PC3000
MODULES

Ideal for:

- **Remote I/O**
- **Alarm Monitoring**
- **Signal Conditioning**
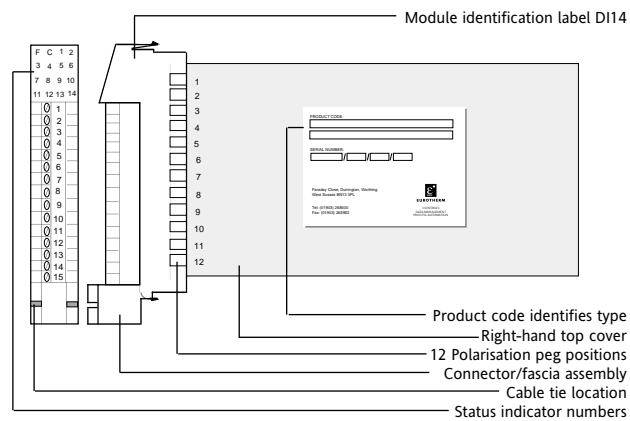
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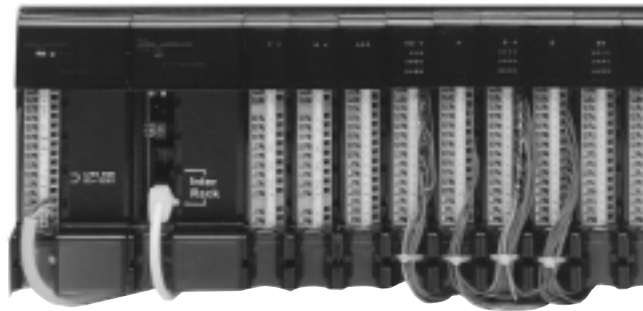
IO Modules
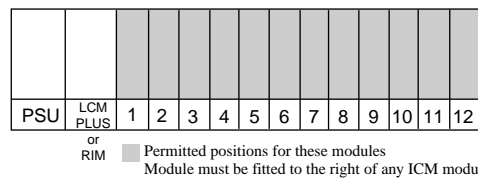## Specification Sheet

Version compatibility

These modules are Version 3 that introduces a new style connector header and a change to the numbering of the Status Indicator LED's. Version 3 modules are compatible with Version 2 and may also be used in the old Version 1 rack together with the enclosed new header.

General form/module identification

Module identification label DI14

Product code identifies type
Right-hand top cover
12 Polarisation peg positions
Connector/fascia assembly
Cable tie location
Status indicator numbers

Location

Modules may be located in any of the 12 slots within a PC3000 main or extension rack. There are no switches or links to set address. Module address is read from the backplane.

PSU	LCM PLUS or RIM	1	2	3	4	5	6	7	8	9	10	11	12

Permitted positions for these modules
Module must be fitted to the right of any ICM modules

12 CHANNEL DIGITAL OUTPUT MODULES

Key features

- 12 output channels per module
- Logic and Relay outputs available
- Detachable plant wiring connector
- Status indication eases commissioning

Description

PC3000 Digital Output modules are offered in two formats. The first provides 12 normally open, form A contacts rated at 1A each and suitable for driving a range of 'power' devices. The second module provides 12 low voltage, open collector (Low side or NPN type) outputs intended for use in higher speed applications.

Each module features a detachable 15 way screw terminal connector assembly.

Function block support

Digital_Out — Provides a direct on/off 'boolean' output for use with alarm indicators, actuator etc. A facility for 'forcing' the output state is provided for use during commissioning. Output sense may be configured by the user as ON/OFF, OPEN/CLOSE etc.

T_Prop_Out — Provides a time proportioned or pulse width modulated output suitable for use as a control output when 'soft-wired' to a PID control loop. A facility for 'forcing' the output state is provided for use during commissioning.

Function block types may be freely mixed across channels on any module.

Types and ordering codes

Type	Code
Small transformers, contactors or valves. Small heaters, Klaxons or alarm indication	**PC3000/DO/VERSION3/RLSTD12**
As above but with last channel dedicated as system 'watchdog' contact. Used to indicate system fault condition	**PC3000/DO/VERSION3/RLFS11**
Solid state relays, thyristor stack and other low voltage control or annunciation applications	**PC3000/DO/VERSION3/LGC12**
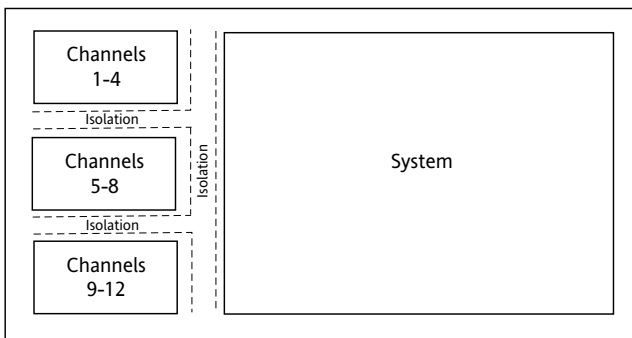
TECHNICAL SPECIFICATION

Number of channels	12
Configuration	Isolated as 3 groups of 4 (3 separate commons)
Isolation type	Galvanism, output group to output group and module to module
Isolation voltage	264V ac rms maximum, group to group channel to ground 3000V ac rms for 1 min
Scan rate	Selectable via PC based Programming Station Maximum scan rate is 5ms

Relay output

Configuration	12, normally open
Output voltage rating	264V ac rms max
Current	1A/channel (resistive load) 4A maximum per group
Peak current	50A for single cycle 75A for total group for single cycle
Contact type	Silver cadmium oxide
Contact protection	RC 'snubber' network
Off leakage current	2mA at 264V ac rms
On/off delay time	10ms max
Life	>1M electrical operations

Logic output

Configuration	12, open collector, NPN
Output voltage rating	24V nominal (30V dc max)
Current	100mA/channel max
On state voltage	0.9V max at 100mA
Protection	Zener clamp @ 30V
Off leakage current	Negligible below clamp voltage e.g. 50nA at 20V 50mA at 30V
On/Off delay time	typically 30μs

Environment

Operating temperature	0 10 50°C
Storage temperature	-20 to 70°C
Relative humidity	5 to 95% non-condensing
Weight	336g (LGC12), 415g (RLYSTD12, RLYFS11)
Electromagnetic compatibility	Emissions: EN 50081-2 generic standard for the industrial environment Immunity: General requirements of EN50082-2(95) standards for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5V)

14 CHANNEL DIGITAL INPUT MODULES

Key features

- 14 digital inputs per module
- Support for a wide range of input sources
- Robust design, excellent noise immunity
- Detachable plant wiring connector
- Status indication eases commissioning

Description

A range of Digital Input modules suitable for direct connection to a wide range of plant inputs. Modules for low voltage and high voltage ac and dc applications as well as a module which includes an integral power supply for use with contact input sources are included.

All modules provide 14 input channels. Channels are isolated from the rest of the system and share a common return. Channels do not provide inter-channel isolation. All inputs sink current and feature over-voltage protection and noise filtering. Full system isolation ensures excellent noise immunity.

Function block support

Digital_In	Provides a direct digital input function. Naming, sense, etc. are user configurable. Facility for 'forcing' input value read by program is provided.
Debounce_In	Provides a programmable 'debounce', digital input for use with contact input sources. Other functions similar to Digital_In.

Types and ordering codes

	Type	Code
5Vdc	CMOS IC and transistor output devices. High speed input from counters etc.	**PC3000/DI/VERSION3/5LL14**
24Vdc	Solid state and transistor output devices.	**PC3000/DI/VERSION3/24LL14**
24Vac	Limit switches employing low voltage ac for signalling	**PC3000/DI/VERSION3/ACLL14**
85-264Vac	Limit switches and relays employing high voltage ac for signalling	**PC3000/DI/VERSION3/HL14**
Contact closure	For 'voltage-free' relay contact inputs	**PC3000/DI/VERSION3/CC14**

Note:
/5LL14 and /24LL14 variants have user configurable input range by means of a link
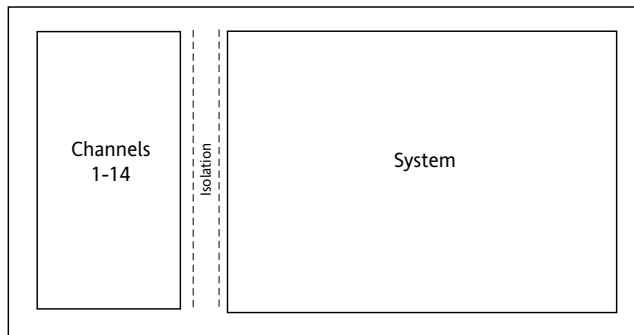
TECHNICAL SPECIFICATION

Module specifications			
Module	**5LL14**	**24LL14**	**ACLL14**
I/P voltage	5V±10%	24V±10V	24V rms±10%
Max voltage	±50V	±50V	45V rms
Frequency	-	-	48-62Hz
Wetting supply	-	-	-
ON at	3.5V	17.3V	16.2V rms
OFF at	1.5V	7.7V	7.1V rms
I/P current	2.5mA	2.5mA	3mA
I/P channels	14	14	14
ON delay	<3ms	<4ms	<15ms
OFF delay	<4ms	<4ms	<15ms

Module specifications		
Module	**CC14**	**HL14**
I/P voltage	-	85-264Vrms
Max voltage	±40V	264V rms
Frequency	-	48-62Hz
Wetting supply	14V	-
ON at	1kΩ	65V rms
OFF at	10kΩ	49V rms
I/P current	2.5mA	0.9mA - 5.5mA
I/P channels	14	14
ON delay	<8.5ms	<15ms
OFF delay	<8.5ms	<15ms

Configuration	Open circuit input corresponds to logic '0'

Note:
/CC14 is designed for use with low level type contacts i.e. gold flash (14V, 2.5mA 'wetting' supply)

Environment

Weight	350g (approx)
Operating temperature	0-50°C
Storage temperature	-20-70°C
Relative humidity	5-95% non-condensing
Electromagnetic compatibility	Emissions: EN 50081-2 generic standard for the industrial environment Immunity: General requirements of EN50082-2(95) standards for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5V)
Atmospheres	Electronically conductive pollution must be excluded from the cabinet in which PC3000 is installed. This product is not suitable for use above 200m or in corrosive or explosive atmospheres, without further protection.
Insulation	All inputs have reinforced insulation to the system and other modules, which provides protection against electrical shock.

4 CHANNEL ANALOGUE OUTPUT MODULES

Key features

- 4 output channels per module
- High performance, high stability
- Voltage or current loop application
- Detachable plant wiring connector
- Status indication eases commissioning

Description

The PC3000 4 channel Analogue Output module provides four isolated channels suitable for direct connection to wide range of output actuator and monitoring devices.

Modules are offered in two 'factory' variants with each module providing four channels configured as voltage or current outputs.

Channels may be readily re-configured in the field by means of a simple link selection and output types may be mixed across channels. Channel configuration is reported and range, offset etc. are user configurable via the supporting Function Block and the PC based Programming Station. Refer to the list of Types and Ordering Codes for further details.

The module incorporates high precision analogue components to ensure stability over the full temperature range. The module may be used for control outputs (i.e. demand signal for heating control) or as a re-transmission output to provide monitor information to a data acquisition system or as a setpoint for another control loop.

The module exhibits high noise immunity; channels are fully isolated from other I/O in the system. Outputs include high frequency noise rejection filtering.

Plant wiring is by means of a detachable 15 way screw terminal connector assembly.

Function block support

Analog_Out — Provides output type/range selection, scaling and offset function and full access to parameters associated with calibration. A facility for providing 'transducer' calibration is incorporated. Full indication of channel mode, status etc. is provided.
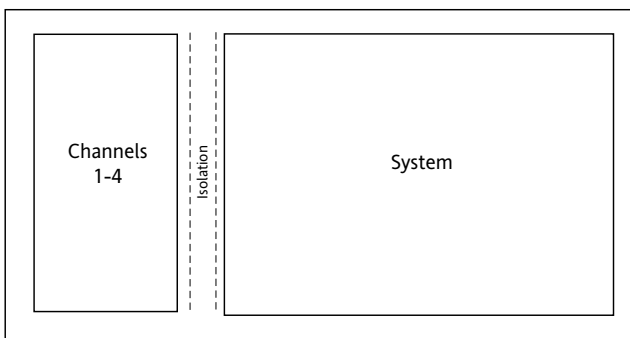
The range, scaling, offset etc., of each channel is completely independent.

Types and ordering codes

Type	Code
4 channels, voltage configuration	**PC3000/AO/VERSION3/V2**
4 channels, current configuration	**PC3000/AO/VERSION3/mA4**

The V4 and mA4 variants are functionally identical. Output types i.e. voltage and current may be mixed on the same module by link selection.

TECHNICAL SPECIFICATION

Number of channels	4 isolated
Isolation type	Galvanic, module to module
Isolation voltage	264V ac rms maximum channel to ground
Output resolution	12 bit plus sign
Calibrated accuracy	±0.25% of range
Linearity	0.1%
Ranges	-10 to 10V ⎤ See note
	0 to 20mA ⎦
	Other ranges included offset ranges (1 to 5V, 4 to 20mA) are selectable from the Programming Station
Scan rate	Selectable via PC based Programming Station
	Nominal scan rate at 100ms
Calibration values	Stored in EEPROM on card
Output current	20mA in voltage mode
Protection	Short circuit proof
Short circuit current	Approx. 40mA (voltage output)
Open circuit voltage	Approx. 15V (current output)
Maximum burden	600Ω (12V headroom)
Output Impedance	0.6Ω
Temperature Stability	(Voltage mode)
Gain stability	30ppm°C typical
Zero stability	25µV/°C typical
Temperature stability	(Current mode)
Gain stability	80ppm/°C typical
Zero stability	0.1µA/°C typical
Output response time	
Hardware filter	<50ms to 1% (10ms typical)

Note: Full resolution is maintained on these ranges. A range of 0 to 5V offers 11 bit resolution

Environment

Operating temperature	0 to 50°C
Storage temperature	-20 to 70°C
Relative humidity	5 to 95% non-condensing
Weight	370g approx
Electromagnetic compatibility	Emissions: EN 50081-2 generic standard for the industrial environment
	Immunity: General requirements of EN50082-2(95) standards for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5V)

4 CHANNEL ANALOGUE INPUT MODULES

Key features
- 4 input channels per module
- High performance, high stability
- Support for wide range of sensor types
- Detachable plant wiring connector
- Status indication eases commissioning

Description

The PC3000 4 channel Analogue Input modules provide four fully isolated channels suitable for direct connection to a wide range of input sources.

Modules are offered in four variants with each module providing four identical channels. Range sensor type etc. are user configurable on a per channel basis via the supporting Function Block and the PC based Programming Station. Refer to the list of **types** for further details.

The millivolt input incorporates a high precision temperature sensor for measurement of the cold junction temperature to ensure excellent rejection of ambient temperature changes. similarly, state of the art input convertor drift compensation techniques are included in all modules to ensure stability over the full temperature range.

The resistance input variant may be used with two or three wire transducers. Automatic compensation for lead resistance is provided when used with three wire sources.

The process level input variant permits direct connection of high level (up to 10V) signals, without the need for external attenuation.

Current inputs are handled by means of an external burden resistor fitted to the detachable connector assembly. This ensures that the current lop does not get interrupted during maintenance.

All modules offer four ranges. Refer to the specification for details. Range selection and channel configuration is user configurable via the supporting Function Block and the PC based Programming Station.

Selection of sensor type (e.g. J type thermocouple and PT100 Resistance Thermometer from a choice of 40 types) is achieved by similar means. Full details of these parameters and many others is included in the PC3000 Function Block Reference. (HA022917).

Excellent noise immunity and line frequency rejection is achieved by full isolation.

Input channels are isolated from each other and from other modules in the system.

Each module features a detachable 15 way screw terminal connector assembly.

Function block support

Analog_In	Provides input type/range selection, sensor type or linearisation, scaling and offset functions and full access to parameters associated with calibration. Sensor break point is user configurable. Full indication of channel mode, status etc. is provided.
Analog_In_R	Provides similar functions to the above but provides support specifically for the Resistance Thermometer variant and removes all non-RT parameters.

The configuration of each channel is completely independent.

Types and ordering codes

Type	Code
Linear millivolt, thermocouple, and millivolt level pyrometer	**PC3000/AI/VERSION3/mV4**
As above but with external burden resistors provided	**PC3000/AI/VERSION3/mA4**
Process level and volt level pyrometer	**PC3000/AI/VERSION3/V4**
Linear resistance and resistance thermometers	**PC3000/AI/VERSION3/RT4**

The mV4 and mA4 variants are functionally identical. Input types e.g. Process level and thermocouple input can not be mixed on the same module unless external attenuation is provided.

TECHNICAL SPECIFICATION

Number of channels	4 fully isolated
Isolation type	Galvanic, channel to channel, module to module
Isolation voltage	264V ac rms maximum channel to channel or channel to ground
Conversion type	Integrating
Input resolution	14 bit basic (15 bit effective)
Calibration accuracy	±0.25%
Ranges	Refer to section on input type
Scan rate	Selectable via PC based Programming Station Maximum scan rate is 100ms
Integration period	Automatically selected to reject 50 to 60Hz
Calibration values	Stored in EPROM on card
Input bias current	250nA
Source resistance error	0.25µV/Z of lead
Common mode rejection	120dB (48-52Hz and 58-62Hz)
Series mode rejection	60dB (48-52Hz and 58-62Hz)
Temperature stability	
Gain stability	25ppm/°C maximum (5ppm/°C typ)
Zero stability	0.5µV/°C maximum (0.05µV/°C typ)
Input filtering	
Hardware filter	Single pole, f_c = 1Hz
Software filter	Rolling average, 4 samples and Programmable First Order low pass filter via Programming Station
Input response time	
Hardware filter	700ms to 1%
	1s to 0.1%
	1.56s to 0.003% (14 bits)
Software filter	Rolling average imposes 4 sample delay on input

Thermocouple input

Module type	PC3000/AI/VERSION3/mV4
Ranges	-10 to 10mV
	-10 to 20mV
	-10 to _50mV
	-10 to 100mV
Zero error	10mV range: type ±1µV
	20mV range: typ ±2µV
	50mV range: type ±5µV
Input impedance	>1MΩ
Break protection	Upscale only. 'Soft' breakpoint selectable via the Programming Station
Break current	250nA
Break protection time	25s from zero to overrange detect typical on 50mV range
	54s from zero to overrange detect typical on 100mV range
Temperature stability	
Cold junction measurement error	50:1
Gain stability	25ppm/°C maximum (5ppm/°C typ)
Zero stability	0.5µV/°C maximum (0.05µV/°C typ)
Linearisation	Handled via on-board microcontroller
Cold junction calibration error	±0.5°C

Thermocouple and Pyrometer Types *over the page*

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Thermocouple and Pyrometer Types

Code	Type		Min & Max. Range (°C)	Recommended Range (°C)	Linearisation Error (max) (±°C)	Resolution[1] (°C)	Voltage Range
1	Iron Constantan	J	-210 to 1200	0 to 600	0.05	0.093	100mV
2	Fe/Nonst (DIN)	L	-210 to 900	0 to 600	0.1	0.091	100mV
3	Ni Cr/Ni Al	K	-265 to 1372	-250 to 1200	0.1	0.14	100mV
4	Cu/Con	T	-270 to 400	-250 to 395	0.1	0.047	50mV
5	Pt13%Rh/Pt	R	-50 to 1767	0 to 1600	0.1	0.21	50mV
6	Pt10%Rh/Pt	S	-50 to 1767	0 to 1600	0.1	0.21	50mV
8	Pt30%Rh/Pt6%Rh	B	0 to 1820	200 to 1800	0.4	0.25	50mV
9	W/W26%Re	W	0 to 2320	0 to 2300	0.2	0.2[2]	50mV
11	WRe5%WRe26%	W	0 to 2320	0 to 2300	0.1	0.19[2]	50mV
12	Ni Cr/Con	E	-270 to 1000	0 to 780	0.1	0.068	100mV
23	Pt10%-PtRh40%		0 to 1800	200 to 1780	1.0	0.29	50mV
24	W5%Re/W26%Re	C	0 to 2300	0 to 2300	0.2	0.18[2]	50mV
25	PtRh20%PtRh40%		0 to 1880	0 to 1600	0.4	0.64	50mV
28	Platinell II		0 to 1370	0 to 1200	0.1	0.15	100mV
29	W-WRe26%	G2	0 to 2320	0 to 2200	0.1	0.2	50mV
33	NiCi-NiMo		0 to 1260	0 to 1100	0.1	0.09	100mV
35	WRe3%Wre25%	D	0 to 2400	0 to 2380	0.2	0.18[2]	50mV
38	WRe5%WRe26%		0 to 2000	0 to 1980	1.0	0.17[2]	50mV
45	Nicosil/Nisil	N	0 to 1300	0 to 1285	0.4	0.08	50mV
48	Q004Pyrometer		700 to 1600	800 to 1550	0.4	0.026	100mV[3]
51	Q003Pyrometer		600 to 1500	700 to 1400	0.1	0.02	100mV[3]
54	R026Pyrometer		0 to 500	100 to 495	0.1	0.02	50mV
61	IVDI Pyrometer		1000 to 2500	1000 to 2480	0.4	0.09	10V
62	DTI Pyrometer		750 to 2500	1200 to 2480	0.4	0.026	10V
63	DTI/10 Pyrometer		1000 to 3000	1100 to 2980	0.4	0.036	10V
64	RO23 Pyrometer		700 to 1700	300 to 1690	0.4	0.1	10V
82	FP/GP 10 Pyrometer		450 to 900	500 to 895	0.4	0.005	10V
83	FP/GP11 Pyrometer		600 to 1300	700 to 1290	0.4	0.009	10V
84	FP/GP 12 Pyrometer		750 to 1850	1000 to 1840	0.4	0.016	10V
85	FP/GP 20 Pyrometer		300 to 750	400 to 745	0.4	0.006	10V
86	FP/GP 21 Pyrometer		500 to 1100	510 to 1090	0.4	0.010	10V

Notes:

[1] All resolution figures are at Full Scale unless otherwise noted

[2] Resolution averaged over recommended range

[3] Pyrometers 48 and 51 require external 500Ω, 0.1% burden resistor

Voltage and Current Input

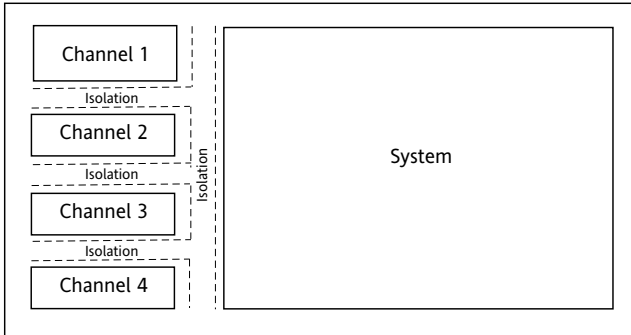|	
Module type	**PC3000/AI/VERSION3...**
Ranges	-10 to 10mV
	-10 to 20mV
	-10 to 50mV **.../mV4**
	-10 to 100mV
	-1 to 1V
	-2 to 2V
	-5 to 5V **.../V4**
	-10 to 10V
	0 to 10mA (5 ohm/burden/50mV) **.../mA4**
	0 to 20mA (5 ohm/burden/100mV)
Input impedance	>1MΩ on mV ranges
	540k on V ranges
Break protection	Upscale only. "Soft' breakpoint selectable via the Programming Station
Break current	250nA
Break protection time	25s from zero to overrange detect typical on 50mV range
	54s from zero to overrange detect typical on 100mV range
Temperature stability	
Millivolt ranges	
Gain stability	25ppm/°C max (5ppm/°C typ)
Zero stability	0.5µV/°C max (0.05µV/°C typ)
Voltage ranges	
Gain stability	40ppm/°C max (10ppm/°C typ)
Zero stability	100µV/°C max (10µV/°C typ)
Current ranges	
Burden	Adds 5ppm/°C max to millivolt range figures

Range	Resolution (µV or µA)	Zero Error (µV or µA)
-10 to 10mV	1	typ ±1
-10 to 20mV	1.5	typ ±2
-10 to 50mV	3	typ ±5
-10 to 100mV	6	typ ±10
-1 to 1V	100	typ ±100
-2 to 2V	200	typ ±200
-5 to 5V	500	typ ±500
-10 to 10V	1000	typ ±2000
0 to 10mA	0.5	typ ±1
0 to 20mA	1	typ ±2

Resistance Inputs

Module type	**PC3000/AI/VERSION3/RT4**
Sensor types	2 or 3 wire Pt100 Resistance Thermometer. Linear inputs such as potentiometers may also be connected.
Sensor Bias Current	200µA
Maximum Lead Resistance	25Ω/lead
Lead Rejection	0.015Ω/Ω
Temperature Stability	
Gain stability	40ppm/°C maximum (10ppm/°C typ)
Zero stability	2.5mW/°C maximum (0.25mW/°C typ)

Type	Range (Ω or °C)	Resolution (mΩ or °C)	Linearisation Error (max) (±°C)
Lin	0 to 50	2.5	-
Lin	0 to 100	5	-
Lin	0 to 250	12.5	-
Lin	0 to 500	25	-
Pt100	-200 to 800	0.05	0.05

Environment

Operating temperature	0 to 50°C
Storage temperature	–20 to 70°C
Relative humidity	5 to 95% non-condensing
Weight	390g approx
Electromagnetic compatibility	Emissions: EN 50081-2 generic standard for the industrial environment Immunity: General requirements of EN50082-2(95) standards for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5V)

4 CHANNEL ANALOGUE INPUT MODULE
HIGH IMPEDANCE VERSION

Key features

- 1 High impedance channel (>100Mohms) Suitable for Zirconia probes
- 3 Standard low level input channels
- High performance, high stability
- Support for wide range of sensor types

Description

The High Impedance version of the PC3000 4 Channel Analogue Input module provides for fully isolated channels suitable for direct connection to a wide range of input sources.

Channel 1 is configured as a high Level, High Impedance channel suitable for use with a high source impedance transducer e.g. Zirconia Oxygen probe. The remaining three channels are configured as standard millivolt input channels.

Internally, the high level channel 1 input will be attenuate to provide compatibility with the standard 10mV, 20mV, 50mV and 100mV ranges. An input level of 2V will correspond to a value of 20mV at the output of the Analogue Input function block. A pre/post scaling factor of 100 should therefore be used to deliver the correct voltage level at the function block outputs.

Function block support

Analog_In	Provides input type/range selection, sensor type or 'linearisation', scaling and offset functions and full access to parameters associated with calibration. Sensor break point is user configurable. Full indication of channel mode, status etc. is provided.

The configuration of each channel is completely independent.

Types and ordering codes

Type	Code
1 High impedance channel 3 Millivolt channels	**PC3000/AI/VERSION3/MV3/HIZ1**

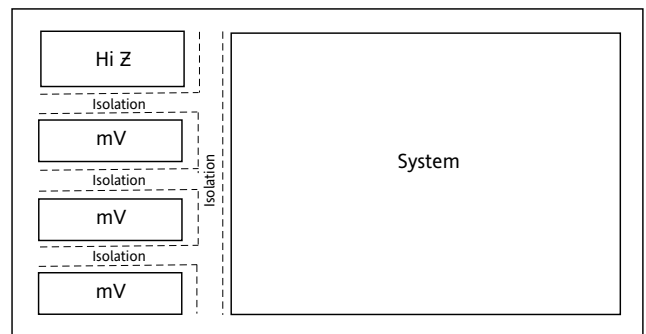## TECHNICAL SPECIFICATION

Number of channels	4 fully isolated
Isolation type	Galvanic, channel to channel, module to module
Isolation voltage	264V ac rms maximum channel to channel or channel to ground
Conversion type	Integrating
Input resolution	14 bit basic (15 bit effective)
Calibrated accuracy	±0.25%
Scan rate	Selectable via PC based Programming Station Maximum scan rate is100ms
Integration period	Automatically selected to reject 50 to 60Hz
Calibration values	Stored in EPROM on card
Common mode rejection	120dB (48-52Hz and 62Hz)
Series mode rejection	60dB (48-52Hz and 58-62Hz)
Input filtering	
Hardware filter	Single pole, f_c = 1Hz
Software filter	Rolling average, 4 samples and programmable first order low pass via programming station
Input response time	
Hardware filter	700ms to 1% 1s to 0.1% 1.56s to 0.003% (14 bits)
Software filter	Rolling average imposes 4 sample delay on input

Thermocouple input *see page 5*

Thermocouple and Pyrometer Types *see page 6*

Voltage and Current Input *see page 6 for millivolt values*

	High impedance channel
Ranges	-1V to 1V -1 to 2V -1V to 5V -1V to 10V
Zero error	1V range: type ±100µV 2V range: type ±200µV 5V range: type ±500µV 10V range: type ±200µV
Input impedance	>100MΩ
Input bias current	<2nA
Break protection	None
Temperature stability	
Gain stability	50ppm/°C max (25ppm/°C typ)
Zero stability	100µV/°C typ)

Environment

Operating temperature	0 to 50°C
Storage temperature	-20 to 70°C
Relative humidity	5 to 95% non-condensing
Weight	390g approx
Electromagnetic compatibility	Emissions: EN 50081-2 generic standard for the industrial environment Immunity: General requirements of EN50082-2(95) standards for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5V)

4 CHANNEL ANALOGUE INPUT MODULE FREQUENCY VERSION

Key features

- 2 Frequency input channels 10Hz to 10KHz
- Sine or square wave signals, 100mV to 70V
- Standard high level voltage input channels
- High performance high stability

Description

The frequency input version of the PC3000 4 Channel Analogue Input Module provides four fully isolated channels suitable for direct connection to a wide range of input sources. Channels 1 and 3 are configured as frequency input channels suitable for use with a variety of frequency inputs including encoders, proximity detectors etc. The inputs are AC coupled with a maximum DC offset of ±50V. The remaining channels are configured as standard Process Level voltage inputs.

The frequency to voltage convertor produces signal levels which are compatible with the standard 1V, 2V, and 10V input ranges. An input of 5kHz will correspond to a value of 5V at the output of the Analogue Input function block. A pre post scaling factor of 1000 should therefore be used to deliver the correct frequency in Hz at the function block outputs.

Function block support

Analog_In — Provides input type/range selection, scaling and offset functions and full access to parameters associated with calibration. Full indication of channel mode, status etc. is provided.

The configuration of each channel is completely independent.

Types and ordering codes

Type	Code
2 Frequency input channels 2 Process level channels	**PC3000/AI/VERSION3/V2/FV2**

TECHNICAL SPECIFICATION

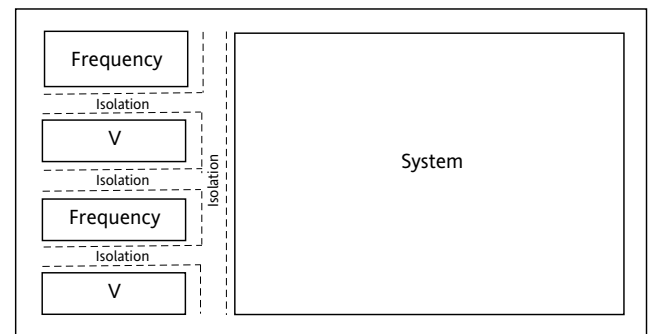|	
Number of channels	4 fully isolated
Isolation type	Galvanic, channel to channel, module to module
Isolation voltage	264Vac rms maximum channel to channel or channel to ground
Conversion type	Integrating
Input resolution	14 bit basic (15 bit effective)
Calibrated accuracy	±0.25%
Scan rate	Selectable via PC based Programming Station
	Maximum scan rate is 100ms
Integration period	Automatically selected to reject 50 or 60Hz
Calibration values	Stored in EEPROM on card
Common mode rejection	120dB (48-52Hz and 58-62Hz)
Series mode rejection	60dB (48-52Hz and 58-62Hz)

Thermocouple and Pyrometer Types *see page 6*

Voltage and Current Input

Ranges	High level channels	Frequency channels
	-1 to 1V	10Hz to 1kHz
	-2 to 2V	10Hz to 2kHz
	-5 to 5V	10Hz to 5kHz
	-10 to 10V	10Hz to 10kHz
Zero error	-1 to 1V range: typ ±100µV	
	-2 to 2V range: typ ±200µV	
	-5 to 5V range: typ ±500µV	
	-10 to 10V range: typ ±2000µV	
Input impedance	540kΩ	>100kΩ
Min.input signal to trigger f/v	N/A	100mV
Max. input signal	N/A	70Vrms
Max. D.C. offset	N/A	±50V
Input filtering		
Hardware filter	Single pole, fc=1Hz	F-V filter single pole, fc=0.3Hz
Software filter	Rolling average, 4 samples and programmable first order pass filter via programming station	
Temperature stability		
Gain stability	40ppm/°C max (10ppm/°C typ)	
Zero stability	100ΩV/°C max (10µV°C typ)	

Environment

Operating temperature	0 to 50°C
Storage temperature	-20 to 70°C
Relative humidity	5 to 95% non-condensing
Weight	390g approx
Electromagnetic compatibility	Emissions: EN 50081-2 generic standard for the industrial environment
	Immunity: General requirements of EN50082-2(95) standards for industrial environments
Safety standards	EN61010, installation category 2. (voltage transients must not exceed 2.5V)

2 CHANNEL PULSE INPUT MODULE

Key features

- 2 Pulse input channels up to 200kHz
- Pulse count and quadrature versions available
- 2 Selectable voltage inputs 5V/12V
- Status indication eases commissioning
- Detachable plant wiring connector

Description

This module provides 2 channels for general purpose high speed counting and totalising applications, and a supply for powering encoders. A variant of this module permits decoding of quadrature encoders. The module can handle pulse inputs up to 200kHz.

All data refers to the later 'Mk 2' pulse input module.

The inputs have reinforced insulation to the "System" and other modules. There is no inter-channel isolation. Both channels operate at the same selected voltage.

Function block support

PIM2	Provides support for locating the Pulse Input Module by entering address details. One block required for each card.
PI_Smpl_Ctr	Used for controlling the block and providing Total and Delta count information. One block required for each channel.

Types and ordering codes

Type	Code
Single input pulse counting mode Link selectable for 5V input	**PC3000/PI/VERSION3/12P2**
Quadrature input mode Link selectable for 12V input	**PC3000/PI/VERSION3/5Q2**

TECHNICAL SPECIFICATION

Number of channels	2 isolated
Isolation type	Galvanic, module to module
Isolation voltage	264Vac rms maximum channel to ground
Input frequency	0-200kHz (800kHz 4 x quadrature encoder)
Max count	24 bit (16,777, 216)
Input voltage	Switching levels 30% and 70% of encoder supply voltage
Encoder supply	12V @150mA or 5V @500mA short-circuit protected