Squirrel SQ2020
Powerful data loggers for all applications
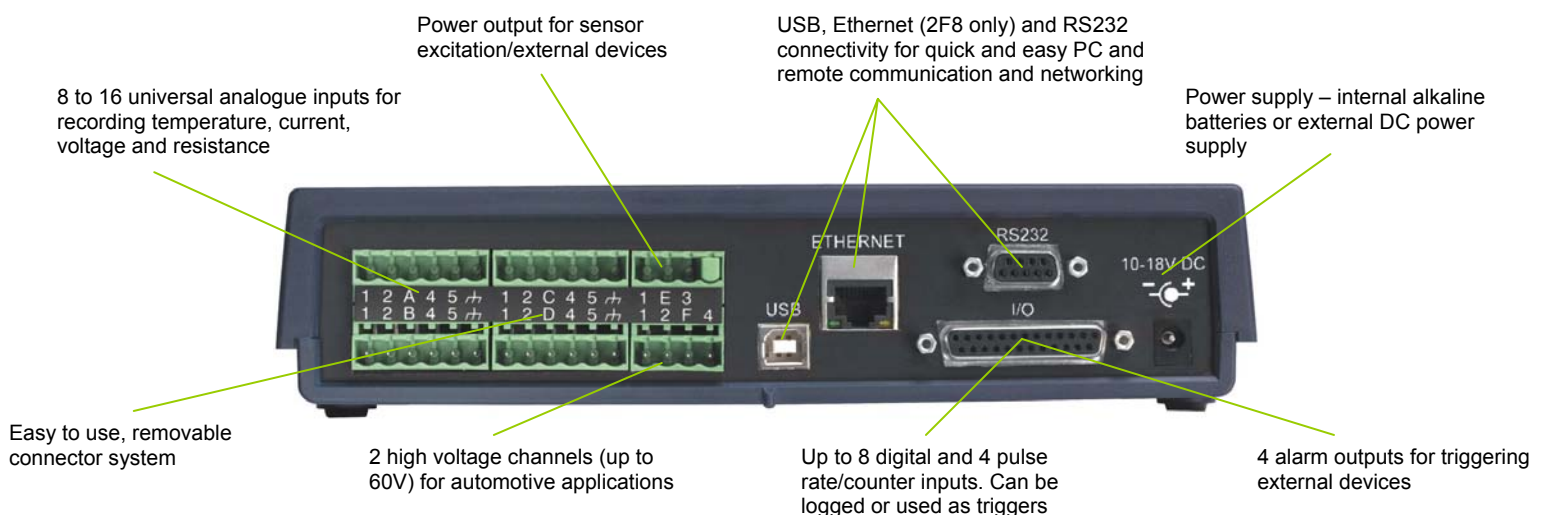
Grant
DATA ACQUISITION

Overview

The Squirrel 2020 series of hand held data loggers combines high performance, powerful features and universal inputs in a compact and easy to use instrument.

Using high accuracy 24-bit analogue to digital converters, removable memory and Ethernet networking (on the 2F8), the SQ2020 series is the ideal data logger for industrial, scientific research and quality assurance applications. Together with our comprehensive suite of software, SquirrelView, the SQ2020 provides standalone data acquisition, real-time metering and data analysis straight out-of-the-box.

3 Year Warranty

Key features

- 8 true differential or 16 single ended universal analogue inputs for voltage, current or resistance measurements plus 2 high voltage, 4 pulse and 8 digital event/state inputs
- Analogue inputs can be used with thermistors, thermocouples, 2, 3 or 4 wire RTD temperature sensors and 4-20mA signals
- Logging rates of up to 100Hz on up to two channels (on the 2F8)
- Large non-volatile internal memory storage for up to 1.8 million readings
- Ethernet (on the 2F8), USB and RS232 communication ports
- Download of internal data to removable MMC/SD (Multi Media Card / Secure Digital) memory
- Sensor power and FET outputs for use with external devices
- Easy to read LCD and simple 4 button user interface
- Up to 16 calculated / derived channels may be created using mathematical functions

Power output for sensor excitation/external devices

USB, Ethernet (2F8 only) and RS232 connectivity for quick and easy PC and remote communication and networking

8 to 16 universal analogue inputs for recording temperature, current, voltage and resistance

Power supply – internal alkaline batteries or external DC power supply

Easy to use, removable connector system

2 high voltage channels (up to 60V) for automotive applications

Up to 8 digital and 4 pulse rate/counter inputs. Can be logged or used as triggers

4 alarm outputs for triggering external devices

Communications:

Ethernet (on 2F8), USB and RS232 serial ports are inbuilt. This allows simple connection to either a PC based TCP/IP network, a wireless to PC connection or to a GSM modem for remote data downloading. This flexibility enables global data access and retrieval as well as complete system integration of the SQ2020 series into complex and critical applications.

Multiple configurations stored in the logger:

Up to six logger configurations (channel type, names, logging speeds, triggers etc), together with the current configuration, can be held in the logger's internal memory. Additional configuration settings can also be loaded from the external MMC/SD memory card. This allows the operator to quickly and easily switch between logger configurations without the need for a PC.

Comprehensive software configuration via SquirrelView:

The SquirrelView software (supplied with the SQ2020 series data loggers) allows logger configuration, data download and data export whilst giving the user full control over the SQ 2020. The optional SquirrelView Plus gives the user access to many advanced data analysis and data archiving/transfer features.
Please refer to our separate SquirrelView data sheet for all its advanced features.

Concurrent sampling:

The SQ2020 series uses multiple analogue to digital converters that enables true concurrent sampling and logging. This allows the user to configure a channel to log at a rate of 100Hz (20Hz on 1F8) whilst retaining different sample speeds on other channels. This makes the SQ2020 series ideal for measuring dynamic parameters that change at different rates such as temperature and pressure.

System specifications:

Input channels:

		SQ2020 - 1F8	SQ2020 - 2F8
Analogue input channel options	Analogue to digital converters	1	2
	Differential	8	8
	Single ended*	16	16
	3 or 4 wire	0	4
Additional channels	Pulse	(2 x fast – 64kHz) & (2 x slow – 100Hz)	(2 x fast – 64kHz) & (2 x slow – 100Hz)
	Event/digital	8 state inputs or 1 x 8 bit binary	8 state inputs or 1 x 8 bit binary
	High voltage	2	2
	Internal channels	1 temperature	1 temperature

*Please refer to our Technical Note for the configuration of these inputs

Standard ranges for temperature channels:

Each channel can be individually set to any of the ranges listed below. Pt100 to IEC751 and JIS1604 and Pt1000 to IEC751.

Input type	Ranges °C	Ranges °F
Y & U: Thermistor	-50 to 150	-58 to 302
Pt100/Pt1000*	-200 - 850	-328 to 1562

*2 wire only on 1F8

Input type	Ranges °C	Ranges °F
K: Thermocouple	-200 to 1372	-328 to 2501
T: Thermocouple	-200 to 400	-328 to 752
J: Thermocouple	-200 to 1200	-328 to 2192
N: Thermocouple	-200 to 1300	-328 to 2372
R & S: Thermocouple	-50 to 1768	-58 to 3214

Standard ranges for d.c. voltage:

Each voltage channel can be any of the voltage ranges below. Mixed differential and single ended configurations are permitted. Please refer to our Technical Note for the permitted combinations of inputs.

Voltage range	Voltage range	High voltage input range*
-0.075 to 0.075V	-3.0 to 3.0V	4.0 to 20.0V
-0.15 to 015V	-6.0 to 6.0V	4.0 to 40.0V
-0.3 to 0.3V	- 6.0 to 12.0V	4.0 to 60.0V
-0.6 to 0.6V	-6.0 to 25.0V	
-0.6 to 1.2V		
-0.6 to 2.4V		

*max of 2 may be selected

Standard ranges for current and resistance channels:
Each current channel can be any of the current ranges below. Current ranges use differential input channels.

Current range (External 10Ω shunt)	Resistance range 2 wire	Resistance range 3 and 4 wire (2F8 version)
-30.0 to 30.0mA	0.0 to 1250.0Ω	0.0 to 500.0Ω
4 to 20mA	0.0 to 5000.0Ω	0.0 to 4000.0Ω
	0.0 to 20000.0Ω	
	0.0 to 300000.0Ω	

Analogue inputs
Accuracy: (at 25°C) voltage and resistance
± (0.05% readings + 0.025% range)
Common mode rejection: 100dB
Input impedance: > 1M Ω
Linearity: 0.015%
Series mode line rejection: 50/60Hz 100dB

Analogue – digital conversion
Type: Sigma-Delta
Resolution: 24bit
Sampling rate: up to 10, 20* or 100* readings per second per ADC. No 100Hz on 1F8

* With mains rejection off

Alarm outputs
4 x open drain FET (18V 0.1A)

Power output for external device
Regulated 5 VDC at 50mA or logger supply voltage at 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 1Gb - removable MMC/SD (For transferring internal memory and storing setups only)

Calculated channels
Up to 16 virtual channels derived from physical input channels

Resolution
Up to 6 significant digits

Programming/logger setup
SquirrelView or SquirrelView Plus software

Communication
Standard: RS232 (Auto bauding to 115200 baud)
Ethernet 10/100 base TCP/IP
USB 1.1 and 2.0 compatible
External options: GSM, WIFI and PSTN Modems

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

Power consumption @ 9V
Sleep mode: 600µA
Logging: 40-80mA

Dimensions and weight
Dimensions: W235 x D175 x H55mm
Weight: Approx 1.2kgs
Enclosure material: ABS

Memory modes (internal only)
Stop when full or overwrite

Display and keypad
2 line x 20 character LCD display
Battery state and external power indicator
Keypad lock
Navigate to:
Arm/disarm/pause/continue
Meter any channel or alarm
Select from up to 6 x pre-stored setups
Status/diagnostics/memory/time and date
Download to MMC/SD

Operating environment
-30°C to +65°C
Humidity: 90% at 40°C non-condensing

Accessories
MPU 12V: Universal (97-263V AC) power supply
LC76: DC lead
SQ20RB12-6: External rechargeable battery (12V, 6Ah)
SB102: 25 way digital I/O connector
CS202: Current shunt kit (4 x 10Ω 0.125W
PEL4: Rugged weather proof enclosure
CAL2020: Test and Calibration certificates
SQ20A802: External GSM communications kit
MMC64: Multi Media Card
(Please see price list for additional accessories)

Please note: SQ2020 is supplied with software, manual, USB cable, wall bracket and batteries and 4 current shunt resistors

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Grant data loggers and specialist technical support is available world-wide. Please visit www.grant.co.uk to locate our regional offices and to download technical support materials. You will also find your locally appointed distributor and support centre.

Grant data logging systems bear a CE mark and meet relevant European directives.

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