

Squirrel Data Logger

2020/2040 SERIES

Getting Started

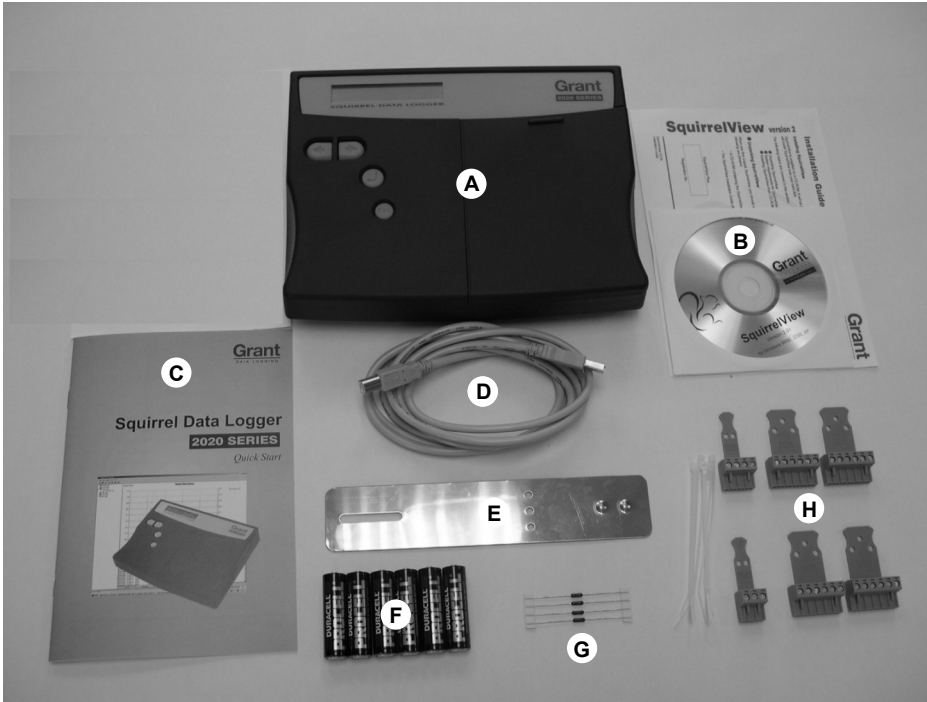


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After reading this document, please refer to the Help contents within SquirrelView (press F1) for further details on your logger and how to use it with the software.

1. Hardware Checklist



- A) SQ2020/2040 Logger
- B) CD containing software (SQA100)
- C) Getting Started manual (this booklet)
- D) USB Cable (LC77)
- E) Mounting bracket/stand for logger (WB6)
- F) Batteries, 6 x AA
- G) Current shunt resistors for 4 to 20mA inputs, 10R x 4 (CS202)
- H) Connectors: 6 way x 4 (18097), 4 way (13975), 3 way (14174), with cable ties

Note: 2040 Logger is supplied with 4 extra 6 way connectors as above (18097).

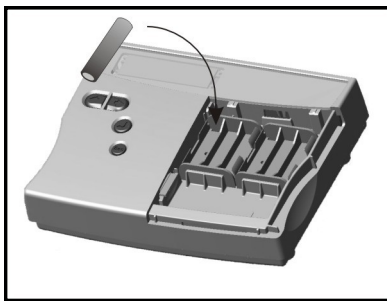
2. General Information

2.1 Installing the batteries

The 2020/2040 uses six AA size alkaline batteries located under the removable cover shown below. To insert new or change the existing batteries:

1. Open the battery cover by pushing down and sliding as shown.
2. Insert six AA* batteries, ensuring the correct polarity.
3. Refit the battery cover

* It is recommended that all replacement batteries are of the same manufacturer, type and condition.



2.2 Power indicator

Battery indicator



When logging please ensure that the batteries in the unit have sufficient capacity to complete the logging task. This can be checked via the battery indicator located in the top right of the display.



HIGH
CAPACITY



LOW
CAPACITY



External power indicator

The logger may be powered from an external source (10-18V DC)



Important: To ensure data protection in the case of an unexpected power loss, please ensure that batteries are fitted whilst the unit is operational.

3. Communicating with your Logger

3.1 Installing the Software

For detailed installation instructions please see the supplied 'Software Installation Guide' supplement. For quick installation please see the steps below;

1. Ensure you have administration rights on the PC you wish to install software on
2. Ensure any current Grant applications are closed
3. Insert the CD into the CD/DVD drive of your computer and wait for it to autorun*
4. Follow the on screen installation wizard

* If after a few minutes autorun has not occurred select the **Run** option from the Windows Start Menu. In the **Command Line** box, type **d:\setup** and press enter (where **d:** is your CD/DVD drive, modify if required)



Important: Please ensure the software is installed before connecting the Squirrel data logger.

3.2 Connecting your Squirrel Data Logger

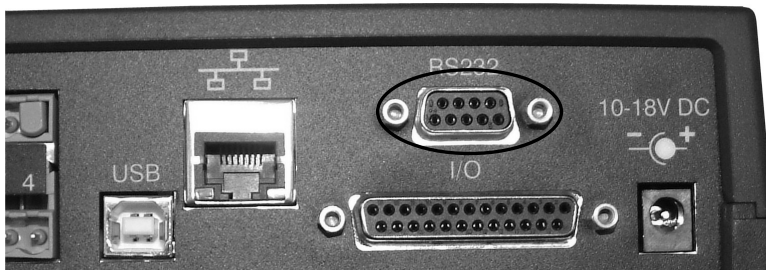
You can connect to your logger by using one of the following methods;

1. Serial (RS232), including serial adaptors
2. USB
3. Ethernet (where fitted)

Please see below for more information.

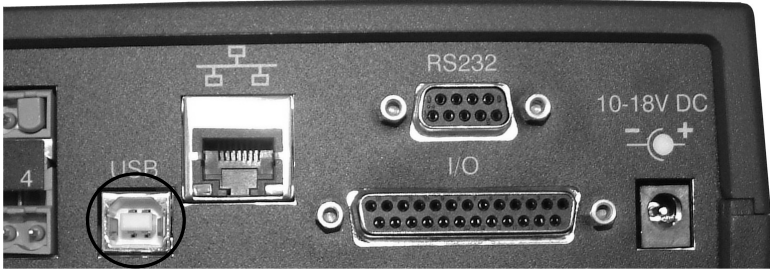
Serial (RS232)

For information on using serial adaptors please see the SquirrelView help file. If using a straight serial (RS232) cable, connect one end to the serial port on the logger and the other end to the PC's serial port. Once connected you are ready to begin communications.



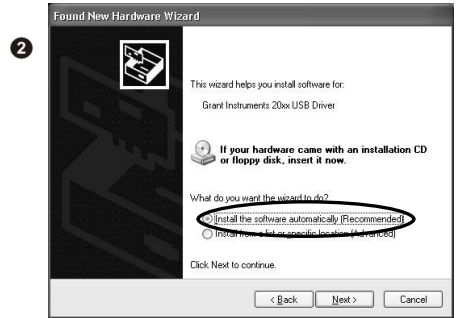
USB

Connect one end of the supplied USB lead to the USB port on the logger and the other end to a USB port on the PC.

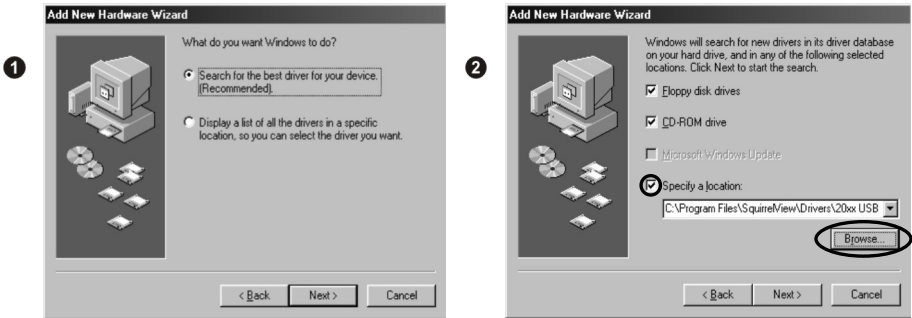


On detection of the logger the PC will launch the driver installation wizard.

Win 2000/XP - During the installation the USB drivers were pre-installed so the wizard will automatically locate the driver. On the 'Found New Hardware Wizard' select 'No, not this time' and for all the other screens select 'Next' to complete the installation.



Win 98SE - Select **Search for the best driver for your device (Recommended)**, Click **Next** and follow the instructions illustrated below.



Select **Continue Anyway** on the Hardware Installation warning which refers to Windows Logo testing. Once the driver installation has completed you are ready to communicate to your logger.

If you experience any problems refer to Troubleshooting->20xx USB Drivers in SquirrelView help.

Ethernet

Before using the Ethernet connection please read the configuration manual which can be found under '`~\SquirrelView\Manuals\SQ20xx Inbuilt Ethernet Configuration.pdf`' where '`~\SquirrelView`' is the installation directory of SquirrelView. Connect your Ethernet network to the Ethernet port on the logger.



Ethernet is only available when the logger is connected via an external power supply.

4. Quick Start Example

After installing SquirrelView an example setfile will be installed within the SquirrelView installation directory. The example file will log the internal temperature of the logger. In order to familiarise yourself with the logger the novice user may find this example Setup useful.

4.1 Startup SquirrelView and Select Logger Type

Click on the shortcut icon on your desktop to launch SquirrelView or select it from your start menu. When the SquirrelView Assistant is loaded, ensure the correct logger type and communication method is selected.

Logger type can be viewed from the SquirrelView assistant, if you need to make any changes select Logger Selection from the toolbar or run the Communication Wizard.

(Note: the default communication method is USB and you will need to change this via the Communication Wizard if you are using any of the other communication methods).

4.2 Synchronise Logger & PC

It is advisable to start by synchronising the Logger clock with the PC clock. See step 1 and 2 below:

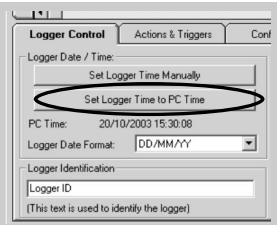
Synchronise clocks:

❶ From SquirrelView Assistant click on Logger Setup.



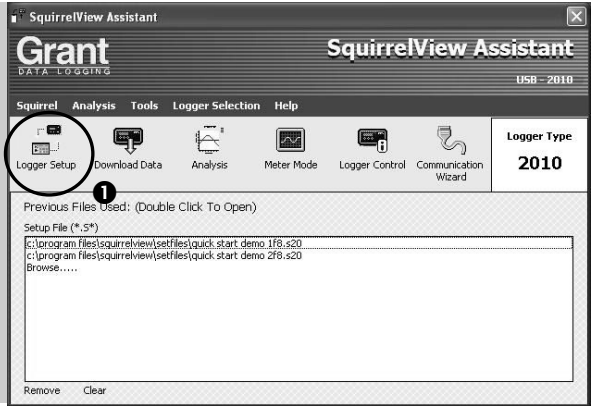
❷ From the Logger Setup screen select the Logger Control tab.

Click on Set Logger Time to PC Time, click OK on the confirmation screen.



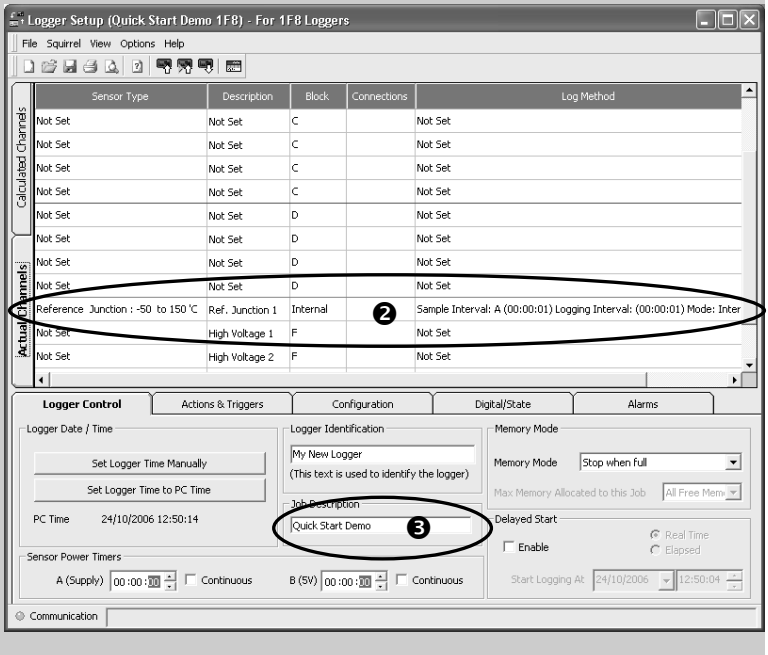
4.3 Running Quick Start Demo

1 In the SquirrelView Assistant click 'Logger Setup' to enter the Logger Setup screen. From here open the demo setfile using **File -> Open** and select the appropriate file for your logger type.



2 The Logger Setup screen is now visible, from here you will be able to set up your logging requirements.

Within the Actual Channels tab scroll down the Sensor Type column to Ref. Junction 1. This is the input you will be reading in this example.



3 The Job Description can be used to describe your setup.

4 Click to send setup to logger and start logging. Let the unit log for a few minutes.



5 Click for **Squirrel-View Assistant**.



6 Click if you wish to meter the input in Real Time.



7 Click on **Logger Control** icon to pause or stop the logging process.



8 In the **Logger Control** window you can view relevant information on the state of the logger. To stop logging click on the stop button.

The screenshot shows the 'Logger Control' window with the following data:

Logger Information	
Logger ID	Logger ID
Serial Number	KS0617012
Logger Type	ZF8
Logger State	Disarmed

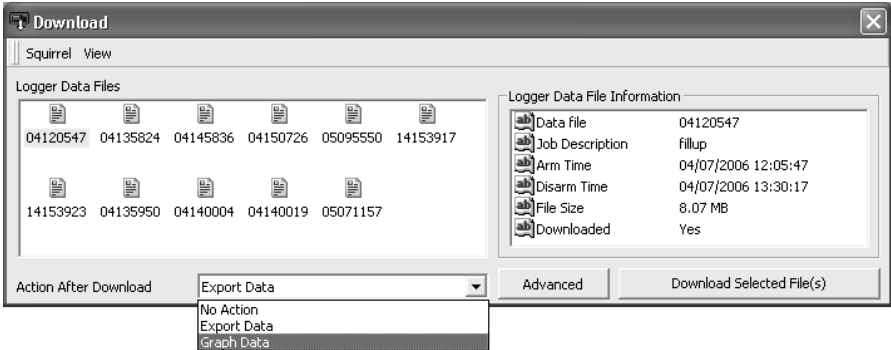
Memory	
Internal Memory Total	15616 KB
Internal Memory Used	14496 KB
Internal Memory Free	1120 KB

Date and Time	
Logger Time	23/10/2006 12:37:03
Status Last Updated	23/10/2006 14:38:49
PC Time	23/10/2006 14:38:49

Power Supply	
Internal Supply	0.0 V
External Supply	12.0 V

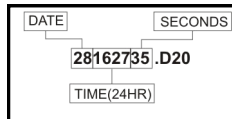
9 To Download the logger click on the 'Download Data' icon from the SquirrelView Assistant.





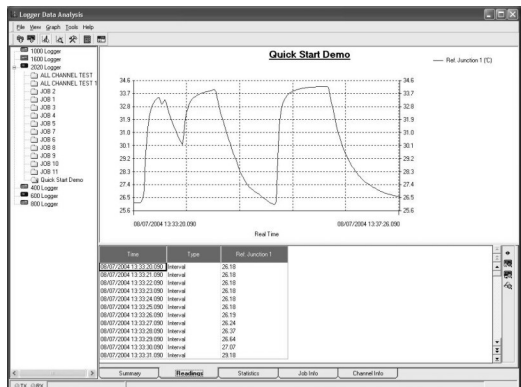
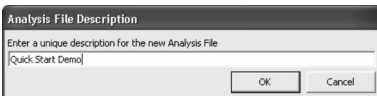
10 In this screen you can now download the Data File and invoke the Export Wizard or download the Data File via Analysis* (See page 10 for further information).

The data File is given a unique name (e.g. 28162735.D20). An explanation of the file name is shown on the right; this shows the date and start time



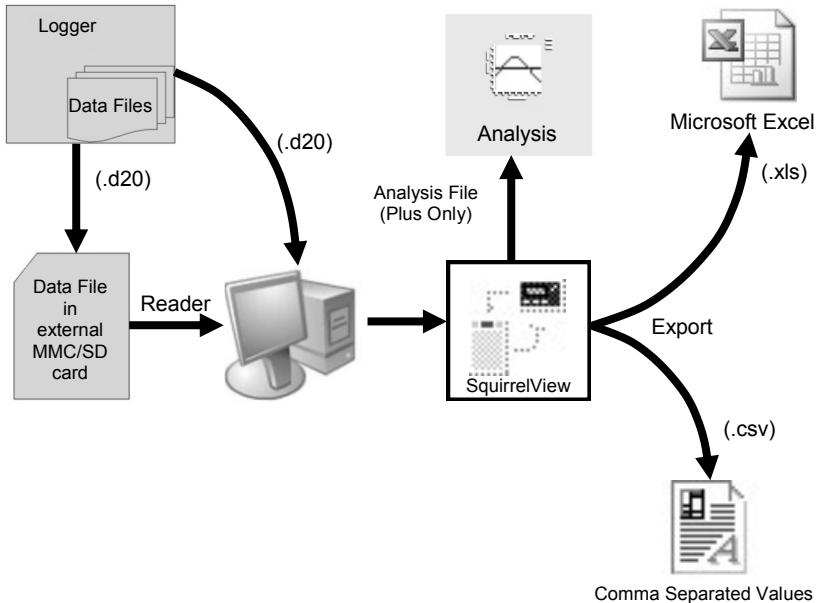
In this example you will download and view the Data in the Analysis* window. Start by selecting the Data File and Graph Data action, then click Download Selected File(s). You will be prompted to save the Data file, then the data will be converted for viewing.

11 Once the decoding has taken place the Analysis File Description window will be presented, click OK to view your Data.



*Available with SquirrelView Plus only.

5. Download Process Explained



The Diagram above shows the download process. Data in the logger is written to the internal memory and may be downloaded by SquirrelView.

Before the data can be viewed it must be converted by SquirrelView for Analysis or exported to .csv or .xls format depending on the PC software being used.

The conversion process can be performed in one of three ways within SquirrelView:

- from SquirrelView assistant->Analysis->Export Data File
- automatically when using the download Data button from SquirrelView*
- or from the Logger Data Analysis screen by selecting File->Import Data menu*

Once the file has been downloaded it can be double clicked to open it with the program specified under 'Tools', 'Preferences', 'File Association Action'.


*Available with SquirrelView Plus only.

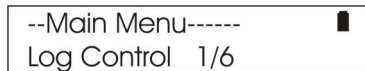
6. Menu and Navigation

6.1 Control Panel

The illustration below shows the navigation controls in more detail.



To use the 2020/2040 control panel press , the opening display will be shown (see right). The display timeout is preset to 10 seconds, however this can be changed by selecting the Configuration tab within the Logger Setup window of SquirrelView.



6.2 Control panel menu

Detailed below is a basic explanation of the top menu structure. For more information on the whole menu structure please refer to the Help->Help Content->Loggers within SquirrelView.

6.3.1 Log Control

In this menu you can Arm (activate) or Disarm (deactivate) the logger.



--Main Menu-----
Log Control 1/6

6.3.2 Meter

Here you can view each channel in Real Time (at 1-2Hz). Use the enter key to auto scroll through the channels.



--Main Menu-----
Meter 2/6

6.3.3 Status

The Status menu gives you access to information relating to the logger such as memory and power supply voltage. You can also override the alarm outputs in here.



--Main Menu-----
Status 3/6

6.3.4 Setup

This contains menus for setting up Language, Time & Date and the opportunity to store and recall Setups.



--Main Menu-----
Setup 4/6

6.3.5 Data Files

This menu allows you to copy data files to an external memory card (if fitted) and delete the data files held within the loggers memory.



--Main Menu-----
Data Files 5/6

6.3.6 Tools

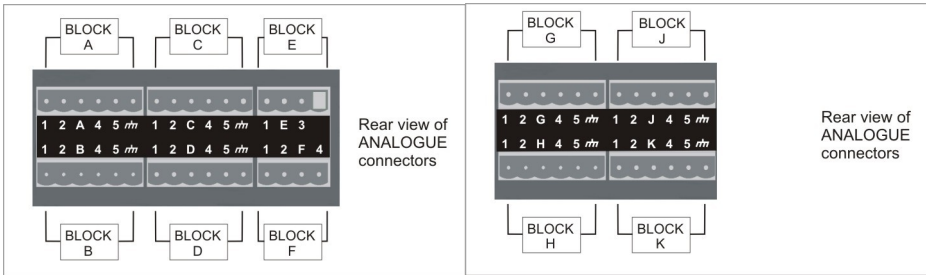
The Tools menu contains maintenance type functions such as querying the software version of the logger, performing a self test and resetting the logger.



--Main Menu-----
Tools 6/6

7. Connections

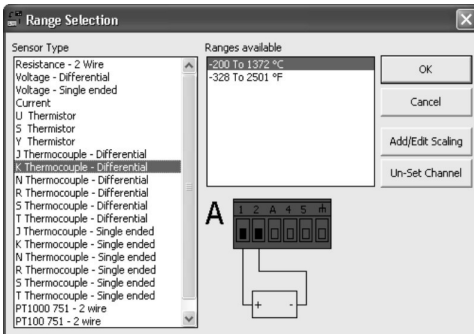
Analogue Inputs



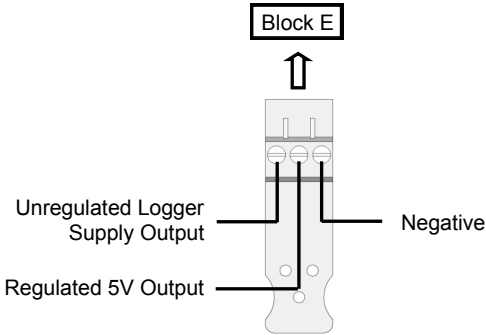
NOTE: Blocks G to K as shown above are only available on 2040 loggers.

As the wiring configuration is dependant upon the sensor type used, it is displayed in SquirrelView during the setup. Follow the wiring diagram to attach the required sensor. If you would like to print the diagrams in more detail or view at a later stage select 'File > Print from Logger Setup'.

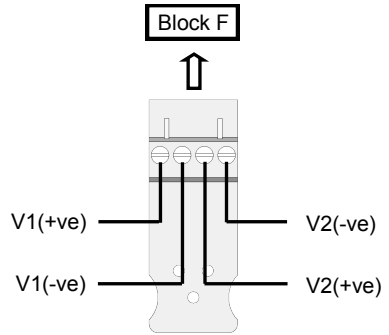
The example below shows the actual K type differential thermocouple sensor connected to the 20xx logger from the wiring diagram to the left.



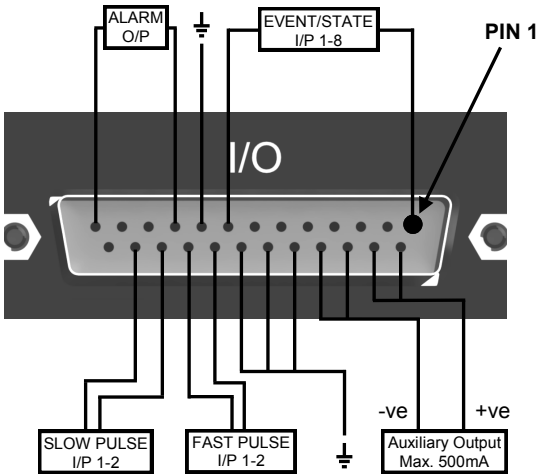
Sensor Power Wiring



High Voltage Input



I/O Socket Wiring



Pin	Connection
1	Event/State Input 1
2	Event/State Input 2
3	Event/State Input 3
4	Event/State Input 4
5	Event/State Input 5
6	Event/State Input 6
7	Event/State Input 7
8	Event/State Input 8
9	Ground
10	Alarm Output A
11	Alarm Output B
12	Alarm Output C
13	Alarm Output D
14	Auxiliary Output +ve
15	Auxiliary Output +ve
16	Auxiliary Output -ve
17	Auxiliary Output -ve
18	Ground
19	Ground
20	Ground
21	Fast Pulse Input 1
22	Fast Pulse Input 2
23	Slow Pulse Input 1
24	Slow Pulse Input 2
25	No Connection

External Memory Card Reader

The external MMC/SD card slot is located inside the battery compartment.



8. Accessories

Grant Instruments supply a wide range of accessories to compliment the range of Squirrel data loggers. These include GSM Modem and Ethernet convertors and wireless adapter as shown below, all of which allow you to contact any Squirrel data logger remotely or where no land line exists. All are very easy to install and connect directly to the logger via RS232. If you need any further details or wish to make a purchase please contact Grant or your local supplier for more details.



RS232 to Ethernet Converter consisting of adaptor box and modem setup Cable. Ethernet configuration software is suitable for Windows 2000 and XP only.

Part No:
SQ20A801

GSM Modem kit comprising of modem , Squirrel connection cable, power lead and antenna with 3m lead. A data-enabled SIM card will also be required from your network service provider.

SQ20A802

Wireless Adaptor comprising of an RS232 adaptor for connecting the logger to the PC at baud rates up to 115K2 with a range of up to 200 metres using the 2.4GHz frequency band. The kit is supplied with all connecting leads.

Note: power supplies (MPU 12V) to be ordered separately

SQ20A803

Removable external memory option	Part No:
Flash Memory Card.	MMC64
Software packages for set-up, transfer and data analysis:	
SquirrelView Plus	
Provides full data analysis, on-line graphing, meter to Excel and export to Excel	SQA200
SquirrelView Plus Multi-User License	
Unlimited use of SquirrelView within a single organisation.	SQA300
Calibration Certificates for Squirrel 2020/40 series (all ranges)	
Note: Test and Calibration Certificates from Grant Instruments are traceable to National Standards	
SQ2020	CAL2020
SQ2040	CAL2040
Weatherproof box	
Robust plastic weatherproof box	PEL4
Wall bracket	
Stainless steel wall and desk bracket	WB6
Power supplies	
100-240V AC 50/60Hz supplied with 3-single fit mains plugs for UK, Euro, and US	MPU 12V
As MPU 12V but supplied with 1m flying lead	MPU 12VFL
Rechargeable battery (12V, 6Ah)	SQ20RB12-6
Rechargeable battery (12V, 15Ah)	SQ20RB12-15
Digital I/O interface connector	
25 way D connector type sub miniature solder connection with cover for digital inputs, alarm and pulse inputs	SB102
Current Shunts	
Pack of 4 precision resistors for 4-20mA analogue channels	CS202
Cables for connecting data loggers to computers/modems.	
Squirrel to PC serial port	LC71
Squirrel to PC USB port	LC77
Squirrel to modem	LC73
12V DC power lead	
2.1mm DC connector and fused with 1.8M lead	LC76
Terminal Blocks	
Plug-in terminal blocks with cable restraint	
3-way	14174
4-way	13975
6-way	18097
Temperature and Humidity probes	
Grant offers a range of temperature and humidity probes suitable for use with its data loggers and other compatible measurement systems. Bespoke or specialist probes are also available. Please enquire if you have specialist probe needs.	

9. Specifications

ANALOGUE INPUTS

Basic accuracy (5-45°C): ± (0.05% readings + 0.025% range)
Common mode rejection: 100dB
Input impedance: > 1MOHM
Linearity: 0.0015%
Series mode line rejection: 50/60Hz 100dB

DIGITAL INPUTS

Zero input voltage 0 to 0.5V (or shorted input)
One input voltage 2.7 to 5V (or open circuit input)
Input protection will turn on below about -0.5V and above about 6V

ANALOGUE-DIGITAL CONVERSION

Type: Sigma-Delta
Resolution: 24bit
Sampling rate: Up to 20/100 readings per second
Note: 100Hz Mode not available on 1F8 models

ALARM OUTPUTS 4 x open drain FET (18V 0.1A Max)

SENSOR POWER SUPPLY Regulated 5 VDC (50mA) or supply voltage (100mA)

TIME AND DATE In built clock in 3 formats

SCALING DATA Displays readings in preferred engineering units

MEMORY

Internal: 16Mb (Up to 1,800,000 readings)
External: Up to 256Mb removable MMC/SD memory card

RESOLUTION Up to 6 significant digits

PROGRAMMING/LOGGER SET-UP SquirrelView or SquirrelView Plus software

COMMUNICATION USB 1.1 and 2.0 / RS232

External options: GSM, Ethernet and wireless

POWER SUPPLY

Internal: 6*x AA Alkaline batteries
External: 10-18VDC Reverse polarity and over-voltage protected



* Maximum operating temperature for supplied alkaline batteries is 50°C

POWER CONSUMPTION @ 9V

Sleep mode:<600µA
Logging:40 - 120mA

DIMENSIONS AND WEIGHT

2020 Logger

Dimensions:W235 x D175 x H55 mm
Weight:Approx 1.2kgs
Enclosure material:ABS

2040 Logger

Dimensions:W235 x D175 x H92 mm
Weight:Approx1.5kgs
Enclosure material:ABS

MEMORY MODES (internal only).....Stop when full or overwrite

DISPLAY AND KEYPAD

2 line x 20 character LCD

OPERATING ENVIRONMENT-30°C to +65°C

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

Due to our policy of continuous improvements, specifications may change without prior notice.

Grant believe that all information declared is correct at the time of issue. No liability is accepted for errors and omissions.

Declaration of Conformity

Manufacturer:-	GRANT INSTRUMENTS (CAMBRIDGE) LTD, Shepreth, Cambridgeshire SG8 6GB
Equipment Name/Type Number:-	2020/2040
Description of Equipment:-	Squirrel 2020/2040 Data Logger
Directives:-	EMC Directive 89/336/EEC
Including Accessories:-	MPU 12V Universal power supply LC71 RS232 serial lead LC77 USB lead

This product complies with the requirements of the above Directive(s) when used with sensor leads up to 3m long, compliance may be affected by using longer leads.

Applied Standards:-	EN 61326:1997(+A1/A2)
Harmonized Standards:-	Electrical Equipment for measurement, control and laboratory use - EMC requirements

USA

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

AUSTRALIA & NEW ZEALAND



ANC
006 134 863

This product complies with the requirements of the European EMC standards indicated above which meet the requirements for C-Tick marking.



Grant

**Grant Instruments
(Cambridge) Ltd**
Shepreth,
Cambridgeshire
SG8 6GB

Tel: +44 (0)1763 260811
www.grant.co.uk
acquisitionales@grant.co.uk
Fax: +44 (0)1763 262410