



Mann Series Process Instruments

Product Information

Mann Series Process Instruments

Signal Isolators

ISO – Signal Powered Isolators	4
TWI Series – Loop Powered Isolators	6
SFI/DFI – Auxiliary Powered Isolators	8
UTX Series – Programmable, Signal Isolator/Converters	10
MannPak MPC – Programmable, Auxiliary Powered, Signal Isolator/Converter	12

Signal Transmitters

ITXPlus Series – Universal, Loop Powered, Signal Isolator/Converters	14
FTX Series – Auxiliary Powered, Isolated, Signal Conditioners	18
STG – Auxiliary Powered, Strain Gauge Converter	26
Micromann AR Series – Universal, Auxiliary Powered, Dual Setpoint	28
Micromann UPI Series – Analogue to Frequency Converters	32

Process Alarms

DPA Series – Auxiliary Powered, Dual Setpoint, Alarm	36
Micromann R Series – Universal, Auxiliary Powered, Alarms	44

Multi-Channel Processing Modules

Micromann Multiplus Series – Multi-Input Signal Processing/Display Modules	48
--	----

Indicators and Auto/Manual Stations

PMX420 Series – Four Digit, Current/Voltage Displays	54
PMX400 Series – Four Digit, Programmable Displays with Alarms and Analogue Output	58
DI350 – 3+1/2 Digit Indicator	62
PM450 – 4+1/2 Digit Indicator	64
LPD350 – 3+1/2 Digit, Loop Powered, Indicator	66
LPD450F – Field Mount, Loop Powered, Display	68
AMS400A – Universal Auto/Manual Station	70

Totalisers

PTX800 Series – Panel Mount, Totalisers/Counters	72
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Calibrators

Portacal 275 – Handheld Signal Source and Loop Calibrator	76
Portacal 1000 – Current/Voltage Instrument Calibrator	78

Appendix

Worldwide Activities	80
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ISO – Signal Powered Isolators

The ISO provides an isolated 4-20 mA signal from any 4–20 mA loop with sufficient drive. It provides a simple way to fix unexpected problems caused by ground loops and high common mode noise.

- Provides complete isolation
- Signal powered
- Suitable for loads up to 400 Ω
- Removable, screw-type, terminal blocks
- Compact metal housing



ISO

4–20 mA



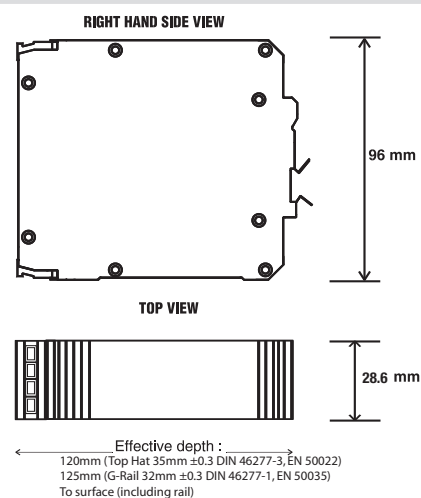
Technical Data

Input	
Type	4–20 mA
Input resistance	200 Ω + load across output
Minimum input resistance	300 Ω
Output	
Type	4–20 mA
Output load range	0–400 Ω
Ripple	< 20 mV peak to peak at maximum load and span
Power supply	
Type	Input loop signal powered
Voltage drop	4 V fixed drop + drop across output
Adjustments	
Type	20-turn potentiometers
Trim	To trim output range
Load	Compensates for low output loads
General	
Linearity	Typically $\pm 0.3\%$ of span
Repeatability	$\pm 0.05\%$ of span
Storage temperature	– 25 to + 70 °C
Operating temperature	0 to 60 °C
Relative humidity	0–95% (non-condensing)
Temperature drift	Typically 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Frequency response	–3 dB point = 5 Hz
Response time	500 mS for 10–90% output change
Noise Immunity	130 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	240 g
Connection type	Plug in terminal blocks with screw connections

Connections

Terminal	Signal	
1	Signal + ve	Input signal
2	Signal – ve	
3		Not Used
4		
5		
6		
7		
8	Output + ve	Output signal
9	Output – ve	
10		Not Used
Case		Earthing is via a stud on lower side of case

Dimension Drawing



Ordering Information

Type	Cat. No.
ISO 4-20 mA	7940010235

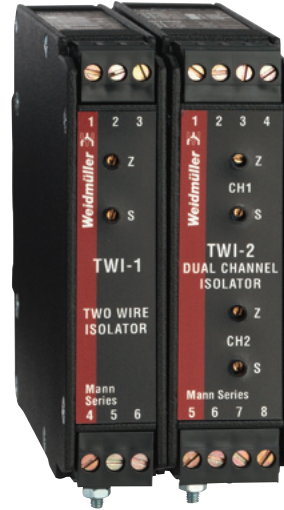
TWI Series – Loop Powered, Isolators

TWI-1 Single Channel

TWI-2 Dual Channel

The TWI-1 and TWI-2 are single and dual channel, loop powered isolators.

- Current or Voltage inputs
- Powered from 4–20 mA output loop
- Highly accurate ($\pm 0.1\%$ of span)
- Front panel zero and span adjustment
- Complete Isolation to 1.5 kV (ac and dc)
- Removable, screw-type, terminal blocks
- Compact metal housing



TWI-1

4–20 mA



TWI-2

4–20 mA



Technical Data

Inputs	
Type	DC milliamp or voltage
Ranges	4–20 mA or 0–10 V
Input impedance	27 Ω (4–20 mA inputs) or ≥ 1 MΩ (0–10 V inputs)
Outputs	
Type	4–20 mA loop powered
Ripple	less than 10 μA peak to peak
Max loop load	$[(V_s - 12) / 0.02] \Omega$ (Typically 600 Ω at 24 V DC)
Power Supply	
Type	12–45 V DC loop powered
Line voltage effect	less than 0.05% of span change for 10 V change in supply over 12–45 V DC range
Adjustments	
Type	22-turn potentiometers
Span	± 25% of nominal span
Zero	± 25% of nominal span
General	
Linearity	± 0.1% of span
Repeatability	± 0.02% of span
Storage temperature	– 25 to + 70 °C
Operating temperature	– 10 to 60 °C
Relative humidity	0–95% (non-condensing)
Temperature drift	< 0.02% span per °C
Long term drift	< 0.1% per 10,000 hours
Input response	200 mS (from 10% to 90% of span)
Frequency response	–3 db point = 5 Hz
Noise Immunity	120 dB CMRR (1.5 kVrms limit) 40 db series mode noise rejection @50 Hz
Isolation	
Isolation (Input to Output to Earth)	1.5 k Vrms for 60s (AC & DC)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	TWI-1 205 gm TWI-2 238 gm
Connection type	Plug in terminal blocks with screw connections

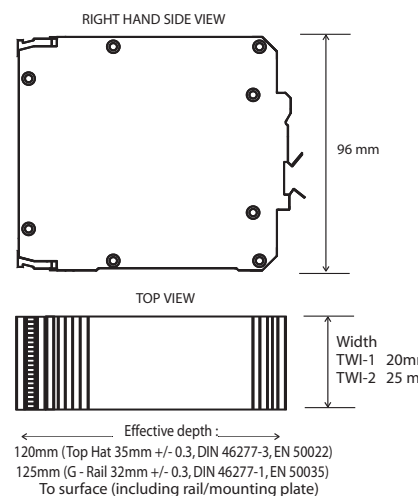
TWI-1 Connections

Terminal	Signal	
1	Signal +ve	Input
2	Not used	
3	Signal –ve	
4	Signal +ve	Output
5	Not used	
6	Signal –ve	
Case	Earthing is via a stud on lower side of case	

TWI-2 Connections

Terminal	Signal	
1	Signal +ve	Input Channel one
2	Signal –ve	
3	Signal +ve	Input Channel two
4	Signal –ve	
5	Signal +ve	Output Channel one
6	Signal –ve	
7	Signal +ve	Output Channel two
8	Signal –ve	
Case	Earthing is via a stud on lower side of case	

Dimension Drawing



Ordering Information

	Single Channel	Dual Channel
4-20 mA Input	TWI-1 4-20 mA	TWI-2 4-20 mA
0-10V Input	TWI-1 0-10 V	TWI-2 0-10 V
Type (Model Input)	Cat. No.	
TWI-1 4-20 mA	7940010159	
TWI-2 4-20 mA	7940010171	
TWI-1 0-10 V	7940011660	
TWI-2 0-10 V	7940012011	

SFI/DFI – Auxiliary Powered, Isolators

SFI Single Channel, Isolator

DFI Dual Channel, Isolator or Signal Splitter

The SFI is a single channel, auxiliary powered, isolator for current/voltage signals. The DFI combines two isolators, which can be used separately or as a signal splitter.

- Single and dual channel versions
- Power for active input devices
- Highly accurate ($\pm 0.1\%$ of span)
- LED status indication
- Bipolar inputs
- Switch selectable input format
- Front panel zero and span adjustment
- Complete Isolation to 1.5 kV (ac and dc)
- DC powered
- Removable, screw-type, terminal blocks
- Compact metal housing



The standard package has a single 24 V DC output to drive a loop powered transmitter as input. The second power supply output (on DFI channel two) is standard.

Input channel one, Input channel two, Output channel one, Output channel two and the power supply are all fully isolated from one another.

SFI



DFI



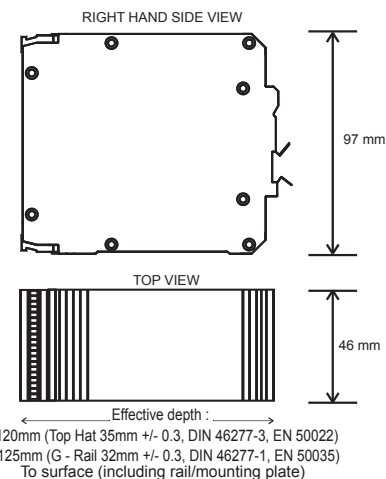
Technical Data

Inputs	
Type	Switch selectable current/voltage format
Ranges	4–20 mA, 0–20 mA, 0–10 V, –10 to +10 V Other ranges on request
Input impedance	22 Ω (current inputs) or 1 MΩ (Voltage inputs)
Power supply (out)	One 24 V DC (to 25 mA) per channel
Outputs	
Type	Current/voltage format (as ordered)
Ranges	4–20 mA or 0–20 mA (into 0–1.5 kΩ load) 0–10 V (minimum load 5 kΩ) 1–5 V (minimum load 2.5 kΩ) Other ranges on request
Input impedance	22 Ω (current inputs) or 1 MΩ (Voltage inputs)
Power Supply	
Type	DC powered
DC	12–50 V DC
Power Usage	4.5 W at 24 V DC (fully loaded including sensor power supply) 3.60 W (fully loaded with no sensor power supply)
Adjustments	
Type	20-turn potentiometers
Span	± 25% of span
Zero	± 25% of span
General	
Accuracy	± 0.1% of span
Repeatability	± 0.05% of span
Storage temperature	–25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0–95% (non-condensing)
Temperature drift	Typically 0.005% span/°C Worst case 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Input response	200 mS (from 10% to 90% of span)
Frequency response	–3 db point = 5 Hz
Noise Immunity	100 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.5 kg
Connection type	Plug in terminal blocks with screw connections

Connections

Terminal	Signal	
1	24 V DC (out)	Input channel one
2	Current +ve	
3	Common –ve	
4	Voltage +ve	Input channel two (DFI only)
5	24 V DC (out)	
6	Current +ve	
7	Common –ve	Power supply
8	Voltage +ve	
9	Neutral (–ve)	Output channel one
10	Live (+ve)	
11	Not used	Output channel two (DFI only)
12	Output +ve	
13	Output –ve	Output channel two (DFI only)
14	Not used	
15	Output +ve	Output channel two (DFI only)
16	Output –ve	
Case	Earthing is via a stud on lower side of case	

Dimension Drawing



Ordering Information

Type (Model Input/Output/Supply)	Cat. No.
SFI 0-10 V/4-20 mA/12-50 V DC	7940016083
SFI 4-20 mA/4-20 mA/12-50 V DC	7940010212
DFI 0-10 V/4-20 mA/12-50 V DC	7940012275
DFI 4-20 mA/4-20 mA/12-50 V DC	7940010167

Note: For other ranges please specify Model 1/2/3 where:
1 = Input, 2 = Output, 3 = Supply

UTX Series – Programmable, Signal Isolator/Converters

UTXSCI Current/Voltage Inputs

UTXSRT Square Root Extractor

The UTX Series signal isolator/converters accept voltage or current inputs from field devices and provide an isolated voltage or current output.

- Auxiliary Powered
- Models to suit linear or square law signals
- 24 V DC power for active input devices
- Programmable digital filter
- Simple secure calibration method
- Easily calibrated to suit most input and output ranges
- Absolute value, reverse action, high limit and low limit functions
- LED status indication
- Complete Isolation to 1.5 kV (ac and dc)
- Removable, screw-type, terminal blocks
- Compact metal housing



You can change the switch settings and supply different voltages/currents during calibration to change the set-up.

The switch settings allow you to select:

- Low limit clamp
- High limit clamp
- Absolute value function
- Digital filter constant
- Direct or reverse acting output
- Output type (current/voltage)

You can select the input type (current or voltage) by connecting the input signal to different terminals. Both the input and output ranges are determined by the calibration.

There are two models in the UTX Series. The UTXSCI has proportional outputs for linear signals.

The UTXSRT accepts inputs from square law devices and produces an accurate linearised output. It also incorporates a low signal cut-out to prevent accumulated errors at low flow rates. The cut-out level is switch selectable.

UTXSCI / UTXSRT



Technical Data

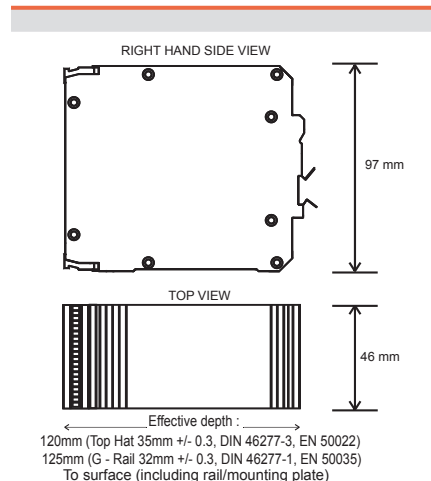
Input	
Type	Analogue current or voltage signals
Range limits	Inside the range ± 22.00 mA or ± 11.00 V
Minimum recommended span	10% of nominated range
Transducer supply	24 V DC (to 25 mA) output
Input Impedance	22 Ω (current inputs) or 1 M Ω (voltage inputs)
Resolution	2 μ A/1 mV per bit
Output	
Type	Programmable current/voltage
Current drive	Up to 900 Ω load
Voltage drive	True voltage source (up to 20 mA)
Range limits	Inside the range 0.00–22.00 mA or 0.00–11.00 V
Minimum recommended span	2 mA or 1 V
Resolution	2 μ A/1 mV per bit
Output ripple	Less than 20 mV P/P
Functions	
Low limit	Clamps the output at calibrated output zero when the input goes below the calibrated input zero level
High limit	Clamps the output at calibrated output full scale when the input goes above the calibrated input maximum.
Absolute value function	Performs absolute value calculations, e.g., a unit calibrated to give a 0–10 V output for a 5–10 V input will give a 10–0 V output for a 0–5 V input.
Power Supply	
Type	DC powered
DC	12–50 V DC (other voltages on request)
Power usage	6 W at 24 V DC
Performance	
Linearity	Better than $\pm 0.1\%$ typical – dependant on input span
Storage temp	–25 to +70°C
Operating temp	0 to 60 °C
Temp drift	< 0.02% span per °C
Long term drift	0.1% per 10,000 hours
Reponse (10–90%)	Programmable in 8 steps (from 250 ms to 10 s)
Setup retention	100 years
Noise immunity	120 dB CMRR (1.5 kVrms limit)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Connection type	Plug in terminal blocks with screw connections
Weight	0.5 kg

UTX Series Connections

Terminal	Signal	
1	24 V DC (out)	Input signals
2	Current +ve	
3	Common –ve	
4	Voltage +ve	
5	Not Used	Power supply
6	Not Used	
7	Security Link (link if you want to calibrate the instrument)	
8	Neutral (–ve)	
9	Live (+ve)	Output Signals
10	Live (+ve)	
11	Not Used	
12	Not Used	
13	Not Used	Output Signals
14	Output +ve	
15	Current –ve	
16	Voltage –ve	

Note: Earthing is via a stud on lower side of case

Dimension Drawing



Ordering Information

Type (Model Supply)	Cat. No.
UTXSCI 12-50 V DC	7940010172
UTXSRT 12-50 V DC	7940017913

Note: Other ranges available on request. Please specify as UTX/1/2 where:
 1 = SCI for linear signals or SRT for square law signals
 2 = Power Supply Voltage

MannPak MPC – Programmable, Auxiliary Powered, Signal Isolator/Converter

The MannPak MPC signal isolator/con-verters accept voltage or current inputs from field devices and provide an isolated voltage or current output.

- Auxiliary Powered
- 24 V DC power for loop powered input devices
- Simple secure calibration method
- Calibration allows for input to output scaling and reverse action if required
- LED status indication
- Complete input to output to power supply Isolation to 1.5 kV (ac and dc)
- Compact 22.5 mm wide housing
- Mounts on 35 mm 'Top Hat' and G-rail



The MannPak MPC 4-wire DC Input Isolator provides 3-way isolation for all standard DC milliamp and voltage signals, with better than 0.1% accuracy (typically 0.05%). For simple elimination of ground loops where auxiliary power is available.

Features

- Compact 22.5 mm wide housing
- 1500 Vrms 3-way isolation
- 24 V DC field supply for loop powered transmitter inputs
- 9-60 V DC power supply
- CE approved (CSA & UL pending)
- Scaleable input to output
- Output action direct or reverse

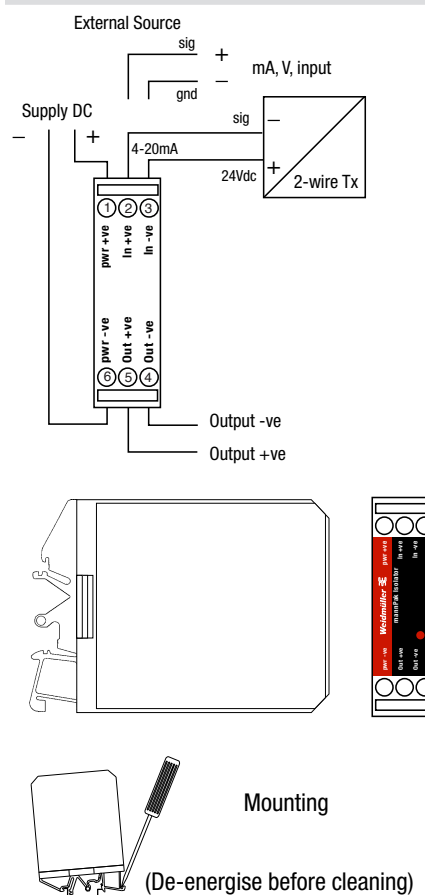
MannPak MPC



Technical Data

Input	
Type	Analogue current or voltage signals (Jumper select)
Range limits	Inside the range 0–22.00 mA or 0–11.00 V
Minimum recommended span	10% of nominated range
Transducer supply	20 mA @ 24 V DC output (safety limited to 32 mA)
Input Impedance	100 Ω (current inputs) or >1 MΩ (voltage inputs)
Resolution	3.5 μA/1.76 mV per bit
Output	
Type	Current/voltage (Jumper select)
Current drive	Up to 1 kΩ load
Voltage drive	Loads ≥ 500 kΩ
Range limits	Inside the range 0.00–22.00 mA or 0.00–11.00 V
Minimum recommended span	2 mA or 1V
Resolution	3.5 μA/1.76 mV per bit
Output ripple	Less than 20 mV P/P
Power Supply	
Type	DC powered
DC	9–60 V DC
Power usage	2 W at 24 V DC
Performance	
Linearity	Better than ± 0.1% (typical ± 0.05%)
Storage temp	–25 to +70 °C
Operating temp	0 to 60 °C
Temp drift	< 0.05% span per °C
Long term drift	0.1% per 10,000 hours
Setup retention	100 years
Noise immunity	120 dB CMRR (1.5 kVrms limit)
Response time 10%–90%	< 220 ms
Housing	
Type	Dual DIN rail mount
Dimensions	75.5 x 22.5 x 119 (max)
Connection type	Screw connections 22–12 AWG (0.5–4.0 sq mm)
Weight	0.2 kg
Approvals	
CE	EN61326:1997 including ammendment 1 and 2
UL/CSA	Pending

Installation Diagram



Ordering Information

Type	Cat. No.
MannPak MPC	7940015297

ITXPlus Series – Universal, Loop Powered, Signal Isolator / Converters

ITXPlus Rail mount

CBX100 Cable interface

- Universal Input
- Converts, filters and isolates most common signals and sensor types
- Fully isolated
- Loop powered
- PC Programmable
- Cost effective
- Compact
- Rail mount
- Automatic CJC for thermocouple inputs
- Automatic lead length compensation for RTD inputs
- Sensor burnout detection
- Preset and user-defined linearisation



The ITXPlus is a truly universal, compact, loop powered, isolated, signal converter. You can program it to suit most input signals. It will measure, convert, filter, and isolate the signal and provide you with an industry standard 4–20 mA output.

For linear temperature measurement, you can use any thermocouple or RTD type with the default tables. The ITXPlus will also accept resistance, potentiometer (position), millivolt, milliamp or voltage signals.

You don't even need to recalibrate to change the input type. The program has inbuilt square root, linear, x1.5 and x2.5

transfer functions or you can set up a table of input/output values to characterise any unusual curve.

The set-up software is easy to use, works on any PC, and allows you to completely configure the unit – even while the loop is operating.

The cable interface (sold separately) provides full isolation between standard serial ports on your PC and the transmitter (order as CBX100).

Technical Data

Inputs		Thermocouple, RTD, Milliamp, Voltage, Millivolt, Resistance			Power Supply		
Thermocouple Inputs	Type	Standard			Type	Output loop powered	
	B	IEC584			Operating voltage	10–40 V DC	
	C	IEC584			Voltage effect	0.005% per volt	
	E	IEC584			Output		
	J	IEC584			Type	4–20 mA (limited to 22 mA)	
	K	IEC584			Ripple	less than 20mV p/p at max load and span	
	L	DIN 43710	–100 °C 1200 °C		Maximum loop load (4–20 mA loop)	[(Vs – 10)/0.02] Ω (Typically 700 Ω at 24 V DC)	
	N	DIN 43710	–180 °C 1372 °C		Output Action	Direct or reverse	
	R	IEC584	–100 °C 900 °C		Performance		
	S	IEC584	–180 °C 1300 °C		Storage temp	–20 to +70 °C	
	T	IEC584	–50 °C 1760 °C		Operating temp	–10 to +70 °C	
	W3	ASTM	–50 °C 1760 °C		Relative Humidity	10–90% (non-condensing)	
	W5	E98890	–200 °C 400 °C		Temp drift	Typically 0.01% span per °C	
	Other Thermocouple types	You can define 2–101 point linearising curves for other types				Long term drift	0.1% per 10,000 hours
	Cold Junction Compensation	Better than ± 1.0 °C				Update time	20–200 mS
Sensor error detect	Yes				Digital filter range	1–100	
Milliamp	–10 mA to + 20 mA into 40 Ω (min span 1 mA)				EMI effect	Better than ± 0.5% full scale	
Voltage	–5 V to + 10 V into 2 MΩ (min span 0.5 V)				Approvals	Electromagnetic compatibility AS/NZS 3548/2064	
Millivolt	–100 mV to +200 mV into 2 MΩ (min span 4 mV)				Response time	Typically 200 ms for 10–90% output change	
2, 3, 4-wire RTD	Type	Standard			Noise immunity	Common mode Series mode	
	Pt 100	DIN 43710	–200 °C 850 °C		Isolation	1.5 kVrms for 60 s (AC & DC)	
	Pt 100	JIS	–200 °C 630 °C		Housing		
	Pt 200	DIN 43710	–200 °C 850 °C		Type	ITXPlus	
	Pt 200	JIS	–200 °C 630 °C		Weight	ITXPlus	
	Ni 120	DIN 43710	–80 °C 320 °C		Dimensions	See mechanical drawings	
	Cu 100	DIN 43710	–100 °C 260 °C		Digital communications		
	Cable resistance per wire	5 Ω Maximum				Type	For set-up and calibration only
	Sensor Current	0.1 mA				Equipment required	CBX100 Interface module IBM PC
	Sensor cable resistance effect (3/4 wires)	< 0.002 Ω per Ω of cable resistance					
	Resistance	0 to 10 kΩ (min span 10 Ω)					
	Accuracy	Input Type	Span	Temp coefficient	Accuracy		
		E,J,K,L,N,T,U	< 500 °C	± 0.02 °C per °C ambient	Better than ± 1.0 °C		
		B, C, R, S, W3, W5	> 500 °C	± 0.01% Full scale per °C ambient	Better than ± 2.0 °C		
		mV, V, mA		± 0.02 °C per °C ambient	Better than ± 0.1% FS		
	RTD	All	N/A	Better than ± 0.5 °C			
	Resistance			Better than ± 0.1% FS			

Signal Transmitters

ITX+



CBX100



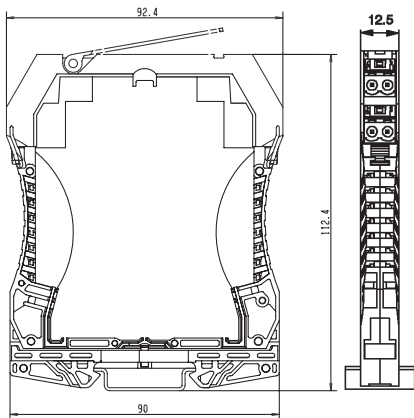
ITX Plus Connections

Terminal	Signal	
5	Loop -ve	Output (4-20mA)
6	Loop +ve	
Notice polarity of outputs is reversed compared to ITX Plus H		
1	Signal +ve	Thermocouple
2	Signal -ve	
1	A _{sense}	4-wire RTD (or Resistance)
3	A	
2	B	3-wire RTD (or Resistance)
4	B _{sense}	
1	A _{sense}	2-wire RTD (or Resistance)
3	A	
2	B	Voltage (mV or V)
3	Signal +ve	
2	Signal -ve	Current (mA)
1	Signal +ve	
2	Signal -ve	Potentiometer
3	A	
1	Wiper	
2	B	

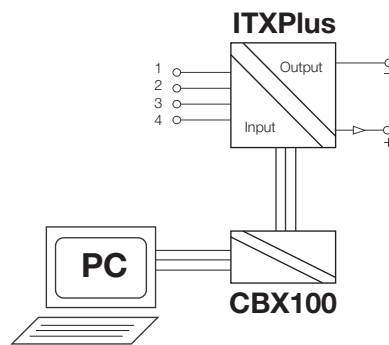
CBX100 Interface kit

- Connects ITXPlus to PC for Set-up and calibration
- Rechargeable battery (allows for about 8hrs use)
- Provides full isolation between PC and ITXPlus
- Software allows you to store the set-up of each transmitter on disk

Mechanical Drawing



Connection Diagram



Note: disconnect battery charger before using CBX100

Ordering Information

Type (Model Input/Output/Supply)	Cat. No.
ITX+ 4-20 mA/4-20 mA/12-45 V DC	7940016563

Default input range is 4-20 mA. For others please specify.

Ordering Information

Type	Cat. No.
CBX100	7940010208

FTX Series – Auxiliary Powered, Isolated, Signal Conditioners

**FTXDMA, FTXDCV, FTXDMV, FTXPOT
FTXRTD, FTXRTL, FTXTCX/P, FTXTCL
FTXAVX, FTXRES, FTXHLS
FTXMAS, FTXDRT, FTXCND**

The FTX series signal conditioners isolate and convert measurement signals to standard current/voltage format with a high degree of accuracy.

- Models available to suit most plant based measurements
- Complete input to output to power supply Isolation to 1.5 kV (ac and dc)
- Switch selectable analogue output ranges
- Highly Accurate (0.1%)
- DC powered
- Non-interacting zero and span controls
- Front panel mounted test points for output signal monitoring
- Wide zero and span adjustments
- Removable, screw-type, terminal blocks
- Compact metal housing



The FTX Series of transmitters can be manufactured to accept almost any industrial input and convert the measurement to a standard industrial current or voltage output.

Three port isolation is standard: eliminating ground loops and ensuring the FTX will work with any receiving device that can accept a sourced output.

The input is set up by means of a "personality card" which conditions the input

and converts it to a linear smoothed isolated output.

The output can drive 20 mA into any load from 0–1000 ohms and has a true voltage sourcing capability even into loads as low as 1000 ohms.

The output type and range are set by user adjustable DIP switches. A whole host of special output ranges have been developed over time including bipolar voltage and current outputs.

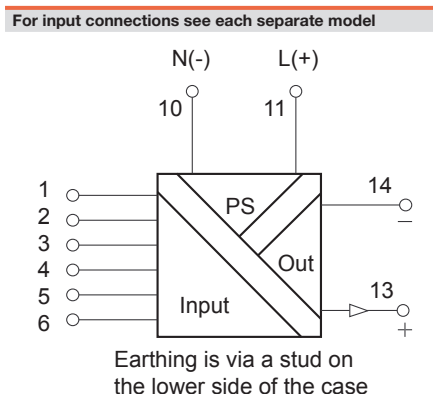
FTX



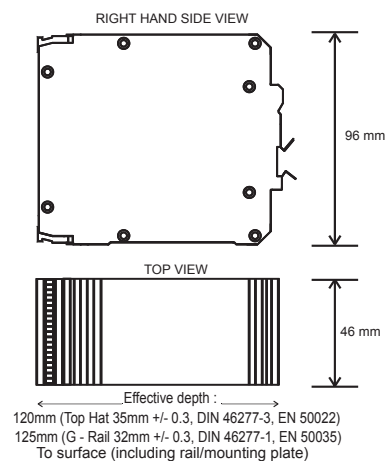
Technical Data

Output	
Type	Switch selectable analogue current and voltage
Current ranges	0–20 mA into 0–1 K Ω load 4–20 mA into 0–1 K Ω load Note: see also high output drive capability (/HSD) option
Voltage ranges	True voltage source up to maximum current of 20 mA 0–5 V DC 0–10 V DC 1–5 V DC –10 V to +10 V (see BP option) less than 20 mV P/P at maximum load & span
Ripple	
Power Supply	
Type	DC powered
DC	24 V DC (20 to 28 V DC) / Other voltages on request
Custom Power Supply Voltages	See /CPS option below
Power Usage	3 W at 24 V DC
Adjustments	
Type	20-turn potentiometers
Span	\pm 25% of nominal span
Zero	\pm 25% of nominal span
General	
Accuracy	Typically \pm 0.1% of span
Linearity	Typically \pm 0.1% of span
Repeatability	\pm 0.05% of span
Storage temperature	–25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0–95% (non-condensing)
Temperature drift	Typically 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Frequency response	–3 dB point = 5 Hz
Response time	200 mS for 10–90% output change
Noise Immunity	130 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.45 Kg
Connection type	Plug in terminal blocks with screw connections
Options	
CPS/[Voltage Required] Custom Power Supply	48 V DC
HOD High Output Drive capability	1500 Ω for current outputs – 24 V DC powered versions only
BP Bipolar outputs	–10 V to +10 V
NSO Non standard output range	Specify range

General Connection Diagram



Dimension Drawing



Switch Selection

Output	Switch bit								C/V
	1	2	3	4	5	6	7	8	
0–20 mA	C	C	C	O	C	O	C	O	C
4–20 mA	O	C	O	O	C	O	C	O	C
0–5V	C	C	C	O	C	O	O	O	V
1–5V	O	C	O	C	O	C	O	O	V
0–10V	C	O	C	C	O	C	O	O	V
2–10V	O	O	O	C	O	C	O	O	V

For switch settings C = Closed/On & O = Open/Off

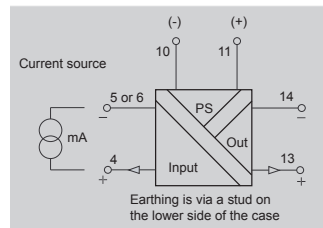
**FTX Series – Auxiliary
Powered, Isolated, Signal
Conditioners
DC Current/Voltage Inputs**

FTXDMA



DC milliamps

- For DC milliamp signals
- Low input impedance
- Accepts bipolar inputs

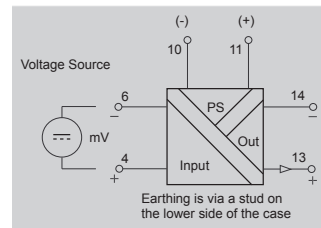


FTXDMV



DC millivolts

- For DC millivolt signals
- High input impedance
- Accepts bipolar inputs

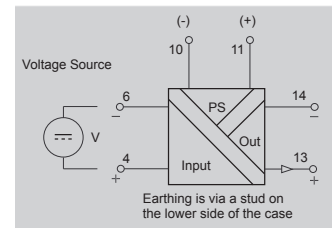


FTXDCV



DC voltage

- For DC voltage signals
- High input impedance
- Accepts bipolar inputs



Technical Data

Inputs	DC milliamps	DC millivolts (< 500 mV)	DC voltage (>500 mV)
Input Type Standard ranges	0–1 mA into 100 Ω 1–5 mA into 22 Ω 0–10 mA into 10 Ω 0–50 mA into 10 Ω 4–12 mA into 10 Ω 12–20 mA into 10 Ω 0–20 mA into 10 Ω 4–20 mA into 10 Ω –20 to +20 mA into 10 Ω Note: other ranges are available on request.	As ordered	0–1 V into 10 MΩ 0–5 V into 500 KΩ 0–10 V into 1 MΩ 0–20 V into 2 MΩ 1–5 V into 500 KΩ 2–10 V into 1 MΩ –10 V to +10 V into 2 MΩ Note: other ranges are available on request
Input Impedance	From 10 Ω (see above)	10 MΩ	Up to 2 MΩ (see above)
Input span range	20 μA to 500 mA	2 to 100 mVDC (see also LS option)	0.1 to 300 V DC (see also HV option) Note: for voltages above 300 V DC use the external attenuator – Attenuator
Input offset range	0–500% of span (see HO option)	0–500% of span (see HO option)	0–500% of span (see HO option)
Options			
HO High Offset	For zero value > span	For zero value > span	For zero value > span
LS Low Span		For spans from 2 mV to 8 mV	
HV High voltage option			For spans > 60 V

Ordering Information

Type (Model Input/Output/Supply)	Cat. No.	Type (Model Input/Output/Supply)	Cat. No.	Type (Model Input/Output/Supply)	Cat. No.
FTXDMA 4–20 mA/ 0–10 V DC/24 V DC	7940011588	FTXDMV 0–50 mV/ 4–20 mA/24 V DC	7940011965	FTXDCV 0–10 V/ 4–20 mA/24 V DC	7940014960
FTXDMA 4–20 mA/ 4–20 mA/24 V DC	7940011716			FTXDCV 0–5 V/ 4–20 mA/24 V DC	7940014327

Note: For other ranges please specify FTXDMA 1/2/3 where:
1 = Input current range
2 = Output Signal
3 = Power Supply Voltage

Note: For other ranges please specify FTXDMV 1/2/3 where:
1 = Input current range
2 = Output Signal
3 = Power Supply Voltage

Note: For other ranges please specify FTXDCV 1/2/3 where:
1 = Input current range
2 = Output Signal
3 = Power Supply Voltage

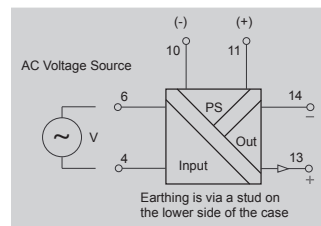
**FTX Series – Auxiliary
Powered, Isolated, Signal
Conditioners
AC Current/Voltage Inputs**

FTXAVX



AC voltage

- Class 0.5 device
- Optional “true RMS” input circuit for non-sinusoidal signals



Technical Data

Inputs	
Input Type	AC Voltage
Input waveform (Standard units)	True sine wave input with a frequency in the range 47–63 Hz (see /RMS option for other waveforms)
Standard ranges	As ordered
Input Impedance	Dependant on input > 1 MΩ
Input span range	8 mV to 300 V AC (see also HV option) Note: for voltages above 300 V AC use the external attenuator – NTX/H/Attenuator
Input offset	0–500% of span (see HO option)
Adjustments	
Input span adjustment	
Input zero adjustment	
General	
Instrument Class	0.5
Linearity	Typically ± 0.2% of span
Frequency response	– 3 db point = 1 Hz
Response time	15 mS for a 10–90% output change
Weight	0.45 kg
Isolation	1.5 kVrms for 60 s (AC and DC)
Options	
/RMS True RMS averaging	Will accurately convert any waveform (max crest factor = 11)
/HV High voltage input	For input voltages > 60 V AC
/HO High offset input	For offset > span

Ordering Information

Type	Cat. No.
(Model Input/Output/Supply)	
FTXAVX 0–125 V AC/ 4–20 mA/24 V DC	7940017855

Note: For other ranges please specify FTXAVX 1/2/3 where:
1 = Input voltage range
2 = Output Signal
3 = Power Supply Voltage

Signal Transmitters

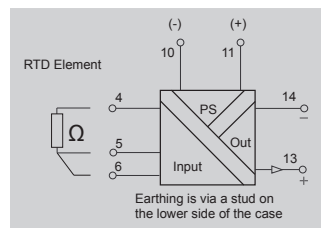
FTX Series – Auxiliary Powered, Isolated, Signal Conditioners RTD Signals (Temperature/Resistance)

FTXRTD



RTD Resistance

- 2-wire or 3-wire RTD inputs
- Automatic lead length compensation

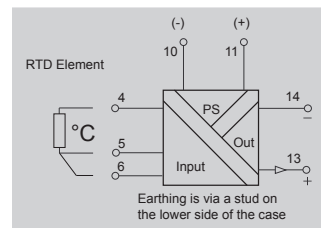


FTXRTL



Temperature (RTD)

- 2-wire or 3-wire RTD inputs
- Output linearised to temperature
- Automatic lead length compensation



Technical Data

Inputs	FTXRTD	FTXRTL
Input Type	2 or 3-wire PT100 RTD resistance (Link terminals 5 & 6 for 2-wire operation)	2 or 3-wire PT100 RTD temperature (Link terminals 5 & 6 for 2-wire operation)
Standard Ranges	-100 to 0 °C -50 to 0 °C -25 to 25 °C 0 to 50 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C 0 to 300 °C 0 to 400 °C 0 to 500 °C Note: other inputs on request	-100 to 0 °C -50 to 0 °C -25 to 25 °C 0 to 50 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C 0 to 300 °C 0 to 400 °C 0 to 500 °C Note: other inputs on request
Lead length compensation	Lead length compensation reduces the effect of equal changes in lead length by a factor of 100 or more.	Lead length compensation reduces the effect of equal changes in lead length by a factor of 100 or more.
Burnout action	Upscale to 150% of span	Upscale to 150% of span
Excitation current	0.5 mA (constant current)	0.5 mA (constant current)

Ordering Information

Type	Cat. No.	Type	Cat. No.
(Model 1/2/3/4 – See key below)		(Model 1/2/3/4 – See key below)	
FTXRTD PT100/0–100C/ 4–20 mA/24 V DC	7940017856	FTXRTL PT100/ 0–100 C/4–20 mA/24 V DC	7940017926

Note: For other ranges please specify FTXRTD 1/2/3/4 where:
1 = Input RTD type
2 = Input temperature range (°C)
3 = Output Signal
4 = Power Supply Voltage

Note: For other ranges please specify FTXRTL 1/2/3/4 where:
1 = Input RTD type
2 = Input temperature range (°C)
3 = Output Signal
4 = Power Supply Voltage

FTX Series – Auxiliary Powered, Isolated, Signal Conditioners Thermocouple Signals (Temperature/mV)

These fully isolated units can take signals from grounded thermocouples without effect on the stability or accuracy of measurement.

The FTXTCL will typically give a better than 10:1 improvement in the linearity of the thermocouple characteristic. Some T/C types are highly non-linear and better suited to conversion using software in the receiving device.

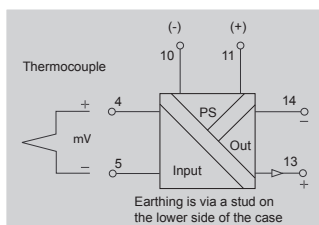
For these applications we recommend the FTXTCX/P.

FTXTCX/P



T/C mV

- Measures thermocouple millivolts
- Switch selectable input ranges
- Automatic cold junction compensation
- Selectable upscale or downscale burnout

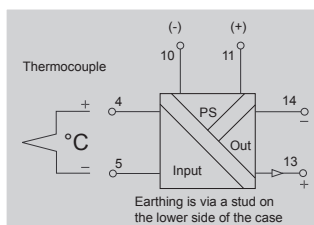


FTXTCL



Temperature (T/C)

- Output linearised to temperature
- Accepts most common thermocouple types
- Automatic cold junction compensation
- Selectable upscale or downscale burnout



Technical Data

Inputs	
Input Type	Thermocouple mV (with CJC)
Standard Thermocouple types	B, E, J, K, N, R, S, & T
Standard ranges	As ordered
Span range	2–80 mV
Input offset	0–100% of span
Input Impedance	10 MΩ
Burnout action	Upscale or downscale (field selectable)
General	
Linearity	Linearity typically shows a 10:1 improvement in linearity of thermocouple characteristic
Cold Junction Compensation	Automatic
Options	
LS Low Span option	For spans from 2 mV to 8 mV
HO High offset option	For zero values > span

Inputs	
Input Type	Thermocouple mV (with CJC)
Standard Thermocouple types	B, E, J, K, N, R, S, & T
Standard ranges	As ordered
Span range	2–80 mV
Input offset	0–100% of span
Input Impedance	10 MΩ
Burnout action	Upscale or downscale (field selectable)
General	
Linearity	Linearity typically shows a 10:1 improvement in linearity of thermocouple characteristic
Cold Junction Compensation	Automatic
Options	
LS Low Span option	For spans from 2 mV to 8 mV
HO High offset option	For zero values > span

Inputs	
Input Type	Thermocouple temperature
Standard Thermocouple types	E, J, K, N, R, S, & T
Standard ranges	As ordered
Span range	8–80 mV
Input offset	0–100% of span
Input Impedance	10 MΩ
Burnout action	Upscale or downscale (field selectable)
General	
Linearity	Linearity typically shows a 10:1 improvement in linearity of thermocouple characteristic
Cold Junction Compensation	Automatic
Options	
LS Low Span option	For spans from 2 mV to 8 mV
HO High offset option	For zero values > span

Ordering Information

Type	Cat. No.
(Model 1/2/3/4 – See key below)	
FTXTCX/P K/0-1000C/	7940017858
4–20 mA/24 V DC	

Type	Cat. No.
(Model 1/2/3/4 – See key below)	
FTXTCL K/0-200C/	7940017857
4–20 mA/24 V DC	

Note: For other ranges please specify FTXTCX/P 1/2/3/4 where:
 1 = Input thermocouple type
 2 = Input temperature range (°C)
 3 = Output Signal
 4 = Power Supply Voltage
 Default Burnout Action is Upscale.
 For Downscale please specify on order.

Type	Cat. No.
(Model 1/2/3/4 – See key below)	
FTXTCL K/0-200C/	7940017857
4–20 mA/24 V DC	

Note: For other ranges please specify FTXTCL 1/2/3/4 where:
 1 = Input thermocouple type
 2 = Input temperature range (°C)
 3 = Output Signal
 4 = Power Supply Voltage
 Default Burnout Action is Upscale.
 For Downscale please specify on order.

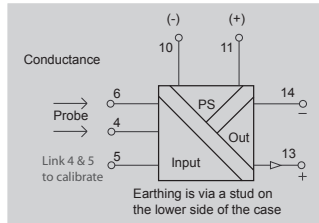
FTX Series – Auxiliary Powered, Isolated, Signal Conditioners Process Signals

FTXCND



Conductance

- Accurately measures conductance
- Internal conductance simulator for easy calibration
- 0 V DC measuring current to reduce probe degradation

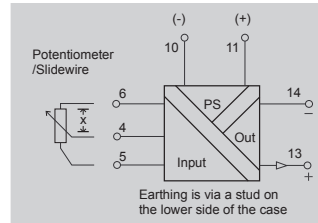


FTXPOT



Position

- Measures slidewire or potentiometer wiper position
- Measurement is independent of actual resistance

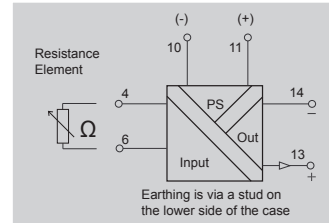


FTXRES



Resistance

- Measures accurately over a wide range of resistances



Technical Data

Inputs	Conductance probes	3-wire potentiometer or slidewire wiper position	2-wire or 3-wire resistance																					
Input Type	Conductance probes	10 Ω to 1 MΩ (end to end) Note: measurement is independent of potentiometer end to end resistance within these ranges	20 Ω to 100 kΩ As ordered																					
Input Ranges	<table border="1"> <thead> <tr> <th>Range</th> <th>Input range adjustment</th> <th>Simulator value</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>0-600 to 0-1150 μS</td> <td>833 μS</td> </tr> <tr> <td>B</td> <td>0-1100 to 0-2000 μS</td> <td>1471 μS</td> </tr> <tr> <td>C</td> <td>0-1900 to 0-3500 μS</td> <td>2564 μS</td> </tr> <tr> <td>D</td> <td>0-3000μS to 0-5500 μS</td> <td>4000 μS</td> </tr> <tr> <td>E</td> <td>0-5000 to 0-9000 μS</td> <td>6667 μS</td> </tr> <tr> <td>F</td> <td>0-7500 μS to 14mS</td> <td>10 mS</td> </tr> </tbody> </table> <p>Other ranges on request</p>	Range	Input range adjustment	Simulator value	A	0-600 to 0-1150 μS	833 μS	B	0-1100 to 0-2000 μS	1471 μS	C	0-1900 to 0-3500 μS	2564 μS	D	0-3000μS to 0-5500 μS	4000 μS	E	0-5000 to 0-9000 μS	6667 μS	F	0-7500 μS to 14mS	10 mS	10 Ω to 1 MΩ (end to end) Note: measurement is independent of potentiometer end to end resistance within these ranges	20 Ω to 100 kΩ As ordered
Range	Input range adjustment	Simulator value																						
A	0-600 to 0-1150 μS	833 μS																						
B	0-1100 to 0-2000 μS	1471 μS																						
C	0-1900 to 0-3500 μS	2564 μS																						
D	0-3000μS to 0-5500 μS	4000 μS																						
E	0-5000 to 0-9000 μS	6667 μS																						
F	0-7500 μS to 14mS	10 mS																						
Switching freq	400 Hz ± 20 Hz																							
Probe excitation	± 0.1 V at 10,000 μS span ± 7 V at 100 μS span																							
Options																								

Ordering Information

Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
(Model 1/2/3/4 – See key below) FTXCND 0-10,000 uS/ 4-20 mA/24 V DC	7940017927	(Model 1/2/3/4 – See key below) FTXPOT 100 Ohms/ 0-100%/4-20 mA/24 V DC	7940011520	(Model 1/2/3/4 – See key below) FTXRES 0-5 KOhm/ 4-20 mA/24 V DC	7940012833

Note: For other ranges please specify FTXCND 1/2/3 where:
1 = Input Range
2 = Output Signal
3 = Power Supply Voltage

Note: For other ranges please specify FTXPOT 1/2/3/4 where:
1 = Potentiometer end-to-end resistance
2 = Input range as % of travel
3 = Output Signal
4 = Power Supply Voltage

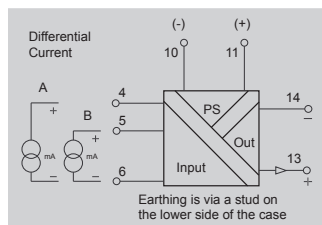
Note: For other ranges please specify FTXRES 1/2/3 where:
1 = Input resistance range (Ω)
2 = Output Signal
3 = Power Supply Voltage

**FTX Series – Auxiliary Powered, Isolated, Signal Conditioners
Dual Signals**

FTXMAS



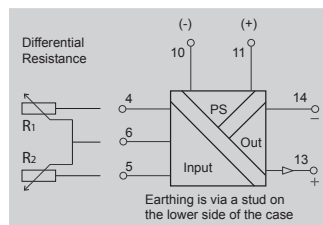
- Differential mA**
- Accurately measures the difference between two DC milliamp signals
 - Low input impedance



FTXDRT



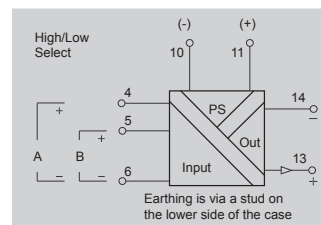
- Differential Resistance**
- Accurately measures the difference in resistance between two resistance elements



FTXHLS



- High/Low Selector**
- Jumper selectable high/low select operation
 - Smooth transfer between signals



Technical Data

Inputs	FTXMAS	FTXDRT	FTXHLS
Input Type	Two DC milliamp inputs (of the same type)	Two resistance legs R_1 & R_2 in 2-wire configuration with $R_1 > R_2$	Two inputs of the same format
Standard ranges	0–20 mA 4–20 mA Note: other ranges are available on request.	As ordered	0–20 mA (into 10Ω) 4–20 mA (into 10Ω) 0–10 V DC (input impedance 1 MΩ) 1–5 V DC (input impedance 1 MΩ) Note: other ranges are available on request.
Input Impedance	10 Ω		
Span range		$(R_1 - R_2)$ 20 Ω–100 kΩ	
Input offset		0–100% of input span	
R2 range		0–1000% of input span	
General			
Transfer Function	Output \propto A-B	Output $\propto R_1 - R_2$	High: Selects the higher of A and B Low: Selects the lower of A and B (Jumper Selectable)

Ordering Information

Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
(Model 1/2/3/4 – See key below)		(Model 1/2/3/4 – See key below)		(Model 1/2/3/4 – See key below)	
FTXMAS 4–20 mA/ 4–20 mA/24VDC	7940015137	FTXDRT 2000hm/ 20–400 hm/4–20 mA/24 V DC	7940017928	FTXHLS 4-20mA/HI/ 4–20 mA/24 V DC	7940011517

Note: For other ranges please specify FTXMAS 1/2/3 where:
1 = Input current range (for both inputs)
2 = Output Signal
3 = Power Supply Voltage

Note: For other ranges please specify FTXDRT 1/2/3/4 where:
1 = R_2 minimum value
2 = $R_1 - R_2$ range in ohms
3 = Output Signal
4 = Power Supply Voltage

Note: For other ranges please specify FTXHLS 1/2/3/4 where:
1 = Input signal format
2 = Select (HI/LO)
3 = Output Signal
4 = Power Supply Voltage

STG – Auxiliary Powered, Strain Gauge Converter

The STG converts the signal generated by a resistance bridge strain gauge to a standard analogue signal format.

- Remote sensing bridge power supply provides highly stable excitation voltage
- Can power bridges up to $4 \times 350 \Omega$ at 10 V
- Tare adjustment and test points to correct for initial loading
- Front panel adjustment and test points accurately set the bridge excitation voltage
- Highly accurate (0.1 % of span)
- LED power indication
- DC powered
- Removable, screw-type, terminal blocks
- Compact metal housing



STG



Technical Data

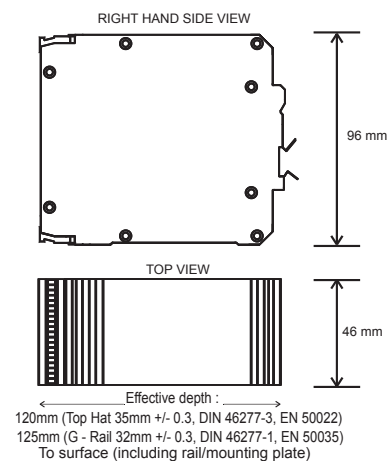
Input	
Type	Resistance bridge strain gauge
Input span ranges	1 mV to 700 mV
Input impedance	1 MΩ
Bridge excitation voltage	
Type	Remote sensing
Excitation voltage	5 V or 10 V
Ripple	less than 10 mV p/p at full load
Drive capability	120 mA @ 10 V (equivalent to 4 x 350 Ω loadcells @ 10 V)
Output	
Type	4–20 mA, 0–20 mA and 1–5 V (selected by push-fit jumpers)
Current ranges	0–20 mA, 4–20 mA into 0–1 KΩ load
Voltage ranges	0–5 V DC, 0–10 V DC, 1–5 V DC (true voltage source to 20 mA)
Ripple	< 20 mV peak to peak at maximum load and span
Power supply	
Type	DC powered (as ordered)
DC	24 V DC (permissible range 20–28 V DC)
Power Usage	3 W at 24 V DC
Adjustments	
Type	20-turn potentiometers
Span	45–105% of nominal span
Zero	± 10% of nominal span
Tare	± 100% or 0–200% of input span
Bridge excitation	± 10% of nominal voltage
General	
Linearity	Typically ± 0.05% of span
Repeatability	± 0.05% of span
Storage temperature	–25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0–95% (non-condensing)
Temperature drift	Typically 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Frequency response	–3 dB point = 5 Hz, optional 1 KHz
Response time	200 mS for 10–90% output change, optional 1 ms
Noise Immunity	130 dB CMRR (1.5 kVrms limit)
Isolation (power supply only)	1.5 kVrms for 60 s (AC & DC)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.45 Kg
Connection type	Plug in terminal blocks with screw connections

Connections

Terminal	Signal	
1	Sense –ve	Bridge Excitation Voltage
2	Sense +ve	
3	Excitation +ve	
4	Excitation –ve	
5		Not Used
6		
7	Signal +ve	Input signal
8	Signal –ve	
9		Not Used
10	Neutral (–ve)	
11	Live (+ve)	Power Supply
12		
13	Output +ve	Output signal
14	Output –ve	
15		Not Used
16		
Case	Earthing is via a stud on lower side of case	

Note: only the power supply is isolated.

Dimension Drawing



Ordering Information

Type (Model Input/Output/Supply)	Cat. No.
(Model 1/2/3/4 – See key below)	
STG 10 V/2 mV/V/4–20 mA/24 V DC	7940011671

Note: For other ranges please specify STG/1/2/3/4 where:
 1 – Bridge excitation voltage
 2 – Bridge sensitivity
 3 – Output signal format
 4 – Power supply voltage

Micromann AR Series – Universal, Auxiliary Powered, Isolated, Signal Conditioners with Alarms

UCVAR Current/Voltage Inputs

URTAR Resistive Temperature

Detector Inputs (RTD)

UTCAR Thermocouple Inputs

UHZAR Frequency Inputs

CLCAR Non-linear Current/Voltage Inputs

CNDAR Conductivity sensor Inputs

Micromann universal transmitters convert, filter, monitor, display and isolate measurement signals with a high degree of accuracy. Each model covers a range of similar signal and sensor types

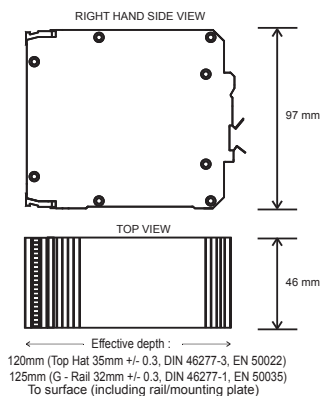
- Programmable current/voltage output
- Two versatile alarm channels with LED status indication
- Display in Engineering units
- Complete isolation
- DC powered
- Removable, screw-type, terminal blocks
- Compact metal housing



The Micromann series are fully isolated, microprocessor based, signal transmitters for use with process measurement signals and sensors. They also have two alarm channels. You can program all features of Micromann operation through the front panel keypad. When the set-up is complete, you simply remove the security link to protect the setup.

The analogue output calibration is simple and sets up both current and voltage outputs. So, you can use any current or voltage output range without recalibration. You can tailor each alarm's operation individually during setup. If necessary, you can also allow setpoint adjustment (from the front panel) during normal operation.

The Micromann can be ordered with one SPDT contact alarm instead of the standard normally open relay contacts. Alarm operation can be set to 'manual reset' so that active alarms will remain tripped until manually cleared.



Technical Data

Display	
Type	Full 4 digit, red 7 mm LED
Scaling	to display in % or engineering units
Display range	-999 to 9999
Status indicators	Trip1 / Trip 2 / Processor status
Analogue output	
Type	Programmable current/voltage
Current drive	up to 900 Ω load
Voltage drive	True voltage source (up to 20 mA)
Current range	Inside the range 0.00-22.00 mA
Voltage range	Inside the range 0.00-11.00 V
Minimum Recommended Span	2 mA or 1 V
Output action	Direct or reverse acting
Isolation	1.5 kVrms for 60 s (AC & DC)
Output ripple	less than 20 mV P/P (voltage) less than 40 μA P/P (current)
Alarm outputs	
Type	Two normally open relay contact outputs with common -ve return and in-built suppression caps
Rating	3 A at 240 V AC / 30 V DC resistive
Isolation	1.5 kVrms for 60 s (AC & DC)
Setpoints	Any value within 25% of the display range
Deadband	From 1 display count
Alarm action	High alarm or Low alarm
Output sense	Normally de-energised or energised
Alarm reset	Automatic or manual
Alarm timer delay	From 0 to 4200 seconds
Power Supply	
Type	DC powered
DC	12 to 50 V DC (other voltages on request)
Power Usage	6 W at 24 V DC
Housing	
Type	Registered Design, Dual DIN rail mount, Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.5 kg
Connection type	Plug in terminal blocks with screw connections

Performance	
Linearity	Better than ± 0.1% typical
Accuracy	Better than ± 0.1% typical
Repeatability	± 0.05% of span
Storage temperature	-25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0-95% (non-condensing)
Temperature drift	Less than 0.02% span per °C
Long term drift	0.1% per 10,000 hours
Reponse time	320 ms for 10-90% output change
Input step response	Programmable (from 250 mS to 32 s)
Sampling rate	5 samples per second
Setup retention	100 years minimum
Noise immunity	120 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Options	
NT	No analogue output
DT	Single SPDT alarm output
FC	Factory configuration – specify values for all settings
FPS	Custom transducer power supply

Connections

Terminal	Signal	
1	See individual models	Input signals
2		
3		
4		
5		
6		
7	Link to change the set-up	Security Link
9	Neutral (-ve)	Power supply
10	Live (+ve)	
11	Channel one	Alarm outputs
12	Channel two	
13	Common	
14	Output (+ve)	Analogue outputs
15	Current (-ve)	
16	Voltage (-ve)	
Case	Earthing is via a stud on lower side of case	

Signal Transmitters

Micromann AR Series – Universal Auxiliary Powered Signal Conditioners with Alarms

UCVAR



Current/Voltage

- Convert, filter and Isolate current and voltage signals
- Power for active input devices
- Linearises square law signals
- Bipolar inputs

UTCAR



Temperature (T/C)

- Select J, K, N, T, E, B, S, R or mV inputs
- Temperature Display in °C/°F
- Burn-out alarm
- CJC Temperature display

URRAR



Temperature (RTD)

- Accepts 2-wire and 3-wire PT100 RTD inputs
- Temperature Display in °C/°F
- Automatic lead length compensation

Technical Data

Inputs	UCVAR	UTCAR	URRAR																																												
Input Type	Analogue current/voltage signals	Thermocouple (type J, K, N, T, E, B, S, R) or millivolt signals	2-wire or 3-wire, PT100 RTD (to BS1904:1984/IEC751:1983)																																												
Standard range limits	-55.00 mA to +55.00 mA or -55.00 V to +55.00 V (without recalibration)	<table border="1"> <thead> <tr> <th rowspan="2">Input Type</th> <th colspan="2">Display Limits</th> </tr> <tr> <th>Upper</th> <th>Lower</th> </tr> </thead> <tbody> <tr> <td>J</td> <td>870 °C (1598 °F)</td> <td rowspan="5">-50°C (-58 °F)</td> </tr> <tr> <td>K</td> <td>1372 °C (2502 °F)</td> </tr> <tr> <td>N</td> <td>1300 °C (2372 °F)</td> </tr> <tr> <td>T</td> <td>400 °C (752 °F)</td> </tr> <tr> <td>E</td> <td>700 °C (1292 °F)</td> </tr> <tr> <td>B</td> <td>1800 °C (3272 °F)</td> <td>0°C (32 °F)</td> </tr> <tr> <td>S</td> <td>1768 °C (3214 °F)</td> <td rowspan="2">-50°C (-58 °F)</td> </tr> <tr> <td>R</td> <td>1768 °C (3214 °F)</td> </tr> <tr> <td>mV</td> <td>60.00 mV</td> <td>-9.99 mV</td> </tr> </tbody> </table>	Input Type	Display Limits		Upper	Lower	J	870 °C (1598 °F)	-50°C (-58 °F)	K	1372 °C (2502 °F)	N	1300 °C (2372 °F)	T	400 °C (752 °F)	E	700 °C (1292 °F)	B	1800 °C (3272 °F)	0°C (32 °F)	S	1768 °C (3214 °F)	-50°C (-58 °F)	R	1768 °C (3214 °F)	mV	60.00 mV	-9.99 mV	<table border="1"> <thead> <tr> <th colspan="2">Display Limits</th> <th rowspan="2">Resolution</th> </tr> <tr> <th>Upper</th> <th>Lower</th> </tr> </thead> <tbody> <tr> <td>700 °C</td> <td>-200 °C</td> <td>1 °C</td> </tr> <tr> <td>1292 °F</td> <td>-328 °F</td> <td>1 °F</td> </tr> <tr> <td>200.0 °C</td> <td>-99.9 °C</td> <td>0.1 °C</td> </tr> <tr> <td>400.0 °F</td> <td>-99.9 °F</td> <td>0.1 °F</td> </tr> </tbody> </table>	Display Limits		Resolution	Upper	Lower	700 °C	-200 °C	1 °C	1292 °F	-328 °F	1 °F	200.0 °C	-99.9 °C	0.1 °C	400.0 °F	-99.9 °F	0.1 °F
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Input impedance	22 Ω (current inputs) 1 MΩ (voltage inputs)	1 kΩ (e.g., IS barrier resistance)	30 Ω (lead resistance)																																												
Resolution	1 µA/1 mV per bit for small ranges	to display temperature (in °C or °F) or mV See table above	to display temperature (in °C or °F) See table above																																												
Minimum recommended span	1 mA or 1 V	1 °C/°F or 0.01 mV	1 °C/°F or 0.1 °C/°F																																												
Linearisation	Linear or square root																																														
Transducer supply	24 V DC (to 25 mA) output																																														
Maximum input impedance																																															
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Scaling	to display in % or engineering units	to display temperature (in °C or °F) or mV	to display temperature (in °C or °F)																																												
Display range	-999 to 9999	See table above	See table above																																												
Resolution	0.001 engineering units	1 °C/°F or 0.01 mV	1 °C/°F or 0.1 °C/°F																																												
Performance																																															
Accuracy		Less than 0.02% per °C ambient change	< 1 °C for 1 °C resolution or < 0.25 °C for 0.1 °C resolution																																												
CJC tracking error			Better than 0.05% error for equal changes in lead resistance																																												
Lead length compensation																																															

Input Connections

Terminal	Signal	Terminal	mV Signal	T/C Signal	Terminal	Signal
1	24 V DC (out)	1			1	Not used
2	Current +ve	2	mV +ve	CJC Board (white dot to terminal 2)	2	A
3	Common -ve	3	mV -ve		3	B
4	Voltage +ve	4			4	B _{sense}
5	Not used	5			5	Not used
6		6	Not used		6	Not used

Ordering Information

Type (Model Supply)	Cat. No.	Type (Model Supply)	Cat. No.	Type (Model Supply)	Cat. No.
UCVAR 12-50 V DC	7940010195	UTCAR 12-50 V DC	7940012190	URRAR 12-50 V DC	7940010250
Note: For other ranges please specify as UCVAR 1 where 1 = Power Supply Voltage		Note: For other ranges please specify as UTCAR 1 where 1 = Power Supply Voltage Default Burnout Action is Upscale. For Downscale please specify on order.		Note: For other ranges please specify as URRAR 1 where 1 = Power Supply Voltage	

UHZAR



Frequency

- Connects directly to a wide range of frequency sources
- Power for active input devices

CNDAR



Conductivity

- Suits any conductivity probe
- Autoranging
- Probe temperature compensation
- Programmable cell constant
- Linearises probe characteristic

CLCAR



Lineariser

- Generate any input to output characteristic
- Linearise measurements from non-linear sensors
- Tailor control signals to suit non-linear control elements

Technical Data

Inputs	
Input Type	Programmable frequency (includes debouncing for voltfree contacts)
Standard range limits	Any range inside the limits 0 to 10 kHz
Minimum recommended span	0.001 Hz
Input voltage range	50 mV to 250 V (ac and dc) others on request
Sensor supply output	Nominally 12 V DC to 25 mA others on request (see /FPS option)
Temperature range	0–200 °C (for RTD)
Cell Constants	0–01 to 99.99/cm
Excitation voltage	Less than 6 V p/p @ 400 Hz
Lead length compensation	< 2% of change for equal changes in lead resistance (up to 30 Ω)
Temperature Compensation	Linear or user defined up to 5 points
Input impedance	22 Ω (Current) or 1m Ω (Voltage)
Display	
Scaling	to display in % or engineering units
Display range	–999 to 9999
Resolution	0.001 engineering units
Performance	
Accuracy	Better than 0.05% of span
Linearity	Better than 0.05% of span
Repeatability	± 0.02% of span
Noise immunity	40 dB CMRR (1.5 kVrms limit)

Input Connections

Terminal	Signal
1	12 V DC (out)
2	Pull Up/Down
3	0V
4	Signal +ve
5	Signal –ve
6	High voltage Signal +ve

Terminal	Cell	PT100 RTD
1	Not used	
2	A	
3	B	
4		A
5		B
6		B _{sense}

Terminal	Signal
1	24 V DC (out)
2	Current +ve
3	Input –ve
4	Voltage +ve
5	Not used
6	Not used

Ordering Information

Type (Model Supply)	Cat. No.
UHZAR 12–50 V DC	7940010184

Note: For other ranges please specify as UHZAR 1 where 1 = Power Supply Voltage

Type (Model Supply)	Cat. No.
CNDAR 12–50 V DC	7940010232

Note: For other ranges please specify as CNDAR 1 where 1 = Power Supply Voltage

Type (Model Supply)	Cat. No.
CLCAR 12–50 V DC	7940010489

Note: For other ranges please specify as CLCAR 1 where 1 = Power Supply Voltage

Micromann UPI Series – Analogue to Frequency Converters

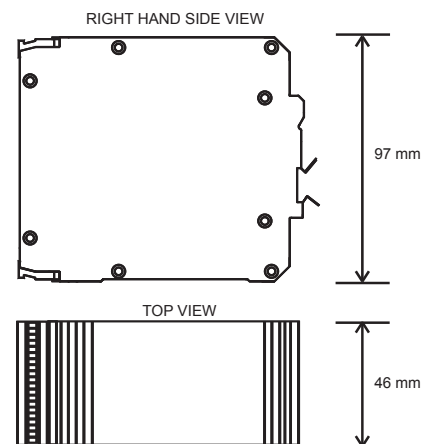
UPIR Low Frequency Outputs

UPIT High Frequency Outputs

Micromann universal analogue to frequency converters accept an analogue signal and convert it to a proportional output frequency.

- Accept any common current or voltage signal format
- 24 V DC supply for active input devices
- Frequency pulse output
- Programmable low-cut-off level (to prevent accumulated errors at low input levels)
- Inbuilt linearisation for square law signals
- Single alarm channel
- Display in Engineering units
- Complete isolation
- DC powered
- Removable, screw-type, terminal blocks
- Compact metal housing





Effective depth :
 120mm (Top Hat 35mm +/- 0.3, DIN 46277-3, EN 50022)
 125mm (G - Rail 32mm +/- 0.3, DIN 46277-1, EN 50035)
 To surface (including rail/mounting plate)

Technical Data

Display	
Type	Full 4 digit, red 7 mm LED
Scaling	Shows the output frequency in pulses per sec (Hz), pulses per minute or pulses per hour.
Display range	0 to 9999
Status indicators	Trip1 / Processor status
Inputs	
Input Type	Analogue current/voltage signals
Standard range limits	-55.00 mA to +55.00 mA or -55.00 V to +55.00 V (without recalibration)
Input impedance	22 Ω (current inputs) 1 MΩ (voltage inputs)
Resolution	1 μA/1 mV per bit for small ranges
Minimum recommended span	1 mA or 1 V
Linearisation	Linear or square root
Transducer supply	24 V DC (to 25 mA) output
Power Supply	
Type	DC powered
DC	12 to 50 V DC (other voltages on request)
Power Usage	6 W at 24 V DC
Performance	
Linearity	Better than ± 0.1% typical
Accuracy	Better than ± 0.1% typical
Repeatability	± 0.05% of span
Storage temperature	-25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0-95% (non-condensing)
Temperature drift	Less than 0.02% span per °C
Long term drift	0.1% per 10,000 hours
Reponse time	320 ms for 10-90% output change
Input step response	Programmable (from 250 mS to 32 s)
Sampling rate	5 samples per second
Setup retention	100 years minimum
Noise immunity	120 dB CMRR (1.5 kVrms limit)
Isolation	1.5k Vrms for 60 s (AC & DC)
Housing	
Type	Registered Design, Dual DIN rail mount, Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.5 kg
Connection type	Plug in terminal blocks with screw connections
Options	
FC	Factory configuration – specify values for all settings
FPS	Custom transducer power supply

Connections

Terminal	Signal	
1	24 V DC (out)	Input (Current/Voltage) signals
2	Current +ve	
3	Common -ve	
4	Voltage +ve	
5	Not used	
6		
7	Link to change the set-up	Security Link
8		
9	Neutral (-ve)	Power supply
10	Live (+ve)	
11		
12	See individual units	Alarm and Pulse outputs
13		
14		
15	Not Used	
16		
Case	Earthing is via a stud on lower side of case	

**Micromann UPI Series –
Analogue to Frequency
Converters**

UPIR



UPIT



Analogue to Frequency Converter

- SPDT relay contact frequency output
- For frequencies up to 25 Hz
- Single SPDT alarm channel

Analogue to Frequency Converter

- Open collector transistor output
- For frequencies up to 1 kHz
- Single open collector transistor alarm channel

Technical Data

Pulse output

Type
Max frequency
Output resolution
Pulse rate units
Isolation

SPDT relay contact closures
(frequency according to input level)
25 Hz

Per second, minute or hour
Fully isolated

Isolated O/C transistor output
(frequency according to input level)
999.9 Hz

2 microseconds
Per second, minute or hour
Pulse output shares a common negative return with the alarm output

Alarm output

Type
Coil energisation

SPDT relay contact
Normally Energised (NE) or Normally De-energised (ND)

Isolated O/C transistor output
normally energised ("on") or
normally de-energised ("off")

Alarm reset
Alarm time delay
Deadband range
Setpoint range
Contact rating

Manual or automatic
From 0 to 4200 seconds
In 1 display unit increments
Any value in the display range
3 A @ 240 V AC (resistive load)
5 A @ 24 V DC/110 V AC (resistive load)
Note: A suppressor capacitor should be used (to
increase contact life) when switching inductive loads.

Manual or automatic
From 0 to 4200 seconds
In 1 display unit increments
Any value in the display range
To 200 mA "on" state current
or 50 V DC "off" state voltage
Note: back-emf diodes must be used for inductive loads.

Connections

Terminal	Signal	
11	Normally Closed	Alarm output
12	Common	
13	Normally Open	
14	Normally Closed	Frequency output
15	Common	
16	Normally Open	

Terminal	Signal
11	Alarm Output
12	Frequency Pulse output
13	0 V

Ordering Information

Type (Model Supply)	Cat. No.
UPIR 12–50 V DC	7940010908

Note: For other ranges please specify as UPIR 1 where:
1 = Power Supply Voltage

Type (Model Supply)	Cat. No.
UPIT 12–50 V DC	7940015988

Note: For other ranges please specify as UPIT 1 where:
1 = Power Supply Voltage

DPA Series – Auxiliary Powered, Dual Setpoint, Alarms

DPADMA, DPADCV, DPADMV
DPAAVX, DPARTD, DPATCX
DPAPOT, DPARES, DPAMAS, DPADRT

The DPA series alarms provide two trip points for signal monitoring.

- Models available to suit most plant based measurements
- Two independent alarm channels
- LED status indication
- Dual SPDT relay outputs
- High or Low alarms in any combination
- High repeatability
- Front panel deadband and setpoint adjustments
- Full Isolation to 1.5kV (ac and dc)
- DC powered
- Removable, screw-type, terminal blocks
- Compact metal housing



The inputs can be taken from any floating or grounded signal source according to the model selected.

The trip set points and hysteresis (dead-band) are adjusted from the front panel.

You can select High/Low operation for each setpoint by using solderless jumpers.

Alarms can be generated when power is lost to the instrument by selecting normally energised operation for one or both of the output relays (using internal solderless jumpers).

DPA



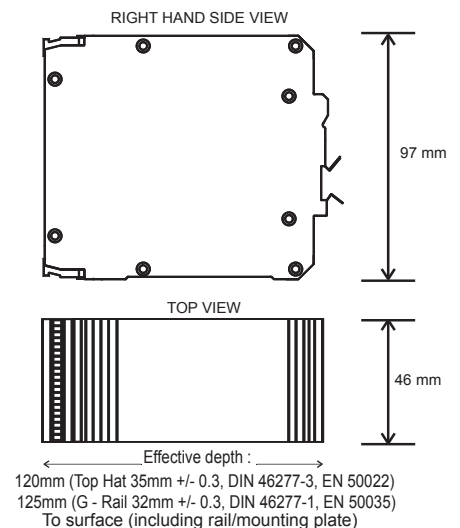
Technical Data

Output	
Type	SPDT relay contacts internally set to normally energised (NE) or normally de-energised (ND) operation
Rating	3 A at 240 V AC, 5 A at 24 V DC/110 V AC resistive
Isolation	1.5 kV from input & power supply 1.5 kV between relay outputs
Power Supply	
Type	DC powered
DC	24 V DC $\pm 10\%$ Note other DC voltages are available on request
Power Usage	3 W at 24 V DC
Adjustments	
Type	20-turn potentiometers
Set-point	0–100% of maximum input
Deadband	1 to 25% of maximum input
General	
Repeatability	$\pm 0.05\%$ of span
Storage temperature	-25 to $+70$ °C
Operating temperature	0 to 60 °C
Relative humidity	0–95% (non-condensing)
Temperature drift	Typically 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Input response	450 mS (from 10% to 90% of span)
Trip response	Typically 5 mS
Noise Immunity	130 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Housing	
Type	Registered Design Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.5 kg
Connection type	Plug in terminal blocks with screw connections
Options	
CPS Universal Power Supply	48 V DC
HO High offset	For offset > span

DPA Series Connections

Terminal	Signal	
1	See individual models	Input signals
2		
3		
4		
5	Not Used	
6		
7		
8		
9	Neutral (-ve)	Power supply
10	Live (+ve)	
11	Normally Closed	Alarm channel one (Relay Contacts)
12	Common	
13	Normally Open	Alarm channel two (Relay Contacts)
14	Normally Closed	
15	Common	
16	Normally Open	
Case	Earthing is via a stud on lower side of case	

Dimension Drawing



**DPA Series – Auxiliary
Powered, Dual Setpoint,
Alarms
DC Current/Voltage Inputs**

DPADMA



- DC milliamps**
- For DC milliamp signals
 - Low input impedance
 - Accepts bipolar inputs
 - Power for active input devices

DPADMV



- DC millivolts**
- For DC millivolt signals
 - High input impedance
 - Accepts bipolar inputs

DPADCV



- DC voltage**
- For DC voltage signals
 - High input impedance
 - Accepts bipolar inputs

Technical Data

Inputs	DC milliamps	DC millivolts (< 500 mV)	DC voltage (> 500 mV)
Input Type	DC milliamps	DC millivolts (< 500 mV)	DC voltage (> 500 mV)
Standard ranges	0–1 mA into 100 Ω 1–5 mA into 22 Ω 0–10 mA into 10 Ω 0–50 mA into 10 Ω 4–12 mA into 10 Ω 12–20 mA into 10 Ω 0–20 mA into 10 Ω 4–20 mA into 10 Ω –20 to +20 mA into 10 Ω Note: other ranges are available on request.	As ordered	0–1 V into 10 MΩ 0–5 V into 500 KΩ 0–10 V into 1 MΩ 0–20 V into 2 MΩ 1–5 V into 500 KΩ 2–10 V into 1 MΩ –10 V to +10 V into 2 MΩ Note: other ranges are available on request
Input Impedance	From 10 Ω (see above)	10 MΩ	Up to 2 MΩ (see above)
Input span range	20 μA to 500 mA	8 to 100 mVDC	0.1 to 300 V DC (see also HV option) Note: for voltages above 300 V DC use the external attenuator – Attenuator
Input offset range	0–500% of span (see HO option)	0–500% of span (see HO option)	0–500% of span (see HO option)
Options			
HO High Offset	For zero value > span	For zero value > span	For zero value > span
HV High voltage option			For spans > 60 V

Input Connections

Terminal	Signal	Terminal	Signal	Terminal	Signal
1	24 V DC (out)	1	Not Used	1	Not Used
2	Signal +ve	2	Signal +ve	2	Signal +ve
3	Not Used	3	Not Used	3	Not Used
4	Signal –ve	4	Signal –ve	4	Signal –ve

Ordering Information

Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
(Model 1/2 – See key below)		(Model 1/2 – See key below)		(Model 1/2 – See key below)	
DPADMA 4–20 mA/24 V DC	7940011294	DPADMV 0–100 mV/24 V DC	7940017849	DPADCV 0–10 V DC/24 V DC	7940011718
		DPADMV 0–10 mV/24 V DC	7940017848	DPADCV 1–5 V/24 V DC	7940012970
Note: For other ranges please specify DPADMA 1/2/3/4/5/6 where:		Note: For other ranges please specify DPADMV 1/2/3/4/5/6 where:		Note: For other ranges please specify DPADCV 1/2/3/4/5/6 where:	
1 = Input current range		1 = Input current range		1 = Input current range	
2 = Power Supply Voltage		2 = Power Supply Voltage		2 = Power Supply Voltage	
3 = Trip 1 Low (L) /High (H)		3 = Trip 1 Low (L) /High (H)		3 = Trip 1 Low (L) /High (H)	
4 = Relay coil 1 energisation NE/ND		4 = Relay coil 1 energisation NE/ND		4 = Relay coil 1 energisation NE/ND	
5 = Trip 2 Low (L) /High (H)		5 = Trip 2 Low (L) /High (H)		5 = Trip 2 Low (L) /High (H)	
6 = Relay coil 2 energisation NE/ND		6 = Relay coil 2 energisation NE/ND		6 = Relay coil 2 energisation NE/ND	
Default is 3 = L, 4 = NE, 5 = H, 6 = NE		Default is 3 = L, 4 = NE, 5 = H, 6 = NE		Default is 3 = L, 4 = NE, 5 = H, 6 = NE	

**DPA Series – Auxiliary
Powered, Dual Setpoint,
Alarms
AC Current/Voltage Inputs**

DPAAVX



AC voltage

- Class 0.5 device
- High performance, precision rectified, input circuit
- High Impedance Inputs

Technical Data

Inputs	
Input Type	AC Voltage
Input frequency range	47–63 Hz
Standard ranges	1 V to 1.5 kV (see HV option)
Input Impedance	Dependant on input > 1 MΩ
Input span range	8 mV to 250 V AC (see also HV option) Note: for voltages above 250 V AC use the external attenuator – NTX/H/Attenuator
Input offset	0–500% of span (see HO option)
General	
Instrument Class	0.5
Input response	250 mS (from a 10–90% of span)
Trip response	Typically 150 mS
Weight	0.5 kg
Isolation	1.5 kVrms for 60 s (AC and DC)
Options	
/HV High voltage input	For input voltages > 60 V AC
/HO High offset input	For offset > span

Input Connections

Terminal	Signal
1	Not Used
2	AC Voltage
3	Not used
4	AC Voltage

Ordering Information

Type	Cat.No.
(Model 1/2 – See key below) DPAAVX 0–125 V AC/24 V DC	7940017847

Note: For other ranges please specify
DPAAVX 1/2/3/4/5/6 where:

- 1 = Input current range
- 2 = Power Supply Voltage
- 3 = Trip 1 Low (L) /High (H)
- 4 = Relay coil 1 energisation NE/ND
- 5 = Trip 2 Low (L) /High (H)
- 6 = Relay coil 2 energisation NE/ND

Default is 3 = L, 4 = NE, 5 = H, 6 = NE

DPA Series – Auxiliary Powered, Dual Setpoint, Alarms Temperature (RTD or Thermocouple)

DPARTD



DPATCX



Temperature (RTD)

- 2-wire or 3-wire RTD inputs
- Automatic lead length compensation

Temperature (T/C)

- Accepts most common thermocouple types
- Automatic cold junction compensation
- Selectable upscale or downscale burnout

Technical Data

Inputs		
Input Type	2 or 3-wire PT100 RTD Resistance	Thermocouple temperature
Standard ranges	-100 to 0 °C -50 to 0 °C -25 to 25 °C 0 to 50 °C 0 to 100 °C 0 to 150 °C 0 to 200 °C 0 to 250 °C 0 to 300 °C 0 to 400 °C 0 to 500 °C Other ranges and RTD types on request	B, E, J, K, N, R, S, & T mV Span range 8–80 mV
Input Impedance		10 MΩ
Burnout action	Sets any high alarms (upscale)	Upscale or Downscale (Internally selectable)
Excitation current	0.5 mA (constant current)	
General		
Lead length compensation	Lead length compensation reduces the effect of equal changes in lead length by a factor of 100 or more.	
Cold Junction Compensation		Automatic
Options		
DS Downscale burnout		will trigger Low alarms if T/C burns out
US Upscale burnout		will trigger high alarms if T/C burns out

Input Connections

Terminal	Signal	Terminal	Signal
1	Not used	1	Not used
2	A	2	Signal +ve
3	B	3	Signal -ve
4	B _{sense}	4	Not used

Ordering Information

Type	Cat. No.	Type	Cat. No.
(Model 1/2/3 – See key below)		(Model 1/2/3 – See key below)	
DPARTD PT 100/0-100 C/24 V DC	7940014900	DPATCX K/0-1000 C/24 V DC	7940017853
DPARTD PT100/0-200 C/24 V DC	7940017852		
DPARTD PT 100/0-50 C/24 V DC	7940014212		
Note: For other ranges please specify DPARTD 1/2/3/4/5/6/7 where: 1 = Input RTD type 2 = Temperature range 3 = Power Supply Voltage 4 = Trip 1 Low (L) /High (H) 5 = Relay coil 1 energisation NE/ND 6 = Trip 2 Low (L) /High (H) 7 = Relay coil 2 energisation NE/ND Default is 4 = L, 5 = NE, 6 = H, 7 = NE		Note: For other ranges please specify DPATCX 1/2/3/4/5/6/7 where: 1 = Thermocouple type 2 = Temperature range 3 = Power Supply Voltage 4 = Trip 1 Low (L) /High (H) 5 = Relay coil 1 energisation NE/ND 6 = Trip 2 Low (L) /High (H) 7 = Relay coil 2 energisation NE/ND Default is 4 = L, 5 = NE, 6 = H, 7 = NE	

DPA Series – Auxiliary Powered, Dual Setpoint, Alarms Process Signals (Position or Resistance)

DPAPOT

DPARES



Position

- Provides position alarms (from slidewire/potentiometer inputs)
- Independant of device end-to-end resistance

Resistance

- Available to suit a wide range of resistances

Technical Data

Inputs

Input Type

Input Ranges

3-wire potentiometer or slidewire wiper position

10 Ω to 1 MΩ (end to end)

Note: input measures percentage travel and is independant of potentiometer end to end resistance within these ranges

2-wire resistance

20 Ω to 100 kΩ As ordered

Input Connections

Terminal	Signal
1	Not used
2	Wiper
3	B (100% travel)
4	A (0% travel)

Terminal	Signal
1	Not used
2	A
3	Not used
4	B

Ordering Information

Type	Cat.No.
(Model 1/2/3 – See key below)	
DPAPOT 10 KΩm/0–100%/ 24 V DC	7940017851
DPAPOT 1 KΩm/0–100%/ 24 V DC	7940017850

Note: For other ranges please specify DPAPOT 1/2/3/4/5/6/7 where:

- 1 = Potentiometer end-end resistance
- 2 = Input range as % of travel
- 3 = Power Supply Voltage
- 4 = Trip 1 Low (L) /High (H)
- 5 = Relay coil 1 energisation NE/ND
- 6 = Trip 2 Low (L) /High (H)
- 7 = Relay coil 2 energisation NE/ND

Default is 4 = L, 5 = NE, 6 = H, 7 = NE

Type	Cat.No.
(Model 1/2 – See key below)	
DPARES 0–1 KΩm/24 V DC	7940017917

Note: For other ranges please specify DPARES 1/2/3/4/5/6 where:

- 1 = Input resistance (Ω's)
- 2 = Power Supply Voltage
- 3 = Trip 1 Low (L) /High (H)
- 4 = Relay coil 1 energisation NE/ND
- 5 = Trip 2 Low (L) /High (H)
- 6 = Relay coil 2 energisation NE/ND

Default is 3 = L, 4 = NE, 5 = H, 6 = NE

DPA Series – Auxiliary Powered, Dual Setpoint, Alarms Differential Signal (Milliamp or Resistance)

DPAMAS



DPADRT



Differential mA

- Monitors the difference between two current loop signals
- Low input impedance
- Power for active input devices

Differential Resistance

- Monitors the difference in resistance between two resistance elements

Technical Data

Inputs	
Input Type	Two DC milliamp inputs (of the same type)
Standard ranges	0–20 mA 4–20 mA Note: other ranges are available on request.
Input Impedance	10 Ω
Span range	
Input offset	
R2 range	
General	
Transfer Function	Output α A–B
Options	
HO High Offset	

Inputs	
Input Type	Two DC milliamp inputs (of the same type)
Standard ranges	0–20 mA 4–20 mA Note: other ranges are available on request.
Input Impedance	10 Ω
Span range	
Input offset	
R2 range	
General	
Transfer Function	Output α A–B
Options	
HO High Offset	

Inputs	
Input Type	Two resistance legs R1 & R2 in 2-wire configuration with R1 > R2
Standard ranges	As ordered
Input Impedance	
Span range	(R1–R2) 20 Ω–100 kΩ
Input offset	0–100% of input span
R2 range	0–1000% of input span
General	
Transfer Function	Output α R1–R2
Options	
HO High Offset	For offsets > span

Input Connections

Terminal	Signal
1	Not used
2	Current source A +ve
3	Current source B +ve
4	Common

Terminal	Signal
1	Not used
2	R ₁
3	R ₂
4	Common –ve

Ordering Information

Type	Cat. No.
(Model 1/2/3 – See key below) DPAMAS 4–20 mA/24 V DC	7940016144

Type	Cat. No.
(Model 1/2/3 – See key below) DPADRT 200 Ohm/ 20–400 hm/24 V DC	7940017919

Note: For other ranges please specify DPAMAS 1/2/3/4/5/6 where:

- 1 = Input current range (for both inputs)
- 2 = Power Supply Voltage
- 3 = Trip 1 Low (L) /High (H)
- 4 = Relay coil 1 energisation NE/ND
- 5 = Trip 2 Low (L) /High (H)
- 6 = Relay coil 2 energisation NE/ND

Default is 3 = L, 4 = NE, 5 = H, 6 = NE

Note: For other ranges please specify DPA-DRT 1/2/3/4/5/6/7 where:

- 1 = R2 minimum value (Ω's)
- 2 = R1-R2 range (Ω's)
- 3 = Power Supply Voltage
- 4 = Trip 1 Low (L) /High (H)
- 5 = Relay coil 1 energisation NE/ND
- 6 = Trip 2 Low (L) /High (H)
- 7 = Relay coil 2 energisation NE/ND

Default is 4 = L, 5 = NE, 6 = H, 7 = NE

Micromann R Series – Universal, Auxiliary Powered, Alarms

UCVR Current/Voltage Inputs

URTR Resistive Temperature

Detector Inputs (RTD)

UTCR Thermocouple Inputs

UHZR Frequency Inputs

CNDR Conductivity Sensor Inputs

XFAR Extended Function Alarm

Micromann universal alarms monitor and display process measurements. Each model covers a range of similar signal and sensor types

- Two versatile alarm channels with LED status indication
- Dual SPDT relay outputs
- Display in Engineering units
- Complete isolation
- DC powered
- Removable, screw-type, terminal blocks
- Compact metal housing

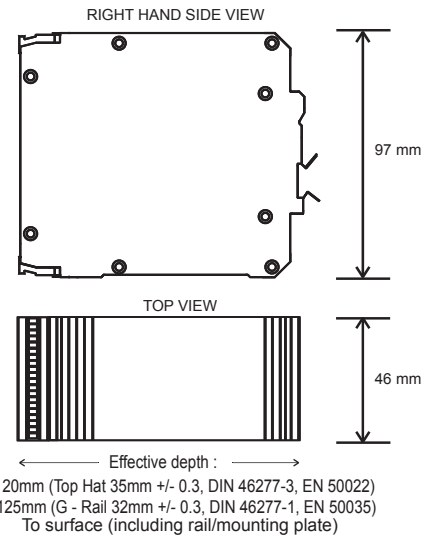


The Micromann series are fully isolated, microprocessor based, alarm modules for use with most common process measurement signals and sensors. You can program all features of Micromann operation through the front panel keypad. When the set-up is complete, you simply remove the security link to protect the setup.

You can tailor each alarm's operation individually during setup. If necessary, you can also allow setpoint adjustment (from the front panel) during normal operation. Alarm operation can be set to 'manual reset' so that active alarms will remain tripped until manually cleared.

Technical Data

Display	
Type	Full 4 digit, red 7 mm LED
Scaling	to display in % or engineering units
Display range	-999 to 9999
Status indicators	Trip1 /Trip 2 / Processor status
Alarm outputs	
Type	Two SPDT relay contact outputs
Rating	3 A at 240 V AC / 30 V DC resistive
Setpoints	Any value within the display range
Deadband	From 1 display count
Alarm action	High alarm or Low alarm
Output sense	Normally de-energised or energised
Alarm reset	Automatic or manual
Alarm timer delay	From 0 to 4200 seconds
Power Supply	
Type	DC powered
DC	12 to 50 V DC (other voltages on request)
Power Usage	6 W at 24 V DC
Housing	
Type	Dual DIN rail mount, Anodised Aluminium Enclosure
Dimensions	See diagram
Weight	0.5 kg
Connection type	Plug in terminal blocks with screw connections
Performance	
Repeatability	± 0.05% of span
Storage temperature	-25 to +70°C
Operating temperature	0 to 60 °C
Relative humidity	0-95% (non-condensing)
Temperature drift	Less than 0.02% span per °C
Long term drift	0.1 % per 10,000 hours
Reponse time	320 ms for 10-90% output change
Input step response	Programmable (from 250 mS to 32 s)
Sampling rate	5 samples per second
Setup retention	100 years minimum
Noise immunity	120 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Options	
FC	Factory configuration – specify values for all settings
FPS	Custom transducer power supply



Connections

Terminal	Signal	
1		
2		
3	See individual models	Input signals
4		
5		
6		
7	Link to change the set-up	Security Link
8		
9	Neutral (-ve)	Power supply
10	Live (+ve)	
11	Normally Closed	Alarm Channel One
12	Common	
13	Normally Open	Alarm Channel Two
14	Normally Closed	
15	Common	
16	Normally Open	
Case	Earthing is via a stud on lower side of case	

Process Alarms

Micromann R Series – Universal, Auxiliary Pow- ered, Alarms

UCVR



Current/Voltage

- Convert, filter and Isolate current and voltage signals
- Power for active input devices
- Linearises square law signals
- Bipolar inputs

UTCR



Temperature (T/C)

- Select J, K, N, T, E, B, S, R or mV inputs
- Temperature Display in °C/°F
- Burn-out alarm
- CJC Temperature display

URTR



Temperature (RTD)

- Accepts 2-wire and 3-wire PT100 RTD inputs
- Temperature Display in °C/°F
- Automatic lead length compensation

Technical Data

Inputs	
Input Type	Analogue current/voltage signals
Standard range limits	-55.00 mA to +55.00 mA or -55.00 V to +55.00 V (without recalibration)
Input impedance	22 Ω (current inputs) 1 MΩ (voltage inputs)
Resolution	1 μA/1 mV per bit for small ranges
Minimum recommended span	1 mA or 1 V
Linearisation	Linear or square root
Transducer supply	24 V DC (to 25 mA) output
Maximum input impedance	
Display	
Scaling	to display in % or engineering units
Display range	-999 to 9999
Resolution	0.001 engineering units
Performance	
CJC tracking error	
Lead length compensation	

Inputs	
Input Type	Thermocouple (type J, K, N, T, E, B, S, R) or millivolt signals
Standard range limits	
Input impedance	
Resolution	
Minimum recommended span	
Linearisation	
Transducer supply	
Maximum input impedance	
Display	
Scaling	to display temperature (in °C or °F) or mV
Display range	See table above
Resolution	1 °C/°F or 0.01 mV
CJC tracking error	Less than 0.02% per °C ambient change
Lead length compensation	

Inputs	
Input Type	2-wire or 3-wire, PT100 RTD (to BS1904:1984/IEC751:1983)
Standard range limits	
Input impedance	
Resolution	
Minimum recommended span	
Linearisation	
Transducer supply	
Maximum input impedance	
Display	
Scaling	to display temperature (in °C or °F)
Display range	See table above
Resolution	1 °C/°F or 0.1 °C/°F
CJC tracking error	
Lead length compensation	Better than 0.05% error for equal changes in lead resistance

Display Limits		Resolution
Upper	Lower	
700 °C	-200 °C	1 °C
1292 °F	-328 °F	1 °F
200.0 °C	-99.9 °C	0.1 °C
400.0 °F	-99.9 °F	0.1 °F

Input Type	Display Limits	
	Upper	Lower
J	870 °C (1598 °F)	
K	1372 °C (2502 °F)	
N	1300 °C (2372 °F)	-50 °C (-58 °F)
T	400 °C (752 °F)	
E	700 °C (1292 °F)	
B	1800 °C (3272 °F)	0 °C (32 °F)
S	1768 °C (3214 °F)	
R	1768 °C (3214 °F)	-50 °C (-58 °F)
mV	60.00 mV	-9.99 mV

Terminal	Signal
1	24 V DC (out)
2	Current +ve
3	Common -ve
4	Voltage +ve
5	Not used
6	

Terminal	mV Signal	T/C Signal
1		
2	mV + ve	CJC Board (white dot to terminal 2)
3	mV - ve	
4		
5		
6	Not used	

Terminal	Signal
1	Not used
2	A
3	B
4	B _{sense}
5	Not used
6	Not used

Input Connections

Ordering Information

Type (Model Supply)	Cat. No.
UCVR 12-50 V DC	7940010174

Note: For other ranges please specify as UCVR 1 where 1 = Power Supply Voltage

Type (Model Supply)	Cat. No.
UTCR 12-50 V DC	7760000017

Note: For other ranges please specify as UTCR 1 where 1 = Power Supply Voltage
Default Burnout Action is Upscale. For Downscale please specify on order.

Type (Model Supply)	Cat. No.
URTR 12-50 V DC	7940011087

Note: For other ranges please specify as URTR 1 where 1 = Power Supply Voltage

**Micromann R Series –
Universal, Auxiliary Pow-
ered, Alarms**

UHZR



Frequency

- Connects directly to a wide range of frequency sources
- Power for active input devices

CNDR



Conductivity

- Suits any conductivity probe
- Autoranging
- Probe temperature compensation
- Programmable cell constant
- linearises probe characteristic

XFAR



**Extended function current/
voltage alarm**

- Rate of change alarms (increase, decrease or both)
- Deviation alarms (deviation from setpoint)
- Alarm inhibit inputs (for each channel)
- Loss of signal alarms (for elevated zero signals)

Technical Data

Inputs			
Input Type	Programmable frequency (includes debouncing for volfree contacts)	Conductivity cell, conductance and Pt100 RTD (probe temperature compensation)	Process current or voltage signals
Standard range limits	Any range inside the limits 0 to 10 kHz	Any range inside the limits 0 to 20,000 µS using 4 selectable ranges: 0–200 µS; 0–1,000 µS; 0–5,000 µS; or 0–20 mS.	Any range inside the limits –22.00 mA to +22.00 mA or –11 V to +11 V
Minimum recommended span	0.001 Hz	20% of selected range	2 mA or 1 V
Input voltage range	50 mV to 250 V (ac and dc) others on request		
Sensor supply output	Nominally 12 V DC to 25 mA others on request (see /FPS option)		Nominally 24 V DC to 25 mA others on request (see /FPS option)
Temperature range		0–200 °C (for RTD)	
Cell Constants		0–01 to 99.99/cm	
Excitation voltage		Less than 6 V p/p @ 400 Hz	
Lead length compensation		< 2% of change for equal changes in lead resistance (up to 30 Ω)	
Temperature Compensation		Linear or user defined up to 5 points	
Input impedance			
Display			
Scaling	to display in % or engineering units	µS, mS, µS/cm, mS/cm or °C	to display in % or engineering units
Display range	–999 to 9999	0–200.0 µS (0.1 µS resolution)	–999 to 9999
Resolution	0.001 engineering units	0–1,000 µS (1 µS resolution)	0.001 engineering units
		0–5,000 µS (1 µS resolution)	
		0–20.00 mS (0.01 mS resolution)	
		0–200.0°C (0.1 °C resolution)	
Performance			
Repeatability	± 0.02% of span	± 0.05% of span	
Noise immunity		40 dB CMRR (1.5 kVrms limit)	
Notes			

Input Connections

Terminal	Signal	Terminal	Cell	Pt100 RTD	Terminal	Signal
1	12 V DC (out)	1	Not used		1	24 V DC (out)
2	Pull Up/Down	2	A		2	Current +ve
3	0 V	3	B		3	Input –ve
4	Signal +ve	4		A	4	Voltage +ve
5	Signal –ve	5		B	5	Channel one inhibit +ve
6	High voltage Signal +ve	6		B _{sense}	6	Channel two inhibit +ve
					7	Inhibit input common

Ordering Information

Type (Model Supply)	Cat. No.	Type (Model Supply)	Cat. No.	Type (Model Supply)	Cat. No.
UHZR 12–50 V DC	7940015213	CNDR 12–50 V DC	7940017921	XFAR 12–50 V DC	7940014450
Note: For other ranges please specify as UHZR 1 where 1 = Power Supply Voltage		Note: For other ranges please specify as CNDR 1 where 1 = Power Supply Voltage		Note: For other ranges please specify as XFAR 1 where 1 = Power Supply Voltage	

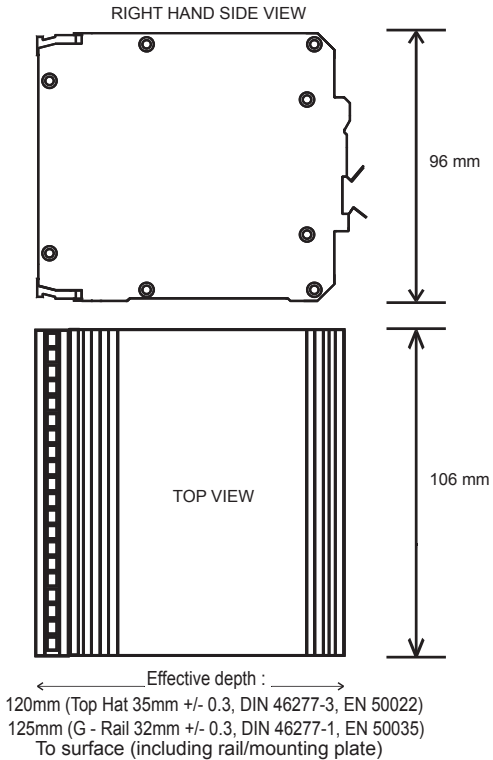
Micromann Multiplus Series – Multi-Input Signal Converter/Displays

AI8 8 Channel Current/Voltage Input Module

RI4 4 Channel Temperature (RTD) Input Module

- Calculate, monitor and display any input or combination of inputs in engineering units
- Up to 4 alarm channels
- Up to 2 analogue outputs
- RS422/485 Modbus RTU Communications (compatible with most major industrial software packages)
- Includes configuration and DDE Client server software
- Built-in suite of single and multi-variable functions including linearisation, minimum, maximum, average, difference, sum and product
- DC powered
- Fully Isolated
- Highly accurate (to 0.05% of span)
- PIN numbers protect instrument calibration and set-up





Connection Details (DIN rail mount modules)

Pin	Signal	
1 to 14 Input signals (see individual modules for detail)		
15	Signal +ve	Analogue output one (optional)
16	Current -ve	
17	Voltage -ve	
18	Signal +ve	Analogue output two (optional)
19	Current -ve	
20	Voltage -ve	
21	Neutral / - ve	Power supply
22	Live / +ve	
23	Not used	
24	Transmit -ve	RS422/485* Output (* For RS485 output connect 24 & 27 and 25 & 26)
25	Transmit +ve	
26	Receive +ve	
27	Receive -ve	
28	Not used	
29	Normally Closed	Alarm Channel One (standard)
30	Normally Open	
31	Common	
32	Normally Closed	Alarm Channel Two (optional)
33	Normally Open	
34	Common	
35	Normally Closed	Alarm Channel Three (optional)
36	Normally Open	
37	Common	
38	Normally Closed	Alarm Channel Four (optional)
39	Normally Open	
40	Common	

Note 1: Earthing is via a stud on the underside of the case
 Note 2: Double grey lines indicate isolation between ports

Multi-Channel Processing Modules

MultiPlus instruments allow multiple inputs, multiple outputs and multiple alarms to be processed simultaneously. The units use a series of 'internal' variables that are calculated from the input values. These variables can be used for the alarms, for output as analogue/digital signals or for the display.

All MultiPlus products are constructed using a common platform with many common features. The differences between the models are:

- Housing (DIN Rail)
- Input conditioning circuit
- Software features for the input type

All units are programmable in plain english from the front panel keypad or via the digital communications port (if fitted).

Technical Data

Display	
Type	Displays 'internal' variables and input values or input values only (in engineering units)
Format	2 line by 16 character alphanumeric backlit LCD display
Range	-99999 to +99999
Scaling	Anywhere within display limits
Units	58 pre-defined plus 4 user defined
Display scrolling	Manual or Automatic
Automatic scroll time	2 to 20 seconds
'Internal' variables	
Values	See individual inputs for available formulas
Analogue outputs (optional)	
Type	Proportional to any input or 'internal' variable
Format	Analogue current/voltage signal
Number of channels	0 or 2 (as ordered)
Current range	Inside the range 0.00 to 20.00 mA
Voltage range	Inside the range 0.00 to 10.00 V
Recommended minimum span	2 mA or 1 V
Alarms	
Type	Monitor any input or 'Internal' variable (see individual models for details of 'internal' variables)
Number of channels	1 (standard) or 4 (optional)
Contacts	SPDT relay contacts
Rating	5 A at 240 V AC or 24 V DC resistive
Digital Communications (optional)	
Type	Serial communications
Protocol	Modicom Modbus RTU
Interface type	RS485 / RS422
Baud rate	4800 / 9600 / 19200
Parity	None
Slave ID	1 to 247
Power Supply	
Type	DC powered
Low voltage version	12-50 V DC - Other voltages on request
Power Consumption	AI: 12 Watts / RI: 9,5 Watts
General	
Accuracy	Better than 0.05% of span at 25 °C
Electromagnetic compatibility	Approved AS/NZS 3548/2064 (C-Tick)
Storage Temp	-20 to +60 °C
Operating Temp	0 to 50 °C
Humidity	10-90 % non condensing
Temperature drift	Less than 0.01 % of full range per °C
Isolation (see connection diagram)	1.5 kVrms for 60 s (AC & DC)

AI8 8 channel analogue input module/display

- Accept eight current/voltage signals
- Will power eight loop powered inputs
- All channels can be individually linearised
- Inbuilt math functions
- Bipolar inputs

Technical Data

Inputs	
Type	Analogue Current/Voltage signals
Number of channels	8
Standard range limits	-20.00 mA to +20.00 mA or -10.00 V to +10.00 V (without recalibration)
Input impedance	22 Ω (current inputs) 1 MΩ (voltage inputs)
Linearisation	x, √x, x2, x1.5, x2.5 or User defined (21 point curve)
Recommended minimum span	
Digital filtering	Damping factor from 1 to 99
Transducer supply	24 V DC ± 10% (to 160 mA) output
CMRR	120 dB to earth / 60 db to signal 0 V
'Internal' variables	
Values	<ul style="list-style-type: none"> • Average of any selected inputs • Maximum of any selected inputs • Minimum of any selected inputs • Difference between any 2 inputs • (IN1 x IN2 x IN3 x IN4)/(IN5 x IN6 x IN7 x IN8) • (IN1 - IN2) x IN3
Performance	
Accuracy	Better than 0.02% full scale input
Temperature drift	Less than 0.005% full scale per °C
Response time (10 to 90%)	from 120 to 200 mS (dF = 1)

AI8 - DIN rail mount module



AI8 Input Connections

Pin	Signal	
1	Input 1 +ve	Analogue Current/Voltage Inputs
2	Input 2 +ve	
3	Inputs 1 & 2 -ve	
4	Input 3 +ve	
5	Input 4 +ve	
6	Inputs 3 & 4 -ve	
7	Input 5 +ve	
8	Input 6 +ve	
9	Inputs 5 & 6 -ve	
10	Input 7 +ve	
11	Input 8 +ve	
12	Inputs 7 & 8 -ve	
13	0 V DC (out)	Field Supply
14	24 V DC (out)	

Ordering Information

Type (Model-[1][2][3][4])	Cat. No.
See key below	
AI8 0042	7940018245
AI8 2012	7940018246
AI8 2042	7940011206
AI8 2112	7940018247
AI8 2142	7940015938

Note: For other ranges please specify AI8 [1][2][3][4] where:

- 1 = No. of analogue output channels (0 or 2)
- 2 = No. of digital communications channels (0 or 1)
- 3 = No. of relays fitted (1 or 4 only)
- 4 = Power supply (2 for 'Low Voltage' Version)

Example: AI8 0112 (AI8 with digital comms, 1 alarm output, and 'low voltage' power supply)

Multi-Channel Processing Modules

RI4 4 channel Temperature (RTD) module/display

- Four RTD temperature inputs
- Any combination of PT100, Ni120, Cu10 RTD's
- All channels individually linearised to temperature
- Automatic lead length compensation
- Inbuilt average, maximum, minimum and difference functions
- Display in °C or °F

RI4 – DIN rail mount module



Technical Data

Inputs			
Type	Temperature (RTD)		
RTD types	PT 100, Ni 120 or Cu 10 RTD		
Number of channels	4		
Standard range limits:			
RTD Type	Range	Resolution	Accuracy
PT100	-220 °C to +850 °C	0.382 °C	0.5 °C
	-220 °C to +220 °C	0.16 °C	0.5 °C
Ni120	-80 °C to +320 °C	0.203 °C	0.5 °C
Cu 10 @ 0°C	-60 °C to +260 °C	0.128 °C	1.0 °C
Cu 10 @ 25°C	-60 °C to +260 °C	0.128 °C	1.0 °C
Linearisation	All inputs linearised to temperature		
Digital filtering	Damping factor from 1 to 99		
CMRR	120 dB to earth / 60 db to signal 0 V		
'Internal' variables			
Values	Select any combination of inputs for: <ul style="list-style-type: none"> • Average measured temperature • Maximum measured temperature • Minimum measured temperature • Difference between any 2 temperatures 		
Performance			
Accuracy	See table under 'inputs'		
Temperature drift	Less than 0.01% of span per °C		
Response time (10 to 90%)	from 120 to 200 mS (dF=1)		

RI4 Input Connections

Pin	Signal	
1	A	RTD Input channel one
2	B	
3	B _{sense}	
4	A	RTD Input channel two
5	B	
6	B _{sense}	RTD Input channel three
7	A	
8	B	
9	B _{sense}	RTD Input channel four
10	A	
11	B	
12	B _{sense}	
13		Not used
14		

Ordering Information

Type (Model-[1][2][3][4])	Cat. No.
See key below	
RI4 0012	7940017071
RI4 0042	7940018248
RI4 2142	7940018250

Note: For other ranges please specify RI4 [1][2][3][4] where:

- 1 = No. of analogue output channels (0 or 2)
- 2 = No. of digital communications channels (0 or 1)
- 3 = No. of relays fitted (1 or 4 only)
- 4 = Power supply (2 for 'Low Voltage' Version)

Example: RI4 0012 (RI4 with 1 alarm output, and 'low voltage' power supply)

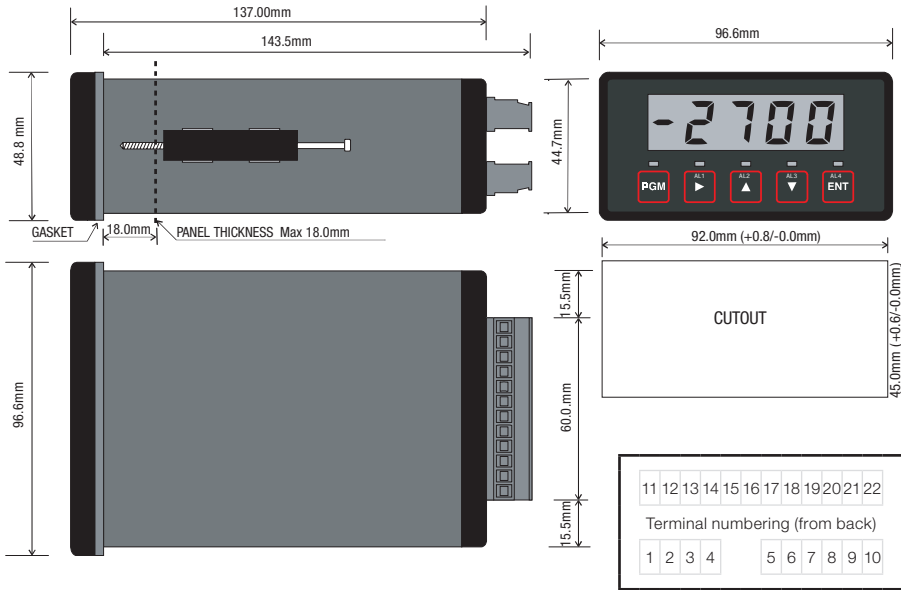
PMX420 Series – Four Digit, Current/Voltage Displays

PMX420 Display

PMX420Plus Display with Alarms and Analogue Output

- Bright four digit LED display in engineering units
- Process current and voltage inputs
- Bipolar Inputs
- Inbuilt square root function
- Maximum and minimum recall
- Integral power supply for active input devices
- DC power supply
- Fully Isolated
- Available with 4 alarm channels and analogue current/voltage output
- LED alarm status indication
- 1/8 DIN standard front with IP65 rating
- Indicate and change setpoints in engineering units





Technical Data

Display	
Type	Full 4 digit, red 14.2 mm LED
Scaling	To display in % or engineering units
Display range	-9999 to 9999
Status indicators	Alarm ch 1-4 and key status
Inputs	
Type	Analogue current or voltage (programmable)
Input Range	Any range inside the limits ± 22 mA or ± 11 V
Input Impedance	25 Ω (current)/1.5 M Ω (voltage)
Resolution	4 μ A/2 mV
Default input range	4-20 mA
Power output	24 V DC \pm 1.5 V DC (to 25 mA)
Transfer function	Linear/square root
Power supply	
Type	DC
Low voltage terminals	18-50 V DC - Other voltages on request
Power usage (maximum)	8.5 W at 24 V DC
Input filtering	
Type	Digital filter (programmable)
Damping factor	1 to 99 (default = 2)
General	
Accuracy	Typically $\pm 0.1\%$ of span
Linearity	Better than 0.05%
Repeatability	$\pm 0.02\%$ of span
Storage temperature	-25 to +70 $^{\circ}$ C
Operating temperature	0 to 60 $^{\circ}$ C
Relative humidity	0-95% (non-condensing)
Temperature drift	Less than 0.02% span/ $^{\circ}$ C
Long term drift	0.1% per 10,000 hours
Frequency response	-3 dB point = 5 Hz
Response time	300 msec for 10-90% output change (digital filtering = 1)
Noise Immunity	120 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Set-up retention	> 10 years (without power)
Housing	
Type	Panel mount
IP rating	IP65 (from front of panel)
Front bezel	1/8 DIN format
Dimensions	See mechanical drawing

Connections

Terminal	Signal	
1	Neutral / - ve	High voltage
2	Live / +ve	power supply
3	Live / +ve	Low voltage
4	Neutral / - ve	power supply
5	+ve Sensor supply / Security Link	Inputs
6	Security Link	
7	Voltage Input +ve	
8	Current Input +ve	
9	Input - ve / 0V	
10	Not connected	
11	Normally Closed	Alarm Channel One (PMX420Plus only)
12	Common	
13	Normally Open	Alarm Channel Two (PMX420Plus only)
14	Normally Closed	
15	Common	Alarm Channel Three (PMX420Plus only)
16	Normally Open	
17	Normally Open	Alarm Channel Four (PMX420Plus only)
18	Common	
19	Normally Open	Analogue output
20	Common	
21	Output +ve	(PMX420Plus only)
22	Output - ve	

General Set-Up Menu Options

Display		
<i>H B r</i>	Display brightness	High or Low
<i>d P z</i>	Display Decimal Point	0.000 to 0000
<i>d L 0 z</i>	Display low	[Value]
<i>d H i z</i>	Display high	[Value]
Inputs		
<i>i P z i</i>	Input type	Current/Voltage
<i>i P L z</i>	Input range low	[Value]
<i>i P H z</i>	Input range high	[Value]
<i>d F z 2</i>	Input filtering	1 to 99
Analogue output		
<i>R O P y</i>	Analogue Output	Enable/disable
<i>O P L z</i>	Output low	[Value]
<i>O P H z</i>	Output high	[Value]
<i>O P - d</i>	Output sense	Direct or reversed
Alarms 1-4 (general options)		
<i>R i 2 y</i>	Alarms 1 & 2	Enable/disable
<i>R 3 4 y</i>	Alarms 3 & 4	Enable/disable
<i>S E L y</i>	Setpoint security	On-the-fly-changes or locked
<i>r 0 r</i>	Alarm reset mode	Manual or Automatic
Alarm options (set for each channel)		
<i>R i n E</i>	Output Coil energisation	Normally Energised or De-energised
<i>R i z H</i>	Alarm Type	High/Low (and Siren/Group for channel four only)
<i>S P i z</i>	Setpoint	According to display range
<i>S 0 0 0</i>	e.g., 50.00 units	
<i>d b i z</i>	Introduces deadband	From 1 count to display range
<i>i 0 0 0</i>	e.g., 10.00 units	
<i>d L i z</i>	Alarm Timer Delay	0-4200s
<i>z 0</i>	e.g., 20 seconds	(default = 0s)

PMX420 Series – Four Digit, Current/Voltage Display

PMX420



- Basic display unit

PMX420Plus



- Analogue output
- Four alarm channels

Technical Data

	PMX420	PMX420Plus
Analogue output		
Type	Not Fitted	Analogue current/voltage
Scaling		To represent any portion of the input range
Range		Any range inside the limits 0–22 mA or 0–11 V
Current drive		Up to 850 Ω load (at 20 mA)
Voltage drive		True voltage source (up to 20 mA)
Output ripple		Less than 20 mV P/P
Output action		Direct/reverse
Alarm outputs (channels one and two)		
Type	Not Fitted	SPDT relay contacts
Rating		5 A at 240 V AC (resistive)
		10 A at 24 V DC (resistive)
Isolation		1 kV between channels
Suppression capacitors		Internal (fitted between normally open contacts)
Alarm outputs (channels three and four)		
Type	Not Fitted	Normally open relay contacts
Rating		5 A at 240 V AC (resistive)
		5 A at 24 V DC (resistive)
Isolation		1 kV between channels
Suppression capacitors		Internal (Fitted between contacts)

Ordering Information

Type	Cat. No.	Type	Cat. No.
PMX420	7940018956	PMX420Plus	7940018957

PMX400 Series – Four Digit, Programmable Displays with Alarms and Analogue Output

PMX400TMP Temperature Display PMX400HZX Frequency Display/Tachometer

- Bright four digit LED display in engineering units
- Up to 4 alarm channels
- Optional analogue output
- DC powered
- Fully Isolated
- LED alarm status indication
- 1/8 DIN standard front with IP65 rating
- Integral power supply for active input devices
- Indicate and change setpoints in engineering units
- Full on-site programming from the front panel keypad



The PMX400 series consists of two models:

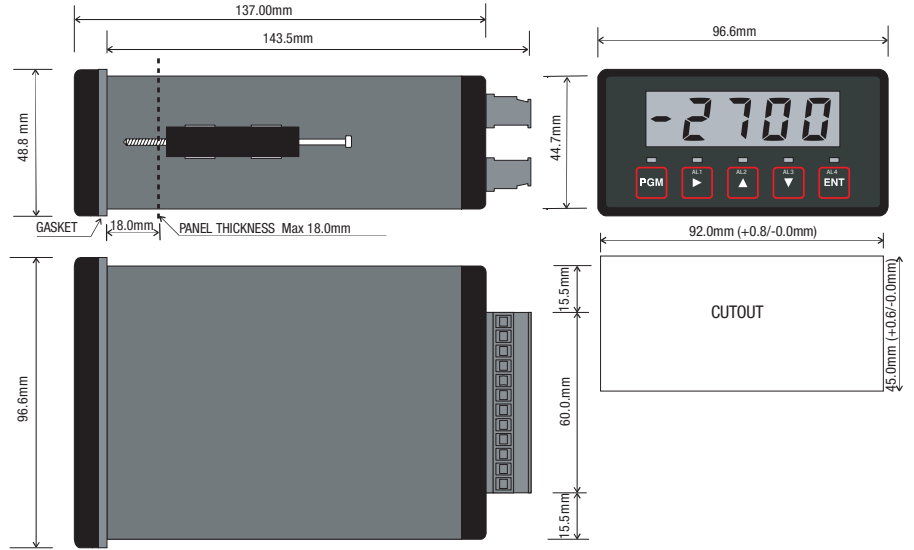
- Temperature display
- Frequency display/Tachometer

Each model supports a wide variety of input signal types and ranges.

The analogue and alarm outputs are optional, except for the HZX which comes with two open collector alarms as standard. Units can be ordered with two or four SPDT relay channels.

Alarm channel four can be set up as a group/siren alarm which operates according to the state of the other three alarms.

Note: if your process measurement is represented by a current or voltage signal you may be interested in the PMX420 Series displays.



Technical Data

Display	Full 4 digit, red 14.2 mm LED
Type	To display in % or engineering units
Scaling	-9999 to 9999
Display range	Alarm ch 1-4 and key status
Status indicators	Analogue current/voltage
Analogue output (optional)	To represent any portion of the input range
Type	Any range inside the limits 0-22 mA or 0-11 V
Scaling	Up to 850 Ω load (at 20 mA)
Range	True voltage source (up to 20 mA)
Current drive	Less than 20 mV P/P
Voltage drive	Direct/reverse
Output ripple	Digital filter (programmable)
Output action	1 to 99 (default = 2)
Input filtering	Typically ± 0.1% of span
Type	Better than 0.05%
Damping factor	± 0.02% of span
General	Storage temperature
Accuracy	Operating temperature
Linearity	Relative humidity
Repeatability	Temperature drift
Storage temperature	Long term drift
Operating temperature	Frequency response
Relative humidity	Response time
Temperature drift	Noise Immunity
Long term drift	Isolation
Frequency response	Set-up retention
Response time	Housing
Noise Immunity	Type
Isolation	IP rating
Set-up retention	Front bezel
Housing	Dimensions
Type	Panel mount
IP rating	IP65 (from front of panel)
Front bezel	1/8 DIN format
Dimensions	See mechanical drawing

General set-up menu options

Display	Display brightness	High or Low
H I B r	Display Decimal Point	0.000 to 0000
d P z	Display low	[Value]
d L 0 z	Display high	[Value]
d H 1 z	Inputs	
i P z i	Input type	See individual units
i P L z	Input range low	[Value]
i P H z	Input range high	[Value]
d F z 2	Input filtering	1 to 99
Analogue output	Analogue Output	Enable/disable
R O P y	Output low	[Value]
O P L z	Output high	[Value]
O P H z	Output sense	Direct or reversed
O P z d	Alarms 1-4 (general options)	
R 1 2 y	Alarms 1 & 2	Enable/disable
R 3 4 y	Alarms 3 & 4	Enable/disable
S E L y	Setpoint security	On-the-fly-changes or locked
n 0 r	Alarm reset mode	Manual or Automatic
Alarm options (set for each channel)	Output Coil	Normally Energised or De-energised
R i n E	Alarm Type	High/Low (and Siren/Group for channel four only)
R i z H	Setpoint	According to display range
S P 1 z	e.g., 50.00 units	
S 0 0 0	Introduces deadband	From 1 count to display range
d b 1 z	e.g., 10.00 units	
i 0 0 0	Alarm Timer Delay	0-4200s
d L 1 z	e.g., 20 seconds	(default = 0s)
2 0		

PMX400TMP

- Accepts thermocouple, RTD or mV inputs
- Total sensor diagnostics
- Indicates temperature in °C or °F
- Configure without the need to calibrate
- Indicates setpoints in °C or °F
- Automatic CJC for thermocouple inputs
- Automatic lead length compensation for RTD inputs

Options

The basic software will control the optional analogue outputs and alarm channels without modification. So, to retrofit an option, you can simply add a card, calibrate and setup for your installation from the front panel.

PMX400TMP



Technical Data

Display	
Scaling	To display in °C, °F or mV
Inputs	
Type	Thermocouple, PT100 RTD or mV
Standard ranges:	Any range inside limits shown (no recalibration required)
J Type Thermocouple	-50 °C (-58 °F) to 870 °C (1598 °F)
K Type Thermocouple	-50 °C (-58 °F) to 1372 °C (2502 °F)
N Type Thermocouple	-50 °C (-58 °F) to 1300 °C (2372 °F)
T Type Thermocouple	-50 °C (-58 °F) to 400 °C (752 °F)
E Type Thermocouple	-50 °C (-58 °F) to 700 °C (1292 °F)
B Type Thermocouple	0 °C (32 °F) to 1820 °C (3308 °F)
S Type Thermocouple	-50 °C (-58 °F) to 1768 °C (3214 °F)
R Type Thermocouple	-50 °C (-58 °F) to 1768 °C (3214 °F)
mV signals	-200.00 mV to 200.00 mV
RTD (Pt100)	-220.0 °C (-364.0 °F) to 820.0 °C (1508.0 °F)
Cold junction compensation for thermocouple inputs	Automatic
Lead length compensation for RTD inputs	Automatic
Power supply	
Type	DC powered
DC	20-28 V DC (others on request)
Power usage	6 W at 24 V DC
Alarm outputs (all channels)	
Type	SPDT relay contacts
Rating	5 A at 240 V AC (resistive) 10 A at 24 V DC (resistive)
Isolation	1 kV between channels
General	
Sampling rate	5 samples per second
Options	
/AO	With analogue output fitted
/4RO	With all alarm channels fitted

Terminal	Signal	
1	Neutral / - ve	Power supply
2	Live / +ve	
3	Output +ve	Analogue output (/AO option only)
4	Current - ve	
5	Voltage - ve	
6	Security Link	Link to allow access to the set-up mode (normally not connected)
7	Security Link	
8	CJC Board (white mark aligns with terminal 11)	Thermocouple inputs
9		
10		
11		
12	Not used	
8	Not used	RTD inputs
9		
10		
11	B _{sense}	
12	A	
8	Not used	Millivolt inputs
9		
10		
11	mV input - ve	
12	mV input + ve	
13	Normally Closed	Alarm Channel One (/4RO option only)
14	Common	
15	Normally Open	
16	Normally Closed	Alarm Channel Two (/4RO option only)
17	Common	
18	Normally Open	
19	Normally Closed	Alarm Channel Three (/4RO option only)
20	Common	
21	Normally Open	
22	Normally Closed	Alarm Channel Four (/4RO option only)
23	Common	
24	Normally Open	

Connections

Type	Model Supply/Options	Cat. No.
	PMX400TMP 24 V DC	7940017862
	PMX400TMP 24 V DC/4RO/AO	7940012968

For other ranges please specify PMX400TMP 1/2 where:
1 = Supply and 2 = Options

PMX400HZX

- Measures frequency of signals from industrial sensors
- Provides power for active input devices
- Two alarm channels
- Debounce for contact closure inputs

Options

The basic software will control the optional analogue outputs and alarm channels without modification. So, to retrofit an option, you can simply add a card, calibrate and setup for your installation from the front panel.

Technical Data

Display
Scaling
Inputs
Type
Range
Sensor power output
Input voltage range
Power supply
Type
DC
Power usage
Alarm outputs (channels one and two)
Type
Operation
Rating
Isolation
Alarm outputs (channels three and four)
Type
Rating
Isolation
General
Response time
Options
/AO
/RO
/FPS

Inputs

Inputs can be taken from many sources, including:

- NAMUR sensors
- 3-wire PNP/NPN sensors
- PNP/NPN open collector outputs
- TTL logic
- Solid State Switches
- Low and high voltage pulses
- Volt-free contacts

To display in engineering units															
Programmable frequency															
Any range within the limits shown															
<table border="1"> <thead> <tr> <th>Span range</th> <th>Zero range</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>0 to 9.999 Hz</td> <td>0 to 9.998 Hz</td> <td>0.001 Hz</td> </tr> <tr> <td>0 to 99.99 Hz</td> <td>0 to 99.98 Hz</td> <td>0.01 Hz</td> </tr> <tr> <td>0 to 999.9 Hz</td> <td>0 to 999.8 Hz</td> <td>0.1 Hz</td> </tr> <tr> <td>0 to 9999 Hz</td> <td>0 to 9998 Hz</td> <td>1 Hz</td> </tr> </tbody> </table>	Span range	Zero range	Resolution	0 to 9.999 Hz	0 to 9.998 Hz	0.001 Hz	0 to 99.99 Hz	0 to 99.98 Hz	0.01 Hz	0 to 999.9 Hz	0 to 999.8 Hz	0.1 Hz	0 to 9999 Hz	0 to 9998 Hz	1 Hz
Span range	Zero range	Resolution													
0 to 9.999 Hz	0 to 9.998 Hz	0.001 Hz													
0 to 99.99 Hz	0 to 99.98 Hz	0.01 Hz													
0 to 999.9 Hz	0 to 999.8 Hz	0.1 Hz													
0 to 9999 Hz	0 to 9998 Hz	1 Hz													
Nominally 12 V DC (to 25mA) – others on request (/FPS option)															
50 mV AC to 250 V AC or 3 V DC to 250 V DC															
DC powered															
24 V DC ±10 % (others on request)															
6 W at 24 V DC															
NPN open collector transistor type															
Switched to 0 V when "on"															
to 200 mA "on" state current															
or 50 V DC "off" state voltage															
Note: back-emf protection must be used for inductive loads															
Common negative rail															
SPDT relay contacts															
5 A at 240 V AC (resistive)															
10 A at 24 V DC (resistive)															
1 kV between channels															
220 mS (10–90 mS, df=1)															
With analogue output fitted															
With alarm channels three and four fitted															
Custom input sensor supply voltage. State voltage, e.g., PMX400HZX.../FPS/24 V DC															

Ordering Information

Type (Model Supply/Options)	Cat. No.
PMX400HZX 24 V DC	7940015595
PMX400HZX 24 V DC/RO/AO	7940011979

For other ranges please specify PMX400HZX 1/2 where:
1 = Supply and 2 = Options

PMX400HZX



Connections

Terminal	Signal	
1	Neutral / - ve	Power supply
2	Live / +ve	
3	Output +ve	Analogue output
4	Output - ve	(/AO option only)
5	Common	Alarm Channel One
6	Channel 1	and
7	Channel 2	Alarm Channel Two
8	Security Link	Inputs/Security link
9	Pull up/down	
10	Signal - ve / 0V	Link 12 & 8 for set-up
11	Signal +ve	mode (otherwise leave
12	+12 V DC out	disconnected)
See user manual for full explanation of input connections		
13	Normally Closed	Alarm Channel Three
14	Common	(/RO option only)
15	Normally Open	
16	Normally Closed	Alarm Channel Four
17	Common	(/RO option only)
18	Normally Open	

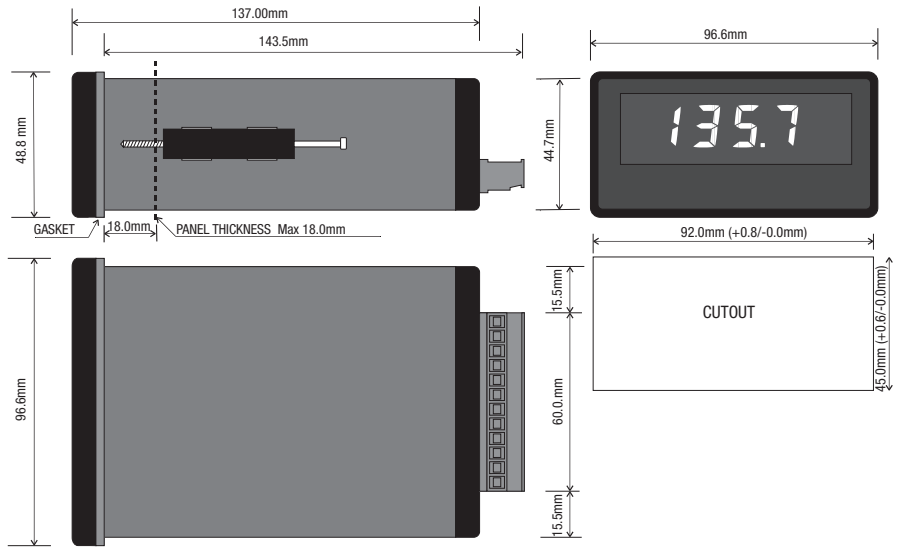
DI350 – 3+½ Digit Indicator

DI350 Current/Voltage Inputs

- Bright 3+½ digit LED display in engineering units
- Current or Voltage signal inputs
- Integral power supply for active input devices
- Linearity $\pm 0.1\%$ of span
- DC powered
- Fully Isolated
- 1/8 DIN standard front with IP65 rating
- Removable, screw type, terminal blocks



DI350



Technical Data

Display	
Type	Full 3½ digit, red 14.2 mm LED
Scaling	To display in % or engineering units
Display range	-1999 to 1999
Decimal point setting	1.000, 10.00, 100.0
Inputs	
Type	Analogue current or voltage signals (as ordered)
Standard ranges	4-20 mA / 0-10 V (Other ranges are available on request)
Input Impedance	22 Ω (current inputs) or 1 M Ω (voltage inputs)
Transducer supply	24 V DC (to 25 mA) output
Adjustments	
Type	22-turn potentiometers
Zero	± 1200 counts
Span	from 20 to 2100 counts
Power supply	
Type	DC powered
DC	24 V DC nominal (range 12-35 V DC) - Other voltages on request
Power usage	6 W at 24 V DC
Performance	
Linearity	Better than 0.1% typical
Storage temperature	-25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0-95% (non-condensing)
Temperature drift	Less than 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Response time	200 msec for 10-90% output change
Noise Immunity	105 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC) between input and power supply
Housing	
Type	Panel mount
IP rating	IP65 (from front of panel)
Front bezel	1/8 DIN format
Dimensions	See mechanical drawing
Weight	0.48 kg

Connections

Terminal	Signal	
1	24 V DC Sensor Supply	Inputs
2	0 V DC Sensor Supply	
3	Input +ve	
4	Input -ve	
5	Not used	
6		
7	Live (+ve)	Power Supply
8	Neutral (-ve)	

Ordering Information

Type (Model Input/Display/Supply)	Cat. No.
DI350 0-10 V/0-100.0/24 V DC	7940011570
DI350 4-20 mA/0-100.0/24 V DC	7940010185

For other ranges please specify DI350 1/2/3 where:

- 1 = Input range
- 2 = Display range
- 3 = Power Supply Voltage

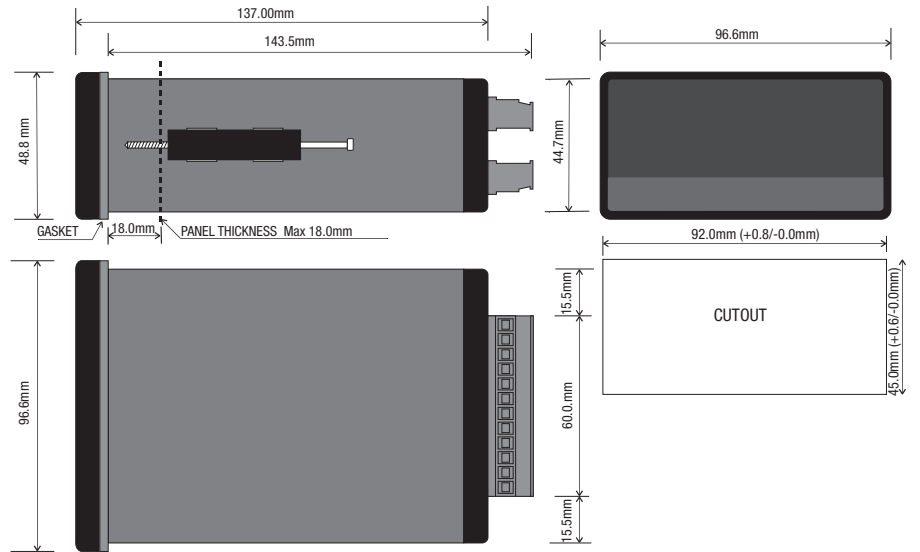
PM450 – 4+½ Digit Indicator

PM450 Current/Voltage Inputs

- Bright 4+½ digit LED display in engineering units
- Current or voltage inputs
- Integral power supply for active input devices
- DC powered
- Fully Isolated
- 1/8 DIN standard front with IP65 rating
- Removable, screw type, terminal blocks



PM450



Technical Data

Display											
Type	Full 4+½ digit, red 14.2 mm LED										
Scaling	To display in % or engineering units										
Display range	-19999 to 19999										
Inputs											
Type	Analogue current or voltage signals (switch selectable)										
Standard ranges	<table border="1"> <tr> <th>Range</th> <th>Input Impedance</th> </tr> <tr> <td>4-20 mA, 0-20 mA</td> <td>10 Ω</td> </tr> <tr> <td>0-10 mA</td> <td>20 Ω</td> </tr> <tr> <td>0-2 V, 0-10 V, 0-200 mV, 40-200 mV</td> <td>10 MΩ</td> </tr> <tr> <td>0-5 V, 1-5 V</td> <td>500 kΩ</td> </tr> </table>	Range	Input Impedance	4-20 mA, 0-20 mA	10 Ω	0-10 mA	20 Ω	0-2 V, 0-10 V, 0-200 mV, 40-200 mV	10 MΩ	0-5 V, 1-5 V	500 kΩ
Range	Input Impedance										
4-20 mA, 0-20 mA	10 Ω										
0-10 mA	20 Ω										
0-2 V, 0-10 V, 0-200 mV, 40-200 mV	10 MΩ										
0-5 V, 1-5 V	500 kΩ										
Transducer supply	24 V DC (to 25 mA) output										
Adjustments											
Type	20-turn potentiometers										
Zero adjustment ranges (select by jumper)	± 5% or ± 60% of nominal span										
Span adjustment ranges (select by jumper)	0-30%, 30-60%, 60-90% or 90-120% of nominal span										
Power supply											
Type	DC powered										
DC	Nominal 24 V DC (permissible range 20-28 V DC) (others on request)										
Power usage	6 W at 24 V DC										
Performance											
Accuracy	Better than 0.1% typical										
Storage temperature	-20 to +70 °C										
Operating temperature	0 to 60 °C										
Relative humidity	0-95% (non-condensing)										
Temperature drift	Less than 0.02% span/°C										
Response time	200 mS for 10-90% output change										
Isolation	1.5 kVrms for 60 s (AC & DC) between input and power supply										
Housing											
Type	Panel mount										
IP rating	IP65 (from front of panel)										
Front bezel	1/8 DIN format										
Dimensions	See mechanical drawing										
Weight	0.5 kg										

Connections

Terminal	Signal	
1	24 V DC Sensor Supply	Inputs
2	0 V DC Sensor Supply	
3	Input +ve	
4	Input -ve	
5	Not used	
6		
7	Live (+ve)	Power Supply
8	Neutral (-ve)	

Ordering Information

Type (Model Input/Display/Supply)	Cat No.
PM450 4-20 mA/0-100.00/24 V DC	7940010218

Note: For other ranges please specify PM450 1/2/3 where:

- 1 = Input range
- 2 = Display range
- 3 = Power Supply Voltage

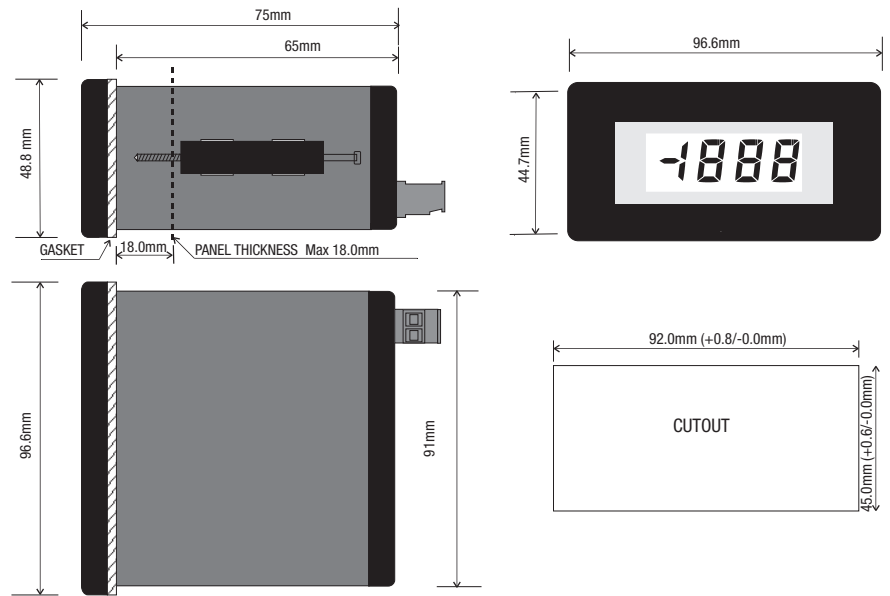
LPD350 – 3+½ Digit, Loop Powered, Indicator

The LPD350 is a compact, cost effective, 3+½ digit indicator designed specifically for current loop signals.

- Large 3+½ digit LCD display in engineering units
- 4–20 mA input
- Loop powered (125 Ω loop load)
- Direct or Reverse action display
- Linearity $\pm 0.1\%$ of span
- 1/8 DIN standard front with IP65 rating
- Removable, screw type, terminal blocks



LPD350



Technical Data

Display	
Type	3+1/2 digit 12.7 mm (0.5 Inch) LCD
Range	-1999 to +1999
Decimal point selection	1888 1.888 18.88 or 188.8
Overrange display	Blanked except for 1 at left
Inputs	
Type	4-20 mA
Voltage drop	2.5 V @ 20 mA
Max loop loading	125 Ω
Max forward current	100 mA continuous or 500 mA for 10 s
Max reverse current	500 mA continuous
Adjustments	
Type	20-turn potentiometers
Zero	±1999 counts in two switched ranges
Span	from 0 to 3998 counts in 3 switched ranges
General	
Accuracy	± 0.05% span error ±1 count
Repeatability	± 0.05% span error
Temperature drift	Zero ± 0.1 counts per °C
	Span ± 0.1 counts per °C
Operating temp range	-20 to +70 °C
Storage temp range	-25 °C to +85 °C
Response time	200 mS from 10-90% output
Sample rate	2.5 per second
Housing	
Type	Panel mount
IP rating	IP65 (from front of panel)
Front bezel	1/8 DIN format

Connections

Terminal	Signal	
1	Input - ve	Inputs
2	Input + ve	

Ordering Information

Versions	Cat. No.
LPD350 4-20 mA/0-100.0	7940010163

Note: For other ranges please specify LPD350 1/2 where:

- 1 = Input current range
- 2 = Display range

LPD450F – Loop Powered Display

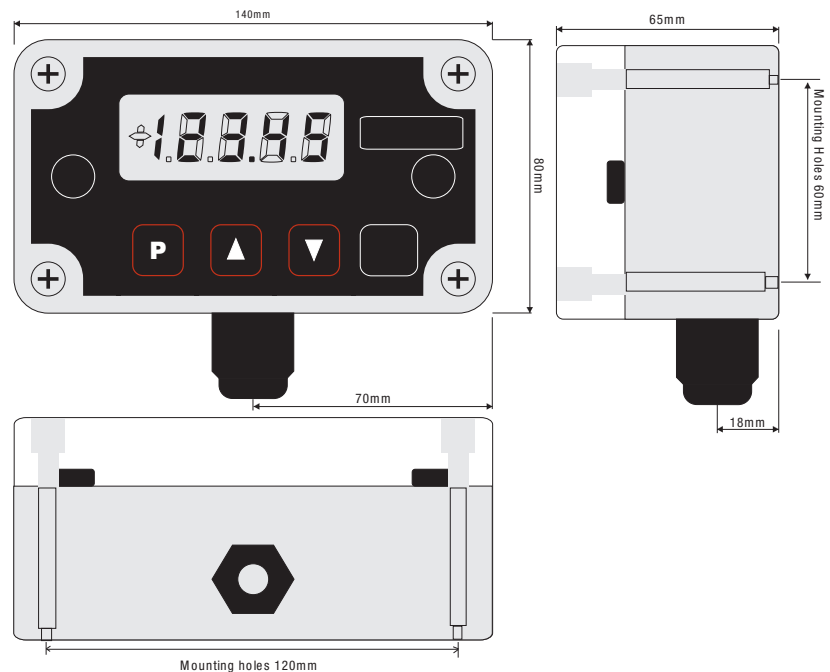
The LPD450F Display allows you to display process variables.

- Large 20 mm LCD display in engineering units
- 4–20 mA inputs (Loop Powered)
- Inbuilt signal linearisation ($\sqrt{\quad}$, $\times 1.5$, $\times 2.5$ or user defined)
- Peak and Valley Display Feature
- IP67 rated
- Pipe mount bracket option



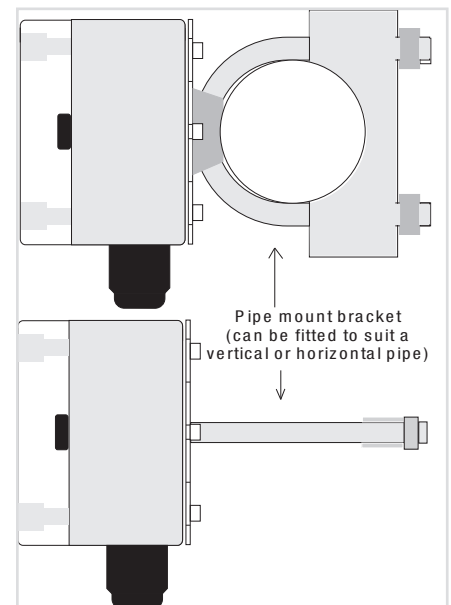
The LPD450F allows you to display process variables in any required unit of measurement. The display is loop powered by the 4–20 mA current loop with no external supply required. The 20 mm display characters make the process values easily visible at a distance even in direct sunlight. Traffolyte Labels are available as an option for both engineering units and tag numbers. As an option, the unit can be supplied with a pipe mounting bracket suitable for both horizontal and vertical pipes.

LPD450F



Technical Data

Display	
Type	4+½ digit 20 mm (0.8 inch) LCD
Scaling	to display in % or engineering units
Range	–19999 to +19999 (default 0.00 to 100.00)
Decimal point selection	18888 1.8888 18.888 188.88 or 1888.8
Inputs	
Type	4–20 mA
Transfer function	√, x1.5, x2.5 or programmable (2–21 steps)
Power supply	
Type	Powered by 4–20 mA input (loop powered)
Voltage drop	less than 4.3 V
General	
Accuracy	± 0.05% span error ±1 count
Repeatability	± 0.01% span error
Temperature drift	Zero ± 0.01% per °C
	Span ± 0.1 counts or 0.01% per °C
Operating temp range	0 to +60 °C
Storage temp range	–25 °C to +70 °C
Relative humidity	10–90% non-condensing
Response time (10–90%)	Programmable in 99 steps from 1s to 30s
Sample rate	16 per second
Display update rate	2 per second
Setup retention	100 years minimum
Housing	
Type	Impact resistant polycarbonate
IP rating	Dust tight and waterproof to IP67



Ordering Information

Type (Model Input)	Cat. No.
LPD450F 4–20 mA	7940010236
LPD450F Pipe Mount Kit	7940010667

Note: For other ranges please specify LPD450F 1/2 where:

- 1 = Input current range (4–20mA)
- 2 = Display range

Default display is 0.00–100.00.

AMS400A – Universal Auto/Manual Station

The AMS400A is an interface device used between controlling equipment and field devices to allow manual takeover of automatically controlled processes.

Typical applications are:

- manual start-up of sensitive processes before handover to automatic control
- manual over-ride in case of controller failure or malfunction.

A fully configured AMS400A can be installed in three I/O configurations, which interface between:

- Analogue control equipment and analogue control devices
- Digital control equipment and analogue control devices
- Digital control equipment and digital control devices

For analogue to analogue operation there are digital outputs available to force a change to automatic or manual mode.

You can also set ramp rates and handover settings to ensure a smooth transfer of control.



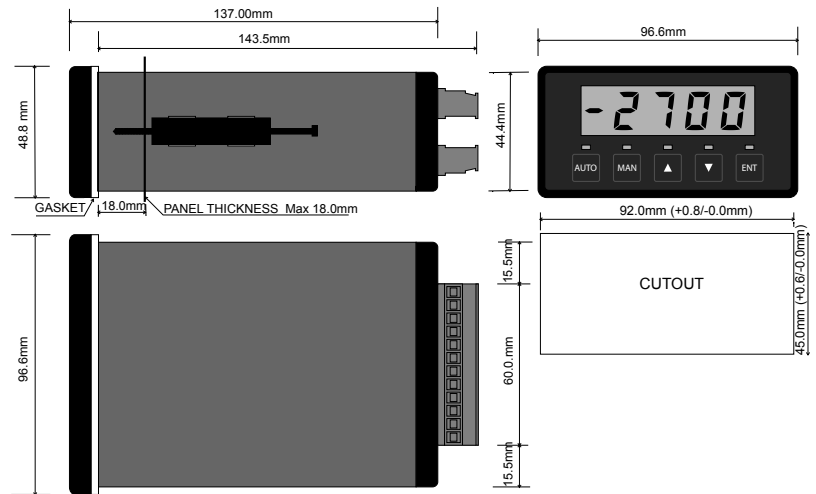
Auto/Manual Station Configurations

'dd' - Digital control equipment to digital field device	
Signal	Description
Digital Input	Up/Down signals from PLC/DCS
Analogue Input	Feedback input from field device
Analogue Output	Not used
Relay outputs	Up/Down outputs to field device
Solid state Output	AMS400A Mode signal to PLC/DCS

'dA'-Digital control equipment to analogue field device	
Signal	Description
Digital Input	Up/Down signals from PLC/DCS
Analogue Input	Feedback input from field device
Analogue Output	Proportional output to field device
Relay outputs	Not used
Solid state Output	AMS400A Mode signal to PLC/DCS

'AA'-Analogue control equipment to analogue field device	
Signal	Description
Digital Input	Force shifts between modes
Analogue Input	Automatic signal from PLC/DCS
Analogue Output	Proportional output to field device
Relay outputs	Not used
Solid state Output	AMS400A Mode signal to PLC/DCS

AMS400A



Technical Data

Display	
Type	Full 4 digit, red 14.2 mm LED
Scaling	To display in % or engineering units
Display range	-9999 to 9999
Status indicators	Operating mode (Automatic or Manual)
Analogue output (optional)	
Type	Analogue current/voltage (selected by internal jumper)
Range	Any range inside the limits 0-24 mA or 0-18 V (determined by calibration)
Current drive	Up to 900 Ω load (at 20 mA)
Voltage drive	True voltage source (up to 20 mA)
Output ripple	Less than 20 mV P/P
Analogue input	
Type	Analogue current/voltage (as ordered)
Range	Any range inside the limits ± 24 mA or ± 12 V (determined by calibration)
Input impedance	50 Ω (current) or 1MΩ (voltage)
Noise immunity	120 dB CMRR (1.5 kVrms limit)
Sampling rate	5 samples per second
Digital Inputs	
Type (jumper selectable)	Voltage pulse or volt-free contact
Minimum pulse width	64 mS
Status outputs	
Type	2 opto-isolated O/C transistor outputs with common negative return
Rating	200 mA on-state current or 50 V DC off state voltage Note: back EMF protection required
Relay outputs	
Type	SPDT relay contacts
Rating (resistive)	3A @ 240 V AC or 5A @ 24 V DC resistive
Isolation	1.5kVrms between channels
Housing	
Type	Panel mount, IP65 rated (from front of panel)
Front bezel	1/8 DIN format
Power supply	
Type	DC powered
DC	24 V DC ±10 % - Other voltages on request
Power usage	6 W @ 24 V DC

General	
Accuracy	Typically ± 0.1% of span
Linearity	Better than 0.05%
Repeatability	± 0.02% of span
Storage temperature	-25 to +70 °C
Operating temperature	0 to 60 °C
Relative humidity	0-95% (non-condensing)
Temperature drift	Less than 0.02% span/°C
Long term drift	0.1% per 10,000 hours
Frequency response	-3 dB point = 5 Hz
Response time	300 mS for 10-90% output change
Noise Immunity	120 dB CMRR (1.5 kVrms limit)
Isolation	1.5 kVrms for 60 s (AC & DC)
Set-up retention	> 10 years (without power)

Connections

Terminal	Signal		Terminal	Signal	
1	Neutral / - ve	Power supply	11	Signal + ve	Analogue Input
2	Live / + ve		12	Signal - ve	
3	Signal + ve	Analogue output	13	Normally Closed	Increment Relay Output
4	Signal - ve		14	Common	
5	0 V		15	Normally Open	
6	AUTO/MAN	Status Outputs	16	Normally Closed	Decrement Relay Output
7	Handover Status		17	Common	
8	Common	Digital Input	18	Normally Open	
9	Increment				
10	Decrement				

Ordering Information

Type (Model 1/2/3/4 - See key below)	Cat. No.
AMS400A 4-20 mA/CC/24 V DC/AO	7940011895
AMS400A 4-20 mA/CC/24 V DC/AORO	7940015937

For other ranges please specify AMS400A 1/2/3/4 where:
 1 = Analogue input format
 2 = Digital input type (VP for voltage pulse or CC for contact closure)
 3 = Power supply voltage
 4 = Output type (AO for analogue output, RO for relay outputs or AORO for both types)

PTX800 Series – Panel Mount, Totaliser/Counters

PTX800A Current/Voltage Inputs

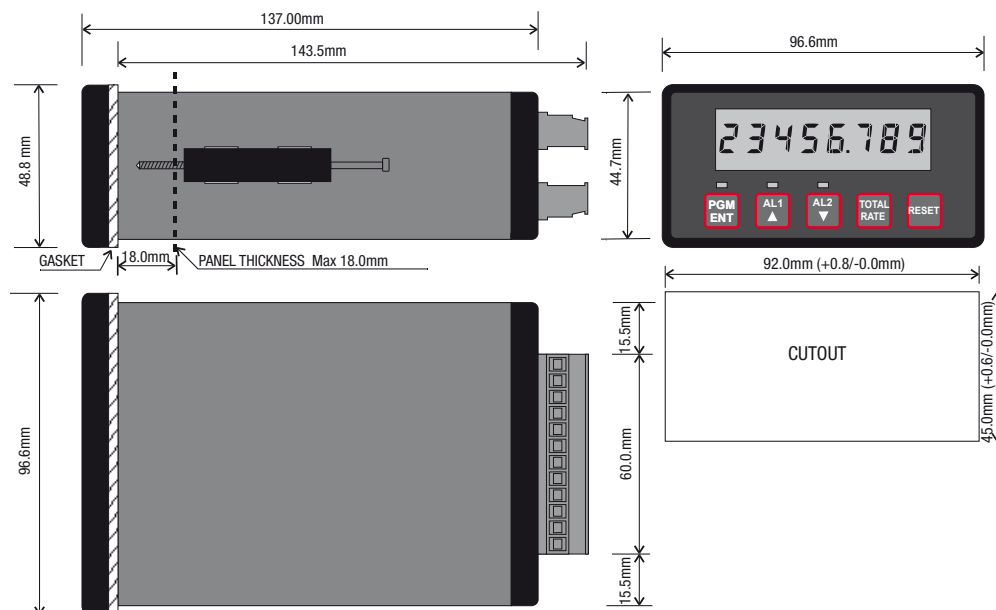
PTX800D Digital Pulse Inputs

These units are available in two models: the PTX800A for analogue current/voltage flow-rate signals; and the PTX800D for flowmeters with digital pulse outputs.

- Display total or rate in any engineering unit
- Bright 8 digit LED display
- Up to 2 alarm channels
- Optional analogue output
- Pulse output
- Reset pulse input
- Last count retention in case of power failure
- DC powered
- Fully Isolated
- LED alarm status indication
- 1/8 DIN standard facia with IP65 rating
- Integral power supply for active input devices

You can set the display for total or rate indication, then simply hold down the 'rate/total' button to check the other value.





Connections

Pin	Signal	
1	Neutral / - ve	Power supply
2	Live / +ve	
3	Signal +ve	Analogue output (optional)
4	Signal -ve	
5	0V	Pulse output
6	Pulse	
7		
8		
9		
10	Inputs (see individual units)	
11		
12		
13	Normally Closed	Alarm one (optional)
14	Common	
15	Normally Open	
16	Normally Closed	Alarm two (optional)
17	Common	
18	Normally Open	

Technical Data

Display		Analogue output (optional)	
Type	Full 8 digit, red 7.2 mm LED	Type	Analogue current/voltage (jumper selectable)
Display brightness	Programmable (in 14 steps)	Range	Determined by calibration (in the range 0-22 mA or 0-11 V)
Scaling	to display in % or engineering units	Output resolution	1.6 µA or 0.8 mV per bit
Rate display	Rates are displayed as up to five digit numbers (from 0-50,000)	Current drive	Up to 900 Ω load (at 20 mA)
Rate timebase	Rates can be displayed per second, minute or hour (also per day for the PTX800A only)	Voltage drive	Note: loop compliance is 18 V
Total display	Totals are displayed as up to eight digit numbers (from 0-99,999,999)	Output ripple	True voltage source (up to 20 mA)
Decimal points	The decimal points can be selected separately for rate and total displays (up to three decimal places)	Alarm outputs (optional)	Less than 20mV P/P
Status indicators	Alarm channel 1, Alarm channel 2 and key status	Type	SPDT relay contacts
Power supply		Rating	3 A at 240 V AC (resistive) reducing to 1 A with L/R=7 msec
Type	DC powered	Isolation	5 A 24 V DC/110 V AC (resistive)
DC	24 V DC	General	1.5 kV between channels
Permissible range	Other voltages on request	Accuracy	Better than 0.05%
Power usage	± 10% (DC supply)	Linearity	Better than 0.05%
Reset pulse input		Repeatability	± 0.02% of span
Type	Contact closure	Storage temperature	-25 to +70 °C
Effect	Resets total and clears any total alarms	Operating temperature	0 to 60 °C
Pulse output		Relative humidity	0-95% (non-condensing)
Type	NPN O/C transistor type (isolated)	Temperature drift	Less than 0.02% span/°C
Scaling	One pulse per integer change in total	Long term drift	0.1% per 10,000 hours
Pulse width	32 millisecond	Noise Immunity	120 dB CMRR (1.5 kVrms limit)
Off time	32 millisecond minimum	Isolation	1.5 kVrms for 60 s (AC & DC)
Max pulse rate	15 pulses per second	Set-up retention	100 years
		Last count retention	100 years
		Housing	
		Type	Panel mount
		IP rating	IP65 (from front of panel)
		Front bezel	1/8 DIN format
		Dimensions	See mechanical drawing

PTX800 Series – Panel Mount, Totalisers/Counters

PTX800D



PTX800A



Digital Pulse Inputs

Scaleable pulse counter and rate indicator for digital pulse signals.

- Flexible inputs suit a wide range of digital input sensors and signals
- Power for active input devices

Current/Voltage Inputs

Programmable Integrating Totaliser and rate indicator for current/voltage signals.

- Inbuilt square law function for signals from differential pressure flow sensors
- Power for active input devices
- Programmable low cut-out rate

Technical Data

Inputs	
Type	
Input range	
Sensor power output	
Input voltage range	
Resolution	
Input impedance	
Rate to Total scaling	
Analogue output (optional)	
Type	
Reset input	
Timing	
Pulse output	
Max pulse rate	
Options	
/AO	
/RO	
/FPS	

Digital pulse, including: NAMUR sensors; 3-wire PNP/NPN sensors; PNP/NPN open collector outputs; TTL logic; Solid State Switches; Low and high voltage pulses; and Volt-free contacts
0 to 10 kHz
Nominally 12 V DC (to 25 mA) Other voltages on request (/FPS option)
50 mV to 250 V Programmable
Programmable (up to 10,000 pulses per unit change in total)
Proportional to rate or total
Close for 100 mS minimum
16 pulses per second
With analogue output fitted (specify format), e.g., PTX800D/.../AO/4-20 mA
With dual alarms
Custom input sensor supply voltage. State voltage, e.g., PTX800D/.../FPS/24 V DC

Linear or square law, rate signal in analogue current or voltage format. Range is determined by the calibration values used.
-24.00 to +24.00 mA or -11.00 to +11.00 V Nominally 24 V DC (to 25 mA) Other voltages on request (/FPS Option)
0.6 µA/0.3 mV 22 Ω (current)/1 MΩ (voltage)
Select from 0.001, 0.01, 0.1, 1, 10, 100 or 1,000
Proportional to rate only
Close for 250 mS minimum
15 pulses per second
With analogue output fitted (specify format), e.g., PTX800A/.../AO/4-20 mA
With alarm channels three and four fitted
Custom input sensor supply voltage. State voltage, e.g., PTX800A/.../FPS/24 V DC

Input Connections

Terminal	Signal	
7	Reset count	Short to 12 to reset
8	Security	Short to 12 for setup mode
9	Pull Up/Down	
10	Input - ve / 0V	Inputs
11	Input +ve	
12	+12 V DC (out)	

Terminal	Signal	
7	Reset count	Short to 8 to reset count
8	Common	
9	Security	Short to 8 for setup mode
10	Input - ve / 0 V	Inputs
11	Input +ve	
12	+24 V DC (out)	

Ordering Information

Type (Model 1/2 – See key below)	Cat.No.
PTX800D 24 V DC	7940011133
PTX800D 24 V DC/ROAO	7940012323

Note: For other ranges please specify PTX800D 1/2 where:
1 = Power Supply Voltage, 2 = Options

Type (Model 1/2/3 – See key below)	Cat.No.
PTX800A 4-20 mA/24 V DC	7940010243
PTX800A 4-20 mA/24 V DC/ROAO	7940014374

Note: For other ranges please specify PTX800A 1/2/3 where:
1 = Input range, 2 = Power supply voltage, 3 = Options

Portacal275 – Handheld Signal Source and Loop Calibrator

The Portacal 275 is an accurate, handheld, signal source and loop tester for milliamp, millivolt and voltage signals.

- Compact, handheld and light
- Simulates loop powered transmitter operation
- LEDs to indicate source/sink operating mode
- 0–20 mA / 4–20 mA current ranges
- 0–5 V / 1–5 V / 0–200 mV voltage ranges
- 0.1 % accurate current source
- Test points for current output monitoring
- Switch select 0%, 100% or variable output
- Precision lockable 10-turn dial for variable signal output
- Powered from two PM3 9 V batteries



The Portacal 275 is an accurate handheld signal source and loop tester for milliamp, millivolt and voltage signals. It can be used in four modes to suit most current/voltage calibration requirements. The modes are:

- voltage source, which simulates auxiliary powered transmitters with proportional voltage outputs;
- millivolt source, which simulates many common plant based signals;

- current source, which simulates auxiliary powered transmitters with proportional current outputs;
- current sink mode, which simulates 2-wire (loop powered) transmitter outputs.

The Portacal 275 has an accurate lockable dial scaled in 0.1% increments from 0 to 100%. By using the dial in combination with the output value switch, you can quickly

and accurately (typically within $\pm 0.25\%$) dial up any signal value in the field without a digital meter for indication. For more accurate bench work (to within $\pm 0.1\%$), test points are provided for multi-meter connection. If you often need a display of the output signal level, you should consider using the Portacal 1000.

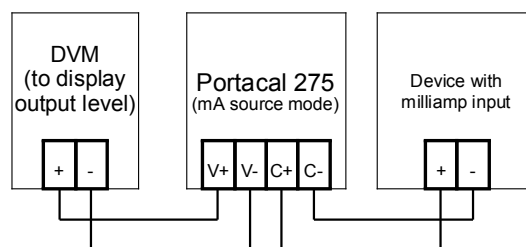
Portacal 275



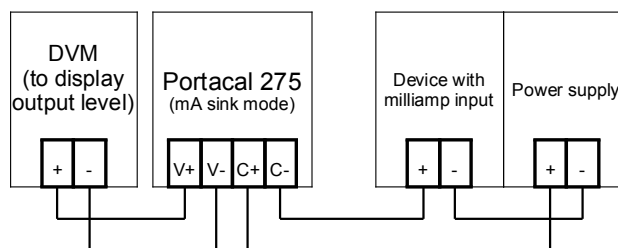
Technical Data

Voltage output	
Type	Millivolt or voltage source
Voltage ranges	0–5 V / 1–5 V
Millivolt ranges	0–200 mV / 40–200 mV
Impedance	250 Ω (voltage source mode) 10 Ω (millivolt source mode)
Accuracy	Better than 0.2% at 0% and 100% of span
Current output	
Type	mA source or sink modes
Ranges	0–20 mA or 4–20 mA
Max load	700 Ω (source mode)
Max Loop loading	$[(V_{supply} - 4) / 0.02] \Omega$ (sink mode)
	Note: for current sink mode the supply loop voltage should be 4–45 V DC, with a maximum of 60 V for 1s – a typical 2-wire loop will use a supply of 24 V DC.
Accuracy	0.1% at 0% and 100%
Ripple	less than 1 μA
Leads (supplied)	
Type	2 x 1 m Banana plug to croc clip Silicon 0.5 mm wire (red and black) and 1 x 100 mm Banana to Banana current loop shorting lead
Controls	
Variable output	0–100% of output range using precision lockable ten-turn dial
Fixed outputs	0% and 100% output using toggle switch
Range selections	0–20 mA, 4–20 mA, 0–200 mV and 0–5 V by toggle switch
Output type	mA source, mA sink, 0–200 mV source, or 0–5 V/1–5 V source, by toggle switches
Power supply	
Type	Battery operated
Batteries	2 x 9 V "PP3" Alkaline
Battery life	load dependent
Current drain	6–22 mA (source mode) 2 mA (sink mode)
Performance	
Operating temperature	0–60 $^{\circ}C$
Storage temp	–25 $^{\circ}C$ to +70 $^{\circ}C$
Temperature drift	Typically 40 ppm per $^{\circ}C$
Dial accuracy	Typically 0.25% of span anywhere on dial
Housing	
Type	Polycarbonate
Dimensions	112 x 62 x 31 mm

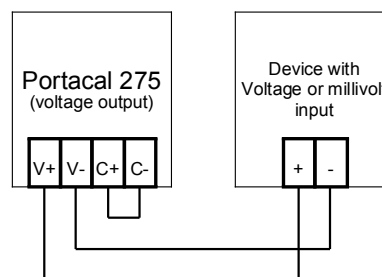
Connection diagrams



Simulating a 4-wire transmitter with current outputs



Simulating 2-wire transmitter operation



Simulating a 4-wire transmitter with voltage outputs or a millivolt signal source.
Note: link C+ and C- with the current loop shorting link provided.

Ordering Information

Type	Cat. No.
Portacal 275	7940010202

Portacal1000 – Current/Voltage Instrument Calibrator

The Portacal 1000 is a microprocessor based calibrator for milliamp and voltage signals.

- Complete diagnostic tool for current/voltage instruments
- Measures and simulates voltage and current signals
- Simulates auxiliary powered and loop powered transmitter operation
- Tests and measures loop powered transmitter operation
- Continuous stepping and ramping functions
- Better than 0.05% accuracy in all modes
- Light and portable
- Works off NiMH batteries, ordinary alkaline batteries
- Audible keypress



The Portacal 1000 has three output (transmitter simulation) modes:

- Voltage source, for simulating auxiliary powered transmitters with voltage outputs
- Current source, for simulating auxiliary powered transmitters with proportional current outputs
- Current sink mode, for simulating 2-wire (loop powered) transmitters.

For each of these modes the most commonly used calibration points are available by pressing one key. There are also nine storage locations for each mode, which you can use to store and recall values that you often use.

You can also program the instrument to repeatedly ramp or step between up to nine stored values in any mode. The values are selected from the stored values and you

specify how many values to use and how long (in seconds) between each change.

The signal measuring modes allow you to test or calibrate:

- voltage outputs
- current outputs
- 2-wire transmitter outputs

When testing a 2-wire (loop powered) transmitter output, the Portacal 1000 also provides power for the device.

Portacal 1000



Technical Data

Voltage output mode		
Range		Any voltage from 0.00 to 13.00 V in 0.01 V steps
Current drive		0–10 mA
Accuracy		± 5 mV
Ripple		less than 1 mV
Memory		Nine user defined voltages (values to two decimal places)
Current output mode		
Type		mA source or mA sink modes
Range		Any current from 0.00 to 26.00 mA in 0.01 mA steps
Max load		600 Ω @ 20 mA (source mode)
Loop loading		100 Ω (sink mode)
Current sink mode loop voltage		9–45 V DC
Accuracy		± 5 μA
Ripple		Less than 1 μA
Memory		Nine user defined mA values (to two decimal places)
Voltage input mode		
Range		0.00 to 13.00V
Impedance		200 KΩ
Accuracy		± 5 mV or ±1 count
Current input mode		
Range		0.00 to 26.00 mA
Impedance		47 Ω
Accuracy		± 5 μA ± 1 count
Two wire power mode		
Type		Measures and powers output of loop powered devices
Range		0.00 to 26.00 mA
Supply to loop		16 V ± 10%
Accuracy		± 5 μA ± 1 Count
Automatic step/ramp mode		
Action	Step	Outputs each value for the programmed time
	Ramp	Ramps to next value over the programmed time
Number of values		Between two and nine
Programmed time		Between 10 s and 4200 s

Display		
Type		Full 4-digit, high contrast 12 mm digit LCD
Annunciators		5 x LED for increment/ decrement and output mode
Scaling		Can display in % for current/voltage measurements
Leads		
Type		2 x 1m Banana Plug to croc clip silicon 0.5 mm wire (red and black)
Keyboard		
Type		16-key Membrane keypad with audible keyclick
1-key recall values		0, 2, 4, 8, 10, 12, 16, 18, 20 mA
2-key recall		0, 1, 2, 4, 5, 6, 8, 9, 10 V
Inc/dec steps		Nine stored locations per output mode
		1, 0.1, 0.01 mA or
		1, 0.1, 0.01 V
Power supply		
Type		Battery
Batteries		4 x 'AA' Alkaline or
		4 x 'AA' NiMH (supplied)
NiCd Battery life (load dependent)		Minimum 10 hrs (@ 20 mA out into full load)
Charging time		Up to 3 hrs using the charger supplied
Performance		
Operating temp		0–60°C
Storage temp		–25°C to + 70°C
Temp drift		Typically better than 0.01% of span per °C
Housing		
Type		Dark brown ABS with black leather carrying case
Dimensions		100 mm (w) by 180 mm (h) by 44 mm (d)
Weight		0.55 Kg

Ordering Information

Type	Cat. No.
Portacal 1000	7940010194

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