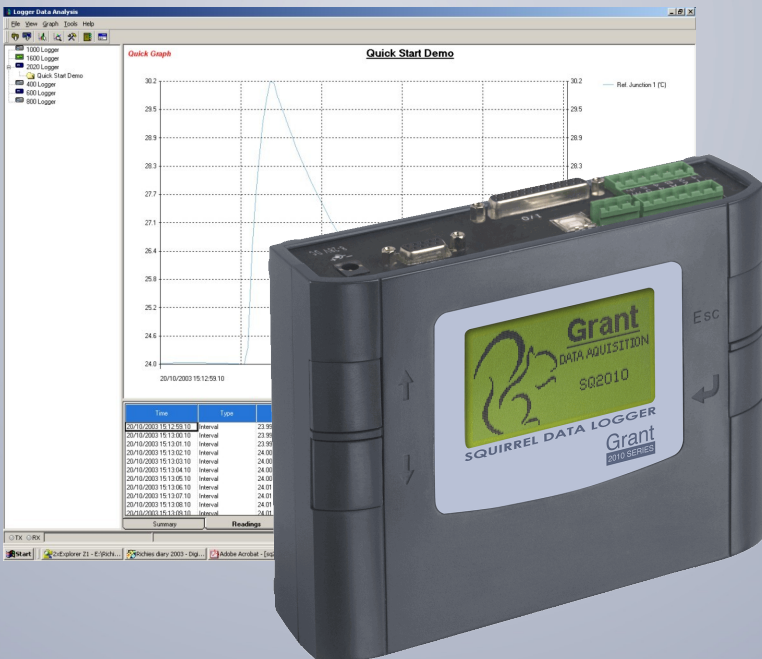


# Squirrel Data Logger

2010 SERIES

*Getting Started*



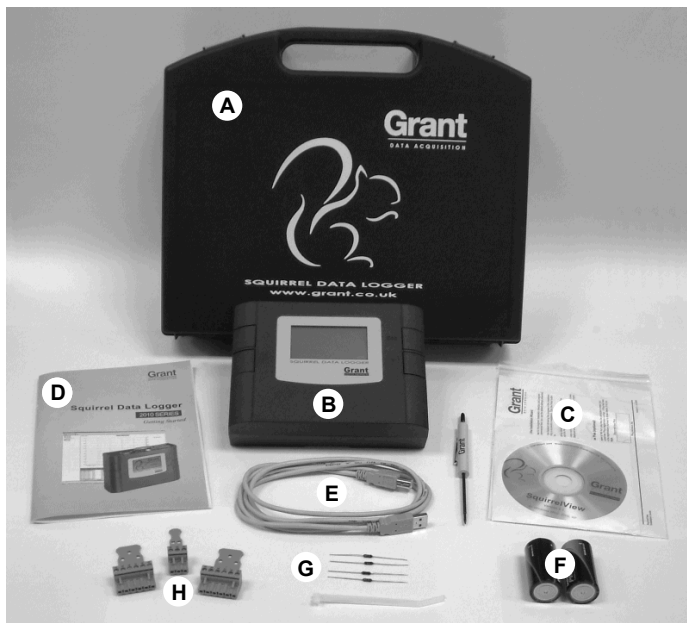
1. Hardware Checklist.....	3
2. General Information.....	4
3. Installing Software and USB Drivers.....	5
4. Quick Start Example.....	6
5. Download Process Explained.....	10
6. Menu and Navigation.....	11
7. Connections.....	15
8. Accessories.....	17
9. Specifications.....	19
10. Declaration of Conformity.....	21



After reading this guide 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

---



## SQ2010 Standard contents

- A) Carry case
- B) SQ2010 Logger
- C) CD containing software (SQA100)
- D) Getting Started manual (this booklet)
- E) USB Cable (LC77)
- F) Batteries, 2 x C
- G) Current shunt resistors for 4 to 20mA inputs, 10R x 4 (CS202)
- H) Connectors: 6 way x 2 (18097), 3 way x 1 (14174) with cable ties

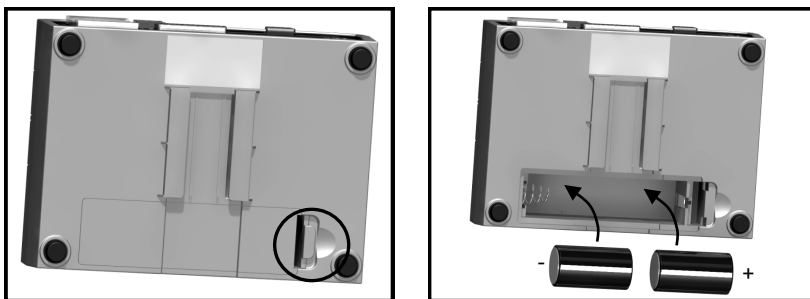
## 2. General Information

### 2.1 Installing the batteries

The 2010 uses two C size alkaline batteries located under the removable cover on the rear of the unit as shown below. To insert new or change the existing batteries:

1. Open the battery cover by releasing the clip (highlighted)
2. Insert 2 C\* 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 (8-28V DC or USB)



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

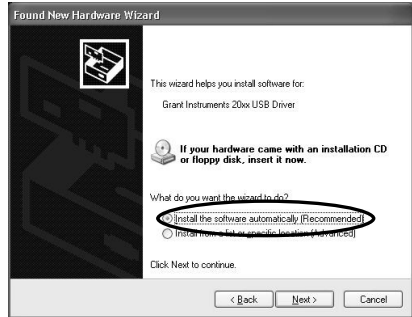
# 3. Installing Software and USB drivers



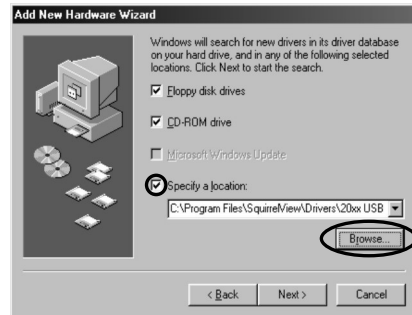
**Important: Please ensure the required software is installed before connecting the logger (refer to the Software Installation Guide)**

After installing the software connect the logger to the PC, on detection 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. If you experience any problems refer to Troubleshooting->20xx USB Drivers in SquirrelView help

# 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.

## 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:

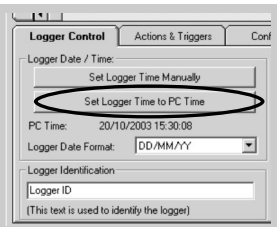
### Synchronise clocks:

❶ From SquirrelView Assistant click on Logger Setup.



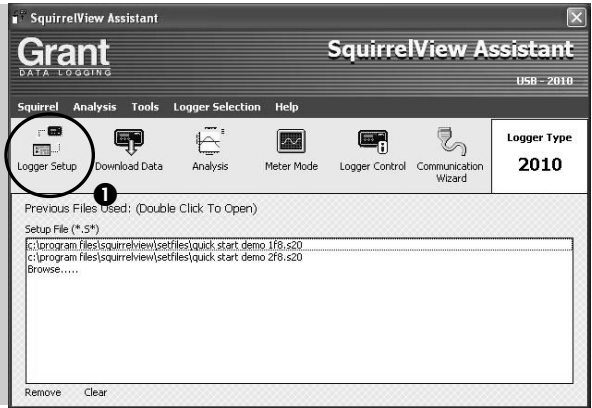
❷ From the Logger Setup screen select the Logger Control tab.

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



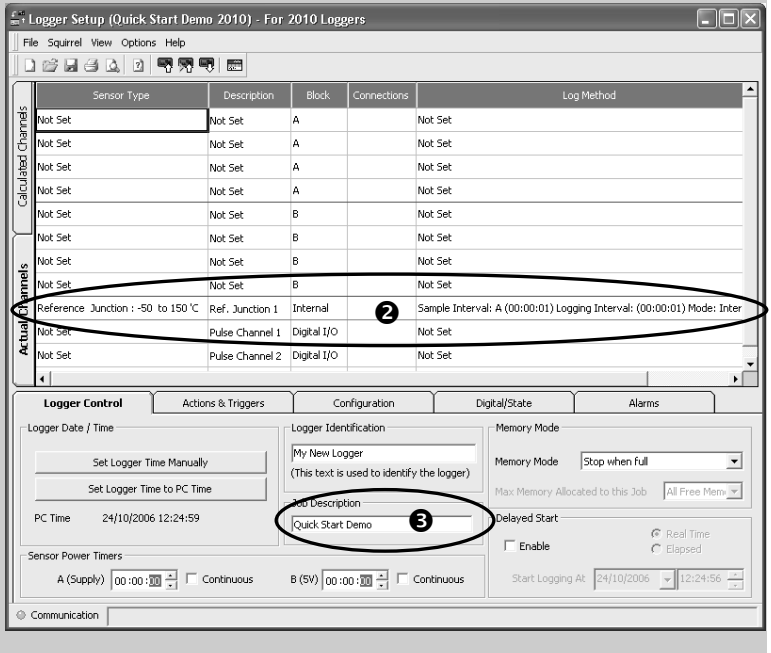
### 4.3 Running Quick Start Demo

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.

Logger Information	
Logger ID	Logger ID
Serial Number	KP0637004
Logger Type	2010
Logger State	Disarmed

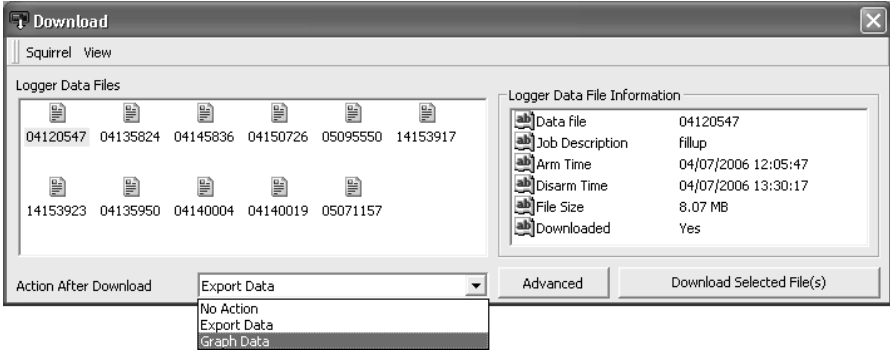
Memory	
Internal Memory Total	15616 KB
Internal Memory Used	384 KB
Internal Memory Free	15232 KB

Date and Time	
Logger Time	19/10/2006 08:48:33
Status Last Updated	19/10/2006 08:48:34
PC Time	19/10/2006 08:48:34

Power Supply	
Internal Supply	2.8 V
External Supply	0.0 V

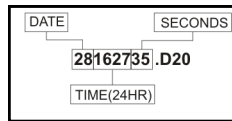
9 To Download the logger click on the 'Download Data' icon from the SquirrelView Assistant.





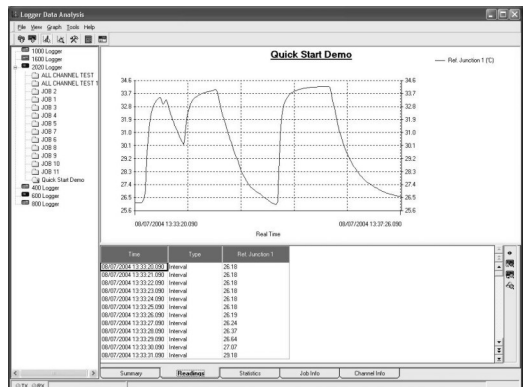
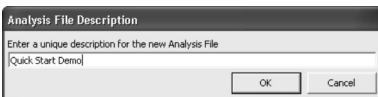
10 In this screen you can now download the Data File and invoke the Export Wizard or download the Data File via Analysis\* (See page 10 for further information).

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.

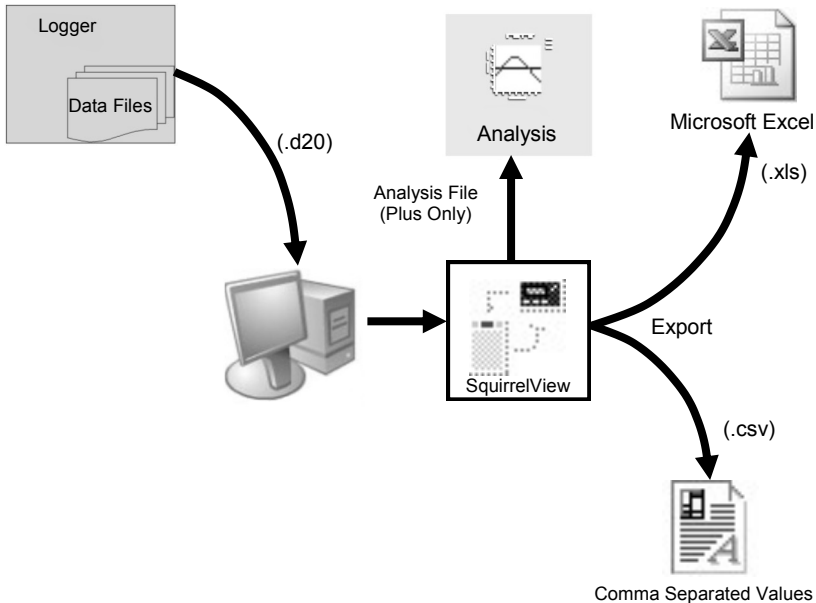
11 Once the decoding has taken place the Analysis File Description window will be presented, click OK to view your Data.



\*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\*

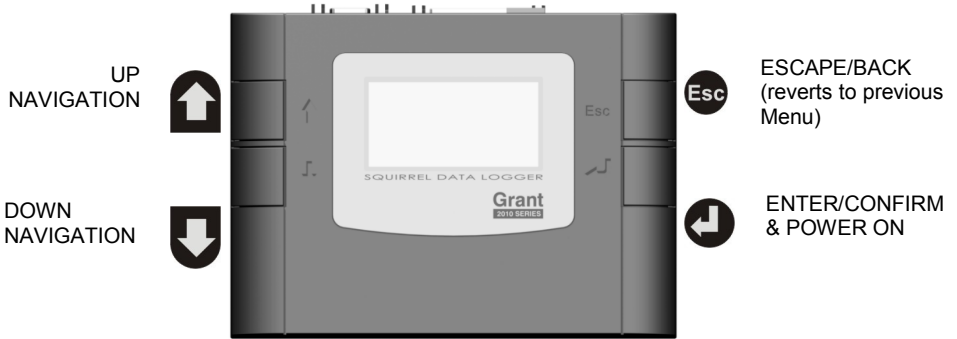
Once the file has been downloaded it can be double clicked to open it with the program specified under 'Tools', 'Preferences', 'File Association Action'.


\*Available with SquirrelView Plus only.

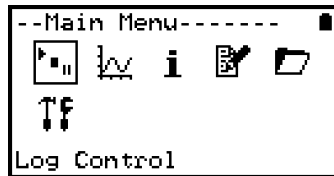
# 6. Menu and Navigation

## 6.1 Control Panel

The illustration below shows the navigation controls in more detail.



To use the 2010 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.

### 6.2.1 Log Control

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



### 6.2.2 Meter

Here you can view each channel in Real Time (at 1-2Hz). Use the enter key for a graphical view of a channel.



### 6.2.3 Status

The Status menu gives you access to information relating to the logger, such as available memory and the power supply voltage. It is also possible to override the alarm outputs from here.



### 6.2.4 Setup

This contains menus for setting the Language, Time, Date, basic Channel Setup, storing and recalling setups and Delayed start.

See 6.3 for more details on basic setup



### 6.2.5 Data Files

This menu allows you delete the data files held within the loggers memory.



### 6.2.6 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.



## 6.3 Creating a basic Setup

The 2010 allows for the creation of a basic channel setup including logging interval, sensor type and sensor power (excitation) if required via the graphical interface. A full setup including more advanced features can be performed using the SquirrelView software included. Below is a brief explanation of how to create a basic channel using the graphical interface

### 6.3.1 Channel Setup

From the 'Main Menu' choose the option 'Setup' then the option 'Channel Setup'.



```
--Setup-----
Sensor Power
Intervals
Channel Setup
Stored Setups
Delayed-Start
Date/Time
Configuration
```

### 6.3.2 Adding or Editing a Channel

Once in 'Channel Setup' you can clear all channels, add/edit a channel, view channel details or delete a channel. Select 'Add/Edit Channel'.



```
--Channel Setup---
Clear Channels
Add/Edit Channel
View Channel
Delete Channel
```

### 6.3.3 Adding a New Channel

The 'Add/Edit Channel' menu shows channels currently set as well as giving you the option to add others. Select 'Add Channel'



```
--Add/Edit-----
Add Channel
```

### 6.3.4 Channel Setup

Select the channel Sensor Type, Range and, if required, which Sensor Power (excitation) time is to be used .



```
--Channel Setup---
Sensor Type
Range
Sensor Power Timer
```

### 6.3.5 Viewing Channels Setup

Once you have finished adding your required channels and details the wiring configuration can be viewed using the 'View Channels' option.



```
--View Channel----
Thermo-Di1111
Ref Junction 1
```



```
--View Channel----
Sensor Power
Not Used
Block:A
1 2 3 4 5
┌──┴──┐
```

Note that Channel Descriptions are automatically assigned based upon the Sensor Type of the channel. This description can be modified using SquirrelView if required.

### 6.3.6 Interval Setup

A setup created from the control panel will assign all channels to the same logging interval. To change or view this interval choose 'Intervals' from the main 'Setup' menu.



```
--Intervals-----
Interval A
View All
```

### 6.3.6 Sensor Power Setup

The sensor power setup can be changed by going to 'Sensor Power' from within the main 'Setup' menu.



```
--Sensor Timer A--
Sen
Off
Continuous
Wiring
```



### Important Notes on Setup using the Control Panel

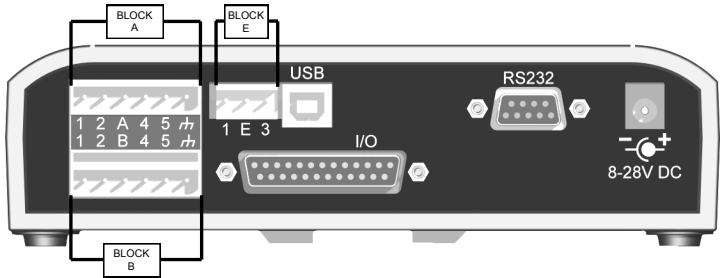
Full setup capabilities of the SQ2010 are provide using the SquirrelView software provide. When using the control panel a few important points should noted:-

- Whilst all channels are assigned to the same interval, Interval A, all intervals can be viewed in the case of a more complex setup from SquirrelView
- To avoid problems with wiring configuration, sensor types are not editable once set but their range and sensor power requirements can be. Delete a channel if you require to change its Sensor Type
- Calculated channels setup from SquirrelView will no be shown on the view channels option
- The reference junction can not be deleted while a sensor type that requires it for correct operation is set up, e.g. A thermocouple.
- You cannot change a setup whilst the logger is armed

# 7. Connections

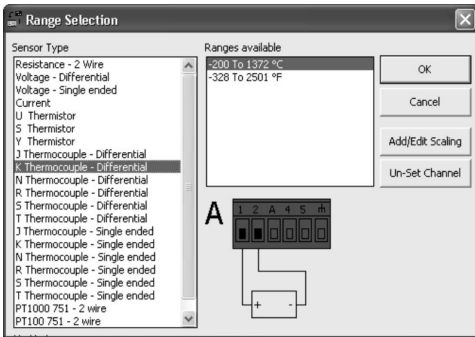
## Analogue Inputs

Rear view of ANALOGUE connectors

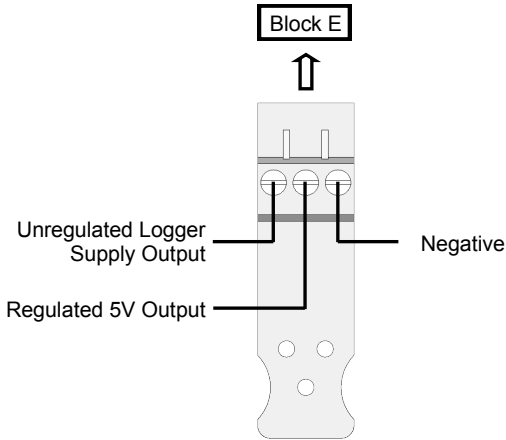


As the wiring configuration is dependant upon the sensor type used, it is displayed in SquirrelView during the setup. Follow the wiring diagram to attach the required sensor. If you would like to print the diagrams in more detail or view at a later stage select 'File > Print from Logger Setup'.

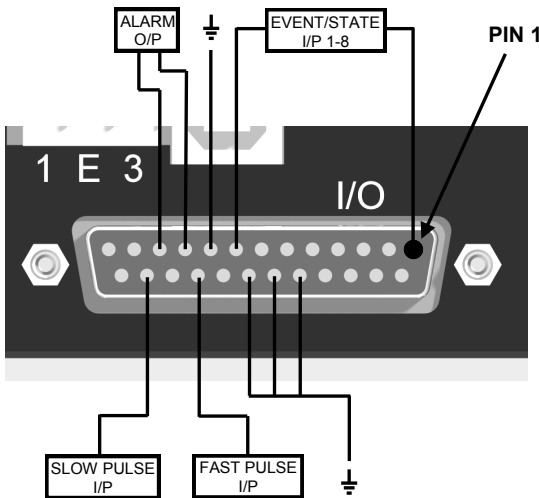
The example below shows the actual K type differential thermocouple sensor connected to the 20xx logger from the wiring diagram to the left.



## Sensor Power Wiring



## I/O Socket Wiring

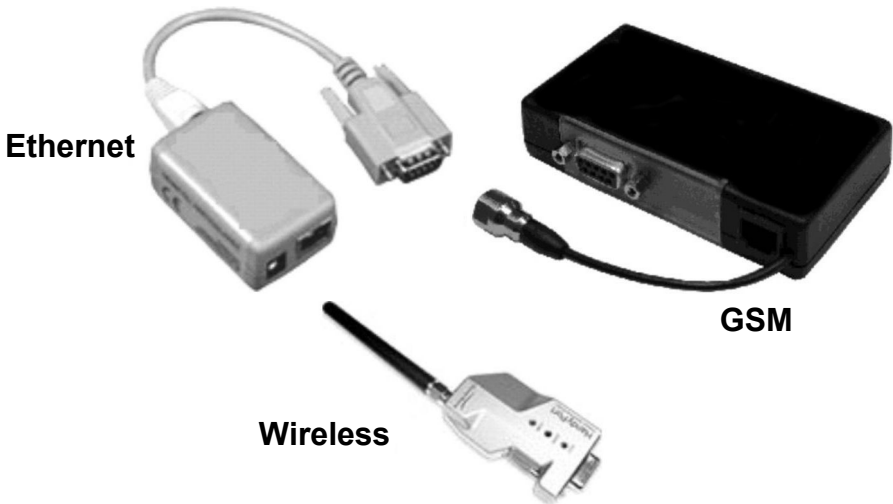


Pin	Connection
1	Event/State Input 1
2	Event/State Input 2
3	Event/State Input 3
4	Event/State Input 4
5	Event/State Input 5
6	Event/State Input 6
7	Event/State Input 7
8	Event/State Input 8
9	Ground
10	Alarm Output A
11	Alarm Output B
12	No Connection
13	No Connection
14	No Connection
15	No Connection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

## 8. Accessories

---

Grant Instruments supply a wide range of accessories to compliment the range of Squirrel data loggers. These include GSM Modem and Ethernet converters 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) need to be ordered separately

SQ20A803

	Part No:
<b>Software packages for set-up, transfer and data analysis:</b>	
<b>SquirrelView Plus</b>	
Provides full data analysis, on-line graphing, meter to Excel and export to Excel	SQA200
<b>SquirrelView Plus Multi-User License</b>	
Unlimited use of SquirrelView within a single organisation.	SQA300
<b>Calibration Certificates for Squirrel 2010 series (all ranges)</b>	
Note: Test and Calibration Certificates from Grant Instruments are traceable to National Standards	
SQ2010	CAL2010
<b>Weatherproof box</b>	
Robust plastic weatherproof box	PEL4
<b>Power supplies</b>	
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
<b>Current Shunts</b>	
Pack of 4 precision resistors for 4-20mA inputs	CS202
<b>Cables for connecting data loggers to computers/modems.</b>	
Squirrel to PC serial port	LC71
Squirrel to PC USB port	LC77
Squirrel to modem	LC73
<b>12V DC power lead</b>	
2.1mm DC connector and fused with 1.8M lead	LC76
<b>Terminal blocks</b>	
Plug-in terminal blocks with cable restraint	
3-way	14174
6-way	18097
<b>Temperature and Humidity probes</b>	
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): .....± (0.10% readings + 0.1% 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 10 readings per second

ALARM OUTPUTS.....2 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)

RESOLUTION.....Up to 6 significant digits

PROGRAMMING/LOGGER SET-UP.....SquirrelView or SquirrelView Plus software

## COMMUNICATION

Internal: .....RS232 & USB 1.1/2.0  
External options: .....GSM, Ethernet and Wireless Ethernet

## POWER SUPPLY

Internal:.....2 x C Alkaline batteries\*  
External: .....8-28V DC Reverse polarity and over-voltage protected



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

**POWER CONSUMPTION @ 12V**

Sleep mode: .....<600µA  
Logging: .....Approx 10 - 30mA

**DIMENSIONS AND WEIGHT**

Dimensions (excluding probes):.....W175 x D135 x H55 mm  
Weight: .....Approx 0.7kgs  
Enclosure material: ..... ABS

**MEMORY MODES** .....Stop when full or overwrite

**DISPLAY AND KEYPAD**

128 x 64 pixel LCD

**OPERATING ENVIRONMENT** .....-30°C to +65°C

Using Supplied Batteries:.....-20°C to +50°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

<b>Manufacturer:-</b>	GRANT INSTRUMENTS (CAMBRIDGE) LTD, Shepreth, Cambridgeshire SG8 6GB
<b>Equipment Name/Type Number:-</b>	2010
<b>Description of Equipment:-</b>	Squirrel 2010 Data Logger
<b>Directives:-</b>	EMC Directive 89/336/EEC
<b>Including Accessories:-</b>	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.

<b>Applied Standards:-</b>	EN 61326:1997(+A1/A2)
<b>Harmonized Standards:-</b>	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](http://www.grant.co.uk)  
[acquisitionales@grant.co.uk](mailto:acquisitionales@grant.co.uk)  
Fax: +44 (0)1763 262410