4 Using the SQ 1600 logger

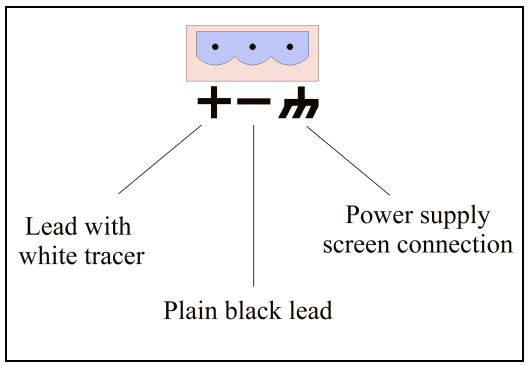
This section describes how to use the Squirrel SQ 1600 data logger. Topics covered are:

- connecting a power supply
- installing a battery pack
- installing a PC card option
- using the SQ 1600 controls
- checking logger operation
- connecting the SQ 1600 to a PC.

Connecting a power supply

You can power the Squirrel SQ 1600 using any supply delivering 8 to 28 V (with maximum ripple 100 mV) capable of supplying a continuous load current of 750 mA. If your logger is fitted with a rechargeable battery pack, your power supply should deliver at least 16.5 V dc when connected to the logger.

The power supply is connected to the power connector at the right-hand end of the top connector row on the SQ 1600 back plate. The supply must be connected to the + and - terminals on the connector:



If you are using a proprietary power supply (not the one supplied with the SQ 1600), connect the screen connection as shown. This is not necessary for the unit supplied with the logger.

Installing a battery pack

Two different types of battery pack can be used with the SQ 1600:

- a manganese alkaline pack, part number SQ16A500
- a lead acid pack, part number SQ16A600.

When discharged, you must replace batteries in a manganese alkaline pack; lead acid packs incorporate a charger which is supplied from the external power connection.

To install a battery pack into the SQ 1600:

1. Unscrew and remove the two screws securing the cover of the SQ 1600. Retain the screws.
2. Disconnect the keyboard and display cables from connectors PL1 and PL2 on the digital printed circuit board within the SQ 1600.
3. Remove and store the cover.
4. Unscrew and remove the two screws securing the back plate of the SQ 1600. Retain the screws.
5. Undo the quarter turn fastener securing the cover of the battery pack and remove the battery pack cover.
6. Plug the battery pack connector into PL6 (the white, 8-way connector) on the digital printed circuit board.

7. Attach the battery pack using the screws removed in step 4.
8. Replace the battery pack cover and secure with the quarter turn fastener.
9. Reconnect the keyboard and display cables to connectors PL1 and PL2 on the digital printed circuit board, ensuring that the keyboard connector is not reversed.
10. Replace the SQ 1600 cover and secure using the two screws that were removed in step 1.

Note If only the **Enter** button on the SQ 1600 works, the keyboard connector is reversed. You must disconnect the connector then reconnect it the other way round.

Installing a PC card option

You can fit PC cards to extend the functionality of the SQ 1600. To fit Grant part no. SQ16A200, providing the logger with a PC card socket containing slots for two PC cards:

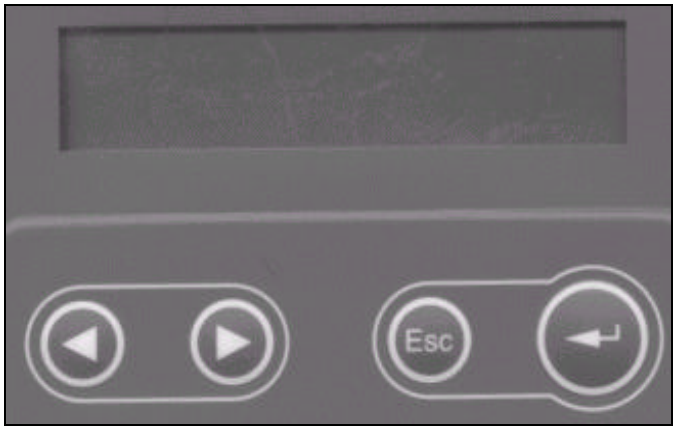
1. Unscrew and remove the two screws securing the cover of the SQ 1600. Retain the screws.
2. Disconnect the keyboard and display cables from connectors PL1 and PL2 on the digital printed circuit board within the SQ 1600.
3. Remove and store the cover.
4. If a battery pack is fitted, disconnect the battery pack cable from PL6 on the digital printed circuit board.
5. Using a pair of pliers, squeeze the barbs of the plastic rivets securing the blanking plate on the rear panel of the SQ 1600. Gently press the rivets out of the rear panel to remove the blanking plate. Save the blanking plate for future use.
6. Connect the PC card socket cable to PL5 on the digital printed circuit board.
7. Position the PC card socket so that the slots are correctly located within the back plate, and secure using the two fixing screws.
8. Fit and tighten the third securing screw through the side panel of the SQ 1600.
9. Reconnect the keyboard and display cables to connectors PL1 and PL2 on the digital printed circuit board, ensuring that the keyboard connector is not reversed.
10. Replace the SQ 1600 cover and secure using the two screws that were removed in step 1.

Note If only the **Enter** button on the SQ 1600 works, the keyboard connector is reversed. You must disconnect the connector then reconnect it the other way round.

There is also an option which allows you to use a PC card reader in your PC such that runs can be transferred directly from PC cards into Setwise. This requires software supplied by Grant (part no SQ16A201) which includes the required instructions.

Using the SQ 1600 controls

You can control the SQ 1600 using the display and buttons on its top cover:



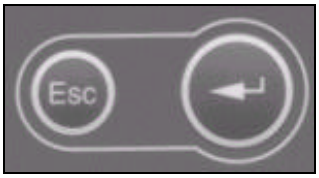
The display is a 20 character, two-line LCD. During normal operation the display will be blank and unlit to conserve power. Whenever a button is pressed a menu or message will be displayed and the backlight will operate for ten seconds.

There are two pairs of buttons, one pair to move the cursor within a screen and one to navigate through screens.

To move the cursor, use the two arrow buttons:

Clicking these buttons will select either the previous or the next option within the screen currently shown on the SQ 1600 display.

To navigate through screens use the **Esc** and **Enter** buttons:



The **Esc** button will close the current screen and move to the previous screen within the hierarchy. Pressing this button repeatedly will display the **Home** screen. The **Enter** button will select the currently highlighted option on the screen.

SQ 1600 screens

You can access SQ 1600 functions from the **Home** screen, which contains a number of options:

- Meter
- Log
- Alarms
- Status
- Config
- Off.

Meter

Selecting this option will show any currently operating sensors and their readings. If you hold the **Enter** button, the sensors will be shown in sequence. When you release the **Enter** button, the displayed sensor will remain selected.

Log

This option allows you to start, pause or stop a logging run. The current status is shown in the bottom right-hand corner of the display, with the available options on the top row.

Alarms

This option shows the current status of any alarms that have been set up. If you hold the **Enter** button, the alarms will be shown in sequence. When you release the **Enter** button, the displayed alarm will remain selected.

Status

This option allows you to view operational status details for the logger. A further screen is displayed in which you can select:

- **Logger Text**, which displays the text defined for the logger during setup
- **Run Text**, which displays the text defined for the current run during setup
- **Memory**, which shows the memory used for the current run (Internal or either of the two optional PC cards)
- **Supply**, which displays a menu allowing you to select **Backup**, **Internal** or **External**; selecting an option shows the voltage level of the selected supply
- **Runs**, which shows a list of current runs; selecting a run shows its run text, and holding the **Enter** button will delete the run from the logger
- **Copy**, which allows runs to be copied but is only displayed if logging is not in progress, the PC card option is fitted and there is a card present in at least one of the slots; the source and destination of the copy are determined automatically from the presence or absence of cards in the two PC card slots: if card 1 (upper slot) is inserted it will be the source of any copy; if card 2 (lower slot) is inserted it will be the destination of any copy; in this way it is possible to do all varieties of copy; hold the **Enter** button to copy the run selected by use of the arrow buttons
- **Version**, which displays a menu allowing you to select **Digital** or **Analogue**; selecting an option displays for **Digital** the logger model and firmware version information, and for **Analogue** the date and time of calibration and firmware version information.

Config

This option allows you to view configuration details for the SQ 1600. This will display a screen containing the following options:

- **Time**, which shows the current date and time for the logger
- **Memory**, which allows you to specify the memory to be used for logging; the current selection is shown in the bottom right hand corner
- **Language**, which allows you to change the language used for logger displays to German, French, Italian or Spanish; the default language is English
- **Battery**, which allows you to specify the type of battery used (Alkaline or Lead-Acid); the current selection is shown in the bottom right-hand corner; you can select a type using the arrow buttons and then hold the **Enter** button; note that the logger is able to determine the type of battery fitted automatically hence this function should only be used to change the type if you are certain that the automatic selection is incorrect
- **Setup**, which allows you to select one of five setup configurations for the logger; highlighting a setup will show its logger text (the message **Invalid Setup** will be displayed if the setup has not been configured); make your selection using the arrow buttons then hold the **Enter** button to load the setup.

Off

This will turn the SQ 1600 off. You can then restart the logger by clicking any of the buttons or starting communication using *Setwise for Windows* via a serial connection.

Checking logger operation

The SQ 1600 data logger is supplied with an integral setup program that allows you to confirm that it is operating correctly. To perform this check:

1. Plug the K-type thermocouple wire plug supplied with the SQ 1600 into input A of the SQ 1600.
2. From the SQ 1600 **Home** screen, select the **Config** option to display the **Configuration** menu.
3. From the **Configuration** menu, select **Setup** to display the **Load Setup** screen:

4. Position the cursor over the number 1 then press and hold the **Enter** button as the preset program loads.
5. When the message **Finished Loading** is displayed, release the **Enter** button.
6. Press the **Esc** button twice to display the **Home** screen, and select **Meter**. The display will show channel 1 and should indicate a value of approximately room temperature.
7. Hold the end of the end of the thermocouple wire between your fingers. The indicated temperature will increase if the SQ 1600 is functioning correctly.

Connecting the SQ 1600 to a PC

You can connect the SQ 1600 to your PC using a standard serial communications lead. A suitable lead can be supplied by Grant (part number LC71). The lead connects the **RS232** socket on the SQ 1600 back plate to a serial port on your computer (this will be the port configured for *Setwise for Windows*).