

# 5100e


MODEL



## Networked or Standalone Graphic Data Acquisition Unit Specification Sheet

- **Colour touchscreen display**
- **Advanced data security and archiving**
- **Designed for network and standalone use**
- **FTP Client and Server**
- **Time synchronisation using SNTP (Server and Client)**
- **Live, remote data viewing**
- **125ms parallel sampling**
- **Review and configuration software as standard**
- **Alarm notification via email**

The 5100e offers unrivalled input accuracy with a 125ms total sample rate for up to 6 input channels. Input channels are freely configurable to suit your process requirements. Each instrument has an intuitive, touch screen display to enable operators to clearly view process data in varying formats. All have onboard Flash data storage capability, Ethernet communication and Floppy disk. Data is stored in a tamper-proof binary format that can be used for secure, long term records of your process. The 5000 Series is truly designed for today's networked world and can be accessed via a Local Area Network, dial-up connection, Intranet or Internet.

Available Features	
Channels	3 or 6
Relays	1
Groups	2
Maths channel	12*
Totaliser	12*
Timers	6
Counters	12*
Alarms	4 per channel Including Maths and totaliser channels
Bridge 5000 remote viewing software	✓
Security	Unlimited unique user names with configurable access and passwords
Configuration software	Standard
Review Lite software	Standard
Standard views	Vertical trend, horizontal trend, vertical bargraph, horizontal bargraph, numeric value
* Total number of maths, totalisers and counters must be equal to the number of selected maths channels	

## Data Logging and Archiving

The 5000 Series recorders have internal Flash memory for secure, short term, data storage. Data stored within the internal memory can be archived to the removable media (floppy disk) on demand or at preset intervals. The 5000 will give indication of how long its internal memory and that of the removable media installed will last according to the configuration of the recorder.

All 5000s have Ethernet capability. The 5100e can be configured to archive to the removable media and / or over the Ethernet. Archiving files over the Ethernet effectively gives a secure, infinite archiving capacity.

Approximate duration for continuous recording of one Group of six channels:

Archive Media	Sample Rate					
	0.5s	1s	5s	10s	30s	60s
1.44Mb floppy disk	0.5 days	1 day	5 days	10 days	30 days	61 days
3Mb Internal Flash	1 day	2 days	10 days	21 days	63 days	127 days
Ethernet	infinite	infinite	infinite	infinite	infinite	infinite

## Time Synchronisation (SNTP)

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

## Math Pack

Multiple math channels are available on the 5100e. Maths functions can be carried out on any channel (input channel, maths channel or totaliser). Up to 12 math channels are available, with 42 functions including (+, -, /, x), flow calculations, averaging and many more.

## Custom Messages

Pre-defined messages can be added as text to the trend or appear as pop-up dialogue boxes on the screen when a certain event occurs for example when a channel goes into alarm

## Operator Notes

Operators can add a free-form note to the trend at any time. This gives total flexibility to add information at any point in time that will be embedded with the process data for the lifetime of the file.

## Message Log and Alarm Summary

Alarms and messages recorded in the 5100e can be viewed quickly and easily from Alarm Summary and Message log pages.

## E-mail

The 5100e offers alarm notification via email for up to 50 recipients. Implementing the widely recognised Simple Message Transfer Protocol (SMTP) the 5100e is able to send text messages to both email and SMS accounts, thus providing instantaneous information regarding the status of the process.

## TECHNICAL SPECIFICATION

### Recorder

#### Environmental performance

Temperature limits	Operation:	5 to 40°C
	Storage:	-20 to 50°C
Humidity limits	Operation:	20% to 80%
	Storage:	20% to 80%
Protection	Bezel and display:	IP54
	Sleeve:	IP20
Shock		BS EN61010
Vibration (10 to 150Hz)		2g peak
Altitude		<2000 metres.

#### Electromagnetic compatibility (EMC)

Emissions and immunity	BS EN61326
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#### Electrical safety

(BS EN61010)	Installation cat. II; Pollution degree 2
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#### 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

#### Physical

Panel mounting	DIN43700
Panel mounting angle	±15°
	Bezel size: 144 x 144mm
	Panel cutout dimensions: 138 x 138mm (-0/+1mm)
Depth behind bezel rear face:	248mm
Weight:	3kg

#### Operator interface

Type	Colour STN LCD with cold cathode backlight, fitted with resistive, analogue, Touch-Panel
Size and resolution	1/4VGA (320 x 240 pixels) 5"

#### Power requirements

Supply voltage	Standard: 85 to 265V ac; 47 to 63Hz or 100 to 370V dc
	Low voltage option: 20 to 42V RMS; 45 to 400Hz or 20 to 54V dc
Power (Max)	60VA (Inrush current 36A)
Fuse type	None
Interrupt protection:	Standard: Holdup >200msec, at 240V ac, with full load
	Low voltage option: 20msec at 20V dc or RMS, with full load

#### 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; Fvalue, Rolling average, Stopwatch etc.

#### Ethernet communications

Type	10Mbps Ethernet. 10BaseT (IEEE802.3)
Transport protocol	TCP/IP
	Provision for File Transfer Protocol (FTP)
	Modbus/TCP SNTP
Cable	Type: CAT5
	Maximum length: 100 metres
	Termination: RJ45

**Transmitter PSU**

Non isolated  
 Number of 4-20mA loops 6  
 Output voltage 24V ±10%  
 Maximum current Continuous: 120mA (total for all outputs)  
 Peak: 240mA (total for all outputs)  
 Isolation (dc to 65Hz BS61010) Installation category II;  
 Pollution degree 2  
 Non isolated. 0V returns are connected to chassis ground.

**Relay Output Board**

**General**  
 Maximum number of relays 1  
 Estimated mechanical life 30,000,000 operations  
 Update rate See 'Update rates' in 'Recorder Specification' above

**AC load ratings**

Derating  
 The figures given below are for restive loads. for reactive or inductive loads, de-rate in accordance with Graph 1, in which

F1 = Actually measured results on representative samples  
 F2 = Typical values according to experience  
 Contact life = Resistive contact life x reduction factor

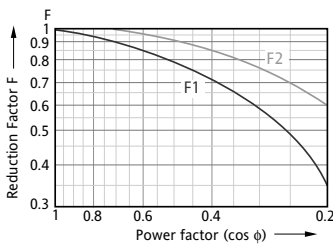
Maximum switching power 500VA  
 Maximum contact voltage 250V providing this does not cause the maximum switching power (above) to be exceeded  
 Maximum contact current 2 Amps providing this does not cause the maximum switching power (above) to be exceeded

**DC load ratings**

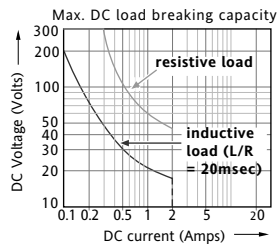
Maximum switching power See Graph 2 for operating volt/amp envelope  
 Maximum contact voltage/Current See Graph 2 for examples

**Safety isolation**

Isolation (dc to 65Hz; BS EN61010) Installation category II;  
 Pollution degree 2  
 Relay to Relay: 300V RMS or dc (double insulation)  
 Relay to ground: 300V RMS or dc (basic insulation)



Graph 1  
 Derating curves for ac loads



Graph 2  
 DC load switching curves

**Input Board**

**General**  
 Input types dc Volts, dc millivolts, dc milliamps (with shunt), Thermocouple, 2/3-wire RTD  
 Contact closure (not Channel 1) >60 ms  
 Freely configurable.  
 Input type mix 6  
 Maximum number of inputs >16 bits, 2nd order delta sigma  
 A/D conversion method See Table1a/1b and Table 3 below.  
 Input ranges Edge connector / terminal block  
 Termination Common mode: >140dB (channel to channel and channel to ground).  
 Noise rejection (48 to 62 Hz) Series mode: >60dB.  
 Maximum common mode voltage 250 Volts continuous  
 Maximum series mode voltage 45mV at lowest range; 12 Volts peak at highest 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: 2500V ac  
 Channel to ground: 1500V ac  
 Insulation resistance >10MΩ at 500 V dc  
 Input impedance 38mV, 150 mV, 1 V ranges: >10MΩ; 10V range: 68.8kΩ  
 Over voltage protection 50 Volts peak (150V with attenuator)  
 Open circuit detection ± 57nA max.  
 Recognition time 500msec  
 Minimum break resistance 10MΩ

**Update/archive rates**

Input/Relay-output sample rate 8Hz  
 Display update 1Hz  
 Archive sample-value Latest value at archive time  
 Trend/Display value Latest value at display update time

**DC Input ranges**

Shunt Externally mounted resistor modules  
 Additional error due to shunt 0.1% of input  
 Additional error due to attenuator 0.2% of input  
 Performance See Table 1

Low Range	High Range	Resolution	Maximum error (Instrument at 20°C)	Worst case temp Performance
-38mV	38mV	1.4µV	0.085% I/P + 0.051% range	80ppm of I/P per °C
-150mV	150mV	5.5µV	0.084% I/P + 0.038% range	80ppm of I/P per °C
-1V	1V	37µV	0.084% I/P + 0.029% range	80ppm of I/P per °C
-10V	10V	370µV	0.275% I/P + 0.030% range	272ppm of I/P per °C

Table 1 DC performance

**Thermocouple data**

Temperature scale ITS 90  
 Bias current 0.05 nA  
 Cold junction types Off, internal, external, remote  
 CJ error 1°C max with inst. at 25°C  
 CJ 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 or low selected  
 Types and ranges See Table 2

T/C Type	Overall range (°C)	Standard	Max 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	DIN43710:1985 (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	DIN43710:1985	0.08°C
NiMo/NiCo	-50 to +1410	ASTM E1751-95	0.06°C
Ni/NiMo	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 2 Thermocouple types and ranges**

**Resistance inputs**

Ranges (including lead resistance) 0 to 150Ω, 0 to 600Ω, 0 to 6kΩ

Influence of lead resistance

Error: Negligible;

Mismatch: 1Ω/Ω

Temperature scale

ITS90

Accuracy and resolution

See Table 3

RTD types and ranges

See Table 4

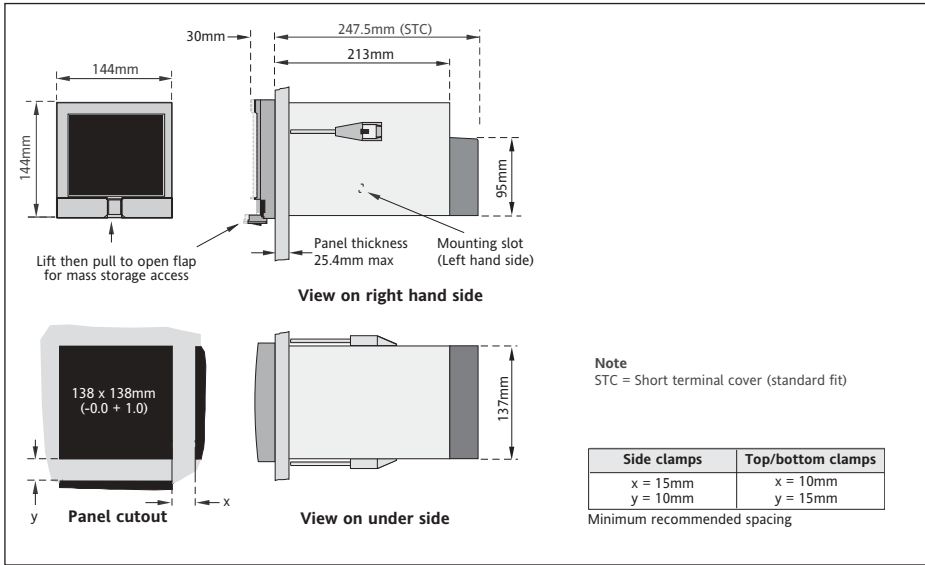
Low Range	High Range	Resolution	Maximum error (Instrument at 20°C)	Worst case temp Performance
0Ω	150Ω	5mΩ	0.045% I/P + 0.110% range	35ppm of I/P per °C
0Ω	600Ω	22mΩ	0.045% I/P + 0.065% range	35ppm of I/P per °C
0Ω	6kΩ	148mΩ	0.049% I/P + 0.035% range	35ppm of I/P per °C

**Table 3 Resistance ranges - accuracy and resolution**

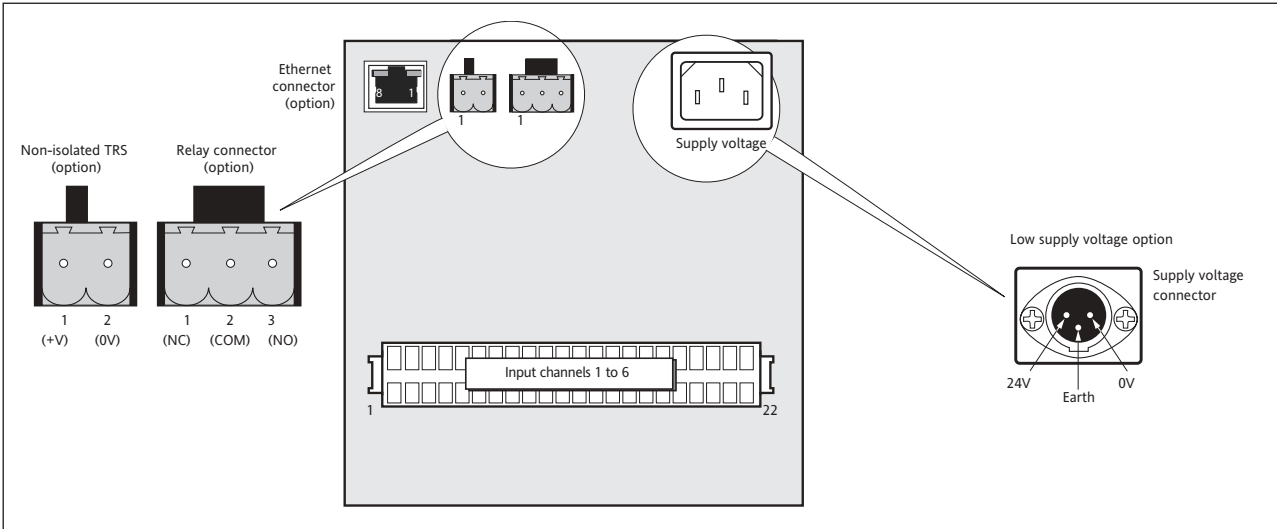
RTD Type	Overall range (°C)	Standard	Max linearisation error
Cu10	-20 to +400	General Electric Co.	0.02 °C
Cu53	-70 to ± 200	RC21-4-1966	<0.01°C
JPT100	-220 to +630	JIS C1604:1989	0.01 °C
Ni1000	-60 to +250	DIN43760:1987	0.01 °C
Ni100	-60 to +250	DIN43760:1987	0.01 °C
Ni120	-50 to +170	DIN43760:1987	0.01 °C
Pt100	-200 to +850	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 4 RTD types and ranges**

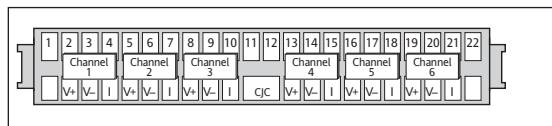
## MECHANICAL INSTALLATION



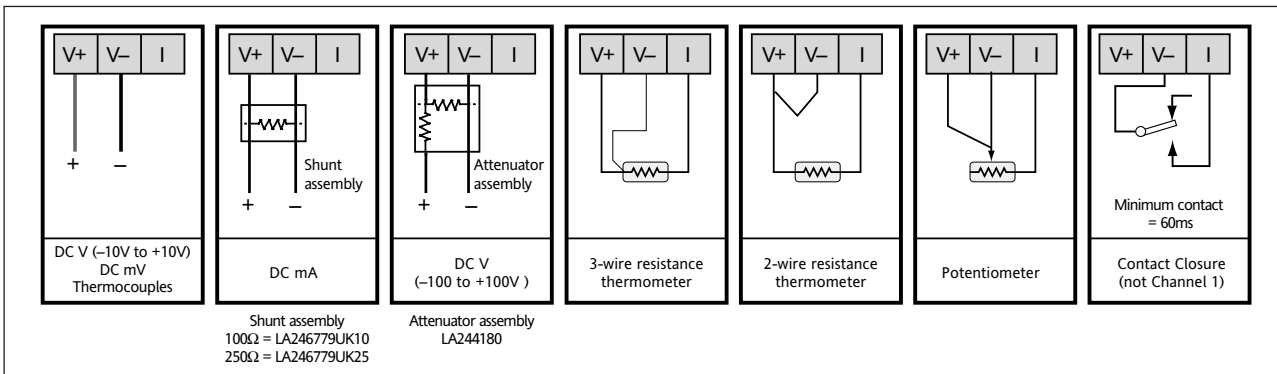
## SUPPLY VOLTAGE



## INPUT BOARD WIRING



## INPUT BOARD SIGNAL WIRING



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