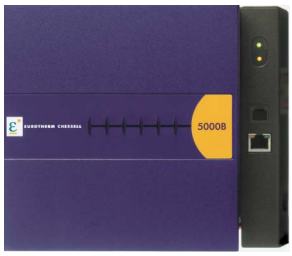
5000B

MODEL



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
- 125msec 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)		
Events	Up to 12 (6 per input board)		
Groups	Up to 6 groups		
Maths channels	Up to 84 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	Four per input/maths channel; Four per totaliser, counter, timer, event		
Standard views	Horizontal/vertical trend, Horizontal/vertical bargraph, Numeric, Vertical Trend History		
Software	**Configuration**	**Full Bridge 5000**	**Review**
	Standard	Standard	Standard

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)

Ethernet communications

General

Electrical standard	10Mbs Ethernet 10baseT (IEEE802-3)
Transfer protocol	Modbus TCP/IP.
	Provision for File Transfer Protocol (FTP)

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.

Full Bridge 5000

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

Full Bridge 5000 software provides a powerful, easy-to-use interface, using a direct Ethernet connection,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 at the same time.

Minimum PC requirements

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

® Windows 2000 and Windows NT are either Registered Trademarks or are Trademarks of Microsoft corporation in the United States and/or other countries

Time synchronization

The 5000B supports Simple Network Time Protocol (SNTP) which, when enabled,updates the instrument time every 15 minutes from the configured SNTP server. The 5000B can also act as a Unicast SNTP server on the network, allowing client instruments to synchronize with the 5000B to a resolution of one millisecond.

Auditor Features

Designed to meet the requirements of the FDA Regulation 21 CFR Part 11 for Electronic Records and Signatures, this software option provides the 5000B with additional security such as password ageing, electronic signatures and time stamped audit trail.

Modbus Master

Allows users to view data from multiple instruments connected either by a local Network connection using Modbus TCP, or a Serial connection using Modbus RTU.

Event Input

The Event Input option offers six isolated event input circuits per board fitted. Triggered externally these discrete inputs can be used to initiate internal actions within the 5000 Series Data Acquisition unit. For example they could be used to remotely start or stop a Batch.

INSTALLATION CATEGORY II
The rate 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.

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 meters

Clock (RTC) data

Temperature stability	0 to 40°C	–3 to +2 ppm
	–40 to +85°C	±7.5 ppm
Ageing		±1 ppm per year

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 opposite page.
Weight	< 1.5kg

Operator interface

Full operation, configuration and file transfer from remote PC

Power requirements

Supply voltage	18 to 30V dc
Maximum power drain	10 Watts
Inrush current (maximum)	18 Amps
	Eurotherm Model 5000P can be used

Back-up Battery

Type	Poly-carbonmonofluoride/lithium (BR2330) Part No. PA261095
Support time (RTC)	1 year min. with recorder unpowered
Replacement period	3 years
Stored data	Time; date; values for totalisers, counters and timers; batch data; Fvalue, Rolling average, Stopwatch etc.

Update/archive rates

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

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		45mV at lowest (38mV) range 12 Volts at highest (10V) range
Isolation*	Channel-to-channel:	300V RMS or dc (double insulation)
	Channel-to-common electronics:	300V RMS or dc (double insulation)
	Channel-to-ground:	300V 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		>10MΩ at 500 Volts dc
Input impedance	10 Volt range:	68.8kΩ
	All other ranges:	>10MΩ
Overvoltage protection		50V peak (150V peak with attenuator)
Open circuit		Recognition time: 500 msec
Current:		57nA
Minimum break resistance:		10MΩ

TECHNICAL SPECIFICATION (continued)

Inputs (continued)

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
–38mV	38mV	1.4µV	0.085% input + 0.051% range	80ppm of input per °C
–150mV	150mV	5.5µV	0.084% input + 0.038% range	80ppm of input per °C
–1V	1V	37µV	0.084% input + 0.029% range	80ppm of input per °C
–10V	10V	370µV	0.275% input + 0.030% range	272ppm of input per °C

Table 2 DC ranges and performance

Thermocouple data

Types and Ranges		See Table 3.
Temperature scale		ITS90
Bias current		0.05nA
Cold junction	Types:	Off, internal, external, remote
	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	0.01°C (typ.) if High/low selected

T/C Type	Overall range (°C)	Standard	Maximum linearisation error
B	0 to +1820	IEC 584.1	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	IEC 584.1	0.03°C
G2	0 to +2315	Hoskins	0.07°C
J	–210 to +1200	IEC 584.1	0.02°C
K	–270 to +1372	IEC 584.1	0.04°C
L	–200 to +900	DIN43700:1985 (To IPTS68)	0.20°C
N	–270 to +1300	IEC 584.1	0.04°C
R	–50 to +1768	IEC 584.1	0.04°C
S	–50 to +1768	IEC 584.1	0.04°C
T	–270 to +400	IEC 584.1	0.02°C
U	–200 to +600	DIN43700:1985	0.04°C
NiMoNiCo	–50 to +1410	ASTM E1751-95	0.06°C
NiNiMo	0 to +1406	Ipsen	0.14°C
Platinel	0 to +1370	Engelhard	0.02°C
Pt20%Rh/Pt40%Rh	0 to +1888	ASTM E1751-95	0.07°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 °C
0Ω	600Ω	22mΩ	0.045% input + 0.065% range	35ppm of input per °C
0Ω	6000Ω	148mΩ	0.049% input + 0.035% range	35ppm of input per °C

Table 4 Resistance ranges – accuracy and resolution

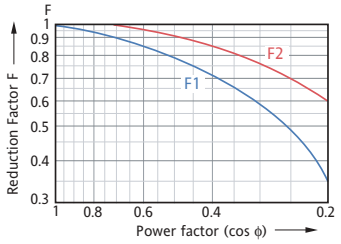
RTD Type	Overall range (°C)	Standard	Max linearisation error (4102C, 4102M only)
Cu10	–20 to +400	General Electric Co.	0.02°C
Cu53	–70 to +200	RC21-4-1966	<0.01°C
JPT100	–220 to +630	JIS C 1604:1989	0 01°C
Ni1000	–60 to +250	DIN43760:1987	0.01°C
Ni120	–50 to +170	DIN43760:1987	0.01°C
Pt100	–200 to +850	IEC 751	0.01°C
Pt100A	–200 to +600	Eurotherm Recorders SA	0.09°C
Pt1000	–200 to +850	IEC 751	0.01°C

Table 5 Resistance thermometer types and ranges

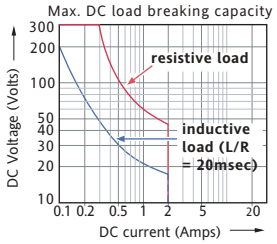
Relay Outputs

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

* With resistive loads. With inductive loads, derate 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

Event Input

Number of inputs		6 discrete inputs
Maximum No. of boards		2
Isolation	Event input to ground:	100V RMS or dc (double insulation)
	Event input to Event input:	0V
Recognition levels	Low:	–30V to +0.8V
	High:	2 to 30V
Maximum frequency		8Hz
Minimum pulse width		62.5ms
Contact resistance	Event:	Active if resistance <35KΩ Inactive if resistance >200KΩ Status not defined if 35KΩ resistance <200KΩ between input terminal and 'C' terminal

Serial Communications

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

Isolation†

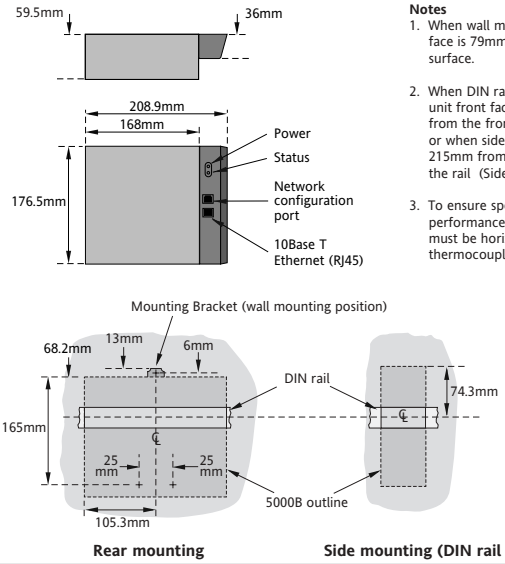
Terminals to ground: 100V RMS or dc (basic insulation)

Transmission standard

EIA232 or EIA485

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

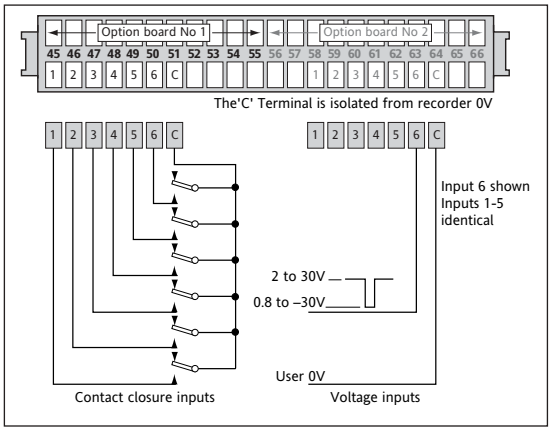
MECHANICAL INSTALLATION



Notes

1. When wall mounted, unit front face is 79mm from the wall surface.
2. When DIN rail mounted, the unit front face is 73.5mm from the front face of the rail or when side mounted is 215mm from the front face of the rail (Side mounting).
3. To ensure specified thermal performance, connectors must be horizontal for thermocouple inputs.

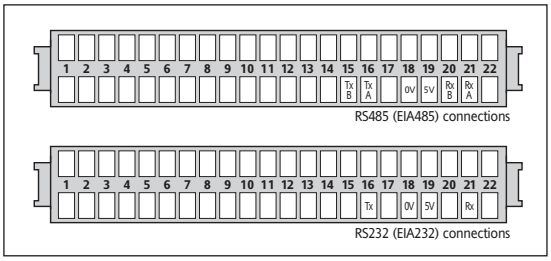
EVENT BOARD WIRING



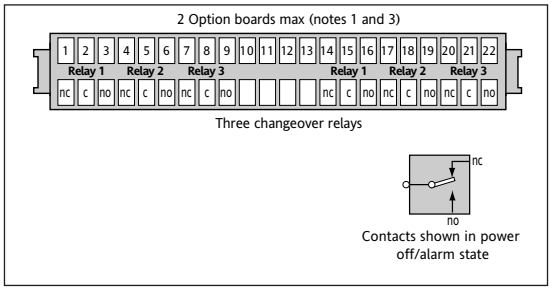
Notes

1. Channels 7 to12 (if fitted) occupy option board slots 1 and 2
2. Relay board 1 fitted as standard
3. Relay boards 1 and 2 (if fitted occupy option board slots 1 and 2 respectively)
4. Event boards (as relay)

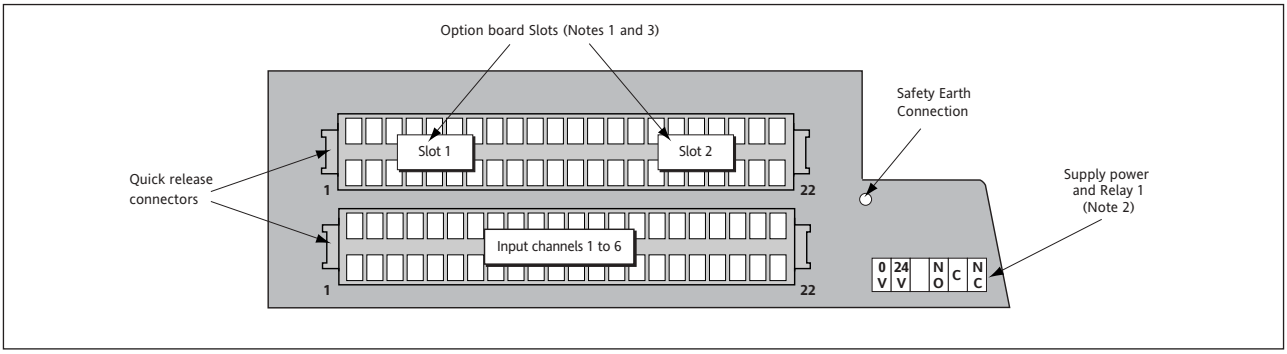
COMMUNICATIONS OPTION WIRING



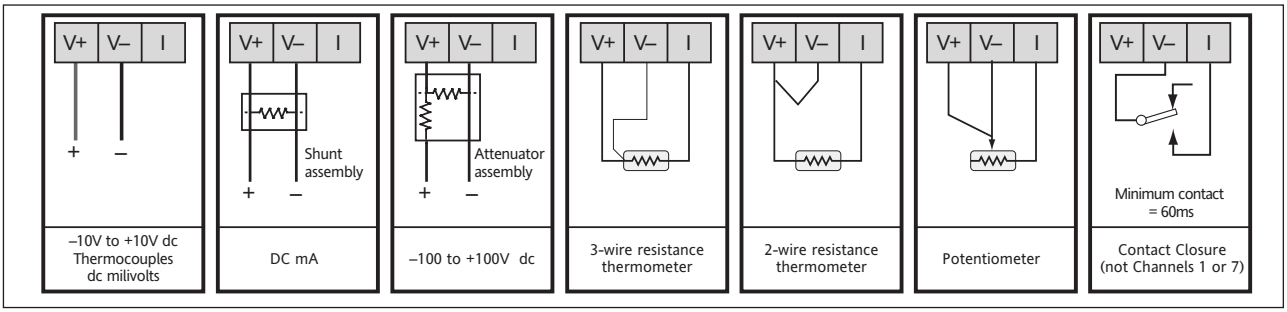
RELAY BOARD WIRING



REMOTE ACCESS UNITS



INPUT BOARD SIGNAL WIRING



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