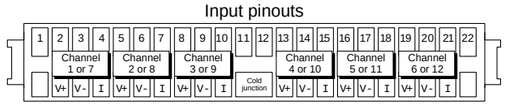
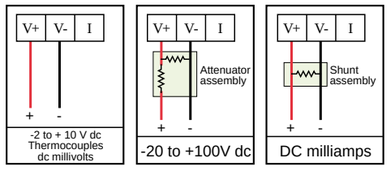
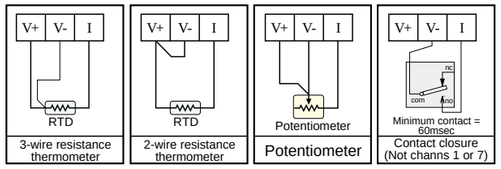
Technical Specification - Installation and wiring

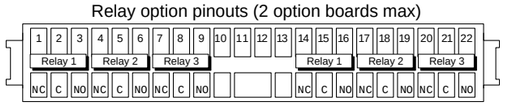
Input pinouts



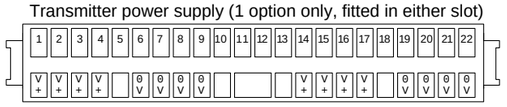




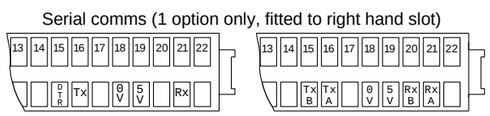
Relay option pinouts (2 option boards max)



Transmitter power supply (1 option only, fitted in either slot)



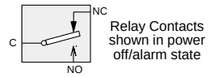
Serial comms (1 option only, fitted to right hand slot)



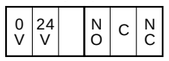
Pinout for EIA232
(DTR used only with Modems)

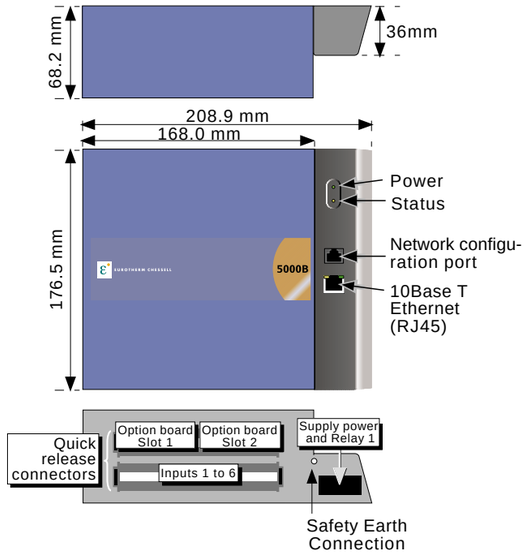
Pinout for EIA485

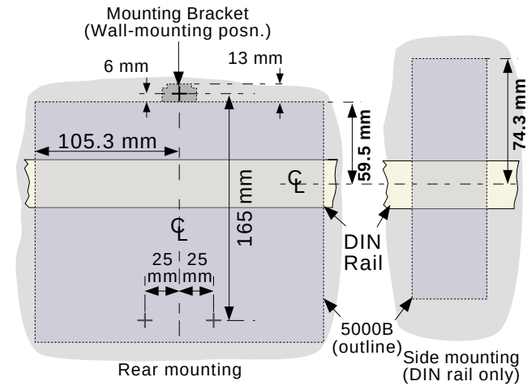
Relay contact definition



Supply power and relay 1 pinout







T35 DIN rail location and
Fixing centres for wall mounting bracket

Notes:
1 Channels 7 to 12 (if fitted) occupy option board slots 1 and 2
2 Relay board 1 fitted as standard
3 Relay boards 2 and 3 (if fitted) occupy option board slots 1 and 2 respectively.
4 When wall mounted, unit front face is 79mm from wall surface
5 When DIN rail mounted, the unit front face is 73.5 mm. from the front face of the rail.
6 To ensure specified thermal performance, connectors must be horizontal for thermocouple inputs.

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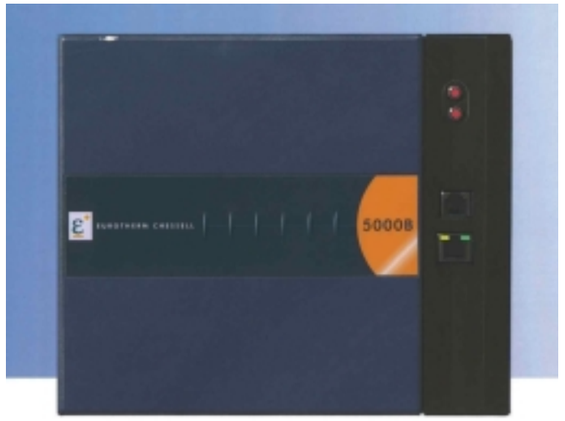
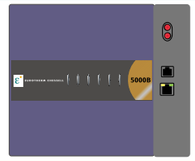
5000B



Networked, Secure, Data Acquisition and Logging Unit

Specification sheet

- **Advanced, secure data logging and archiving**
- **Designed for network integration**
- **FTP client and server**
- **Ethernet and Modbus TCP comms**
- **Time synchronization using SNTP (server and client)**
- **Live, remote, data viewing and operation**
- **Batch functionality**
- **User editable screens for remote viewing**
- **Up to 12 universal inputs**
- **Up to 7 relay outputs**
- **125 msec parallel sampling**
- **Review, Configuration and Bridge software as standard**

Available features	
Input channels	Up to 12 (6 per input board)
Relays	Up to 7 (3 per relay board + 1)
Groups	Up to 6 groups
Maths channels	Up to 36 Derived channels/totalisers/counters
Timers	Up to 12 timers
Screen Builder	6 user screens
Batch	Batch data control
Auditor features	Audit trail, Electronic signing, Signature element controls
Security	Configurable access and passwords for individual user names
Alarms	Two per input/maths channel; Two per totaliser, counter, timer, event
Standard views	Horizontal/vertical trend, Horizontal/vertical bargraph, Numeric, Vertical Trend History

Configuration software	**Bridge 5000**	**Review software**
Standard	Standard	Standard

Technical specification - Data Logging & Archiving

Internal FLASH memory is used for secure data logging. This data can be archived to a remote host, either on demand, or automatically, at a configurable interval. The 5000B Archive Configuration page contains an estimate of how long it will take to fill the memory, this period being dependent on the complexity of the overall recorder configuration. Table 1 below gives some examples.

The 5000B archives over the Ethernet, providing a secure, infinite-capacity, archiving capability.

Log/Archive Destination	Sample rate						
	0.25sec	0.5sec	1sec	5sec	10secs	30secs	60secs
Log to Internal 13.25MB flash	1 day	4 days	9 days	46 days	93 days	281 days	562 days
Archive via Ethernet	Infinite	Infinite	Infinite	Infinite	Infinite	Infinite	Infinite

Table 1 Typical log/archive capabilities versus sample rate (1 group of six channels)

Technical specification - Ethernet communications

General

Electrical standard	10Mbs Ethernet 10baseT
Transfer protocol	Modbus TCP/IP.
	Provision for File Transfer Protocol (FTP)

Technical Specification - Batch functions

Up to six user-defined fields can be configured to cause batch-specific data to be logged with the process data. The information consists of a Field Descriptor of up to 20 characters (e.g. 'Batch number') and associated batch information of up to 60 characters (e.g. '123456').

The user can choose to log up to all six fields on either or both Batch Start and Batch Stop. The information (along with time and date) appears in the trend history for the group and cannot be separated from the process data to which it refers.

Technical Specification - Bridge 5000

Bridge 5000 allows any PC, which meets or exceeds the minimum requirements listed below, to access and control multiple 5000B instruments.

Bridge 5000 software provides a powerful, easy-to-use interface, using a direct connection, an Ethernet link, a local area network or the internet, to allow remote configuration, operation and viewing of data. Each 5000B unit may be connected to up to four remote PCs.

MINIMUM PC REQUIREMENTS

- P90 running Windows® 95/98/NT/Me/2000
- 32 MB RAM
- 50 MB free hard disk space
- Graphics drive capable of displaying > 256 colours (recommended)

® Windows 95, Windows 98 and Windows NT are either Registered Trademarks or are Trademarks of Microsoft corporation in the United States and/or other countries

Technical specification - Recorder

Environmental performance

Temperature limits	Operation:	0 to 50 ˚C
	Storage:	-20 to + 70˚C
Humidity limits	Operation/Storage:	5% to 95% RH (non condensing)
Protection		IP20
Shock		BS EN61010
Vibration (BS EN60068-2-6 Test Fc)		2g peak
Altitude		< 2000 metres

Electromagnetic compatibility (EMC)

Emissions and immunity	BS EN61326

Electrical Safety

(BS EN61010)	Installation category II; Pollution degree 2

Physical

Mounting method	DIN rail (T35) or wall mounted.
Mounting angle	Connectors to be horizontal for T/C inputs - otherwise no constraints.
Size	See figure on back page.
Weight	< 1.5kg

Operator interface

Full operation, configuration and file transfer from remote PC

Power requirements

Supply voltage	18 to 30 V dc
Maximum power drain	10 Watts
Inrush current (maximum)	18 Amps

Update/archive rates

Input/relay output sample rate	8 Hz (all channels)
Display update	Network dependent
Sample value	Value at sample time
Trend value	Latest value at display update time
Calculations	8 Hz update of all alarm setpoints, maths, totaliser, counter etc. values

Technical specification - Inputs

General

Input types		dc Volts, dc millivolts, dc milliamps (needs external shunt) Thermocouple, 2/3 wire RTD, Contact closure (not ch1 or 7) >60msec
Input type mix		Freely configurable
Maximum number of inputs		12
A/D conversion method		>16 bits, 2nd order delta-sigma
Input ranges:		See tables 2 to 5
Termination		Edge connector / Terminal block
Noise rejection (48 to 62 Hz)	Common mode:	>140dB (channel - to - channel)
		>140dB (channel - to - ground)
	Series mode:	>60dB
Maximum common mode voltage		250 Volts continuous
Maximum series mode voltage		45 mV at lowest (±38 mV) range
		12 Volts at highest (±10 V) range
Isolation*	Channel - to - channel:	300 V RMS or dc (double insulation)
	Channel to common electronics:	300 V RMS or dc (double insulation)
	Channel - to - ground:	300 V RMS or dc (basic insulation)
Dielectric strength (BS EN61010) (1 minute type tests)		
	Channel - to - channel:	2500 Volts ac
	Channel - to - ground:	1500 Volts ac
Insulation resistance		>10 MΩ at 500 Volts dc
Input impedance	10 Volt range:	68.8 kΩ
	All other ranges:	>10 MΩ
Overvoltage protection		50V peak (150V peak with attenuator)
Open circuit	Recognition time:	500 msec
	Current:	57 nA
	Minimum break resistance:	10 MΩ

Technical specification - Inputs (Cont.)

DC input ranges

Performance	See table 2
Shunt type	Externally mounted resistor modules
Additional error due to shunt	0.1% of input
Additional error due to attenuator	0.2% of input

Low Range	High Range	Resolution	Maximum error (Instrument at 20˚C)	Worst case temperature performance
-38 mV	38 mV	1.4 µV	0.085% input + 0.051% range	80ppm of input per deg C
-150 mV	150 mV	5.5 µV	0.084% input + 0.038% range	80ppm of input per deg C
-1 V	1 V	37 µV	0.084% input + 0.029% range	80ppm of input per deg C
-10 V	10 V	370 µV	0.275% input + 0.030% range	272ppm of input per deg C

Table 2 DC ranges and performance

Thermocouple data

Types and Ranges		See table 3.
Temperature scale		ITS90
Bias current		0.05 nA
Cold junction	Types:	Off, internal, external
	Error:	1˚C max. with instrument at 25˚C
	Rejection ratio:	50:1 minimum
Upscale/downscale drive		High, low or none selectable for each thermocouple channel
Additional error if High/low selected		0.01˚C (typ.)

T/C Type	Overall range (˚C)	Standard	Maximum linearisation error
B	0 to + 1820	IEC584.1	0 to 400˚C: 1.7˚C 400 to 1820˚C: 0.03˚C
C	0 to + 2300	Hoskins	0.12˚C
D	0 to + 2495	Hoskins	0.08˚C
E	-270 to + 1000	IEC584.1	0.03˚C
G2	0 to + 2315	Hoskins	0.07˚C
J	-210 to + 1200	IEC584.1	0.02˚C
K	-270 to + 1372	IEC584.1	0.04˚C
L	-200 to + 900	DIN43700:1985 (To IPTS68)	0.20˚C
N	-270 to + 1372	IEC584.1	0.04˚C
R	-50 to + 1768	IEC584.1	0.04˚C
S	-50 to + 1768	IEC584.1	0.04˚C
T	-270 to + 400	IEC584.1	0.02˚C
U	-200 to + 600	DIN43710:1985	0.04˚C
NiMoNiCo	-50 to +1410	ASTM E1751-95	0.06˚C
Platinel	0 to +1370	Engelhard	0.02˚C

Table 3 Thermocouple types and ranges

Resistance inputs

Ranges (including lead resistance)		See table 4
Accuracy and resolution		See table 4
RTD Types		See table 5
Temperature scale		ITS90
Influence of lead resistance	Error:	Negligible
	Mismatch:	1Ω/Ω

Low Range	High Range	Resolution	Maximum error (Instrument at 20˚C)	Worst case temperature performance
0Ω	150Ω	5mΩ	0.045% input + 0.110% range	35ppm of input per deg C
0Ω	600Ω	22mΩ	0.045% input + 0.065% range	35ppm of input per deg C
0Ω	6kΩ	148mΩ	0.049% input + 0.035% range	35ppm of input per deg C

Table 4 Resistance ranges - accuracy and resolution

RTD type	Overall range (˚C)	Standard	Max.linearisation error
Cu10	-20 to + 400	General Electric Co.	0.02˚C
Cu53	-70 to + 200	RC21-4-1966	<0.01˚C
JPT100	-220 to + 630	JIS C1604:1989	0.01˚C
Ni100	-60 to + 250	DIN43760:1987	0.01˚C
Ni120	-50 to + 170	DIN43760:1987	0.01˚C
Pt100	-200 to + 850	IEC751	0.01˚C
Pt100A	-200 to + 600	Eurotherm Recorders SA	0.09˚C
Pt1000	-200 to + 850	IEC751	0.01˚C

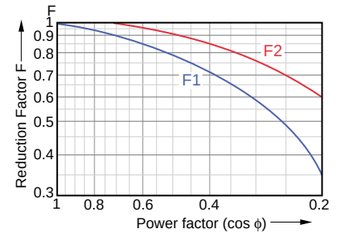
Table 5 Resistance thermometer types and ranges

Technical specification - Relay outputs

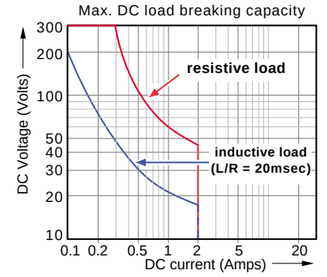
Number of relays fitted	Standard:	1
	Optional:	Up to 2 boards, each with 3 relays
Termination		Edge connector / Terminal block
Maximum ac switching power*		500 VA
Maximum ac breaking current*		2 A within above power ratings
Maximum ac contact voltage*		250 V within above power ratings
Maximum dc power/current/voltage		See graph 2.
Isolation†	Contact - to contact:	300V RMS or dc (double insulation)
	Contact - to - ground:	300 V RMS or dc (basic insulation)

* These figures are for resistive loads. For inductive loads, de-rate according to graph 1, in which:

Contact life = resistive life x F1 or F2, where:
F1 = measured on representative examples and
F2 = typical values according to experience.



Graph 1 Derating curves



Graph 2 DC ratings

Technical specification - Serial communications

(Typical applications: Input of ASCII string inputs from Bar-code readers, credit card readers etc.)

Isolation†

Terminals to ground:	100 V RMS or dc (basic insulation)

Transmission standard

EIA232 or EIA485

†All isolation figures are: DC to 65Hz; BS EN61010 Installation category II; Pollution degree 2:

INSTALLATION CATEGORY II
The rated impulse voltage for equipment on nominal 230V mains is 2500V.
POLLUTION DEGREE 2
Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected.