember that when the PsiLog installation instructions ask you to go to the System screen to start the remote link, you are already there!

Other Psion computers

PsiLog is not limited to the Workabout series of Psion computers. It also works with the Psion Series 3a, 3c, 3mx, and Siena computers. However, the serial interfaces of these computers are designed to connect directly to your desktop PC, and not to data loggers!

To connect them to data loggers, you will need a null-modem device and some gender changers. The Series 3a will also need its 3-Link RS232 Serial Interface. Depending on the data loggers, cables, and null-modem device, you may also need some DB9-DB25 adapters.

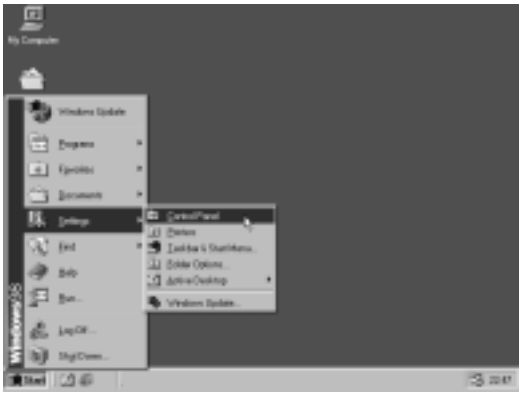
Southern Cross Software Solutions can advise you on how to connect these Psion computers to your data loggers. When contacting Southern Cross Software Solutions, please include details of your Psion computer and data loggers.

Installing PsiLog

The main PsiLog program is installed on your Psion. There is also some Link software that must be installed on your PC computer. If your PC computer is running Windows 95, 98, ME, NT 4, 2000 or XP, install PsiLog by following the instructions below. If your PC computer is running Windows 3.x or MS-DOS, you must contact SCSS directly. Install files for these operating systems are available via email only.

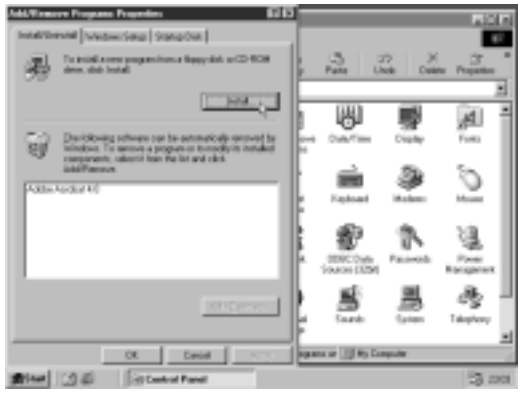
1. Put the PsiLog installation disk into your PC's floppy disk drive.

2. Open the Control Panel (`Start`→`Settings`→`Control Panel`):



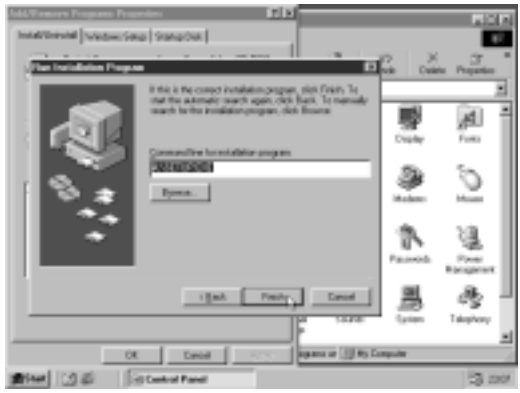
3. Open the `Add/Remove Programs` icon:

4. Click on the `Install...` button:



If you're using Windows 2000 or XP it's a little different. Click on the `Add/Remove Programs` button on the left and then the `CD or Floppy` button on the right.

5. Click on the `Next>` button and Windows will search for the PsiLog setup program. It should find it on the PsiLog Install disk you inserted:



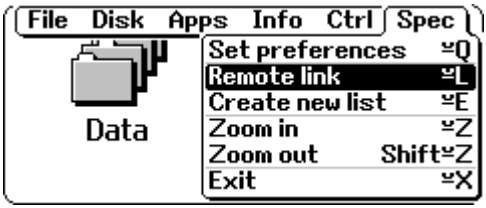
6. Click on the `Finish` button to start the PsiLog install program. After a few seconds your PC screen should show the setup welcome screen:

Press Enter or click on Next>.

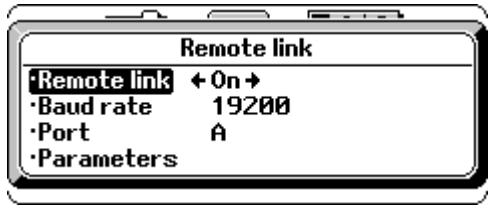
7. Connect your Psion to your PC using an appropriate serial cable. If you're not sure how to do this, see *Serial connections* on page 9 and *Serial communications* on page 88 for more information.

8. Turn on your Psion and activate its Link. You will need to use the System screen to do this. Select System screen from the Special menu:

Then select Remote link from the Spec menu:



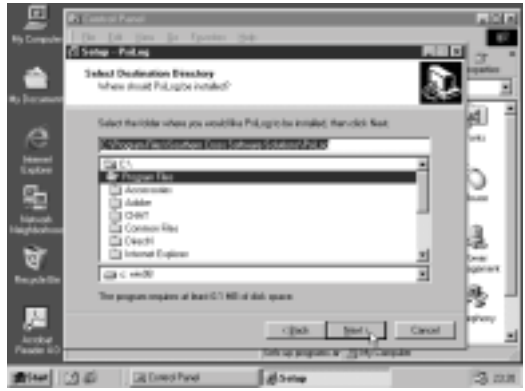
9. Set the Remote link to On, the Baud rate to 19200 and the Port to A (only Workabout computers have a Port option). Press Enter to activate the Link.



10. Go back to your PC and continue the setup there. The information screen shown paraphrases these instructions. You can read it, but this User Guide should provide a clearer explanation.

Press `Enter` or click on `Next>`.

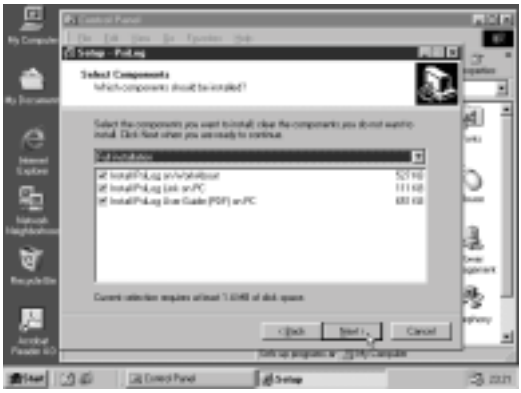
11. You will now be asked for the destination directory:



It defaults to `C:\Program Files\Southern Cross Software`

`Solutions\PsiLog`. If you want to install into a different drive or directory either type in the new drive or directory, or use the controls to select the drive and directory you want. Otherwise, just press `Enter` or click on `Next>` when the drive and directory are what you want. The setup program will create the directory for you if it doesn't already exist.

12. You will now be asked to select which components of PsiLog to install:

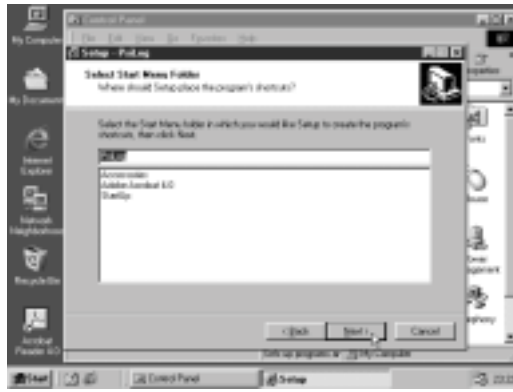


The PsiLog Link component is required for PsiLog to be able to transfer files to and from your PC. If you happen to have some other software installed, such as PsiWin, you can use that instead. You can still install PsiLog Link, though.

The PsiLog User Guide is in Adobe Acrobat PDF format. To read it you must have either the full version of Acrobat installed, or the free Acrobat Reader. Acrobat Reader is too big to fit on the PsiLog floppy disk. You can download it from Adobe's website. The Internet address is:
`http://www.adobe.com/products/acrobat/readstep.html`

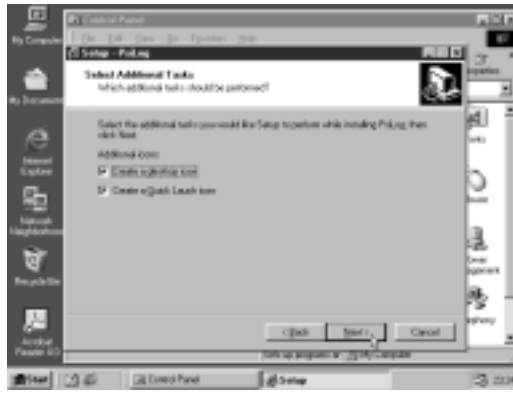
Make sure the components you want to install are ticked, then press `Enter` or click on `Next>` to continue.

13. You will now be asked to select the Start menu folder for the PsiLog icons:



It defaults to `Psilog`, but if you want a different name just type it in. Press `Enter` or click on `Next>` to continue.

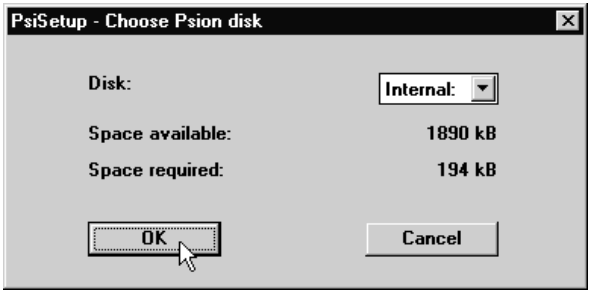
14. The next installation step lets you create extra icons for starting PsiLog Link. If you decided not to install PsiLog Link you won't see this screen; skip ahead to step 15.



15. PsiLog is now ready to install. Just press `Enter` or click on `Install` to continue.

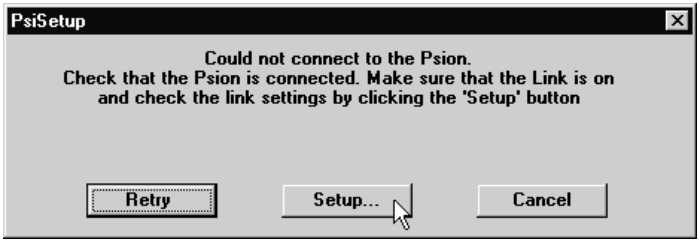
16. If you elected to install PsiLog on your Workabout, after installing the PsiLog files for your PC the setup program will immediately proceed to installing the PsiLog files onto your Psion.

17. **If a connection is established** with your Psion a message `Reading device information from the Psion` will be shown. You may also see a message `Copying communication system files to the Psion`. Eventually, a window similar to the following will appear:

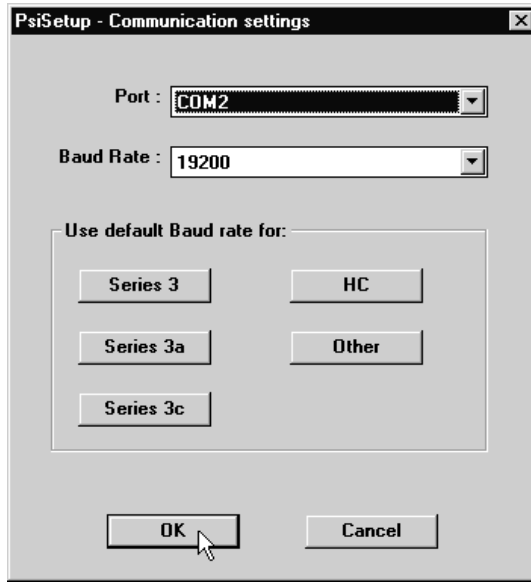


Proceed to step 18.

If there is a problem communicating with your Psion, the following window will appear.



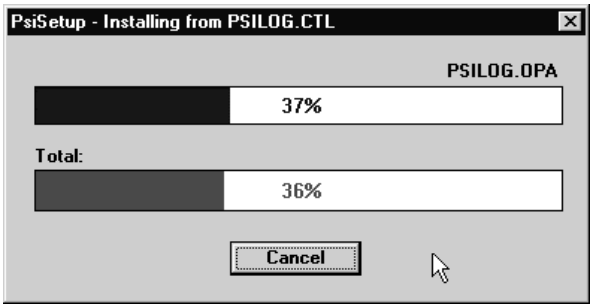
Click on `Setup`. The following dialog will appear:



First check the `Port` setting. Many computers are configured with a serial mouse on COM1, so COM2 may need to be selected. Next, select the `Baud Rate`. The baud rate suggested above in step 9 was 19200. If you have one of the Psion computers mentioned on the buttons, press that button to select the baud rate. The 'Other' model is suitable for Workabout computers. In all cases the Baud Rate must match that being used by your Psion. Click on `OK` and then `Retry`. The window shown at the beginning of this step should appear.

If problems persist, check your cabling and COM port on the PC. Make sure no other Windows programs are running that might be using the COM port. Common programs to check for are Internet diallers and fax systems. See also the *Troubleshooting* starting on page 87.

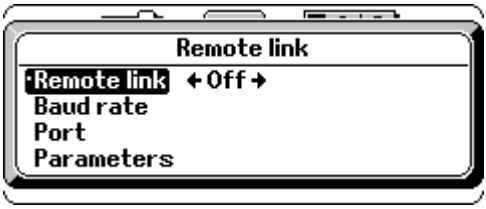
18. Select the Disk you want to install PsiLog to and press `OK`. SCSS recommends you install PsiLog on the Internal RAM disk. Make a note of the disk you select for later reference. The following window will appear showing the progress of the installation:



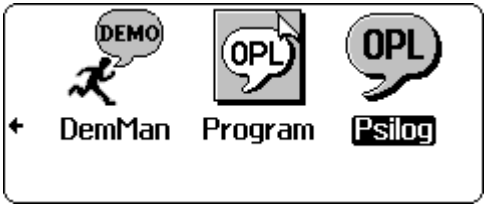
19. When complete, the following window will appear:

Press `Enter` or click on `OK`. The transfer from your PC is complete.

20. You can now turn off the Link on your Psion. Select `Remote link` and set it to `Off`.

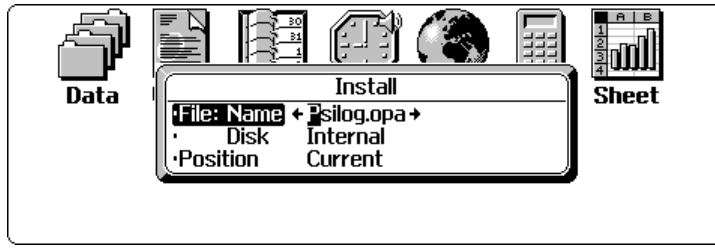


21. PsiLog will now appear under the "Run OPL" icon:

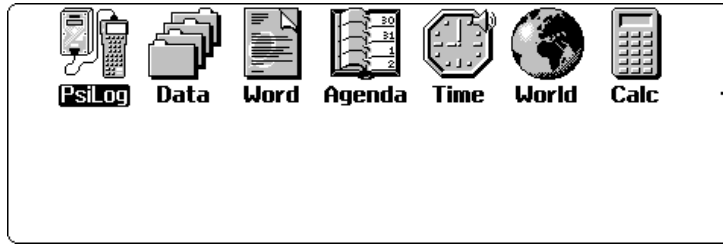


22. **If you are using a non-Workabout Psion computer**, you can install PsiLog as its own icon in the System screen. Press `Psion-I`, select the

`Disk` you copied PsiLog to (the disk you selected in step 18), then in the `Name` field type in `Psilog` and press `Enter`:



PsiLog will appear as an icon:



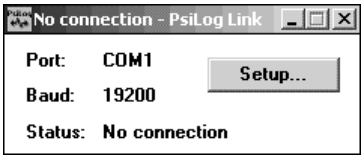
23. Your PC should now be showing a Setup Information screen:

Read the information then click on `Next>`. Click on `Finish` to close the PsiLog install program. The Windows Control Panel will still be open. You can close it if you like.

How to use the Link software

You start the PsiLog Link software much like any other program on your PC. Click on the Start button, select Programs, the group you selected to install the Link software into (the default is PsiLog), and then click on "PsiLog Link".

The Link software will start running:



It will just sit there waiting for PsiLog on your Psion to connect to it. Simply make sure Port is correct and Baud matches the PsiLog settings under Remote link preferences. Your Psion and your PC will have to be connected using a suitable cable.

The following table covers the status messages you're most likely to see:

Status message	Description
Attaching to engine	You may see this message appear briefly when starting PsiLog Link or when disconnecting the cable between your Psion and your PC.
COM port in use	Another program is using the serial port. If the Port setting is correct you will have to determine which program is using the serial port and exit it. You will then either have to exit and restart PsiLog Link, or click on the Setup... button and click OK.

`Connecting`	The cable is OK and the COM port is correct, but your Psion and your PC are not yet linked together. You will see this if you connect your Psion to your PC, but are not actually transferring files. If you attempt to transfer files, but still see this message (and the transfer fails), make sure you have selected the same baud rate for both computers.
`Copying system software`	Some files needed by your Psion computer for the Link to function are being copied from your PC to your Psion. You should only see this the first time you connect your Psion to your PC after your Psion was reset (either manually or through lack of power).
`Disconnecting`	You may see this message appear briefly when you finish a file transfer or disconnect the cable between your Psion and your PC.
`Failed`	You may see this message if the COM port settings are incorrect, or if there is a communications problem between your Psion and your PC.
`Linked`	Your Psion and your PC are connected and transferring files.
`No connection`	There is no physical connection between your Psion and your PC. If the two computers *are* connected, it could be the cable is faulty, or you have selected the wrong COM port.

When you've finished transferring files, simply close PsiLog Link.

Selecting the Link baud rate

Ideally, the Baud setting should be the fastest possible. This depends on two things: the model of your Psion, and the link server software you are using on your PC. The table below lists the maximum baud rates for Psion and Link software packages. Look up your Psion and your Link server software and use the smaller of the two baud rates. Note that PsiLog comes with the PsiLog Link server software.

Psion		Link server software	
Model	Max. baud rate	Name	Max. baud rate
Workabout-mx	115200	PsiLog Link *(This comes with PsiLog)*	57600
Workabout	19200	Epoc Connect	115200
Series 3mx	115200	PsiWin v2.x	115200
Series 3c	57600	PsiWin v1.x	57600
Series 3a	19200	RCOM	57600
Siena	19200	MCLINK	19200
		SLINK	19200

If you are unsure, select 19200 baud as all computers and software packages will work at that baud rate. Make sure your Psion and Link software are configured to use the same baud rates.

If you seem to be having trouble getting a connection, try 19200 baud first and increasing the baud rate if that works, or decreasing it if it doesn't. See the *Troubleshooting* section starting on page 87 if you can't get the Link software to work.

Selecting the correct PDL directory

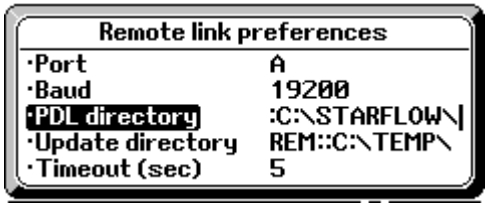
The PDL directory setting of the Remote link preferences dialog must be set to refer to the directory in which your Unidata software is installed.

By default, the Unidata Starlog software package installs to the `C:\STARLOG\` directory, the Unidata Starflow software package to `C:\STARFLOW\`. During the installation of these packages you are given the option of changing these default locations. Whichever package you have, it is critical that PsiLog is set to refer to the directory is has been installed to, otherwise you won't be able to transfer schemes to the Workabout, nor transfer unloaded data to your PC.

By default, the PDL directory setting in PsiLog is `REM::C:\STARLOG\`. The `REM::` part is very important as it specifies the Unidata software is installed on a computer remote from the Workabout. The `C:\STARLOG\` part specifies the default directory the Unidata Starlog software is installed to on your PC.

If you are using the Unidata Starflow software package, or you installed your Unidata software into a directory other than the default, then you **must** change the PDL directory setting to refer to the correct directory on your PC. Remember to include the beginning `REM::`.

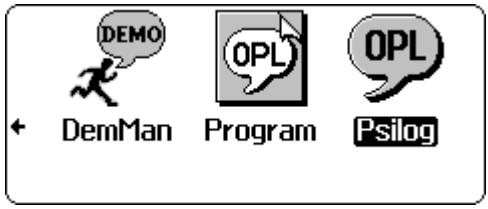
For example, if you are using the Unidata Starflow software package and installed it to the default `C:\STARFLOW\` directory, you must set the PDL directory setting to `REM::C:\STARFLOW\`.



Running PsiLog for the first time

Starting PsiLog

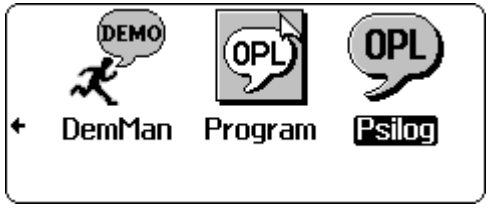
If you have just completed installing PsiLog, you are most likely in the System program. Highlight "Psilog" under the "Run OPL" icon and press `Enter`:



PsiLog will start running.

If you are at the Workabout startup screen, select `System screen` from the `Special` menu:

Now highlight "Psilog" under the "Run OPL" icon and press `Enter`:



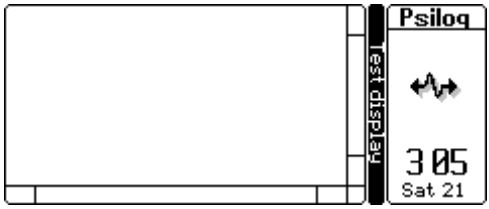
Later on under *Customising the Workabout to start PsiLog automatically* on page 32, you will find out how to enable PsiLog to start from the Workabout startup screen simply by pressing `Enter`.

Initial configuration

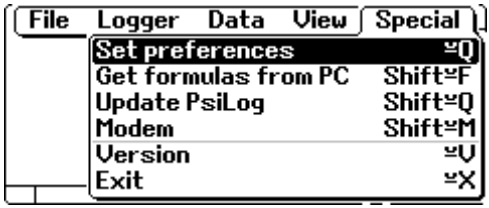
The first time PsiLog is run, it uses a default configuration. For most people this configuration is suitable, but others may need to change it.

When PsiLog starts it will always show a splash screen. Press `Enter` or `Esc` to clear it.

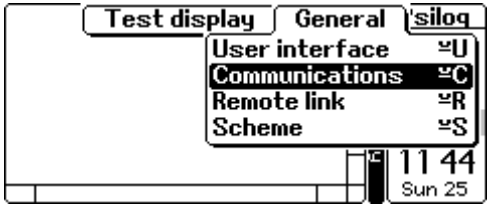
PsiLog has several different screens and will normally start showing whatever screen it was showing when you last used it. When PsiLog starts for the first time, it starts in the Test Display screen.



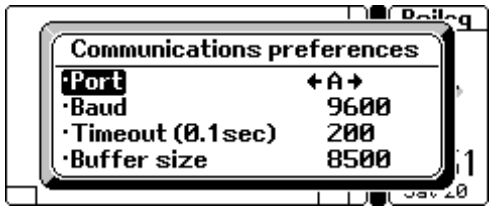
Press `Menu` then use the arrow keys to select `Set preferences` under the `Special` menu.



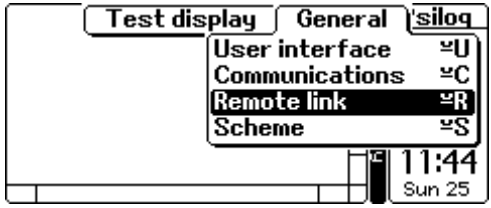
Use the arrow keys to move to the `General` menu and select `Communications`.



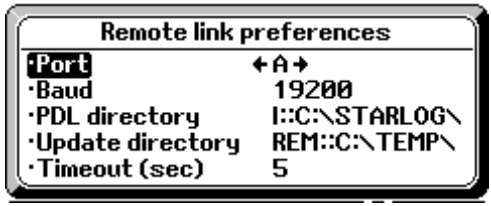
This dialog shows the communication settings used to communicate with your data logger. PsiLog ignores scheme communications settings, so ensure the `Port` and `Baud` settings are correct. Press `Enter` to accept the dialog settings.



Now press `Menu` again, select `Set preferences` then `Remote link`.



This dialog shows the communication settings used to communicate with your PC. From your Psion's point of view, your PC is a remote computer.



If you connect your Psion to your PC via a cable then `Port A` is most likely the correct choice. If you use a docking station then `Port C` is probably correct. Consult your Psion's manual if you are unsure.

For advice on selecting an appropriate remote link baud rate, see *Selecting the Link baud rate* on page 25.

You can change the PC communications settings by running the PsiLog Link program. See *How to use the Link software* on page 24.

The `PDL directory` setting tells your Psion where to look on your PC for the Starlog software package. It is the same as the drive and directory on your PC within which you installed the Starlog software, except that it **must** start with `REM::` (for

remote). For example, if you are using the Unidata Starflow software package and you installed it into the default C:\STARFLOW directory, you must change this setting from the default of REM::C:\STARLOG\ to REM::C:\STARFLOW\.

When you've finished, press Enter to accept the dialog settings.

Optional Starlog files

PsiLog can copy some Starlog software files from your PC. PsiLog will operate perfectly well without them, but some features may not be available.

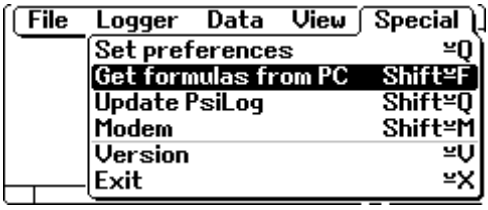
Formula file

The Test Display screen uses this file to perform scaling calculations on data read from data loggers. There is also a Formula Tester feature that can be used to test the operation of formulas.

Not all Test Display screens require formulas. For example, neither rain gauges nor Starflow data loggers require formulas, however, thermistor and thermocouple probes do. If you try to use an FTU file that requires a formula you don't have, PsiLog will display the message Error loading FTU:Procedure not found.

To allow PsiLog access to these formulas, the file must be copied from your PC to the Psion. Connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

Next, press the Menu key and select Get formulas from PC from under the Special menu. If you see the Formula tester function instead, you already have the formula file installed. If you want to re-copy the formula file, you will have to exit PsiLog, delete the formula file yourself, then start PsiLog again. The formula file is called PDLOUT.FOR and is stored in the \APP\PSILOG directory.



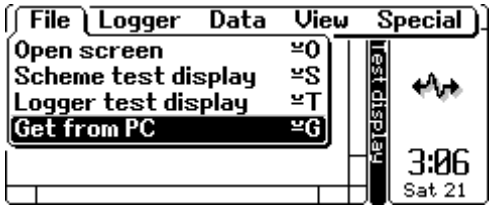
The formula files will be copied automatically. If you see the message Cannot find Starlog software, check your *Remote link preferences* (see page 42) and make sure the Port, Baud, and PDL directory settings are correct.

Version 3 logger test display files

Version 3 logger test display files are used by the Logger Test Display option of the Test Display screen to display an appropriate FTU based upon the type of data logger connected. These files are only available from Starlog/Starflow Version 3 software packages (version 3.06 revision A or later). To copy these files from your PC, follow these instructions:

Connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

Next, make sure you are in the Test Display screen by pressing Shift-Psion-T then press the Menu key and select Get from PC from the File menu.

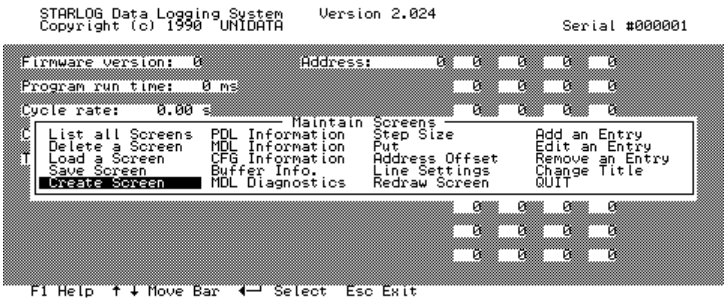


The files will be copied automatically. For a full description of this procedure, see *Transferring files from your PC* on page 70.

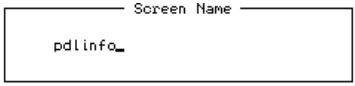
Version 2 logger test display files

Version 2 software does not support the automatic FTU file selection that the Version 3 software supports. Instead, you can select from a set of predefined test displays. Since these files are built into the software and not supplied as separate files, you must follow a special procedure to save them as files so PsiLog can copy them:

1. Start PDLFTU.EXE.
2. Press the Spacebar for the menu, then select Create a screen.



3. Name the screen `PDLINFO` and press `Enter`.



4. Press the `Spacebar` again, then select `PDL Information`.
5. Press the `Spacebar` again, then select `Save Screen`.
6. Repeat steps 2 through 5 another three times, changing the steps as follows:
   - In step 3, change PDLINFO to `MDLINFO`, `CFGINFO` and `BUFINFO`.
   - In step 4, change PDL Information to `MDL Information`, `CFG Information` and `Buffer Info`.
7. Quit PDLFTU.
8. Connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.
9. On your Psion, make sure you are in the Test Display screen by pressing `Shift-Psion-T` then press the `Menu` key and select the `Get from PC` option from the `File` menu. The `FTU` files will be copied automatically.
10. After PsiLog has finished coping the `FTU` files, you may delete them from your PC.

Customising the Workabout to start PsiLog automatically

Workabout computers can be configured to start an application automatically whenever they restart or are reset. You can have PsiLog start automatically by setting the appropriate option. Refer to the section under *User interface preferences* on page 39.

Online support

Southern Cross Software Solutions provides online support for PsiLog on the World Wide Web and via email. Our full contact details can be found on page 1.

World Wide Web (WWW)

On our web site you can find the latest updates to PsiLog, an electronic version of this User Guide (in Adobe PDF format), and various hints and tips. The address of the PsiLog website is:

`http://www.scsoftware.com.au/psilog/`

Email

Southern Cross Software Solutions can be contacted via email. For technical support and troubleshooting queries, please email:

`support@scsoftware.com.au`

Include in your email the version of PsiLog you are using, your PsiLog serial number (select `Version` from the Special menu to see your serial number) and what Psion computer you're using. Try to be as descriptive about your query as possible. When emailing attached files (such as scheme files), please use an archiving program such as WinZip and compress them as a single attachment.

For all other enquiries, please email:

`sales@scsoftware.com.au`

The PsiLog Environment

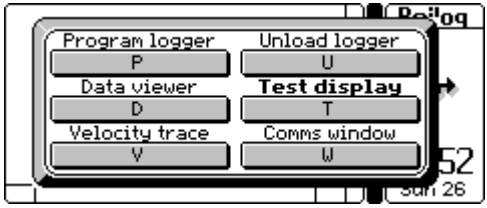
Introduction

The modes

PsiLog operates in a number of different modes. The various modes work together to allow you to program your data loggers, check your data loggers to make sure the scheme is operating correctly, and unload the data they have collected for later transfer to your PC. Each mode operates independently of the others in its own 'window'. The currently available modes are:

- Program logger (hotkey: `Shift-Psion-P`)
- Unload logger (hotkey: `Shift-Psion-U`)
- Data viewer (hotkey: `Shift-Psion-D`)
- Test display (hotkey: `Shift-Psion-T`)
- Velocity trace (hotkey: `Shift-Psion-V`)
- Communications window (hotkey: `Shift-Psion-W`)

Although only one of these may be active at a time, you can easily switch between them using their 'hotkeys'. For easier single-finger operation, you may press `Space` to display the Select Mode window:



Notice that the mode you're currently in is shown in **bold** type. Now, just press the letter shown on the button under each mode label to change to that mode. Pressing `Space` or `Esc` will close the window without changing the mode.

Alternatively, you can use the arrow keys to move the bold type to a different mode and press `Enter` to select that mode.

Note that the Communications Window grabs the `Space` character for sending to the serial port instead of displaying the Select Mode window. To change modes when using the Communications Window, you will have to either press the `Shift-Psion` hotkey or select the mode via the `View` and `Change window` menus.

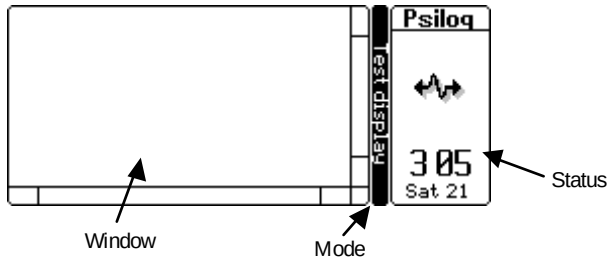
Most modes have a set of preferences that are used to customise them. Select `Set preferences` from the `Special` menu. On the right is the `General` menu covering preferences that affect PsiLog as a whole. To the left of it are the menus that affect the preferences of only the current mode.

Preferences are described on the following pages:

- General preferences on page 39.
- Program logger preferences on page 51.
- Unload logger preferences on page 57.
- Test display preferences on page 78.
- Communications window preferences on page 85.

The display

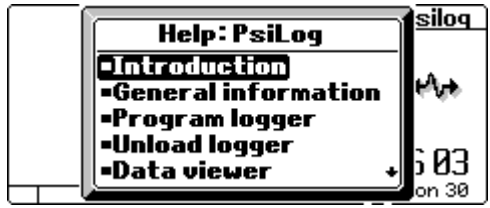
The PsiLog display is split into three sections, as shown below.



The Window area is always visible and shows information pertinent to the current mode. The Mode strip can be turned off via the *User interface preferences* (see page 39). The Status is the standard Psion status display and can be controlled via the usual `Ctrl-Menu` and `Ctrl-Shift-Menu` keys.

Online help

PsiLog has a context-sensitive online help system. Press the `Help` key (`Shift-Esc` for Workabout computers) to display it at any time.



Use the arrow keys to scroll up and down. Many of the help topics have links to related help pages at the bottom. Scroll down to the bottom of the page, highlight the topic you want to view and press `Enter`.

To return to the previous help page, press `Esc`. To close the help completely and return to PsiLog, press `Ctrl-Esc`.

Single key operation

PsiLog has been designed to allow, as much as possible, operation by pressing a single key at a time. This makes operating the Workabout with one hand while holding it in the other much easier.

By default, when you press a letter key PsiLog treats it as if you had held down the Psion key as well. For example, if you are in the Unload logger mode and you want to do an unload, simply press the `U` key.

How PsiLog treats letter keys can be altered via the *User interface preferences* (see page 39).

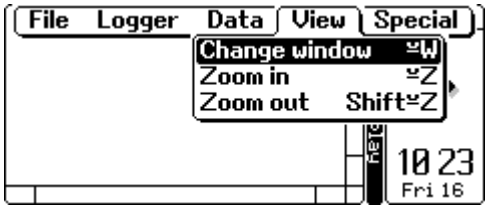
Of course, all functions are available through the menus. While in the menus, you can use the arrow keys to select a function, or you can press the letter corresponding to that function's hotkey to jump to its position in the menus.

Common functionality

Each of the PsiLog modes has some common features. The menus for each of the modes include the View and Special menus.

View menu

The `View` menu is shown below:

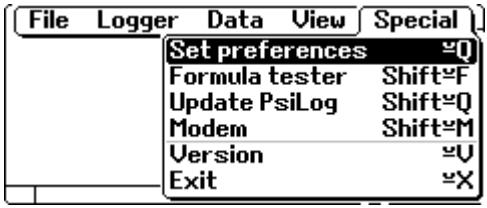


Via the `View` menu you can select a different window, or mode, and zoom in or out. Zooming in and out makes the text in the window bigger and smaller respectively. When the text cannot become any bigger or smaller, the zooming 'wraps around' to

the other extreme. In other words, zooming in from the biggest size text causes PsiLog to change the size of the text to the smallest possible size, and vice versa.

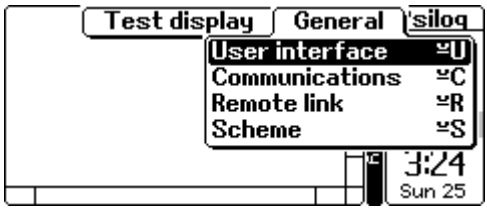
Special menu

The `Special` menu lets you access your PsiLog preferences, the formula tester, the PsiLog updater, modem controller, PsiLog version information, and the Exit command.



Preferences menu

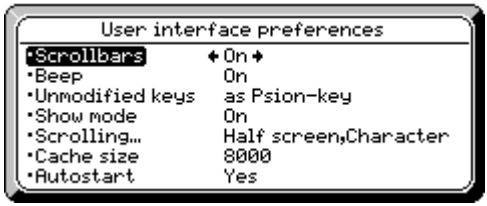
The Preferences menu lets you customise the operation of PsiLog to your personal preferences and to the configuration of your Psion.



Each group of preferences is described below:

User interface preferences

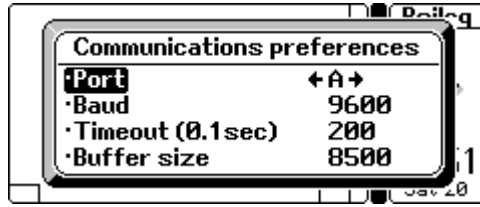
The user interface preference let you alter the appearance of the screen and how PsiLog responds to some keypresses.



- **Scrollbars** – You can turn these `Off` to give more room to display information in the window.
- **Beep** – You can turn the beeping `Off`. Error, warning and information messages will still appear.
- **Unmodified keys** – This affects how PsiLog treats keys that have been pressed without the `Psion`, `Shift` or `Ctrl` keys held down at the same time. This can be used to improve the single-handed operation of PsiLog. For example, if this option is set to `as Shift-Psion` then pressing the `T`, `U`, `P`, and `W` keys will jump to the Test Display, Unload Logger, Program Logger and Communications Window modes directly, without requiring you to hold down the `Shift` and `Psion` keys at the same time.
- **Show mode** – This controls the display of the thin black strip that shows the current mode. It can be turned off to make more room to display information in the window.
- **Scrolling** – This affects how the arrow keys scroll the display. You can scroll either character-by-character, in half-screen jumps or in full-screen jumps. Each of these jumps can be made either by using just the arrow keys, or by holding down the `Ctrl` key while pressing arrow keys.
- **Cache size** – This affects the responsiveness of PsiLog. A small cache size can slow the operation of PsiLog, depending on what it is doing. Testing by SCSS has determined the default of 8000 provides the best balance between speed and memory consumption. However, if you find that you need a little more memory, this can be reduced in decrements of 500. Alternatively, if you feel that PsiLog is too slow, increasing this value in increments of 500 may help. You can fine tune using changes smaller than 500. Be careful, if you set the cache size too big, PsiLog may not have enough memory left to run! See also *Required memory* on page 94 and *Resetting PsiLog preferences* on page 96.
  IMPORTANT NOTE: You must exit and restart PsiLog for changes to this preference to take effect.
- **Autostart** – On Workabout computers, PsiLog can be set to start automatically whenever the computer restarts. Set this option to `Yes` to enable automatic starting. In some instances it may not be possible for PsiLog to automatically start. In that case, the option is not available and always set to `No`. This is always the case for non-Workabout computers.

Communications preferences

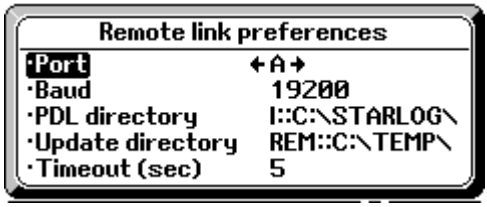
The Communications preferences affect how PsiLog accesses its communications port. PsiLog ignores scheme communications settings, so it is important the `Port` and `Baud` selections are correct.



- **Port** – This is the serial port PsiLog will use to talk to data loggers. Most Psions have just one serial port called A. Some Workabout computers may have other serial ports called by different letters. Consult your Psion's manual to determine which is the correct port to use.
- **Baud** – This is the baud rate to use. If you are connecting directly to your data logger this must be the same as the baud rate set in the data logger (usually 9600). If you are using a modem, this should be set to the slowest speed greater than or equal to the maximum baud rate supported by the modem. For example, for a 14400-baud modem, use 19200 baud.
- **Timeout** – This is how long PsiLog should wait for a response from the data logger. It is specified in 0.1-second units. If you are communicating with a data logger that uses extremely long scan rates (not log intervals) of an hour or more, then this should be set to about 10 seconds. If you are communications with a standard logger, this should be set to be longer than the longest prompt interval. Typically, the longest interval is 15 seconds. PsiLog defaults to 20 seconds. If you set the timeout to too short a value (the minimum value depends on the `Baud` and `Buffer size` settings) PsiLog will beep, display the message `Timeout reset to minimum`, and re-display the dialog with the timeout set to the minimum value.
- **Buffer size** – This is the size of the buffer used to receive data from data loggers. This value limits the largest amount of data PsiLog can request from the data logger in one go. The default of 8500 bytes comfortably allows PsiLog to request up to 4096 bytes of data from the data logger. Note that when data loggers transmit data, it is expanded by a factor of two!

Remote link preferences

The Remote link preferences affect how PsiLog communicates with your PC.



- **Port** – This is the serial port PsiLog will use to transfer files to and from your PC computer. It is likely to be the same as that in the Communications preferences above. Workabout computers may be able to use different ports. Consult your Psion's manual to determine the correct ports to use.
- **Baud** – This should typically be set as fast as possible. See *Selecting the Link baud rate* on page 25 for more information.
- **PDL directory** – This is the directory on your PC where you have installed the Unidata Starlog software package. It should always start with `REM::` to indicate that the Starlog software is remote from the Psion. The default is `REM::C:\STARLOG\`.
- **Update directory** – This is the directory on your PC where you put updates to the PsiLog program. It should always start with `REM::` to indicate that the update files are remote from the Psion. The default is `REM::C:\TEMP\`.
- **Timeout** – This is how long PsiLog should attempt to connect to your PC when it needs to send or receive files.

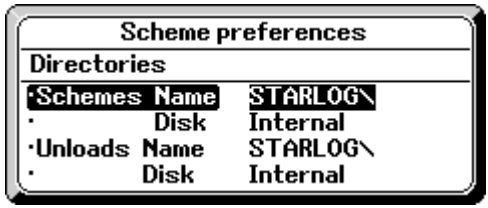
Scheme preferences

The Scheme preferences affect where PsiLog stores schemes and unloads on the Psion.

- **Schemes** – This is the directory on your Psion where PsiLog will store the files related to your schemes. The Program Logger mode will look in this directory for schemes with which to program the data logger, the Test Display mode will look here for Scheme Test Display files, and the Modem dialler will look here for schemes with telephone numbers.

- **Unloads** – This is the directory where PsiLog will store unloaded data. This does not have to be where you keep scheme files on your Psion. In fact, PsiLog doesn't need any scheme files to be able to unload data loggers!

For example, you may prefer to store unloaded data on a high-capacity Flash SSD, but keep all other files on the internal RAM disk.

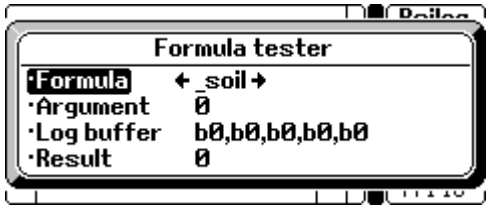


Formula tester

The formula tester allows you to perform manual calculations using formulas in the `PDLOUT.FOR` file. Such formulas include those for thermistors and thermocouples.

If you don't have the `PDLOUT.FOR` file installed, you will see `Get formulas from PC` instead. Refer to *Optional Starlog files* on page 30.

The formula tester lets you select the formula from a list. You can also just start typing the name of the formula if you know the one you want.



You can always calculate from the `Argument` to the `Result`. Some formulas also let you calculate backwards from the `Result` to the `Argument`. If the formula doesn't allow backwards conversion, PsiLog will let you know.

Some formulas require the Log Buffer to be set up. Such formulas include the wind direction formulas. There is no way for PsiLog to automatically determine which formulas require the Log Buffer. You must examine the formula yourself. Refer to the *Data field format* on page 75 for information on what you can enter in the Log Buffer field.

Update PsiLog

The PsiLog Update function lets you automatically update PsiLog when SCSS makes updated versions available. It uses the Remote Link preferences to communicate with your PC.

You can receive updates in a couple of ways. The first is via a compressed archive, or ZIP file. You would extract the files using an 'un-zipping' utility into a temporary directory, such as `C:\TEMP`. The second way is via a floppy disk. In this case the files are already unpacked and may be used directly.

Directory settings

In both cases, PsiLog needs to know where to look for its updated files. You give PsiLog this information in the Update directory setting in the Remote Link preferences dialog. See *Remote link preferences* on page 42.

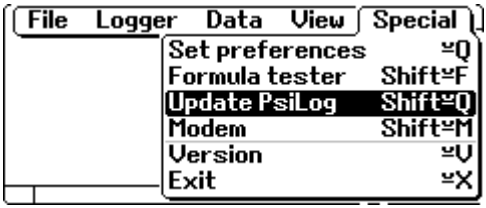
In the case of the archive, it is the directory you extracted the files into. From the example given above, the correct setting would be `REM::C:\TEMP\`.

In the case of the update files being on a floppy disk the correct setting might be `REM::A:\`, assuming that the floppy disk drive on your PC is the A: drive. Change it as appropriate if your floppy disk drive uses a different letter.

Updating PsiLog

Connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

Next, select `Update PsiLog` from the `Special` menu.



PsiLog will establish a link with your PC and start transferring the new PsiLog files. If PsiLog cannot find any update files it will beep and display `Could not find update files`. Check your *Remote link preferences* (see page 42) and make sure the `Port`, `Baud`, and `Update directory` settings are correct.

If all goes well, the following window will appear on the screen showing the progress of the transfer:

If there are any problems, PsiLog will beep and show a message indicating what the problem is.

When the transfer is complete, the screen will go blank for a few moments while PsiLog updates its files before restarting.

Update in detail

To assist in troubleshooting, the following describes the update procedure in detail:

- PsiLog connects to the PC and scans the Update Directory for all files with a name starting with `PSILOG`. Each such file is added to a list.
- PsiLog copies each file on its list to the Psion, placing each one in the same directory as the file it is replacing, but changing its name so that it starts with `_SILOG`. In other words, PsiLog does not replace the old files immediately. This also means that your Psion must have enough free space for *two* copies of PsiLog at once!
- When all the files are copied, PsiLog deletes each old file and renames each new file from `_SILOG`... to `PSILOG`... in turn.
- Once all the files are renamed, PsiLog restarts.

Modem

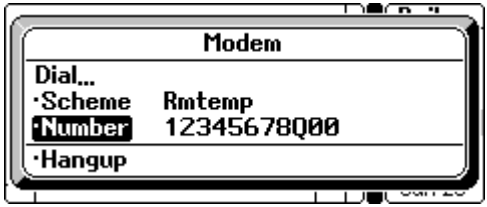
The Modem function lets you take control of a modem connected to your Psion via the serial port. It uses the same Communications settings used to connect to your data loggers, and not the Remote Link communications options.

The telephone number format is the same as for the Starlog software. PsiLog recognises both the Qxx and Mxx Telemetry Switch and Multidrop suffixes. Note that Multidrop communications is not possible over modems.

When dialling out, PsiLog will remember the last telephone number dialled, and so long as you haven't hung up the telephone in the meantime, PsiLog will not attempt to re-dial the number. This is of benefit when you are communicating with several data loggers using the same telephone number and connected via a Telemetry Switch card. If you dial the first number (eg. '12345678Q00') PsiLog will dial the telephone and send the Q-command as normal. If you subsequently select the next data logger at

the site (eg. '12345678Q01'), PsiLog will just send out the new Q-command ('Q01') and not hang up the telephone and redial the number.

If the telephone connection is lost for any reason, including when you Hangup the modem, PsiLog will briefly display the message `Modem disconnected` and beep.



Dialling to a particular scheme

PsiLog will scan the available schemes to determine if any have telephone numbers set. If they do, the scheme will appear in the `Scheme` list. Simply select the scheme to use and press `Enter` while `Scheme` is highlighted.

If none of the available schemes have telephone numbers set, the `Scheme` line will read `None available` and you will not be able to select it.

Dialling to a particular telephone number

If there is a particular telephone number you want to dial, enter the number on the `Number` line and press `Enter` while `Number` is highlighted. If you have a Telemetry Switch at the site, follow the telephone number with the letter `Q` followed by the switch number. If you are using Multidrop communications, simply enter the letter `M` followed by the logger serial number. Remember that Multidrop communications does not work over a modem.

Hanging up the modem

When you have finished communicating with the remote data logger, highlight `Hangup` and press `Enter`. When the modem disconnects, PsiLog will briefly display the message `Modem disconnected` and beep.

Version

This command displays PsiLog version information:

Exit

This command exits PsiLog.

Program logger

Introduction

This mode allows you to program your data logger with a scheme. PsiLog cannot generate schemes by itself. Instead, you must transfer to your Psion one or more schemes already created on your PC using the Unidata Starlog software package.

By default, the scheme files are stored in a directory called `\STARLOG` on your Psion's `Internal` disk. Setting the `Directory` in the Scheme preferences dialog can change this. See *Scheme preferences* on page 42.

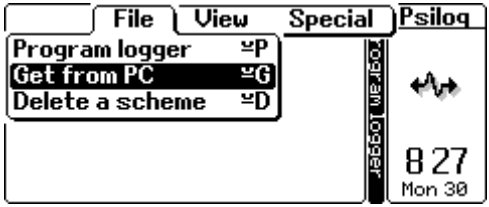
To save space PsiLog only copies the scheme files it needs to the Psion. These are the `*.CDT`, `*.CFG`, `*.ENT`, `*.FTU`, `*.INI`, `*.KBD` and `*.LDR` files. Note that not all schemes have all of these files available. PsiLog will handle missing files automatically.

Transferring schemes from your PC

Before you can use PsiLog to program your data logger, you must copy the scheme from your PC.

To do this, connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

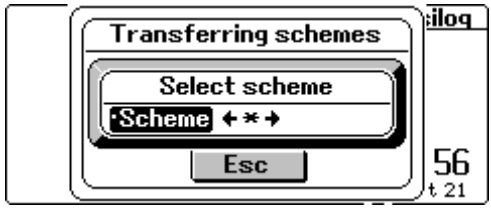
Next, make sure you are in the Program Logger mode by pressing `Shift-Psion-P` then select `Get from PC` from the `File` menu.



PsiLog will establish a link with your PC and get a list of the available schemes.

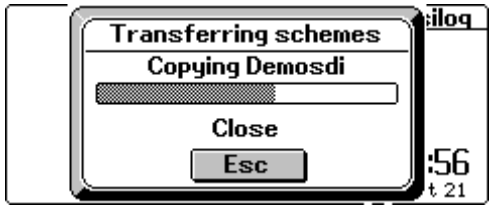
If you see a `Cannot find Starlog software` message, check your *Remote link preferences* (see page 42) and make sure the `Port`, `Baud`, and `PDL directory` settings are correct.

If all goes well, the following dialog will appear on the screen:



The '*' is a special scheme name that means 'select *all* of the schemes'. If you don't want to copy every scheme to your Psion, then select the particular one you want from the list. It is not possible to select more than one scheme to transfer at a time, other than by using the '*' name and copying all of them. Press `Enter` to have PsiLog copy the scheme(s) you have selected.

PsiLog will show the progress of the transfer:



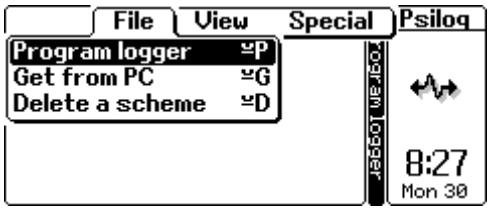
PsiLog will show `Done!` when the transfer is complete.

Programming a logger

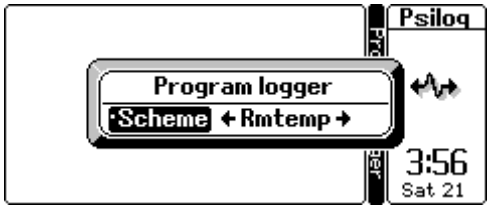
Before you can program your data logger, you must first copy the required scheme from your PC. See *Transferring schemes from your PC* on page 48 for more information.

When programming the data logger, the date/time of your Psion computer is used to set the date/time of the logger. Make sure your Psion computer is set to the correct date/time before programming any data loggers.

First, connect your Psion to your data logger. Make sure you are in the Program Logger mode by pressing `Shift-Psion-P` then select `Program logger` from the `File` menu.



A dialog will appear with the schemes that are on your Psion.



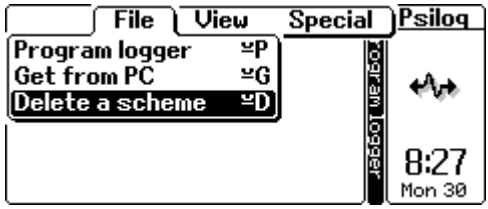
Select the scheme with which you want to program the data logger and press `Enter`. PsiLog will start programming the data logger. When finished, PsiLog will show `Program complete`.

If you see a `Too many retries` message, try again. It may be helpful to increase the retry value. See *Preferences* on page 51. It could also be that the scheme has configured the logger to use a different baud rate. In this case, to program the logger you must first set PsiLog to communicate at the logger's current baud rate, then select `Program logger` from the `File` menu. It should get past the `Configuring logger` stage and fail when it gets to `Loading display`. You will have to set the *Communications preferences* (see page 41) to the newly configured baud rate and start the logger programming again.

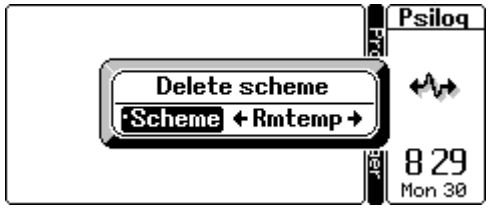
Deleting a scheme

If you're short on disk space, you can delete the files associated with schemes. Each set of scheme files uses about 2K. **Unload files are never deleted** (see *Deleting unloads* on page 56 if that's what you want to do).

Make sure you are in the Program Logger mode by pressing `Shift-Psion-P` then select `Delete a scheme` from the `File` menu.



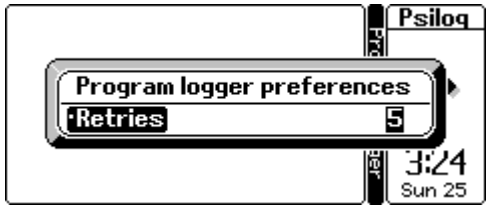
A dialog will appear with the schemes that are on your Psion.



Select the scheme you want to delete and press `Enter`. Another dialog will appear asking you to confirm that you want to delete the scheme files. If you select `Yes` the scheme files will be deleted.

Preferences

The only option for Program Logger is the number of times to retry failed communications requests.



Unload logger

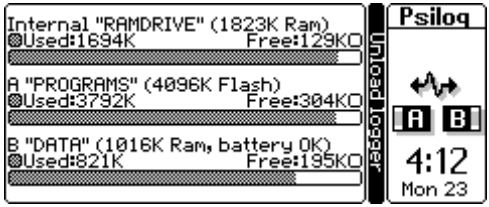
Introduction

This mode allows you to unload your data logger and later transfer that data to your PC. The unloaded data can be stored in your Psion's internal memory or onto separate SSD memory cards. Both RAM and Flash SSDs are supported. At the time of writing, the largest RAM SSD has a 1MB capacity and the largest Flash SSD has 8MB.

By default the unload files are stored in a directory called `\STARLOG` on your Psion's `Internal` disk. Setting the Unloads directory in the Scheme preferences dialog can alter that. See *Scheme preferences* on page 42.

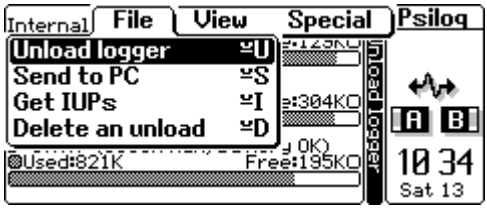
PsiLog does not need to have access to scheme information in order to unload a data logger. All the information needed to unload a data logger is already present inside the data logger itself.

The main window of this mode shows the free disk space available on the Psion. This includes the main internal RAM disk, plus any SSDs you might have installed.

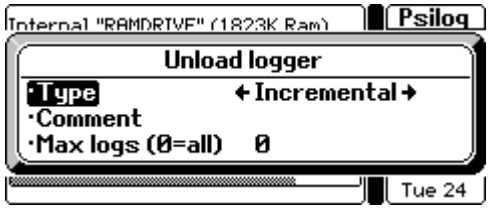


Unloading a logger

You can unload any data logger programmed with a scheme generated by the Unidata Starlog software package. Connect your Psion to the data logger, make sure you are in the Unload Logger mode by pressing `Shift-Psion-U` then select `Unload logger` from the `File` menu.

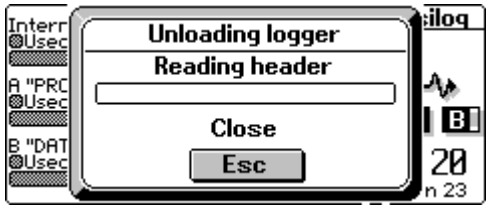


A dialog will appear allowing you to adjust the unloading options.



By default, the unload is `Incremental`. This means that only data logged since you last unloaded will be transferred. If you want to unload *everything*, then select `Full` unload. You can also enter a `Comment`, if you like. The `Max logs` option limits the number of logs transferred, counting from the start of the unload. This can be useful to limit the time spent unloading data. Note that for a full unload the start of the unload is always the earliest data available in the log buffer. For an incremental unload the start is taken as the first data logged after the incremental unload pointer or, if that has been overwritten, the earliest data available in the log buffer (the same as for a full unload).

Press `Enter` to accept the unload settings. Another dialog will appear to show the progress of the unload.



When the unload is complete, PsiLog will show `Unload complete`.

If you see a `Unload failed` message, try again. It may be helpful to increase the retry value. See *Preferences* on page 57.

If you see a `Disk full` message as soon as you start an unload, PsiLog has determined that the unload will not fit into the available disk space. You have several options:

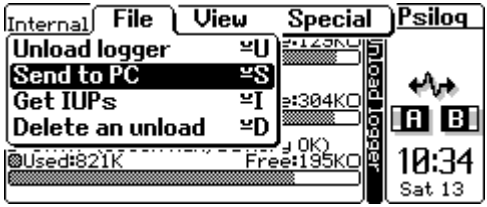
- Set the `Unload` directory of the Scheme preferences to a different disk. See *Scheme preferences* on page 42.
- Change SSDs, if you're using SSDs.
- Set `Max logs` to limit the number of logs to unload.

Transferring data to your PC

To view and produce reports on data you have unloaded, you need to transfer the data to the Starlog software package installed on your PC.

To do this, connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

Make sure you are in the Unload Logger mode by pressing `Shift-Psion-U` then start the PsiLog transfer by selecting `Send to PC` from the `File` menu:

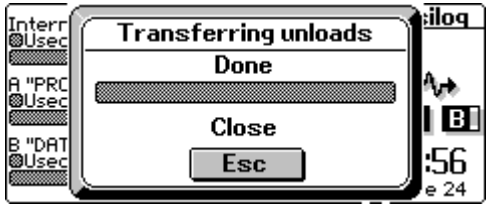


This will start the fully automated file transfer. If you see a message `Cannot find Starlog software` check your *Remote link preferences* (see page 42) and make sure the `Port`, `Baud`, and `PDL directory` settings are correct.

PsiLog will check the unload files it has against the schemes present on the PC. All unloads stored on the Psion that have a corresponding scheme on the PC will be copied to the PC. PsiLog will automatically update the Starlog software index file and incremental unload pointers.

While the transfer is taking place, PsiLog will show a progress dialog:

When the transfer is complete, the PC Link software will return to the waiting state and PsiLog will show Done:



Note that PsiLog can optionally delete each unload from the Psion as it is transferred to the PC. See *Preferences* on page 57.

Synchronising incremental unloads

There is no need to unload the entire data buffer each time you unload a data logger as PsiLog allows you to perform *incremental* unloads.

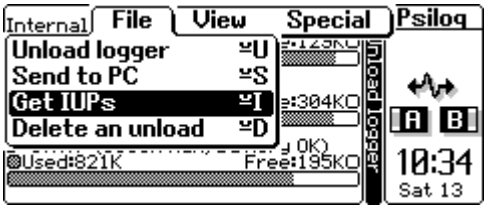
These work by storing a record of the date and time on the most recently unloaded data from a data logger. Then, the next time that data logger is unloaded, only data logged since then is considered.

Since it is possible for both your PC and your Psion to be performing unloads, it is important to keep these records up-to-date. The Get IUPs function of PsiLog ensures that your Psion has the most up-to-date records of incremental unloads.

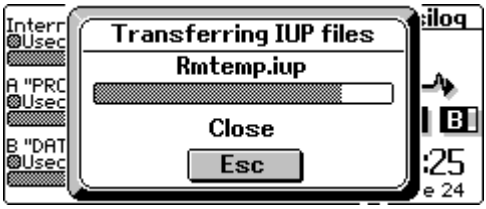
If you have unloaded data from a logger to your Psion, you should transfer it to the PC before synchronising the incremental unload pointers. This ensures that the incremental unload pointers on the PC are the most recent. See *Transferring data to your PC* on page 54.

To do this, connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

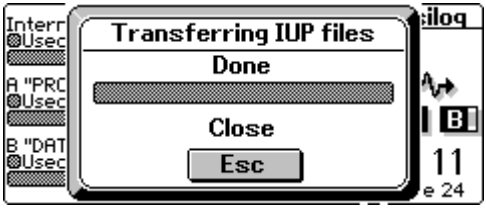
Make sure you are in the Unload Logger mode by pressing `Shift-Psion-U` then start the transfer by selecting `Get IUPs` from the `File` menu:



The transfer is fully automatic. All the incremental unload records (the IUP files) on your PC will be copied to your Psion:



When the transfer is complete PsiLog will show `Done`:



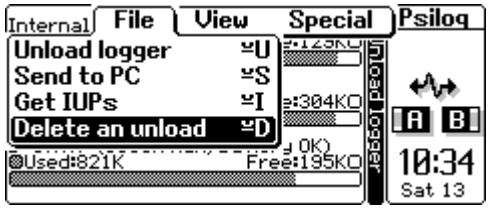
If you see a `Cannot find Starlog software` message, check your *Remote link preferences* (see page 42) and make sure the `Port`, `Baud`, and `PDL directory` settings are correct.

Deleting unloads

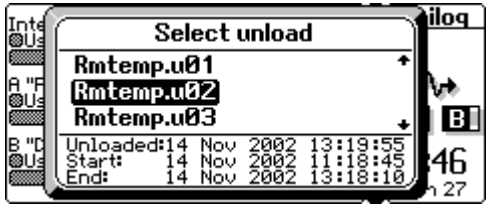
To free space on your Psion, you can delete data you have unloaded from your data logger.

Note that deleting data from Flash SSDs does not free disk space until the SSD is reformatted. See your Psion's manual for more information.

Make sure you are in the Unload Logger mode by pressing `Shift-Psion-U` then select `Delete an unload` from the `File` menu.



A dialog will appear, allowing you to select an unload file. If PsiLog cannot find any unload files it will display the message `No unload files found!`. Use the `Up/Down` arrow keys to select the file.

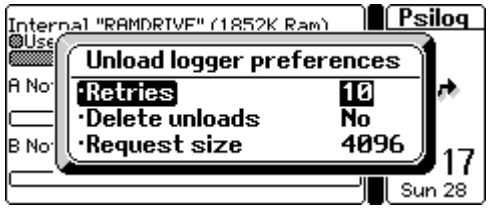


Press `Enter` to accept the selected unload file. PsiLog will ask you to confirm the deletion. Be certain that you want to delete the unload file as once a file is deleted it cannot be recovered.

You can set a preference to have PsiLog automatically delete unload files when they are transferred to your PC. See "Delete unloads" in *Preferences* below.

Preferences

The Unload Logger preferences let you alter the behaviour of the data unloader function of PsiLog.



- **Retries** – This is the number of times PsiLog will make the same request of the data logger before giving up.

- **Delete unloads** – This controls what PsiLog does with the unloaded data after it has been transferred to the PC. If it is `Yes`, unloaded data is deleted after it has been transferred, if `No` the data is left alone and must be deleted later. See *Deleting unloads* on page 56. Note that deleting data from Flash SSDs does not free disk space until the SSD is reformatted. See your Psion's manual for more information.
- **Request size** – This is the maximum size PsiLog will use to transfer data from the data logger. If more than the request size is required to be sent from the data logger, PsiLog will break it up into multiple portions not larger than the request size. If the communications link is poor quality, setting this to a smaller value may improve the speed of communications. Conversely, when the communications link is of high quality (reasonably error-free), then a larger value may improve the speed of communications.

Data viewer

Introduction

This mode allows you to view logged data. It is the same as the PDLOUT program and part of the PDLFTU programs that are part of the Starlog software package on PC computers. Using the Data Viewer, you can make sure the data logger is performing correctly after programming and you can also review data unloaded from the logger.

A tabular view of your logged data is available for unload files and when directly viewing the data logger memory buffer. A plot graph is only available for unload files.

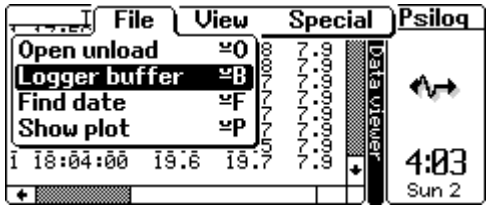
The tabular view is split into two parts: the Header and the Data areas. The Header is always at the top and can be toggled between showing Titles, Units, Comments, and Actions. The plot view displays a single channel at a time and automatically scales the vertical axis to fit the data. You can zoom in and out of the plot view to examine data in detail.

To view unload data, PsiLog requires that you have your scheme program files copied to your Psion. Note that if you previously transferred the scheme files to your Psion in order to be able to program your data logger, you do not need to transfer the scheme files again.

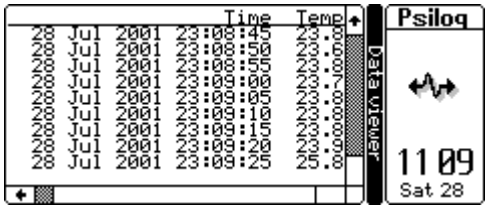
To copy the scheme files to your Psion, refer to *Transferring schemes from your PC* on page 48. This will copy all the scheme program files, plus the files required by the Data Viewer.

Checking your scheme

Connect your Psion to your data logger. Make sure you are in the Data Viewer mode by pressing Shift-Psion-D then select Logger buffer from the File menu.



PsiLog will read the name of the scheme from your data logger and load the appropriate display screen. The display will show the data logged most recently.



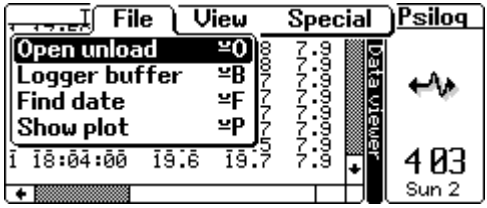
If PsiLog beeps and displays the message `Cannot find schemename.ent`, then make sure you have copied the scheme files to your Psion. See *Transferring schems from your PC* on page 48.

If the message is `Error loading ENT:Procedure not found`, then the formula file is missing. Refer to *Optional Starlog files* on page 30.

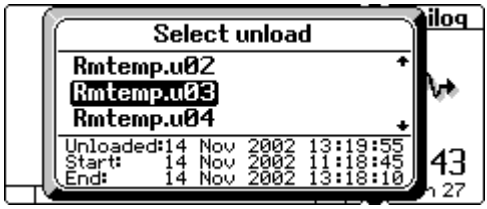
The keys you can use to view the unload buffer are explained in the next section.

Viewing an unload

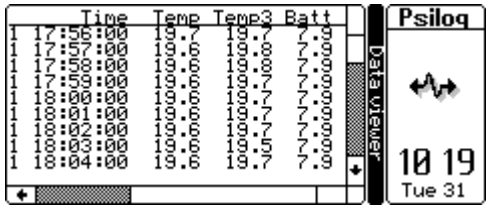
Make sure you are in the Data View mode by pressing `Shift-Psion-D` then select `Open unload` from the `File` menu.



A dialog will appear, allowing you to select an unload file. Use the `Up`/`Down` arrow keys to select the file. If PsiLog cannot find any unload files it will display the message `No unload files found!`.



Press `Enter` to accept the selected unload file. PsiLog will read the name of the scheme from inside the unload file and load the appropriate display screen.



If PsiLog beeps and displays the message `Cannot find schemename.ent`, then make sure you have copied the scheme files to your Psion. See *Transferring schemes from your PC* on page 48.

If the message is `Error loading ENT:Procedure not found`, then the formula file is missing. Refer to *Optional Starlog files* on page 30.

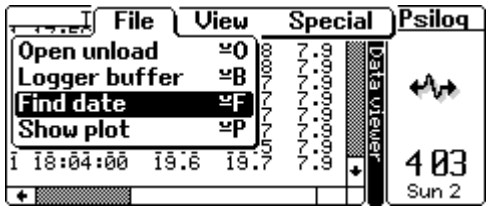
When viewing logged data, the following keys may be used to navigate:

- `Left`/`Right` arrows will scroll the display left and right.
- `Up`/`Down` arrows will scroll the display up and down
- `PgUp`/`PgDn` keys (`Psion-Up Arrow` and `Psion-Down Arrow` on a Workabout) will scroll the display up and down an entire screen full at a time.
- `Home`/`End` keys (`Psion-Left Arrow` and `Psion-Right Arrow` on a Workabout) will jump up to the beginning and down to the end of the data respectively.
- `/` changes the heading row between Title, Units, Comment, and Action.

Note that when you are viewing the log buffer inside a data logger, pressing the `End` (`Psion-Right Arrow` on a Workabout) key will go to the end of the data and 'stick' there. When new data is logged, the display will automatically display the new data, scrolling up if necessary. Using the other navigation keys to scroll up or down will turn the 'stick to end' feature off. Press `End` (`Psion-Right Arrow` on a Workabout) to reactivate it.

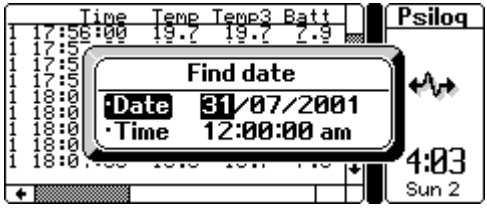
Finding a date

When viewing an unload file, you can have PsiLog search for a particular date/time. Select `Find date` from the `File` menu.



If you get the message `Find date not available`, then you aren't viewing an unload file. If you're viewing a plot, select `Hide plot` from the File menu, otherwise select `Open unload` from the `File` menu. You cannot find a date/time in the Logger Buffer view.

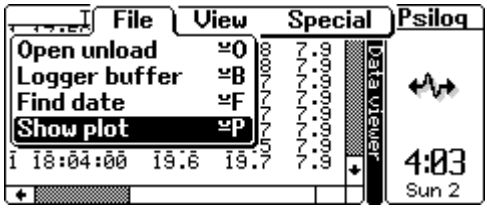
Enter the date/time you want PsiLog to move to in the dialog:



Press `Enter` to accept the dialog and PsiLog will search for the date/time and display the first logged data on or after the date/time from the top of the screen. If the date/time is after the end of the data in the unload file, the current position does not change.

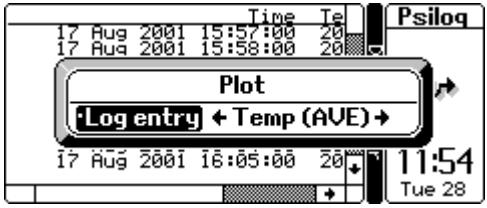
Viewing a plot

To view a plot, select `Show plot` from the `File` menu.



If you get the message `Can only plot unload files`, then first make sure you are viewing an unload file. See *Viewing an unload* on page 60.

The Log Entry selection dialog will appear:



Select the log entry to plot and press `Enter`. Press `Esc` if you decide not to view a plot.

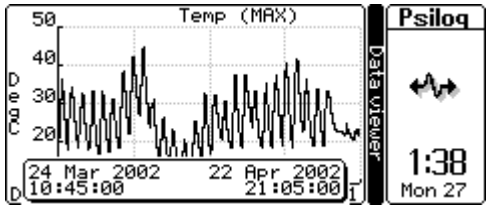
To return to the tabular view of the unload file, select `Hide plot` from the `File` menu.

Plotting can take a long time. PsiLog first has to "range" the data – determine the extremes of the data it has to fit on the screen – then actually plot the data. While PsiLog is ranging and plotting, the messages `Finding ranges` and `Plotting` are shown at the bottom left of the screen. You can press `Esc` to stop plot ranging and drawing. If you do stop the ranging or plotting, the undrawn portion of the plot will be shaded.

When you switch back to the tabular view, PsiLog will automatically position the data corresponding to the left of the plot at the top of the display.

The Plot Display

Plots are displayed one log entry at a time and start out showing the entire unload file.



Pressing `Tab` will open the Log Entry selection dialog where you can select a different log entry to plot.

Gridlines

Gridlines may be shown corresponding to the tick marks on each axis. See *Preferences* on page 66 for the options for gridlines.

Date/Time Window

At the bottom of the above screen shot is a window obscuring the X-axis. This window shows the exact date/time of the range of data displayed. This window can be toggled on and off by pressing the `/` (slash) key or toggled between the top and bottom of the screen by pressing the `Up`/`Down` arrow keys.

When zooming it displays the start/end date/times of the highlighted area.

Title

The title at the top shows the name of the log entry, and the type of logging performed (maximum, average, etc).

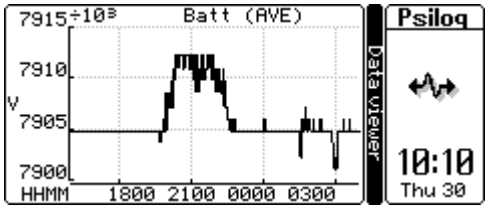
Y-Axis (Log Entry)

The Y-axis down the left side of the plot is automatically scaled to fit the data shown on the screen. The units are shown at the very left of the screen.

A screen shot below shows Y-axis label values that have been scaled. The "÷10^3" at the top of the Y-axis indicates that you must divide the Y-axis label values by 10^3 (1000) to get the true label values. The scaling value is always a power of ten. The power factor is always a multiple of three.

X-Axis (Time)

The X-axis across the bottom of the screen always shows the date/time. The following screen shot has the date/time window turned off, revealing the X-axis:



The X-axis is labelled in short form by only displaying the most significantly changing parts of the date/time. For example, if the range of times covers more than an hour (but less than a day), then hours with optional minutes and seconds will be shown.

In the above screen shot, the bottom left of the screen shows `HHMM`. This indicates the parts of the date/time shown on the X-axis. In this case, the `HHMM` signifies that hours and minutes are shown.

Between one and three parts of the date/time may be shown at each tick on the X-axis. For information on selecting how many parts to show, see *Preferences* on page 66. The available date/time parts are:

Date part	Description
`YY`	Year
`MM`	Month
`DD`	Day

Date part	Description
`HH`	Hour
`MM`	Minute
`SS`	Second

The context of `MM` determines whether it is referring to Month or Minute. If you're unsure, use the / (slash) key to toggle the more detailed date/time window.

The possible date/time short forms are:

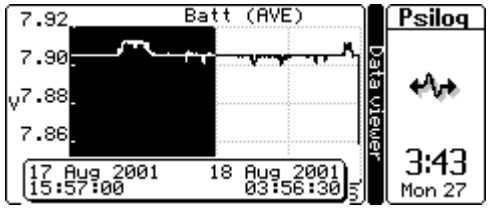
One part	Two parts	Three parts	Used when date/time range is…
`YY`	`YYMM`	`YYMMDD`	More than a year
`MM`	`MMDD`	`MMDDHH`	More than a month, less than a year
`DD`	`DDHH`	`DDHHMM`	More than an day, less than a month
`HH`	`HHMM`	`HHMMSS`	More than a hour, less than a day
`MM`	`MMSS`	`MMSS`	More than a minute, less than an hour
`SS`	`SS`	`SS`	Less than a minute

If PsiLog determines that the last (right most) part is the same for each axis tick, PsiLog will shuffle the parts along to remove the redundant part and reveal a potentially more interesting part. For example, if the selected form is `HHMMSS`, but the seconds are always zero (because the axis interval is, say, two minutes), then PsiLog will change the format to `DDHHMM`.

Zooming

It is possible to zoom in to a section of the plot to see the data in more detail. When zooming, PsiLog always displays the entire unload file and highlights the currently selected section. The `+` key shrinks the highlight (zooms in). The `–` key expands the highlight (zooms out). The `Left/Right` arrow keys move the highlight left and right.

The date/time window (when visible) shows the date/time range of the highlighted data:



When the required area is highlighted, press `Enter` to redraw the plot with the selected data filling the screen. Pressing `Esc` cancels the zoom.

Pressing the `*` (star or asterisk) key with the highlight active will cause the plot to zoom out so that the plot currently being displayed will fit into the highlight.

Pressing the `*` (start or asterisk) key when the highlight is not active will cause the plot to zoom right out and display the log channel for the entire unload file (the starting view).

Key Summary

Keys	Description
`Tab`	Change the log entry being plotted.
`/`	Toggle the date/time window on/off.
`Up/Down` arrows	Toggle the position of the date/time window between the top and bottom of the screen.
`+/-`†	Shrink/expand highlight (zoom in/out).
`Left/Right` arrows†	Move the highlight left/right.
`Enter`	When zooming, redraws the plot with the highlighted area filling the plot area.

`Esc`	When zooming, cancels the zoom.
*	When zooming, zooms out so that the currently visible part of the plot is rescaled to fit into the highlight. When not zooming, zooms right out to show the entire unload file (the starting view).

†If not already zooming, these keys will activate the zoom mode (highlighting).

Preferences

The Data Viewer preferences let you set options related to plotting:

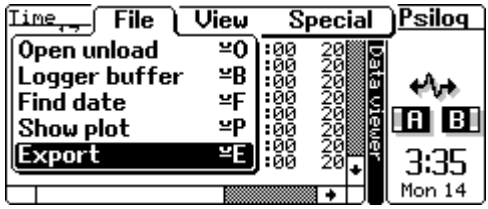
Gridline options may be set individually for the X (time) and Y (log entry value) axes.

- **X axis labels** – One of `One part`, `Two parts`, or `Three parts`. This controls the size of the labels at each tick on the X-axis. Fewer parts result in shorter labels, and therefore more ticks (and gridlines) can fit on the axis.
- **Grid colour** – One of `Off`, `Black`, or `Grey`. If you are running short of memory, black is the preferred colour as using grey requires some extra memory.
- **Grid style** – One of `Solid` or `Dotted`. `Dotted` is the recommended style for use with the `Black` colour. Either style is good with `Grey`.

Exporting an unload

Unload files can be exported by PsiLog in a variety of formats. Data is always exported to a specific directory, selected via preferences. See *Preferences* on page 68 for more information.

To export an unload file, make sure you are in the Data View mode by pressing `Shift-Psion-D` then select `Export` from the `File` menu.



If you are not viewing an unload file you will get the message `Can only export unload files`. If you are viewing an unload file, the Export dialog will appear:

This dialog controls how the unload data is exported. The dialog title shows the name of the unload file being exported. The name of the exported file is based on the unload filename, unload number, and the export Format. See foo in page bar for more information.

- **Range to export** – The `Start/End date/time` fields default to the entire unload if you were looking at a tabular view of the unload file. If you were looking at the graphical (plot) view they default to the range of data you were looking at.

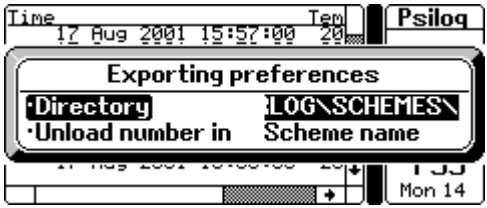
- **Format of export** – The `Format` and `Header rows…` fields control the form of the export. Format can be one of `Text (Tab)` where the fields are separated by tab characters, `Text (CSV)` where the fields are separated by commas, or `Lotus (WK1)` where the fields are exported as a spreadsheet. Pressing the `Tab` key on the `Header rows…` field opens a sub-dialog where you can select how the header rows should appear (if at all). Each row can be set to `None` (the header row is skipped), `Title` (eg "Time", "Temp"), `Action` (eg "RAW", "AVE"), `Units` (eg "degC", "mm"), `Title(Action)` (eg "Time(RAW)", "Temp(AVE)"), or `Title(Units)` (eg "Time", "Temp(degC)".

- **What to export** – The `Entries` field control whether all the logged entries will be exported, or just one particular one. The date/time is always exported.

Press `Enter` to accept the export settings and export the data. If the export directory is on your PC, PsiLog will connect to PsiLog Link (which must be running on your PC) and transfer the file.

Preferences

The Data View Exporting preferences let you set options related to exporting:



- **Directory** – This is the directory all export files will be saved to. If it starts with `REM::` it is a directory on your PC. Make sure PsiLog Link is running on your PC and the two computers are connected via a serial cable. The default is `REM::C:\STARLOG\SCHEMES\`.

- **Unload number in** – This controls where the unload number is placed in the name generated for the export file. Scheme names can be up to eight characters long. Extensions for the unload formats are `TXT`, `CSV`, and `WK1`. There is no more room for unload numbers without replacing part of either the scheme name or extension. If the unload file named `ROOMTEMP.U99` was exported as a Text (CSV) file, then setting this field to `Scheme name` will result in the export file being named `ROOMTE99.CSV`. Setting this field to `Extension` will result in the export file being named `ROOMTEMP.C99`.

Test display

Introduction

This mode allows you to test the operation of your data loggers. It is the same as the PDLFTU program that is part of the Starlog software package on PC computers.

Via the Test Display, you can check that your data logger is operating correctly and that your scheme program is logging data.

Checking your scheme

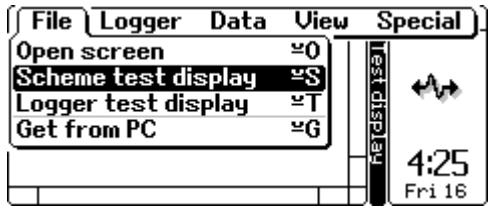
Scheme test display

For this function, PsiLog requires that you have your scheme program files copied to your Psion.

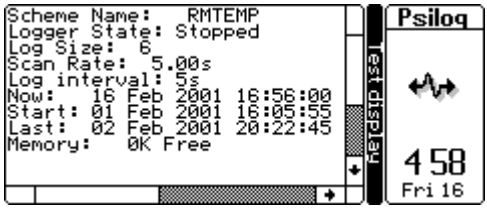
Note that if you previously transferred the scheme files to your Psion in order to be able to program your data logger, you do not need to transfer the scheme files again.

To copy the scheme files to your Psion, refer to *Transferring schemes from your PC* on page 48. This will copy all the scheme program files, plus the files required by the Scheme Test Display.

Connect your Psion to your data logger. Make sure you are in the Test Display mode by pressing Shift-Psion-T then select Scheme test display from the File menu.



PsiLog will read the name of the scheme from your data logger and load the appropriate display screen.



If PsiLog beeps and displays the message `Cannot find schemename.ftu`, then make sure you have copied the scheme files to your Psion. See *Transferring schemes from your PC* on page 48.

If the message is `Error loading FTU:Procedure not found`, then the formula file is missing. Refer to *Optional Starlog files* on page 30.

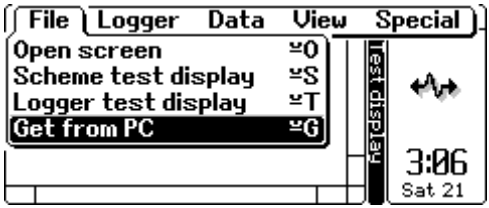
Checking your logger

Transferring files from your PC

Before you can use the Test Display mode for the first time, you must copy several files from your PC.

To do this, connect your Psion to your PC and start the PsiLog Link software. See *How to use the Link software* on page 24 for more information. Note that there is no need to start the Link software on your Psion; PsiLog will do that automatically.

Next, make sure you are in the Test Display mode by pressing `Shift-Psion-T` then select `Get from PC` from the `File` menu.



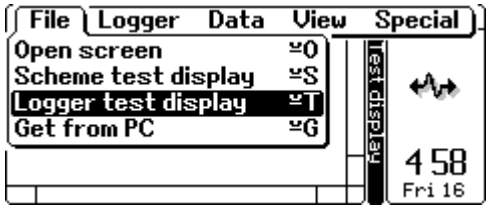
PsiLog will automatically copy all the required files from your PC to the Psion.

If you see a `Cannot find Starlog software` message, check your *Remote link preferences* (see page 42) and make sure the `Port`, `Baud`, and `PDL directory` settings are correct.

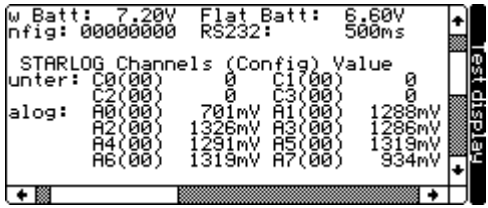
See also *Optional Starlog files* on page 30.

Logger test display

Connect your Psion to your data logger. Make sure you are in the Test Display mode by pressing `Shift-Psion-T` then select `Logger test display` from the `File` menu.



PsiLog will attempt to identify your data logger and display an appropriate screen. Below is part of the test display screen for a Starlogger:



If PsiLog beeps and displays the message `Unable to identify logger` it could be that:

- Some files that PsiLog requires have not been copied to your Psion. Refer to *Transferring files from your PC* on page 70 for instructions on how to copy these files.
- There was a communications problem. Check the data logger, cable, and settings and try again. See also the *Troubleshooting* section starting on page 87.

If the message was `Error loading FTU:Procedure not found` then the formula file is missing. Refer to *Optional Starlog files* on page 30.

Using the test display

PsiLog creates a display almost identical to that produced by the PC Starlog software package `PDLFTU` program. However, as the Psion screen is much smaller than the PC screen, some scrolling is necessary. The arrow keys scroll the display. By default, the arrow keys by themselves will scroll by half the screen size, but if you hold down

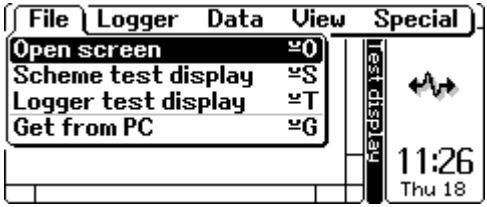
the Ctrl key and press an arrow key, the screen will scroll one character at a time. These settings can be adjusted. See *User interface preferences* on page 39.

See *Address/Step size* on page 74 for some other key presses.

Other test displays

PsiLog allows you to open arbitrary test display files. Such files include special diagnostic screens that Unidata provide with their Starlog software package to assist with troubleshooting. PsiLog will copy these files from the Starlog software package as part of the *Optional Starlog files* (see page 30).

To open a test display file make sure you are in the Test Display mode by pressing Shift-Psion-T then select Open screen from the File menu:



In the dialog that appears, you can type the name of the file you want to open. Press Tab to see a list of files.

This function can be used to open any scheme test display too. Press the Tab key to see the list of files. Navigate to the directory where the scheme files are stored (see *Scheme preferences* on page 42) and select the scheme test display you want to open.

Logger functions

PsiLog allows you to perform the same data logger functions that the PC Starlog software supports.

Initialise

This function initialises the data logger. It causes the data logger to re-read its configuration table and apply the settings. If the data logger was set to its 'sleep' mode, it will 'wake up'. If the data logger is a Macro logger and the current configuration is found to be bad in some way, it will reload the factory default configuration and use that. This may affect running schemes. For non-Macro loggers with configuration tables, initialising the data logger will never affect running schemes.

This has no effect on PDL data loggers and will fail with an error message.

Reset

This function resets the data logger to use its factory default configuration. This is only applicable to Macro loggers. Using this option for non-Macro loggers with configuration tables is identical to the Initialise option above.

This has no effect on PDL data loggers and will fail with an error message.

Sleep

This function will put the data logger to sleep. It will also stop the scheme. While asleep the data logger uses almost no power and does not perform any processing.

This has no effect on PDL data loggers, and will fail with an error message.

Force log

This function only works for schemes generated by recent revisions of the Starlog Version 3 software, and then only those schemes that are 'event based'. See your Starlog software manual for more information.

For those schemes that are compatible with this function, this will cause the scheme to perform a logging cycle on its next scan.

You can use this function if you are on site and want to download the very latest logged data (for example, force an average calculation to be logged).

If the scheme is not event based, PsiLog will beep and display the message `Force log: Scheme not event based`.

Correct time

This function only works for schemes generated by recent revisions of the Starlog Version 3 software. It works for all types of schemes: both 'event based' and 'fixed log interval'.

The effect of this function is either to cause schemes to execute twice per scan or to skip every other scan as appropriate in order for the time to be corrected. In other words, the data logger time is corrected gradually over many scans.

You can check the effect of this function by watching the progress of the time reported by the data logger.

IMPORTANT NOTE: This does not correct the memory card clock used by memory card data loggers. To correct memory card clocks the data logger must be reprogrammed with a scheme.

Data functions

These functions allow you to send information to the data logger, possibly altering scheme parameters. The use of these functions could impair scheme operation. Use them with care.

Address/Step size

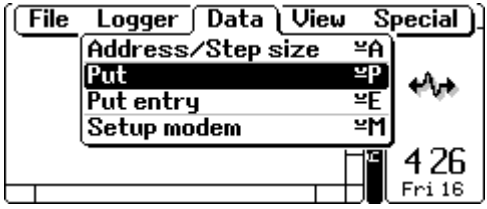
This function sets the current base address and address step size. When the Test Display screen is displayed (no menus or dialogs) you can use `Ctrl-PgUp/PgDn` (`Ctrl-Psion-Up Arrow` and `Ctrl-Psion-Down Arrow` on a Workabout) to change the base address in increments of the step size. As you change the base address this way, the new base address value will appear briefly in the bottom right of the screen.

This function only affects a few specially designed Test Display screens. Scheme test display screens are never affected by these options.

Put

This function allows you to send data to arbitrary addresses in the data logger. By default the `Address` field is the same as the current base address. The `Data` field is where you enter the information to send to the data logger. The format of this field is explained in a later paragraph.

Select the `Put` function from the Data menu:



The `Mode` field is where you specify how the information is to be sent to the data logger. The options are combinations of `Put/Write` and `Standard/Extended`. `Put/Write` refers to the type of data logger memory to write to. `Put` writes into the data logger's virtual memory, while `Write` writes into the data logger's real memory. Refer to your data logger's hardware manual for more information. Note that PDL data loggers do not have real memory; they only have virtual memory.

`Standard/Extended` refers to how the memory is address. `Standard` addressing can only refer to the first 64K of that memory. If you are using a data

logger that has more than 64K memory, and you are writing into that extra memory beyond the first 64K, then you must use the `Extended` mode.

Data field format

The `Data` field can have one or more items, separated by commas. The items can specify numeric and text data. Text items are distinguished by starting with double-quotes (`"`). Anything else and the items are assumed to be numeric.

Text items start and end with double-quotes. The data they represent is made up of the characters between (and not including) the double-quotes.

Numeric items are numbers with some optional formatting characters. Numeric fields may start with an optional size modifier coded as a single letter:

- B/b – The number is a byte integer (8 bits) (-128…255 allowed)
- W/w – The number is a word integer (16 bits) (-32768…65535 allowed)
- D/d – The number is a double-word integer (32 bits) (-2147483648…4294967296 allowed)
- F/f – The number is floating point (64 bits)

If there is no size modifier, then the smallest size that fits the number will be used. For example, if the number is 500, it does not fit in a byte but it will fit in a word, so a word size will be used.

Next, there may be an optional sign character, either '+' or '-', followed by the number itself.

At the beginning of the number there may be an optional base modifier:

- If the number starts with '0X' or '0x' or a dollar sign ('$') or the letter 'H/h' it is assumed to be base 16 or hexadecimal. Hexadecimal numbers allow the character 0 to 9 as normal, but the letters A through F can also represent digits.
- If the number starts with a zero '0' (but not '0x') or the letter 'O/o' then it is assumed to be base 8 or octal. Octal numbers only allow the digits '0' through '7' inclusive.
- If the number starts with the letter 'B/b' then it is assumed to be base 2 or binary. Binary numbers only allow the digits '0' and '1'.

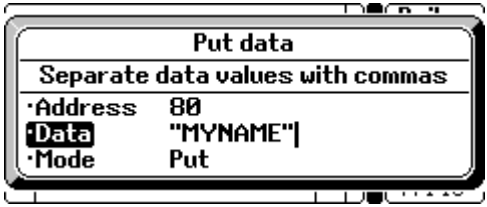
You can also have an optional base modifier at the end of the number:

- If the number ends with 'H' or 'h' it is assumed to be base 16 or hexadecimal.
- If the number ends with 'D' or 'd' it is assumed to be base 10 or decimal, except if the '0x' or '$' hexadecimal base modifier preceded the number. In that case, the 'D' will be treated as a hexadecimal digit of the number.

- If the number ends with 'O' or 'o' it is assumed to be base 8 or octal.
- If the number ends with 'B' or 'b' it is assumed to be base 2 or binary, except if the '0x' or '$' hexadecimal base modifier preceded the number. In that case, the 'B' will be treated as a hexadecimal digit of the number.

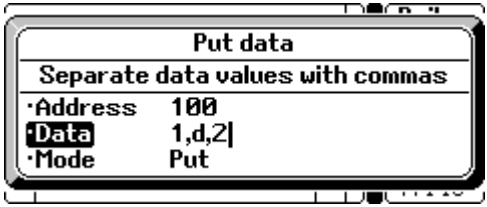
If there are no base modifiers, the default base 10 (decimal) is used. Where there is a conflict of base modifiers not covered above, the modifier at the end of the number takes precedence.

For example, to set the name of the scheme to 'MYNAME' the dialog would look like:



You can enter 'blank' spaces by entering multiple commas. Each extra comma causes a single byte of data logger memory to be skipped (not altered). For example, '1,2,3' causes the values '1', '2', and '3' to be written into three consecutive memory bytes. However, '1,,2' causes '1' to be written into the first byte, the second byte is skipped (not changed) and '2' is written into the third byte. Note that you can only skip bytes, trying something like '1,d,2' will cause '1' to be written to the first byte, the next four bytes will be set to zero (the 'd' specifies a double-word or four-byte value), and '2' will be written to the sixth byte.

Here is an example:

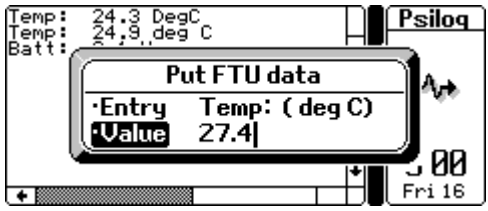


Press `Enter` to accept the dialog and you should see a `Put` message appear in the bottom-left of the screen, followed by `Put:OK` briefly in the bottom-right. If there is a problem putting, simply try again by repeating the procedure.

Put entry

This is very similar to the Put function above, except that it scans the data fields on the Test display screen for ones that are suitable to be written to. Suitable data fields are

placed into the `Entry` field. Choose the data field you want to set from the list, and then enter the value into the `Value` field. The number you enter is as you would like to see it on the Test display screen. For example, if the data field is showing temperature 'degC', then enter your value in 'degC'. If the data field is a string (for example, the scheme name), then enter the new string without double-quotes.



Press `Enter` to accept the dialog and you should see a `Put` message appear in the bottom-left of the screen, followed by `Put:OK` briefly in the bottom-right. If there is a problem putting, simply try again by repeating the procedure.

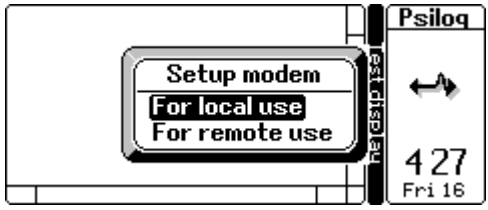
Setup modem

This function is not for use with data loggers, but for modems. It uses the `PDLMODEM.DAT` file from Version 3.09A and later Starlog software to identify and initialise your modem. See *Transferring files from your PC* on page 70.

Modems are divided into two types:

1. **Local** – These modems are connected to computers (for example, your PC or Psion) and are used to dial out to modems connected to data loggers.
2. **Remote** – These modems are connected to data loggers and receive calls made from the modem connected to your computer.

Connect your Psion to the modem (a null-modem cable may be required) and select either `For local use` or `For remote use` as appropriate.



Press `Enter` to accept the dialog and configure the modem according to the settings in the `PDLMODEM.DAT` file. If you see a message `Could not open Pdlmodem.dat` then you need to copy the file from your PC. See *Transferring files*

from your PC on page 70. If you do not have Version 3.09A or later software installed on your PC, then you will not be able to use this function of PsiLog.

Preferences

The Test Display preferences are used to balance memory consumption and communications throughput.

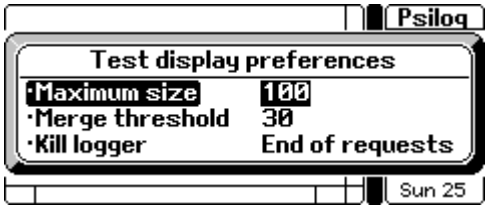
To understand these preferences it is necessary to explain how the Test Display reads information from the data logger.

Each test display screen is usually displaying many different items, all from different parts of data logger memory. On some screens, there could be many tens of items.

To improve the speed of display, PsiLog does not read each display item individually from the data logger. Instead, display items that are close together in data logger memory will be grouped and read in a single request. For example, assume that there are twenty, one-byte display items to be shown. At 9600 baud, each byte will take about 20ms to send. However, there is a fixed overhead of about five bytes (100ms). Reading them individually would take 20 × (20 + 100) = 2400ms. If it were possible to group them into a single request, it would take only 20 × 20 + 100 = 500ms. Note that modem communications can add nearly 1000ms to the overhead (or 22400ms vs. 1500ms).

When deciding how to group display items, PsiLog must decide how close is close enough for a display item to be added to a group. This is called the Merge Threshold. If two display items are closer than the Merge Threshold they will be merged together.

The downside to merging is wasted space between grouped items. For example, if the Merge Threshold is 30, then in the worst case there could be up to 29 bytes of un-needed information being sent from the data logger. Plus, the entire merged request is stored in PsiLog memory.



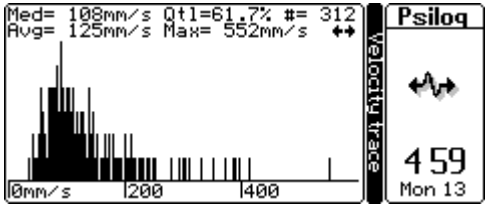
- **Maximum size** – This limits the size of items that can be requested from the data logger in a single group. The display update rate can be improved by making this value bigger. However, if the communications link is poor, you may achieve better results by using smaller values.

- **Merge threshold** – This sets how close in data logger memory display items have to be to be merged. Setting it too high or too low will reduce the speed of communications. Setting it too high tends to waste memory. Depending on the Test display being viewed, and the quality of the communications link between the Psion and the data logger, adjusting this higher or lower may improve the speed of communications.
- **Kill logger** – This affects when the data logger is told to stop communications and wait until the next scan. In this context 'killing' the data logger does not affect the scheme or the data being logged.
  `End of requests` – The data logger is 'killed' after all the requests for a particular display screen have been made once. The next time the data logger wakes up for communications, the requests will be sent again and the display updated. This is the preferred option when the communication speed is fast and relatively error-free, or when the data logger is using moderate to slow scan rates.
  `Each request` – The data logger is 'killed' after the data for each group of display items has been requested and received. The next time the data logger wakes up for communications the Test Display will request data for the next group of data items. This is the preferred option when the communication speed is slow or suffers from errors, or when the data logger is using fast scan rates. This is particularly important for old PDL data loggers, because if they are kept communicating for too long they will miss scans and lose time.

Velocity trace

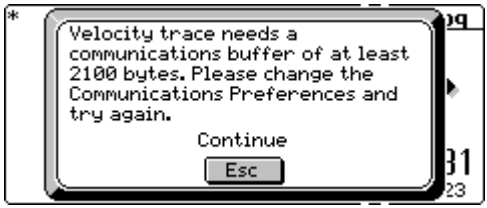
Introduction

This mode only works when PsiLog is connected to a Model 6526 Starflow data logger. You select the Velocity Trace mode by pressing `Shift-Psion-V`. It displays a spectrum of the velocities currently being seen by a Starflow data logger and is the same as the `UDITRACE` program that is part of the Starlog software package on PC computers. The graph of the velocity spectrum allows you to judge if the Starflow is measuring velocity correctly.



If you connect a data logger that is not a Model 6526 Starflow, you will see the "Logger is not a Starflow" message on the screen:

By default, PsiLog has a communications buffer size of 8500. If you have configured PsiLog to have a smaller communications buffer, you may see the following message:



You must increase the size of the communications buffer to the value shown (in the example above, 2100). See *Communications preferences* on page 41.

Display

The bulk of the Velocity Trace screen is devoted to the histogram of velocities. Above the graph are some readings from the Starflow. Select the group of readings being displayed by pressing the left or right arrow keys. There are two groups:

- **Med "median velocity"** – This is the statistical median velocity out of those measured by the Starflow during its most recent sampling. This is the velocity recorded by the Starflow.
  Qtl "quartile" – This is a measurement of how close all the velocity samples are to the median velocity. The larger this value, the more spread out the velocities are.
  # "number of velocity samples" – This is the number of velocity samples taken by the Starflow. The more samples, the better the velocity measurement.
  Avg "average velocity" – This the average of all the velocities measured by the Starflow during its most recent sampling.
  Max "maximum velocity" – This is the largest velocity measured by the Starflow during its most recent sampling.
- **Scheme "scheme name"** – This is the name of the scheme currently programmed in the Starflow.
  Depth "water depth" – This is the depth of water above the Starflow. Deeper water tends to produce better velocity measurements.
  Signal "signal strength" – This is a measure of the strength of the signals received by the Starflow. The larger the number, the stronger the signal.

Further reading

Please refer to the manual that came with your Starflow. It has an excellent chapter describing the use of the velocity trace data and covers the various types of histograms you might see and what they mean.

Communications window

Introduction

This mode, selected by pressing `Shift-Psion-W`, allows you to communicate directly with your data logger or a modem as an aid to troubleshooting problems. In particular, it allows you to access a data logger's diagnostic modes if the logger provides this function. Some data loggers do not support a diagnostic mode.

Note that different data loggers support different types of diagnostic modes. Consult your data logger's hardware manual for more detailed information.

Checking that your data logger is communicating

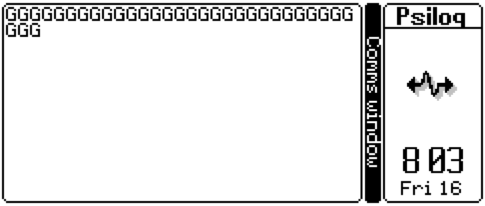
When your data logger is connected to your Psion and everything is configured correctly, you will see a *prompt* from the data logger at regular intervals. Each data logger prompt is an asterisk character (*). Typically, data loggers send out prompts each time they scan (in other words, at the scan rate). However, in some cases when the data logger has a scan rate longer than 15 seconds, prompts may appear every four seconds instead.

The following screen is an example of two data logger prompts and the cursor bar:

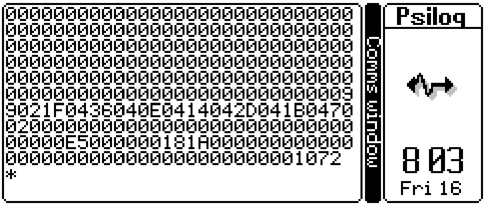
The important thing is, if you can see prompts from the data logger, your communications configuration is correct. If you don't see any prompts, try different baud rates and ports by altering your Communications Preferences. See *Communications preferences* on page 41 and *Serial communications* on page 88 for more information.

If you can see prompts, then you know the link from the data logger to the computer is working. To test the link from the computer to the data logger, send lots of uppercase G's to the data logger. Do not send lowercase g's. They will make the data logger send a lot of information and prevent it from communicating for the duration (about 68sec at the default 9600 baud rate).

Press and hold down the key (`Shift-G`) to do this. You should see lots of capital G's on the screen. You may need to hold the key down for 15-20 seconds.



If the data logger is receiving, then it will respond with some numbers and letters.

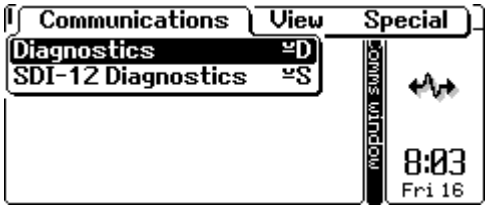


If you see something like that (the exact letters aren't important, so long as you can see numbers and/or letters), then you can be confident that the communications between your Psion and your data logger is working correctly.

If you don't get any response from the data logger, but you did see prompts earlier on, then there must be a break in the link between the computer and the data logger. Try a different cable, or if you know how, check the continuity of the wires from connector to connector. See *Serial connections* on page 9 and *Serial communications* on page 88 for more information.

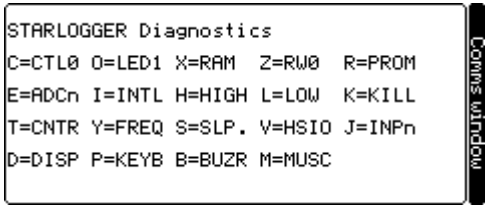
Logger diagnostics

The communications window is also used to gain access to the data logger's diagnostic modes. Assuming that the communications between your computer and data logger is working, make sure you are in the Communications Window mode by pressing `Shift-Psion-W` then select `Diagnostics` from the `Communications` menu:



PsiLog will then tell the data logger to enter diagnostics mode. What you will see will depend on the model of the data logger you have connected. Some data loggers don't have a diagnostic mode, in which case you will probably see a `Timeout` message. Note that you might have to zoom to the smallest font (`Psion-Z`) and hide the status window (`Ctrl-Menu`) before the diagnostics menu will display properly.

Below is what the diagnostic mode of a Model 6004B Starlogger looks like:



The usual command to exit diagnostic mode is `K`. Refer to your data logger's hardware manual for more information about its diagnostic modes.

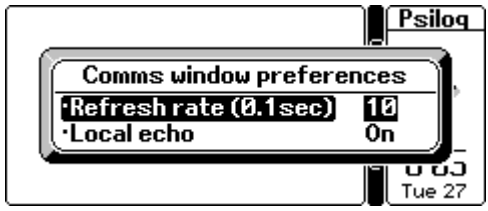
Modem control

You can also use the communications window to send commands to a modem. This can be useful to check and set the configuration, or to manually dial or answer calls. See your modem's manual for the commands that it understands.

See also *Modem* on page 45.

Preferences

The Communications window preferences allow you to adjust the operation of the Communications Window.



- **Refresh rate** – This affects how quickly PsiLog updates the display as characters are received through the serial port. PsiLog is quite slow when it comes to drawing on the screen, so instead of drawing every character as it is received, PsiLog will wait for the time specified by this preference before drawing a batch of letters at once.
- **Local echo** – If this is `On` then every letter you type will be echoed to the screen as you type it. If this is `Off` the letters are not echoed. Often modems are configured to echo characters back to you as you type them. If both the modem and PsiLog are echoing, you will see 'double' as each time you type a letter it will appear twice on the screen. Either turn this preference `Off` or consult your modem's manual to configure the modem not to echo. Normally, this preference should be left `On`.

Troubleshooting

Serial communications
Running PsiLog

Serial communications

Background

In any application that uses serial communications, the serial communications link is where most problems arise. This is due to so many variables being involved. Usually there are multiple serial ports on the computer, sometimes with different sockets. The configuration of the serial port (baud rate, stop bits, and parity) can also vary. Depending on the equipment, even identical sockets with identical configurations cannot talk to each other because of differences in the pin configurations on the plugs and/or sockets!

The solution to these problems comes from understanding where the problems could arise. The following section contains information to assist in understanding and troubleshooting serial communications.

How serial communications works

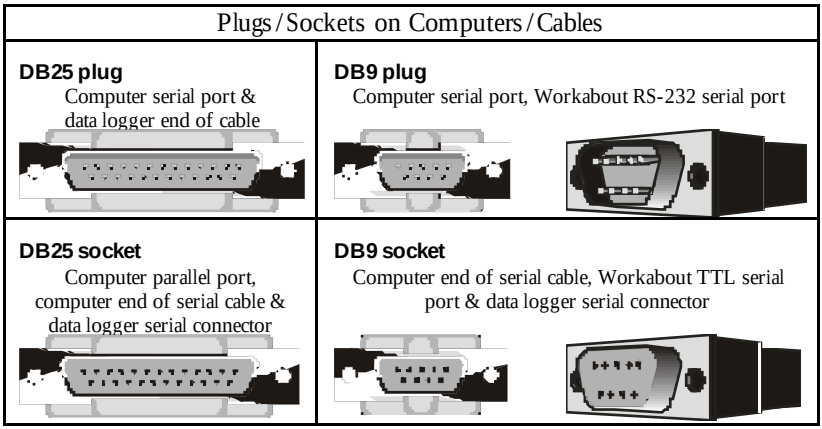
See also *Serial connections* on page 9 for information on cables to use with Workabout computers.

Connectors

On IBM compatible PCs, the physical serial *plugs* can be of two types. They are DB9 and DB25. The numbers refer to the number of pins used. The former has one row of 5 pins and one row of 4 pins; the latter has one row of 13 pins and one row of 12 pins.

There are likely to be other similar *sockets* on the back of the computer. These may have the same shape, but have holes instead of pins. The one with 25 pins (called a DB25 *socket*) is usually a parallel port used for connecting to printers. The one with 15 pins in two rows of 8 and 7 (DB15 *socket*) is your computer's games port, used for connecting a joystick, gamepad or steering wheel. Another 15-pin socket in three rows of five pins each is your video port, used to connect to your monitor. Older computers may use a DB9 socket as their video connector. If you don't see them it's probably OK. They are not relevant to serial communications.

The diagram below shows some plugs and sockets:



Wiring (Cable)

Serial ports are wired in one of two ways: DTE or *Data Terminal Equipment* and DCE or *Data Circuit-terminating Equipment*. An example of a DTE is your PC. Examples of DCEs are data loggers and modems. The connectors are wired in such a way as to allow a DTE to be connected to a DCE via a *straight-through* cable. In other words, pin 1 on the DTE connects to pin 1 on the DCE, pin 2 to pin 2, and so on. Of course, this only makes sense when connectors with identical numbers of pins are used.

A typical situation is to have two computers connected via two modems. Each computer connects to its modem via a straight-through cable. The modem devices are connected via the telephone network.

There may be a situation when two computers need to be connected together without any modems devices in between. For example, it would be unusual to connect two computers sitting right next to each other via modems and the telephone network. The problem is that a computer is designed to connect to a modem and not another computer. The reason is that the wire (call it X) that transmits data from the computer connects via a straight-through cable to the modem wire (X) that receives the data. In other words, if pin X on a computer transmits, then pin X on a modem receives. If two computers were connected to each other then their transmit wires (both X) would be connected together!

The solution is a small device called a *null-modem*. It has two sockets that the cables from each of the computers connect to. The wiring inside the null-modem fakes the presence of real modems by crossing over the receive and transmit wires (among others), allowing the two computers to talk to each other. Sometimes the null-modem comes in the form of a special cable, called a *null-modem cable* that plugs directly into the two computers' serial ports.

Following is a table showing the pins used for RS-232 serial communications from a DTE point of view:

DB25	DB9	Description	Direction (DTE↔DCE)
2	3	TxD: transmit	→
3	2	RxD: receive	←
4	7	RTS: request to send	→
5	8	CTS: clear to send	←
6	6	DSR: data set ready	←
7	5	GND: signal ground	–
8	1	CD: carrier detect	←
20	4	DTR: data terminal ready	→
22	9	RI: ring indicator	←

Note that only 9 pins out of the 25 pins on a DB25 connector are listed above. Computers do not use those other 14 pins for RS-232 communications. However, Unidata data loggers have uses for some of the pins. See your data logger hardware manual for more information.

When connecting two serial devices, you must know if they are DTE or DCE devices. If they are different (DTE and DCE), then you can use a straight-through cable to connect them. If they are the same (DTE and DTE or DCE and DCE), then you must use a null-modem (either device or cable) to connect them. Note that a DTE↔DTE null modem is different from a DCE↔DCE null modem.

To communicate with Unidata data loggers, you need to use a minimum of four wires: TxD, RxD, GND, and RTS. If you are not using the default baud rate, you may need to use some other pins to set the required baud rate. See your data logger hardware manual for more information.

Following are some sample cable connections:

Computer DB25 to Data Logger DB25: 2 to 2, 3 to 3, 4 to 4, and 7 to 7.

Computer/Workabout DB9 to Data Logger DB25: 3 to 2, 2 to 3, 7 to 4, and 5 to 7.

Psion DB25 to Data Logger DB25: 3 to 2, 2 to 3, 6 to 4, and 7 to 7.

Configuration

Having all the pins connected properly will still not ensure your two devices will talk to each other!

To ensure all the bits are sent and received in an orderly fashion they must be sent at a speed agreed to by both devices. This speed is called the *baud rate* and represents the number of bits transmitted/received each second. If the two devices use different baud rates, they will not be able to communicate. Just about any agreed value is possible for a baud rate, but Unidata data loggers only support the following values:

300, 1200, 2400, 4800, 9600, 19200 and 38400. They also support a baud rate of 76800, but this is not supported by computers and can be ignored. The usual baud rate used by Unidata data loggers is 9600.

The two devices also have to agree on the number of data bits to use, the number of stop bits to use, and the type of parity. Again, unless these are the same for both devices, communication will not be able to take place. Possible data bit values are: 5, 6, 7, and 8. Possible stop bit values are 1, 1½, and 2. Possible parity values are: None, Even, Odd, Mark, and Space. All Unidata data loggers ship with a configuration of 8 data bits, 1 stop bit, and no parity. It is almost unheard of for a data logger to have a different configuration. Some data loggers do not even allow these settings to be altered! An incorrect configuration of these settings should only be considered after all other options have been exhausted.

How to troubleshoot

To get serial communications working, first determine the things you do know. For example, you might already know which serial port connector on your computer is the correct one to use. In that case, only the wiring (cable) and/or configuration could be causing problems.

Often it is easy to eliminate some of the more obvious areas of trouble. If you can configure the software at both ends of the serial communications to the exact same settings, then all that remains is the connector and/or the wiring (cable). For example, it is safe to assume that all data loggers will be using 8 data bits, 1 stop bit and no parity. In fact, the PsiLog and Unidata Starlog software packages will always use these settings and not allow you to use any other! That leaves the baud rate as the only configuration variable.

Finding the connector

The data logger is easy – it has just the one connector. Your computer, however, probably has several connectors. Look for the 25 and 9 pin connectors with the pins visible, and not the ones with the holes.

All computers support more than one serial port. To distinguish between them they are called different names. The first port is called COM1 the second COM2 and so on. Unless your port connectors are labelled, it is quite difficult to determine which serial port connector is which.

If you have a data logger, you can connect it using a serial cable suitable for connecting a modem to your computer. Make sure the data logger is awake and scanning. Run the Starlog software, go into the test display and open a Communications Window. If the data logger is connected to the same port the software is using, then some serial data will appear on the screen every time the data logger scans. The serial data can look different depending on the baud rate, but it will look the same each time and

appear at regular intervals. If you happen to have the correct baud rate, it will look like an asterisk (*). If nothing appears on the screen, select a different port and try again. If you have different port connectors, change to a different connector, then try all the ports in the software again. See also *Checking that your data logger is communicating* on page 82.

You could also use a special device called a *breakout box* or *mini-tester*. These devices connect LEDs (lights) to the various communications signals. By connecting one of these devices to a serial port and using a communications program to select each COM port in turn, you'll be able to tell which COM port is named what by seeing when the lights change.

The Psion Workabout computer can vary from model to model, but most likely the serial port on the top right is the correct one. It will be called TTY:A. If you are unsure, consult the manual that came with your Psion. It must have an RS-232 level serial port. Serial ports using TTL levels are not suitable for communicating with either data loggers or your PC.

Wiring (Cable)

Troubleshooting the wiring is not possible without a multimeter or a continuity tester. With these devices you can check that the pins on either end of the cable are correctly connected together. Each pin or socket on each connector has a tiny number next to it. Use these numbers and the description under *How serial communications works* on page 88 to check your cables.

If you don't have any testing equipment, then the only thing is to try a different cable. If you have an external modem it might have come with a serial cable of its own – try that one. Sometimes computer mice come with a small adapter – using that could help. See *Serial connections* on page 9 for descriptions and photos of cables suitable for Workabout computers.

Configuration

The configuration requirements for communicating with data loggers are quite simple: 8 data bits, 1 stop bit, and no parity. The serial link between your Psion and your PC is the same.

The only variable configuration item is the baud rate. This must be set to exactly the same value for both ends of the communication. A typical baud rate for a data logger is 9600.

If everything fails

If all else fails, perhaps you should check for something simple, like a flat battery in the data logger!

Running PsiLog

Background

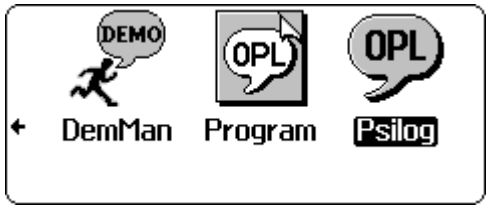
This section assumes you have installed PsiLog by following the instructions under *Installing PsiLog* on page 14.

The rest of this section describes the problems you might encounter when running PsiLog.

Required files

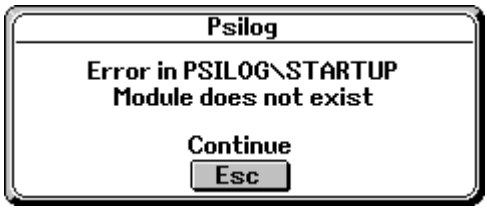
PsiLog requires at minimum three files: a startup program file, the application program file and a resource file.

The startup file is called `PSILOG.OPO` and is stored in a directory called `\OPO` on any local disk (`Internal`, `A`, or `B`) on your Psion. It exists to let you start PsiLog via the "Run OPL" icon of the System screen:



If you have configured PsiLog to autostart (see *User interface preferences* on page 39), then simply pressing `Enter` at the Workabout startup screen will start PsiLog:

The application program file is always called PSILOG.OPA and must be in a directory called \APP on any local disk (Internal, A, or B) on your Psion. If you have somehow deleted PSILOG.OPA, but PsiLog is still listed under the "Run OPL" icon on the System screen, you will get the following when you try to run PsiLog:



You must reinstall PsiLog. Follow the instructions under *Installing PsiLog* on page 14. Reinstallation of PsiLog will not affect any existing unload files, scheme files, or PsiLog settings.

The resource file can have a variety of names: either PSILOG.RSC or PSILOG.~xx where xx is a two-digit number representing a country code. The standard PsiLog program distributed by SCSS comes with PSILOG.~20. In all cases, the resource file is always stored in a directory called \APP\PSILOG on a local disk (Internal, A, or B) on your Psion.

If PsiLog cannot find a suitable resource file, you will get the following when you try to run PsiLog:

You must reinstall PsiLog. Follow the instructions under *Installing PsiLog* on page 14.

Required memory

After PsiLog has been installed, PsiLog requires more memory to run. The following table lists some example PsiLog functions and the memory they require. It does not include any disk space some of these functions may also require, such as storage for formula files:

Function	Memory Required
Startup	46K
Formulas	6K
Viewing online help	4K
Viewing logger test display	6K

The Startup figure given above includes a default 8K cache and 8½K communications buffer. The memory used by these is set via preferences. See *User interface preferences* on page 39 and *Communications preferences* on page 41.

If PsiLog does run out of memory, you will probably see the following:

PsiLog may not even have enough memory to handle your keypresses – not even to exit or adjust your preferences! If this is the case, you will have no option but to force PsiLog to exit. Press `Ctrl-Shift-Psion-K`. PsiLog will immediately exit. Any changes you made to preferences since you started PsiLog may be lost. All your unloaded data will be safe, except for data you might have been in the process of unloading when you forced PsiLog to exit.

If you get this message immediately you start PsiLog, one or more of the following three possibilities will cause it:

1. You are running other programs that have taken up a lot of memory. Exit some of them to free up memory.
2. You have a lot of data stored on the `Internal` disk on your Psion. Either move some of the data to a SSD, transfer some to your PC, or delete some. See *Unnecessary PsiLog files* below.
3. The PsiLog cache and communications buffer settings are too big. See *Resetting PsiLog preferences* below.

Unnecessary PsiLog files

If you are running short of disk space or memory, you can safely delete some files used by PsiLog. Refer to the table below:

Name	Directory (on any local disk: Internal, A or B)	Consequence
PDLOUT.FOR PDLOUT.TXT	\APP\PSILOG	Formulas not available – some test display screens may not load
PDLFTU.DB *.FTU	\APP\PSILOG	Logger test display function will not work
PDLMODEM.DAT	\APP\PSILOG	Setup modem function will not work
Schemename.CDT, .CFG, .ENT, .FTU, .INI, .KBD, .LDR	\STARLOG (default – see *Scheme preferences* on page 42)	Scheme not available to program logger. Scheme test display not available for loggers programmed with the scheme. Data viewer not available for scheme.
Schemename.U??	\STARLOG (default – see *Scheme preferences* on page 42)	Unload data not available to transfer to PC or for viewing. *Deleting unload files is only recommended as a last resort.*
Schemename.IUP	\STARLOG (default – see *Scheme preferences* on page 42)	First incremental unload of a scheme will be a full unload. Scheme incremental unload pointers not available for synchronisation with PC.

You can safely delete these files, but be sure you understand the consequences. To restore the files that were stored in the \APP\PSILOG directory, follow the instructions under *Optional Starlog files* on page 30. To restore the scheme files, follow the instructions under *Transferring schemes from your PC* on page 48. To restore unload files, you will have to unload the data logger again.

See *Deleting a scheme* on page 51 and *Deleting unloads* on page 56 for details on deleting scheme files and unload files.

Resetting PsiLog preferences

The only way to reset PsiLog preferences is to delete the PSILOG.INI file in the \OPD directory. The directory is most likely on the Internal disk, but could also be on the other local disks A or B.

The next time you start PsiLog after deleting PSILOG.INI, PsiLog will create a new PSILOG.INI file with all the settings reset to their defaults.

Glossary

Baud rate – Technically, the number of times per second a signal can change state. Often used interchangeably with **bit rate**. However, modern **modems** are able to send multiple bits per signal change and hence their bit rates are higher than their baud rates.

Bit – A single binary digit, represented as a zero (0) or a one (1).

Bit rate – The number of bits transmitted or received per second.

Byte – A group of eight **bits**.

Circular buffer – A buffer that the logger will store data in that allows the oldest data to be overwritten by newer data when it fills up. Compare **linear buffer**.

Data logger – Device that records data for later retrieval. The units manufactured by Unidata include the ability to measure the data they record.

Flash – A type of memory that does not need to be powered to retain its stored information. Often, data can be stored for up to ten years without loss. Once written, however, the data cannot be erased without erasing the entire device.

FTU – Field Test Unit. Originally, a handheld computer that performed a function similar to PsiLog and the Workabout. Now refers to the Test Display function of the Starlog and PsiLog software packages.

KB – Kilobyte. 1024 **bytes**.

Kill – Tell the data logger to stop communicating for the rest of this scan. Does not affect the scheme or the data being logged.

LED – Light Emitting Diode. A small and power efficient light used by data loggers and other electronic devices. Often coloured red or green, but yellow, blue and white are also possible.

Level converter – A device that can translate between two devices that use different electrical signal levels and would otherwise be unable to communicate.

Linear buffer – A buffer that the logger will store data in until it is full, thereafter refusing to log more data. Compare **circular buffer**.

Log interval – The time between successive logs.

MB – Megabyte. 1048576 **bytes**.

Modem – Modulator-Demodulator. A device that connects digital computers to the analogue telephone network.

PC – Personal Computer. Usually the main computer you would use. It would typically run such programs as Windows and Starlog software.

PDL – Portable Data Logger. The original data logger manufactured by Unidata Australia.

Port – A plug or socket that allows cables to be connected to the computer.

Prompt – A special character (an asterisk '*') sent by the data logger whenever it is ready to communicate. This is usually, but not always, whenever the logger powers up to record its inputs.

RAM – Random Access Memory. A type of memory that must be constantly powered or else it forgets everything stored inside it. In environments where the power supply is not guaranteed, this memory will often have a backup battery to keep it powered in case its main power supply fails.

RS-232 Level – RS-232 level signals represent the binary digits 0 as +3…+12v and 1 as –12…-3v. See also **TTL Level**.

Scan – When a data logger powers up to measure its inputs. Each scan is generally of brief duration, usually less than 50ms. The scan is also typically when a data logger is able to communicate with a computer. When a computer is connected, the logger can wait for up to 1second to allow the communications link to be established.

Scan interval / rate – A reference to the frequency with which a data logger powers up to perform a **scan**.

Scheme – A program that tells Unidata data loggers what to record and when.

Serial – In terms of communications, the method by which binary digits are sent one at a time. The sending more than one bit at a time is called *parallel*. Also used to associate other devices with this type of communication, hence *serial cable* and *serial port*. In general, ten bits need to be transmitted for every eight bits (one byte) of data.

Sleep – A special low power mode where the data logger is not expending power scanning its inputs or trying to communicate.

SSD – Solid State Disk. A type of removable storage used by Psions. SSDs are small cartridges containing electronic circuits that are used to store large amounts of data. They come in two types: **RAM** and **Flash**.

TTL Level - Transistor-Transistor Logic. TTL level signals represent the binary digits 0 as 0v and 1 as 5v. See also **RS-232 Level**.

UDI - Ultrasonic Doppler Instrument. Another name for the Starflow data logger.

Unload - To read recorded information out of your data logger.

Index

K

L

M

N

S

T