

Channels and Ranges

Model 1201 Squirrels have thirteen input channels.
Each channel can be set to any of the ranges available for that channel, or not set.

Channel No.	Input Type	Available Ranges	Resolution			Accuracy* (max error) %R = % of reading
			Part of range	On display	In memory	
1-4	Temperature, (type U thermistor) Celsius or Fahrenheit readings can be selected (for all channels together) by a switch.	-50 to +150°C -58 to +302°F	-50 to -40 °C -40 to -25 °C -25 to +105 °C +105 to +130 °C +130 to +150 °C -58 to -40 °F -40 to -10 °F -10 to +220 °F +220 to +265 °F +265 to +302 °F	0.2 °C 0.1 °C 0.05 °C 0.1 °C 0.2 °C 0.5°F 0.2°F 0.1°F 0.2°F 0.5°F	0.36°F 0.18°F 0.09°F 0.18°F 0.36°F	1.0 °C (-50 to -30°C) 0.35°C (-30 to 0°C) 0.12°C (0 to +40°C) 0.17°C (+40 to +100°C) 0.55°C (+100 to +150°C) 1.8 °F (-58 to -20°F) 0.65°F (-20 to +32°F) 0.22°F (+32 to +104°F) 0.3 °F (+104 to +215°F) 1.0 °F (+215 to +302°F)
5-8	Voltage or Current	-20 to +20 V -2 to +2 V -200 to +200mV -20 to +20 mV -20 to +20 mA -2 to +2mA 4 to 20 mA	Displayed as 0-100%	10 mV 1 mV 100µV 10 µV 10 µA 1 µA 0.05%		0.1%R + 10 mV 0.08%R + 1 mV 0.08%R + 100µV 0.08%R + 20 µV 0.1%R + 10µA 0.1%R + 2 µA 0.1%R + 0.1%
9, 10	Humidity (type L or H humidity probe)∅	0 to 100%			0.1% r.h. ∅	0.25% r.h.
11, 12	Pulse rate or Pulse count	0 to 62.5kHz 0 to 62,500 0 to 625,000 0 to 6,250,000		1Hz 1 10 100		0.003% R + 1Hz 1x 1x 1x
13	Digital or State†	0 to 255 0 or 1		1 0 or 1†		No error No error

* Accuracy figures are for Squirrels used in ambient temperature of 5 to 45°C, and do not include sensor errors.

∅ When setting, display shows L 100% for L probe, H 100% for H probe.

x In addition, there will be a non-cumulative error of 3 milliseconds in the count period whenever the display is switched on (or switches itself off). The effect is an error of 0.3% at a 1 second interval, 0.005% or less at an interval of 1 minute or longer.

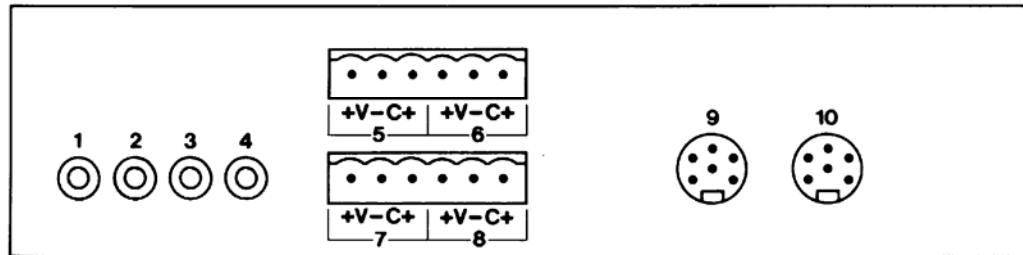
† On the display, state readings are shown as if they were two different channels. The first half-channel displays H followed by the state of input pins 8 to 5, the second half-channel displays L followed by the states of input pins 4 to 1. When setting to "state", display shows H1010.

Measuring Input Types and Details

- Channels 1 to 4** Grant type U thermistor probes The thermistor bead inside them has a resistance of 2000 Ohms at 25°C (Fenwall UUA 32J98 or Dale YSI equivalents).
Resistance 2K at 25°C.
- Channels 5 to 8** **Voltage** — 1 Megohm input impedance.
Current — 10 Ohm input impedance.
- Channels 9 and 10** Grant type L or H humidity probes Type L is similar to Vaisala HMP31, type H to Lee-Integer CH121. Each probe also contains a Grant type U thermistor sensor. The thermistor sensor of the humidity probe plugged into channel 9 is automatically connected to channel 3 unless a separate thermistor probe is plugged into channel 3. Similarly the thermistor associated with channel 10 is connected to channel 4.
- Channels 11 and 12** **Voltage pulses** must have low level below 0.5V d.c., high level between 4 and 20V d.c. Minimum pulse length 8µs, minimum interval between pulses 8µs (maximum frequency 62.5kHz).
Contact closures can also be counted if terminals S and — are linked to connect de-bounce circuits. Minimum closure 5ms, minimum interval between closures 5ms (maximum frequency 100Hz).
- Channel 13** **Voltage** Low level (stored as 0) must be below 0.5V d.c., high level (stored as 1) between 5 and 6V d.c.
Contact closures can also be used. Contact closed is stored as 0, open as 1. The Squirrel is CMOS and TTL compatible with each input held high (through a 1 Megohm resistor) to the internal regulated 5V supply.

Input and Output Connections

Inputs on top of Squirrel

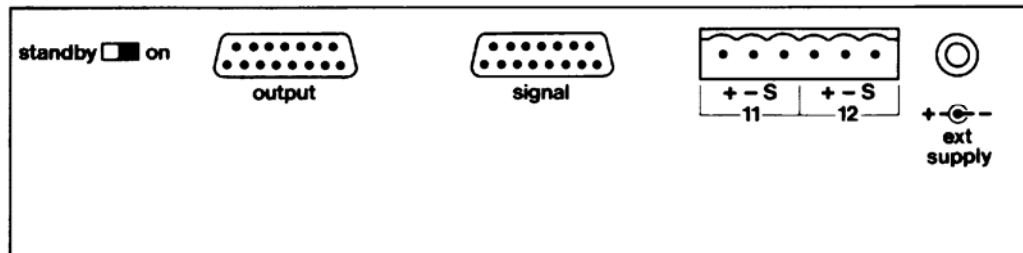


Temperature Sockets for 3.5mm \varnothing jack plugs with locking ring.

Voltage/Current Male sockets for black 6-way plug-in female terminal blocks (3-ways per channel)
NEVER CONNECT VOLTAGE BETWEEN C+ AND -, OR BETWEEN V+ AND - WHEN SET TO A CURRENT RANGE.

Humidity 6-pin DIN sockets

Inputs and outputs on base of Squirrel



Switch

15-way female D connector

15-way male D connector

Pulse count/rate Male sockets for orange 6-way plug-in female terminal blocks (3 ways per channel)
Connect hi to +, lo to -. Connect S to - when counting contact closures.

Male socket for standard power supply plug

Output connector pins

Pin	1	Common — Squirrel ground
"	2	Data Strobe
"	3	Data bit 1
"	4	" 2
"	5	" 3
"	6	" 4
"	7	" 5
"	8	" 6
"	9	" 7
"	10	" 8
"	11	Busy
"	12	Sensor switch-on
"	13	RS232 In
"	14	RS232 Out
"	15	Acknowledge — Printer Connection

Signal connector pins

Pin	1	Event / Digital data bit	1 (hi)
"	2	"	2 (hi)
"	3	"	3 (hi)
"	4	"	4 (hi)
"	5	"	5 (hi)
"	6	"	6 (hi)
"	7	"	7 (hi)
"	8	"	8 (hi)
"	9	Common — Squirrel ground (and Event/Digital lo)	
"	10	1Hz clock pulse input	
"	11	1Hz clock pulse output	
"	12	External Reading Link	
"	13	External Reading Trigger Input	
"	14	Latched Alarm Output	
"	15	Non-latched Alarm Output	

Signal Input/Output Details

External trigger input Voltage levels: START — less than 0.5V d.c., STOP — 4 to 6V d.c.
Contact closures: START — contacts closed, STOP — contacts open.

Alarm outputs Internal contacts close when any channel is in an alarm state. One pair of contacts opens when all channels are no longer in alarm state, the other is latched to remain closed until reset. Contacts can pass up to 50mA from external source of up to 25V d.c.

Sensor switch-on output Internal contacts close 5 seconds before each set of readings is taken in interval and averaging modes, and continuously while in function 2 (meter). Contacts remain closed until final reading of the set is taken. They can pass up to 50mA from an external source of up to 25V d.c.

Printer output Centronics type
Computer output RS232, baud rate 300, 600, 1200, 2400, 4800, 9600 or 19200.

Note: Specification subject to minor amendments.

Grant Instruments (Cambridge) Ltd
Barrington
Cambridge, CB2 5QZ, England
Telephone: (0763) 60811
Fax: (0763) 62410
Telex: 81328

June 1987