Loop Powered Products including:

420TW	Isolating Terminal Blocks
420i	Loop Powered Isolators
RTD/TC-HEAD	In-Head Transmitters

DC/AC Powered Isolation including:

ISOCON	Universal Isolating Converters
DUALCON	Dual Output Isolator
SLIMCON	7.2mm Isolating Converter
TC-TC	Thermocouple Isolator
VCON	AC Current/Voltage Converter
STRAIN	Strain gauge Isolating Converter

Intelligent Transmitters including:

MATHSCON	Dual Input Maths Block
FREQCON	Frequency to Analogue Converter
CHAMELEON	Programmable Maths and Logic Unit

Trip Amplifiers including:

20-ALM	Loop Powered Trip Amplifier
2002	Dual Setpoint Trip Amplifier
NEW 4002	Dual Setpoint, ReTx, Led Display

Industrial Interface has been designing, manufacturing and supporting our range of Signal Conditioning products since 1990.

During that time an on-going programme of research and development has ensured that the range is one of the most innovative, comprehensive and versatile around.

State-of-the-art design and a Quality System to EN ISO 9001:2000 ensure the delivery of quality product and technical back-up every time.

Industrial Interface Ltd
Signal House
Unit 15 Alstone Lane Trading Estate
Alstone Lane
Cheltenham
Glos
GL51 8HF

Tel: 01242 251794
Fax: 01242 571683
Email: sales@industrialinterface.co.uk

Our Website has full documentation, software and manuals to view and download free of charge

Visit
www.industrialinterface.co.uk

CONTENTS

Product Selection Guide

	Loop Powered 420 SERIES	ISOLATING SIGNAL CONVERTERS								TRIP AMPLIFIERS			IN-HEAD		INTELLIGENT PRODUCTS			POWER SUPPLIES
		ISOCON-6	ISOCON-3	TC-TC	DAULCON-6	DUALCON-3	VCON	STRAIN	SLIMCON	20-ALM	2002-ALM	4002-ALM	TC-HEAD	RTD-HEAD	CHAMELEON	MATHSCON	FREQCON	
INPUTS																		
dc voltage	☆	☆	☆		☆	☆	☆		☆		☆	☆			❸	❷		☆
ac voltage							☆				☆	☆						☆
dc current	☆	☆	☆		☆	☆	☆		☆	☆	☆	☆			❸	❷		
ac current							☆											
Potentiometer		☆	☆		☆	☆										❶		
Strain gauge							☆	☆										
Thermocouple/mV	☆	☆	☆	☆	☆	☆					☆	☆	☆			❶		
RTD	☆	☆	☆		☆	☆					☆	☆		☆		❶		
Frequency															❷		☆	
Multiple I/O															❸	❷		
OUTPUTS																		
dc voltage	☆	☆	☆		❷	❷	☆	☆	☆			☆			❷	☆	☆	☆
dc current source	☆	☆	☆		❷	❷	☆	☆	☆			☆			❷	☆	☆	
dc current sink	☆	☆	☆		❷	❷	☆		☆			☆	☆	☆				
mV Output		☆	☆	☆	❷	❷	☆		☆			☆						
Dual outputs					☆	☆									☆			
Relay contacts										❶	❷	❷			❷	❷		
Frequency															❷			
FEATURES AND OPTIONS																		
Loop powered	☆									☆			☆	☆				
dc powered		☆		☆	☆		☆	☆	☆		☆	☆			☆	☆	☆	☆
ac powered			☆	☆		☆		☆				☆						☆
Isolated I/O	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
User-Configurable	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
PC Configurable															☆			
Square-Root Extract		☆	☆		☆	☆						☆			☆	☆	☆	
T/C Linearisation		☆	☆	☆	☆	☆						☆	☆					
RTD Linearisation		☆	☆		☆	☆					☆	☆		☆				
Custom Linearisation		☆	☆		☆	☆									☆			
Full Maths/Logic															☆	☆		
LED Display												☆						
Tx Supply Option		☆	☆	☆	☆	☆	☆	☆				☆			☆		☆	
Integration															☆			
Intelligent Trip												☆			☆			
RS232/485 Comms															☆			
PID / Timers															☆			
Steam Tables															☆			
Flow Computing															☆			
True RMS							☆											
OEM Solution	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆

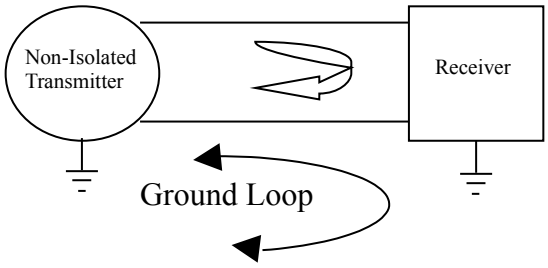
Signal Conditioning & Process Control Equipment

A brief introduction to common applications.

There are four very broad applications of signal conditioning:

Elimination of Ground Loops and AC Electrical Noise

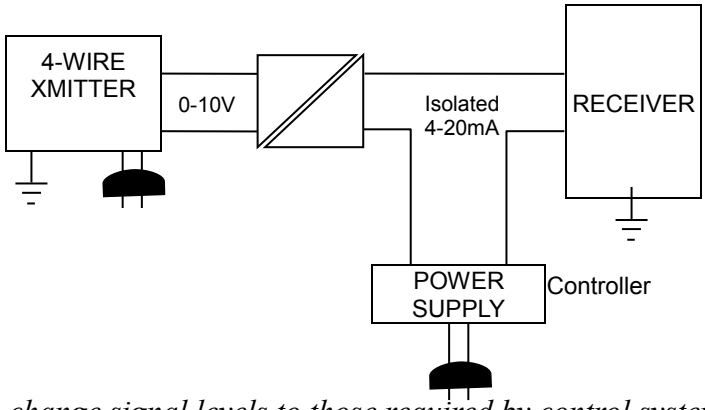
Ground loops can occur where there are multiple current return paths or multiple connections to 'earth ground'. Ground loops cause problems by adding or subtracting a noise current or voltage from the process signal. The measuring system only sees the effected signal and so returns an inaccurate or unstable reading.
Putting a signal isolator between the earthed devices breaks the galvanic path (dc continuity) between the grounds but allows the analogue signal through. In addition common mode voltages (ac continuity) generated by ac noise can also be rejected leading to an electrically 'clean', accurate signal being sent to the measuring instrument.



Earth loops can occur where more than 'earth ground' exists, causing inaccurate signals

Signal Conversion

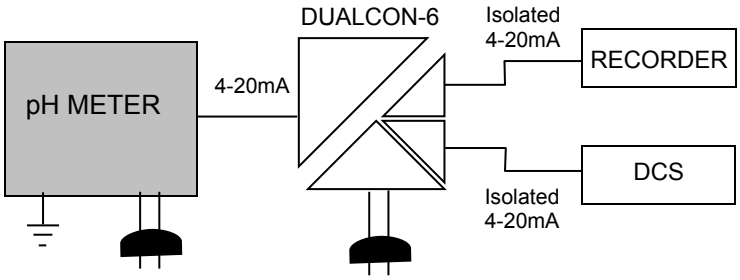
As well as providing isolation between input and output signal conditioners are used to change an incoming signal into the form required by the control or monitoring system. For example a PLC may require 0-10Vdc input from a field instrument which generates a 4-20mA signal. An isolating signal converter can be used to both maintain and integrity of the 4-20mA signal whilst also providing an isolated 0-10Vdc output for the PLC. As well as changing the signal type some conditioners can linearise the incoming signal from, say a thermocouple and provide an output which is proportional to temperature. Other linearising functions available are square-root extraction for how measurements using a pressure drop and linearisation for tank contents where the tank content is not linear with tank level.



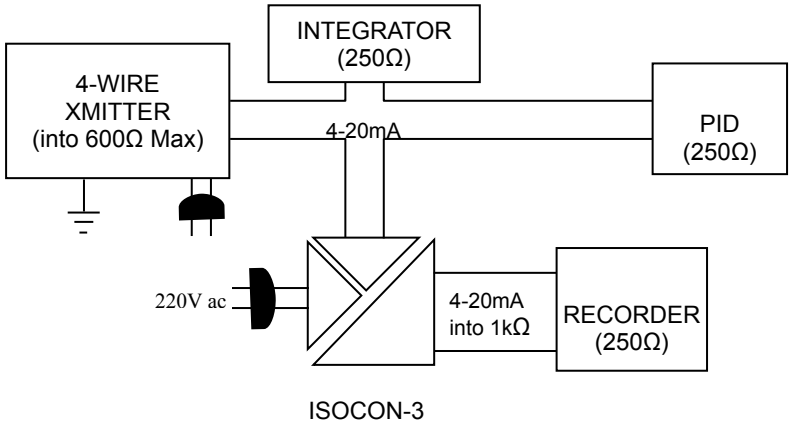
To change signal levels to those required by control systems

Transmitter Sharing and Signal Boosting

It is quite common for one process transmitter, say a fluid temperature transmitter, to be connected to several different instruments, such as a temperature controller a chart recorder and a DCS. Signal isolators can be used to generate extra drive capability for an existing loop or to generate an extra loop, which can be adjusted using zero, and span potentiometers without affecting the existing loop.



two isolated loops operated from one transmitter

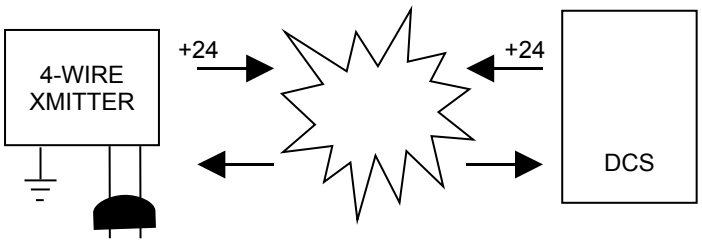


boosts signal in an existing loop

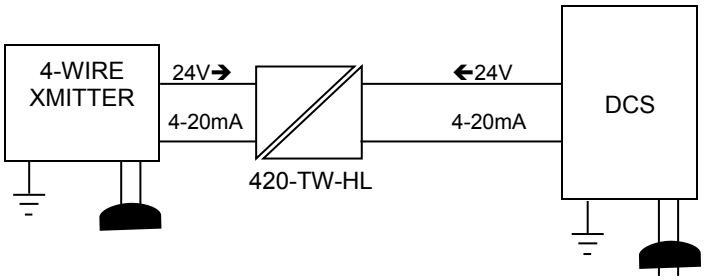
Bucking Power Supplies

This occurs when an existing loop and the measuring instrument are both attempting to power the same loop. A suitable isolator will accept power on both input and output and provide isolation between the two. A typical example would be where a PLC with 24Vdc transmitter excitation needs to be connected to a transmitter, which is line powered.

PROBLEM



SOLUTION



SPECIFYING ISOLATORS

To specify an isolator the following features need to be considered and the appropriate option selected:

1 Power Source

Choose between a loop powered (2-wire) or line powered (4-wire) instrument. For line powered instruments select an ac or dc voltage and for loop powered units specify whether the instrument is input loop powered or output loop powered.

2 Input Signal Type

The input type is usually pre-determined by plant design and instruments are available for virtually all process signals, ranging from mA, voltage high level signals through thermocouple and RTD temperature sensors. A selection guide showing the types of input each device can handle is located at the front of the product catalogue.

3 Input Signal Range

For mA and voltage inputs 4-20mA and 0-10V inputs respectively are the most common type. Thermocouples tend to be used for measuring higher temperatures, in applications where a faster response is required and, being less expensive than RTDs where sensor economy is of prime importance. RTDs have a higher accuracy specification and are more stable than thermocouples. Typical input types are as follows:

4-20mA
0-10Vdc
Type 'K' thermocouple 0-500^{0}C
Pt100 RTD sensor –30 ➔ +30^{0}C

SPECIFYING ISOLATORS

Continued

4 Output Signal Type

The output signal type depends on the final measuring device and its input circuit. The most common types are 4-20mA current loop and 0-10Vdc voltage outputs.

4-20mA loops provide higher noise immunity and are independent of wire resistance (up to the limit of loop voltage available).

Voltage outputs can be easier in control panel applications because that can be calibrated without disconnecting the loop.

Some units feature more than one output. The DUALCON has two, isolated analogue outputs allowing an instrumentation loop to be easily monitored by two separate measuring devices.

Other units have optional alarm relay outputs for indication of high/low and other alarm conditions.

5 Isolation Voltage

Most Industrial Interface units are isolated to a minimum of 1KV. Typically maximum common mode voltages on most sites reach a maximum of 120V peak-to-peak.

6 Accuracy

Typical accuracy requirements are ±0.15%. Greater accuracy devices are available up to the ISOCON with a typical overall accuracy of ±0.01%.

7 Options

The options available vary from instrument to instrument but the most common one is for an isolated transmitter supply on 4-wire isolators. This allows a large number of loops to be powered from a single auxiliary supply but provides input/output and channel-to-channel isolation.

Please see individual data sheets for further options.

LOOP-POWERED INSTRUMENTATION

Output Loop Powered Isolating Terminal Blocks

- Replace Standard DIN-Rail Terminals
- RFI Protection, Input Isolation
- Voltage, Current, Thermocouple & RTD Inputs
- High Noise Immunity

420TWHL	High Level Isolating Terminal Blocks
420TWTC	T/C Input Isolating Terminal Blocks
420TWRTD	RTD Input Isolating Terminal Blocks

Input Loop Powered Isolating Converters

- RFI Protection, Input / Output Isolation
- High Accuracy & Low Voltage Drop
- Low Cost Solution

420i	Loop Powered Isolators
420i-1	1-5V Output Loop Powered Isolators
420V	0-10V Output Loop Powered Isolators

In-Head Isolating Converters

- Thermocouple and RTD Input
- Isolated Output Optional

TCHEAD	T/C Input In-Head Transmitters
RTDHEAD	RTD Input In Head Tx's

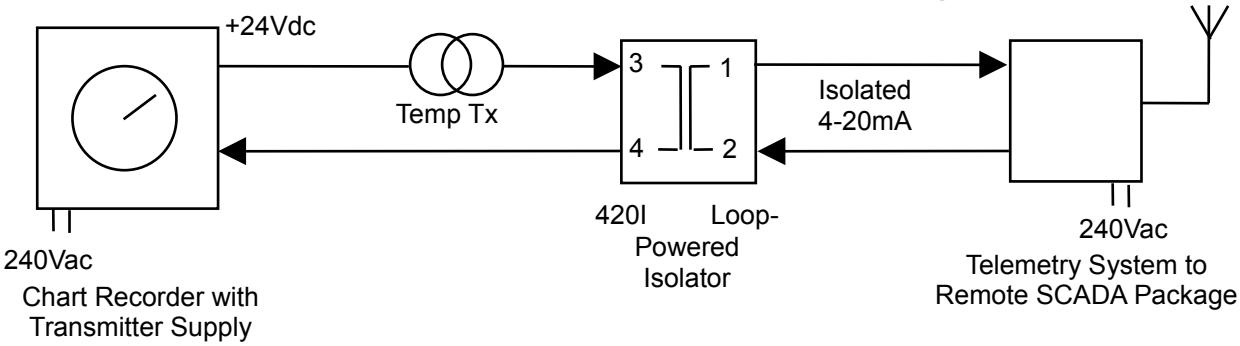
Digital Input/Output Isolating Terminal Blocks

- 5000V DIN Rail Mounted Digital Isolators
- Low Cost and Ultra Compact Solution

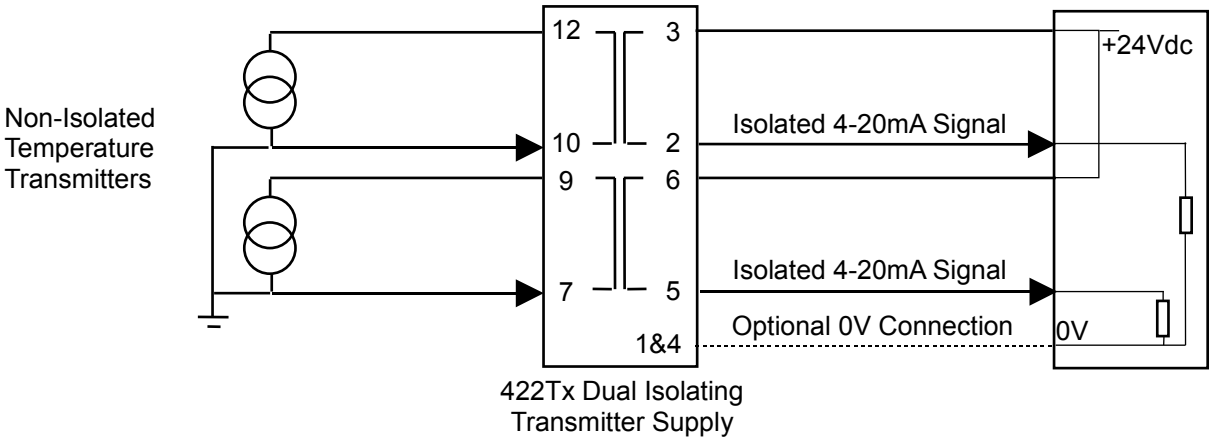
420DIGIN	Digital Input Isolator
420DIGOUT	Digital Output Isolator

TYPICAL APPLICATIONS

420i / V Series of Loop-Powered Isolating Converters

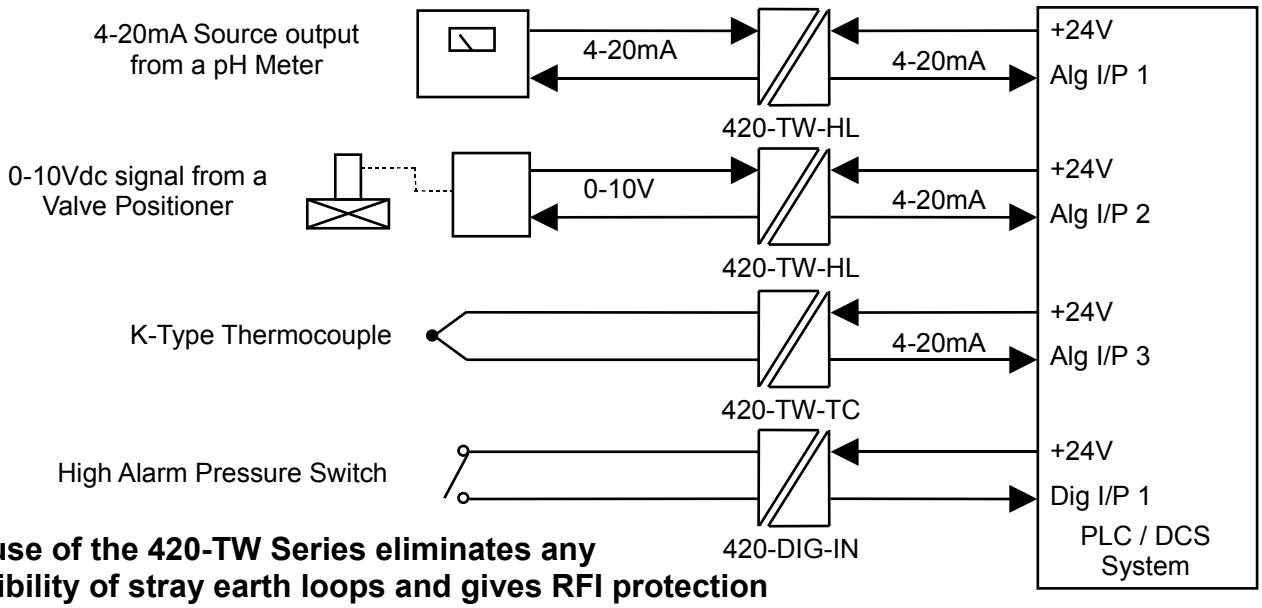


420i Used to Provide a Second Isolated 4-20mA from A Single Transmitter



422Tx Used to Provide 2 Isolated 4-20mA Signals from 2 Non-Isolated Transmitters

420-TW / In-Head Series of Transmitter Isolating Terminal



The use of the 420-TW Series eliminates any possibility of stray earth loops and gives RFI protection

420-TW

ISOLATING TERMINAL BLOCKS

- Replace Standard DIN-Rail Terminals
- RFI Protection, Input Isolation
- Voltage, Current & Thermocouple Inputs.
- Simple 2 Wire Connection
- High Noise Immunity
- Low Cost Solution

Description

The 420-TW series of isolating terminal blocks can replace standard DIN-rail terminals to provide input isolation, signal conversion and excellent RFI and noise rejection.

The units are powered from the output side, making them ideal for plc and data acquisition applications.

Inputs available include thermocouple, RTD, current and voltage and the standard output is 4-20mA.

For thermocouple inputs, internal rotary switches allow the user to select virtually any type of thermocouple and the temperature range required.

A typical wiring arrangements is shown opposite.

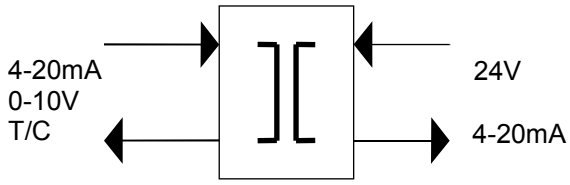
In addition two digital modules are available allowing the isolation of digital inputs and outputs.

The devices are housed in ultra-compact DIN rail mounted enclosures from only 12.5mm wide.

Input Options

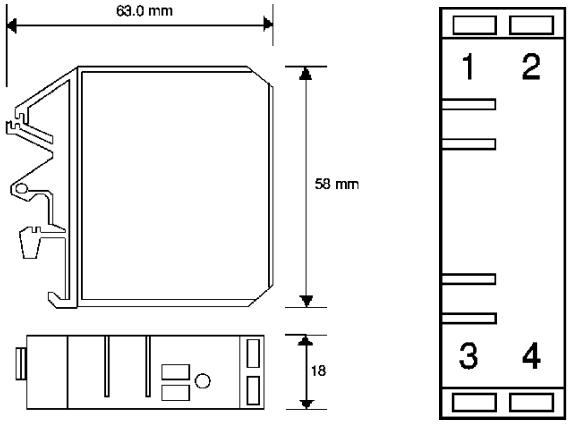
The most common wiring configuration is shown below:

Powered from the Output Side



Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	10V	24V	32V	Powered from Output Side
Input Current	0mA	0-20mA	30mA	
Full Scale Volt Drop		0.2V	0.3V	On Input Side (20mA Input)
Input Impedance (Volt In)		1MΩ		Voltage Input
Input Impedance (mA In)		10Ω		mA Input
Output Linearity Error		±0.1%		
Temp Coefficient			100ppm/ºC	
Load Resistance Error			±5ppm/Ω	0 < R_L < 600Ω
Time Constant (10-90%)		30ms		300ms for Thermocouple Input
Operating Ambient	0ºC		50ºC	
Relative Humidity	0%		90%	
Isolation Voltage	500V			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection. Accuracy figures based on 0-20mA input, 250Ω load resistance, and an ambient temperature of 20≡C.			



HL Input Unit as above
The TC unit is 12.5mm wide and 60.0mm tall
The RTD unit is 12.5mm wide and 75.0mm tall

Installation Data

Mounting	DIN Rail TS32/35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 50g

Connection Details

1. Output Channel +ve
2. Output Channel -ve

3. Input Channel +ve
4. Input Channel -ve

Ordering Information

Please supply:

Part Number:

4-20 In 4-20 Out	420-TW-HL
T/C In 4-20 Out	420-TW-TC
RTD In 4-20 Out	421-TW-RTD
T/C or RTD Type:	e.g. Type K
Temp Range:	e.g. 0-500ºC

420i

LOOP POWERED ISOLATOR

- Low Voltage Drop
- High Accuracy
- 1kV Isolation
- High Noise Immunity
- Low Cost Solution

Description

The 420i loop powered isolator is a 0(4)-20mA direct current isolator. The isolator derives its power from the input signal and therefore requires no external power supply.

The output of the isolator can be connected to any potential within 1kV of the input negative terminal while transients of 2.5kV can be withstood.

The isolator is typically used to enable two control and instrumentation devices, e.g. PLC and local chart recorder, with non-isolated inputs, to monitor the same transmitter output simultaneously.

Alternatively the isolator can be used to isolate signals from non-isolated transmitters or as a noise reduction device.

Two variants are available. The 420i-1 which has a built in precision 250Ω resistor to give a 1-5V output, and the 420V which gives a 0-10V output from a 4-20mA input, whilst dropping just 5V from the input loop.

The device is housed in an ultra-compact DIN rail mounted enclosure, only 18mm wide.

For further information and ordering please see overleaf.

General Specifications

Recommended Operating Conditions

Input Current	0(4)-20mA
Output Current	0(4)-20mA
Output Resistance	0-600Ω.
Overload Capacity	±50mA Input Current

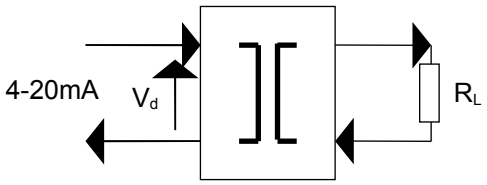
Environmental Conditions

Storage Temperature	-40 to 100 °C
Operating Ambient	-15 to 70 °C
Relative Humidity	0-90 % RH

Other Considerations

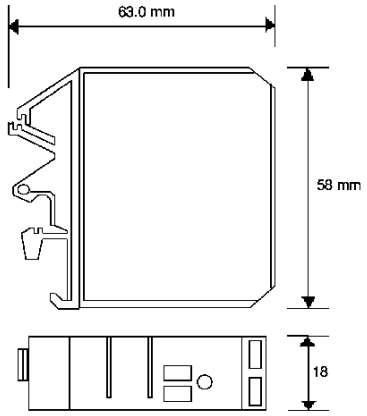
The Voltage drop across the device at 20mA input is:

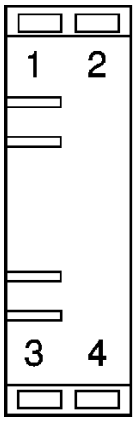
$V_d = 3.2 + (R_L \times 0.02)$



Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage		Loop Power		
Input Current	-50mA	0-20mA	+50mA	
Full Scale Volt Drop[see note]		3.2V	3.5V	At 20mA Input
Output Linearity Error			±0.1%	
Temp Coefficient			90ppm/°C	
Load Resistance Error			-200nA/Ω	$0 < R_L < 600\Omega$
Time Constant (10-90%)		30ms		
Operating Ambient	-15°C		70°C	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection. Accuracy figures based on 0-20mA input, 250Ω load resistance, and an ambient temperature of 20°C. Add volt drop due to load: 0.02 x R_L e.g. 250Ω load total volt drop = 3.5 + (0.02 x 250) = 8.5V			





Installation Data

Mounting	DIN Rail TS32/35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 50g

Connection Details

1. Output Channel +ve
2. Output Channel -ve

3. Input Channel +ve
4. Input Channel -ve

Ordering Information

Please supply:

Part Number:

4-20mA In 4-20mA Out	420i
4-20mA In 1-5V Out	420i-1
4-20mA In 0-10V Out	420V

TC-HEAD

THERMOCOUPLE INPUT IN-HEAD TRANSMITTER

- Field Configurable for T/C Type & Range
- Optional Linearisation
- High Noise Immunity
- High Accuracy
- Low Cost

Description

The TC-HEAD is a low cost, high accuracy 4-20mA temperature transmitter mounted in a head mounting housing.

The unit can accept a wide range of thermocouple input types and these types and the corresponding ranges are user selectable using a push button switch mounted on the unit. No PC software is required.

The unit can be re-ranged again using the on-board push button. This allows setting of zero and span as well selecting which thermocouple type is connected.

Another useful feature is the provision of a large central hole in the unit which allows up to 4mm diameter thermocouples to be withdrawn and replaced without removing the transmitter or field wiring.

This hole is also large enough to accommodate a second thermocouple wire for sensor checking purposes when smaller diameter probes are used.

General Specifications

Input Types

The device can accept any of the following thermocouple types:

J, K, T, R, S, E, B, L and N.

Recommended Operating Conditions

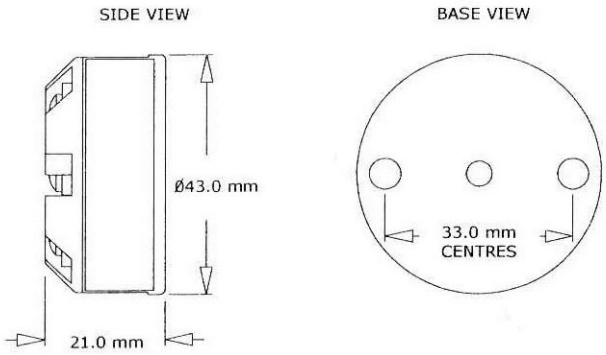
Output Current	4-20mA
Output Resistance	0-750 Ω at 24V input

Environmental Conditions

Storage Temperature	-40 to 90 °C
Operating Ambient	-20 to 70 °C
Relative Humidity	0 to 95 % RH

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	8	24V	30V	
Output Current	3.8mA		22mA	Current Limited
Cold Junction Tracking		±0.02ºC/ºC		Over full operating temperature range
Accuracy		±0.04%		Or 0.5ºC whichever is greater
Temp Coefficient			±100ppm/ºC	0 < Ta < 40ºC
Sample Rate		500ms		
Operating Ambient	-20ºC		70ºC	
Relative Humidity	0%		95%	Non-condensing
Isolation Voltage	50V			
EMC	BS EN61326			
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection.			



Installation Data

Mounting	In Head
Orientation	Any
Conductor size	0.5-4.0mm
Insulation Stripping	10mm
Weight	Approx 30g
Screw Terminal Torque	0.4Nm max

Connection Details

1. Output Channel +ve
2. Output Channel -ve

3. Input Channel -ve
4/5. Input Channel +ve

Ordering Information

Please supply:

Part Number:

No Isolation:	TC-HEAD
Thermocouple Type:	e.g. J,K,T,R,S,E,B,L,N
Temperature Range:	e.g. 0-500ºC
Sensor Break:	Upscale or Downscale

RTD-HEAD

RTD INPUT IN-HEAD TRANSMITTER

- Field Configurable RTD Type & Input Range
- Linearisation of Input
- High Noise Immunity
- High Accuracy
- Low Cost

Description

The RTD-HEAD is a low cost, high accuracy 4-20mA temperature transmitter mounted in a DIN standard housing.

The unit accepts an input from a resistance thermometer type sensor and outputs a 4-20mA signal proportional to the required temperature range. The range required is user selectable using the on-board push button switch.

The unit can be configured for zero and span as well RTD type using the fitted push button switch.

Another useful feature is the provision of a large central hole in the unit which allows up to 4mm diameter RTD's to be withdrawn and replaced without removing the transmitter or field wiring.

General Specifications

Input Types

PT100, PT500 or PT1000 Resistance Thermometer

Recommended Operating Conditions

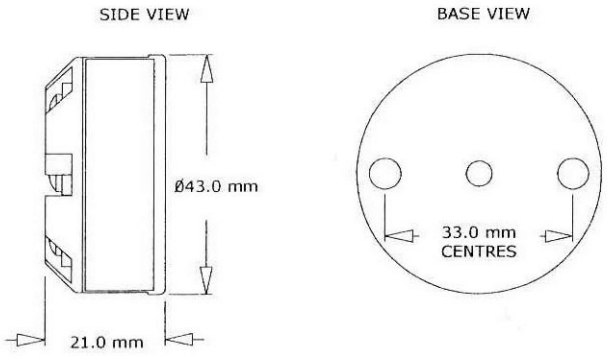
Output Current	4-20mA
Output Resistance	0-800 Ω at 24V input

Environmental Conditions

Storage Temperature	-40 to 90 ºC
Operating Ambient	-20 to 70 ºC
Relative Humidity	0 to 95 % RH

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	8V	24V	30V	
Output Current	3.8mA		22mA	Current Limited
Accuracy		±0.1ºC	±0.2ºC	
Output Linearity Error			±0.1%	
Temp Coefficient			±0.01ºC /ºC	
Time Constant (10-70%)		500ms		
Operating Ambient	-20ºC		70ºC	
Relative Humidity	0%		95%	Non-condensing
EMC	BS EN61326			
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection. Accuracy figures based on 24V loop supply, 10Ω loop resistance, and an ambient temperature of 20ºC.			



Installation Data

Mounting	In Head
Orientation	Any
Conductor size	0.5-4.0mm
Insulation Stripping	10mm
Weight	Approx 26g
Screw Terminal Torque	0.4Nm max

Connection Details

1. Output Channel +ve
2. Output Channel -ve

5. Input Channel +ve
4. Input Channel -ve
3. RTD 3rd Wire

Ordering Information

Please supply:

Part Number:	RTD-HEAD
RTD Type:	PT100, 500 or 1000
Temperature Range:	e.g. 0-500ºC
Sensor Break:	Upscale or Downscale

420-DIG

DIGITAL I/O ISOLATING TERMINAL BLOCKS

- 5000Vrms Isolation
- DIN Rail Mounting
- Low Cost Solution
- Ultra Compact

Description

The 420-DIG range of digital input and output units are typically used to provide field to logic isolation for all types of digital signals.

The units are ultra compact and can be mounted on standard DIN Rail, taking just 22.5mm by 77mm of space.

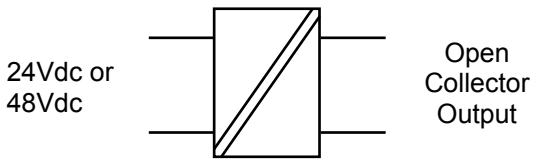
The digital inputs provide an open collector output to the logic side and can accept 24Vdc or 48Vdc signals from the field. They use high voltage opto-isolators to provide up to 7500Vdc (5000Vrms) of field to logic isolation.

The digital outputs can switch up to 50Vdc @ a nominal current of 1A, and are controlled from standard TTL logic levels. An isolation voltage of 5000Vrms is provided.

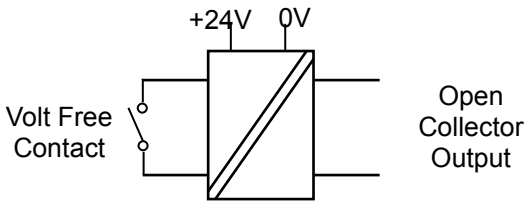
Options include an isolated wetting voltage for the digital inputs and multi-way I/O cards for both inputs and outputs.

Input / Output Options

Digital Inputs

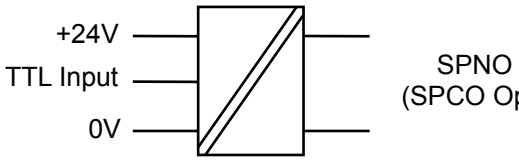


Field voltage is isolated and converted to a standard open collector



Unit supplies wetting voltage (Isolation Optional)

Digital Outputs



Performance Characteristics

Parameter	Typical
Input Range	24Vdc / 48Vdc / Volt Free Contact
Overload Capability	125%
Isolation (Input to Logic Output)	5000Vrms, 7500Vdc
Power Surge Capability	IEC 255-22 Class 3
Input Current 24Vdc Logic Input	10mA (Voltage Inputs)
Power Supply Current	20mA (24Vdc Input, Isolated wetting supply for volt free contact)
Operating Ambient	-15ºC to +80ºC
Open Collector Output:	
ON State Voltage Saturating Operation	0.5V max @ 5mA, 1V max @ 10mA
ON State Voltage Non-Saturating Operation	0.8V max @ 5mA, 1V max @ 10mA
OFF State Voltage	60V max
Rise / Fall Time	6ms (Non-saturating Operation)

Digital Inputs

Connection Details

1. Power Supply +ve (Wetting Voltage Option Only)
2. Power Supply -ve (Wetting Voltage Option Only)

3. 24V Wetting Supply +ve / Volt Free +ve
4. Signal Input +ve or Volt Free -ve
5. Signal Input -ve / Wetting Supply -ve

6. Output Pull-Up Supply
7. Open Collector Output +ve
8. Output Common

Ordering Information

Please supply:

Part Number:	420-DIG-IN
Input Voltage:	e.g. 24V
Isolated Wetting Voltage Required:	Yes / No e.g. 24Vdc

Digital Outputs

Parameter	Typical
Output Range	Up to 50Vdc 1A Resistive
Overload Capability	70V
Isolation	5000Vrms, 7500Vdc Channel-Field / 500Vrms Channel-Channel
Operating Ambient	-15ºC to +80ºC
Control Input	5V TTL
Minimum Logic ON Voltage	2.4V
Maximum Logic OFF Voltage	0.8V
Max Current @ 5V Logic ON	1mA
24V Supply Current @ Logic ON	10mA

Connection Details

1. Logic Input
2. Input Common
3. +24V Supply

4. Relay Output
5. Relay Output

Ordering Information

Please supply:

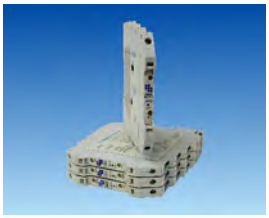
Part Number: 420-DIG-OUT

DC / AC POWERED ISOLATING SIGNAL CONVERTERS

ISOCON/DUALCON
Universal Input Configurable Signal Isolators

- DC Current, DC Voltage inc Bipolar Inputs & Potentiometers
- Thermocouples, E,J,K,N,R,S,T,B with optional linearisation and Cold Junction Compensation
- 2, 3 or 4 wire RTD PT100 / PT1000 linearisation on/off
- Frequency input option, Dual input Maths function option
- DC Current or DC Voltage Outputs Custom Linearisation option
- 12-36Vdc Supply or 90-264Vac Supply
- DUALCON has 2 Independent Isolated Outputs

ISOCON-6	12-36Vdc powered Single Channel
ISOCON-3	90-264Vac powered Single Channel
DUALCON-6	12-36Vdc powered Dual Output Unit
DUALCON-3	90-264Vac powered Dual Output Unit



SLIMCON High Level Input Configurable Signal Isolator

- DC Current, DC Voltage Inputs
- DC Current or DC Voltage Outputs
- 24Vdc Supply
- Ultra Slim 7.2mm Wide

SLIMCON-6

VCON Current / Voltage Input Signal Isolator

- AC/DC Current or Voltage Inputs
- 24Vdc Supply

VCONHL	24Vdc powered

TCTC Thermocouple Isolator

- Produces Isolated identical mV signal to Input Thermocouple

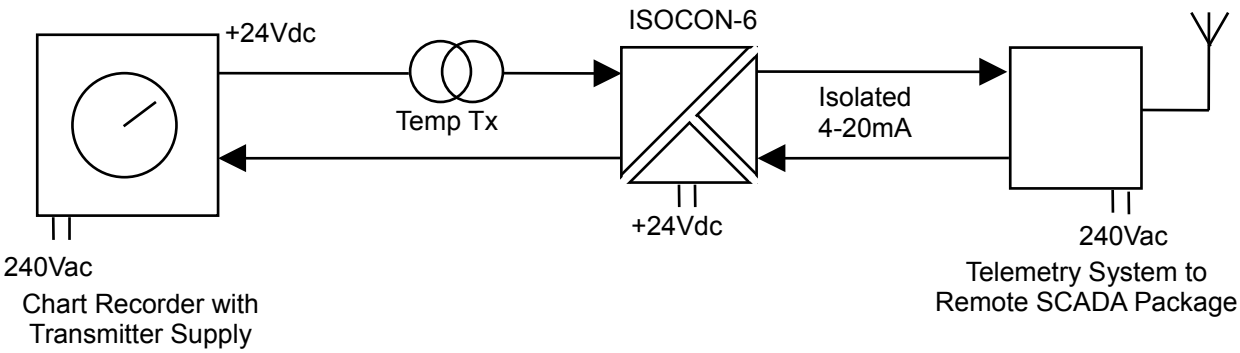
TCTC-6	12-36Vdc powered
TCTC-3	90-264Vac powered

STRAIN Strain Gauge Input Signal Isolator

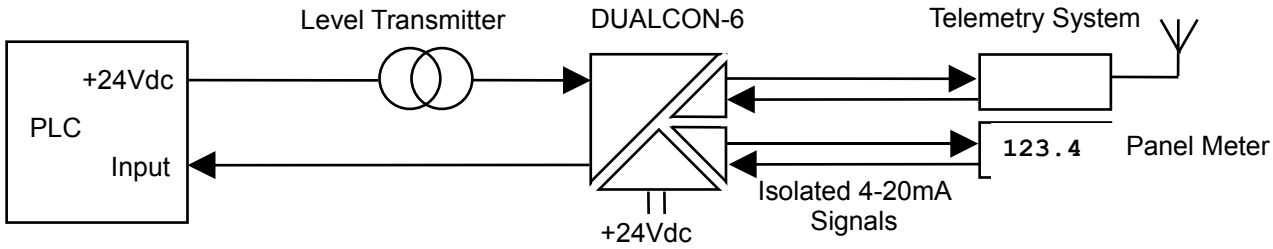
- Isolated Bridge Excitation Voltage
- 24Vdc or 110/240Vac Supply options

STRAIN-DC	24Vdc powered
STRAIN-AC	110/240Vac powered

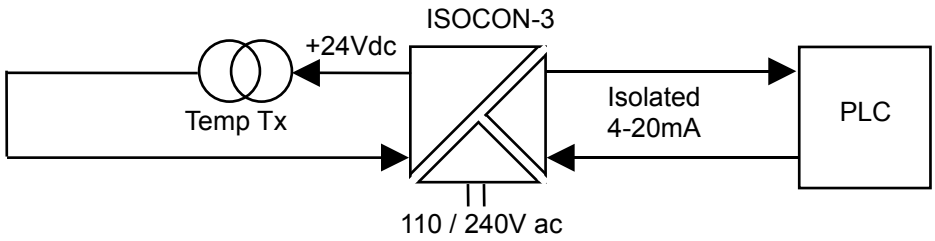
TYPICAL APPLICATIONS



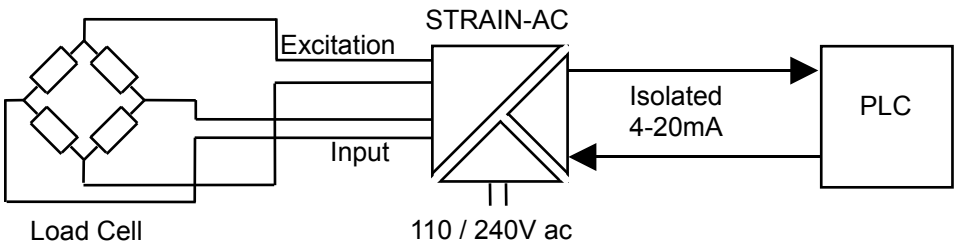
VCON-HL used to provide an isolated 4-20mA signal from an existing instrumentation loop



DUALCON used to provide complete isolation between 3 devices using the same transmitter



MVCON-HL used to provide an isolated power supply for a 2 wire transmitter



STRAIN-AC used to provide excitation for a 4-wire load cell and an isolated 4-20mA output

SLIMCON

ISOLATING SIGNAL CONVERTER

- Wide Range of Inputs Available
- Full 3-Port Isolation
- Zero & Span Pots For Output
- Fast Time Response
- High Accuracy, Low Cost
- Only 7.2 mm Wide

Description

The SLIMCON family of Isolating Signal Converters can accept a range of inputs including 4-20mA and voltage signals. The unit produces a high level DC output of either voltage or current.

Full 3 port isolation is standard on the product range.

The SLIMCON can be factory configured to accept a current or voltage input and provides a current or voltage output.

The input and output of the unit can also be reconfigured using the built in switches together with the zero and span adjustment potentiometers.

The unit is powered from 24Vdc nominal.

Inputs

Standard Ranges are shown below - contact Sales for others.

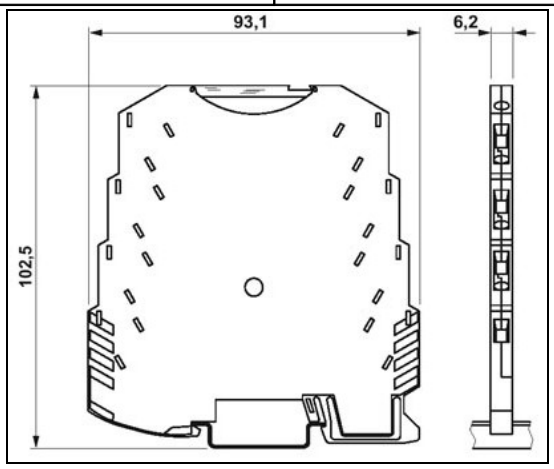
SLIMCON for DC Current & Voltage
0-20mA, 4-20mA, 0-10mA into 5Ω/11Ω
0-10V, 1-5V, 0-5V, 2-10V into 1MΩ

Bipolar Voltage Input version available, please call

Outputs
DC Current and Voltage
Current source or sink
0-20mA, 4-20mA into 500Ω
0-10V, 0-5V, 1-5V into a minimum 100kΩ

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	18V	24V	30V	22Vdc required to drive 500 ohms
Supply Current (mA)		25	30	Based on 24 V dc supply into 500Ω
Input Impedance (Volt)		500kΩ		
Input Impedance (mA)		5Ω	10Ω	Dep't on range (Typ=20mA, max 0-10mA)
Volt drop (mA input)		0.1	0.15	At 20mA input
Output Linearity Error		±0.03%	±0.1%	
Temp Coefficient			±100ppm/ºC	
Load Resistance Error			± 5ppm/Ω	0 <R_L < 500Ω
Time Constant (10-90%)		25mS	30mS	Faster response available on request
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage see note 1	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Accuracy figures based on 24Vdc supply, 4-20mA output with 250Ω load and 20ºC ambient. Device is protected against reverse polarity connection. External 100mA fuse required SLIMCON does NOT provide safety isolation when the input is connected to the mains.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx. 60g

Connection Details

1. Power Supply -ve
2. Power Supply +ve

4. Process Input -ve
5. Process Input +ve

10. Output -ve
12. Output +ve

Ordering Information

Please supply:

Part Number:	SLIMCON
Input Type:	e.g. mA, Volt
Input Range:	e.g. 4-20, 0-10
Output Type:	e.g. mA, Volt
Output Range:	e.g. 4-20mA, 0-10V
Power Supply:	e.g. 24Vdc
Isolation:	Full 3-Port

ISOCON

3 –PORT ISOLATING SIGNAL CONVERTER

- Universal input/output- user selectable
- Frequency Input
- Dual input Maths Unit
- Custom linearisation options
- Wide range AC or DC Supply
- Isolated Transmitter Supply
- Very High Accuracy, Low Cost
- Only 12.5mm Wide on DIN rail

Description

The new **ISOCON** Isolating Signal Converter can accept a wide range of inputs including 4-20mA, thermocouple, RTD and voltage signals. The units produce a high level DC output of either voltage or current.

Full 3 port isolation is standard as is an isolated transmitter supply which can be used to power any standard 2-wire 4-20mA transmitter.

The input type and range can be user selected using simple DIL switches inside the unit. All RTD and Thermocouple inputs can be fully linearised.

Non-interactive zero and span controls make adjustment of the unit quick and simple.

Other features include optional inversion of the input signal, an optional second analogue output (see Dualcon data sheet) and an optional Relay alarm output.

The unit is supplied with two power supply options, either wide ranging ac or dc. The ac version operates from any supply from 90 to 264 Vac and the dc version operates from 12 to 36 Vdc.

For specials such as custom linearisation, frequency input and maths functions etc please contact the sales office.

Outputs

DC Current and Voltage
0-20mA, 4-20mA, 0-10mA into 750Ω
0-1V, 0-10V, 1-5V into a minimum 100kΩ
Others available up to a maximum of:
Current: 0-20mA. Voltage: 0-10Vdc

Inputs

Standard Ranges are shown below - contact Sales for others.

DC/AC Current & Voltage
0-20mA, 4-20mA, 0-10mA into 15Ω
0-1V, 0-10V, 1-5V into 1MΩ

Min & Max Full Scale Ranges are:

DC Current	0 - 1mA	0 - 5A
Bipolar DC Current	±5mA	±10mA
DC Voltage	0 - 1V	0 - 300V*
Bipolar DC Voltage	±5V	±10V
2 Wire Pot	0 - 125Ω	0 - 1kΩ
3 Wire Pot	0 - 1kΩ	0 - 100kΩ

* Note: For input voltages greater than 60Vdc a Divider unit must be specified.

Thermocouples
Types E,J,K,N,R,S,T,B linearised or non-linearised
Ranges: Wide range of inputs
Cold junction compensation (can be turned off)
Upscale or downscale t/c burnout options

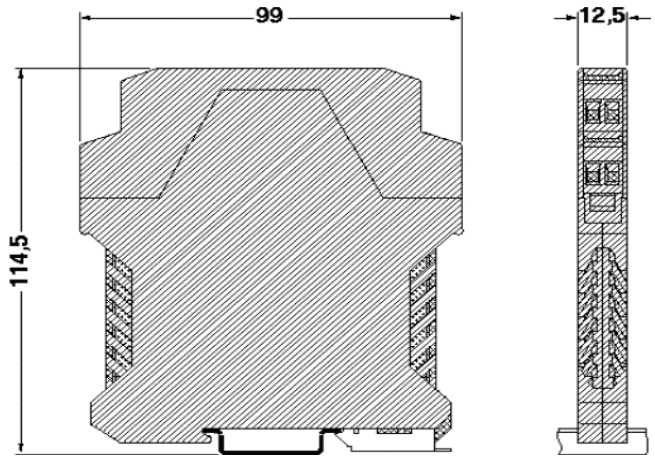
Resistance Thermometers
2, 3 or 4 wire PT100 or PT1000, linearised or non-linearised
Ranges: Wide range of inputs
Upscale or downscale RTD burnout options

Frequency Input
Wide range of freq inputs to 250kHz. Specify FREQCON-6

Dual Input Maths Module
2 inputs, +,-, average,hi,lo,squareroot Specify MATHSCON-6

Custom Linearisation
31 point user linearisation Specify ISOLIN-6

Parameter	Min	Typ	Max	Comments
Supply Voltage	12	24V	36Vdc/32Vac	90 to 264 for ac input version
Supply Current (mA)		45	85	For 24 V dc supply (260mA for 50mS on start up)
Input Impedance (Volt)		1MΩ		Dependent on range (Typ=10V)
Input Impedance(mA)		15Ω		Dependent on range (Typ=20mA)
Volt drop (mA input)		0.3		At 20mA input
Output Linearity Error		±0.01%	±0.05%	
Temp Coefficient			±50ppm/ºC	
Load Resistance Error			+/-5ppm/Ω	$0 < R_L < 750Ω$
Time Constant (10-90%)	25mS (fast)	60ms (normal)		Selectable fast/normal response
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage see note 1	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Accuracy figures based on 24Vdc supply, 4-20mA output with 250Ω load and 20ºC ambient. Device is protected against reverse polarity connection. ISOCON does NOT provide safety isolation when the input is connected to the mains.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 95g

Connection Details

1.	Power Input -ve		
2.	Power Input +ve		
4.	Process Input -ve	T/C -ve	RTD -ve
5.	Process Input +ve	T/C +ve	RTD +ve
3.	Trans supply +ve		RTD 4th Wire
6.		T/C Shield	RTD 3rd Wire
10.	Output -ve		
12.	Output +ve		

Ordering Information

Please supply:

Part Number:	ISOCON
Input Type:	e.g mA, Volt, T/C, RTD
Input Range:	e.g 4-20, 0-10, 0-500ºC
Output Type:	e.g mA, Volt
Output Range:	e.g 4-20mA, 0-10V
Power Supply:	-6 (DC) or –3 (AC)
Isolation:	Full 3-Port
Options:	FREQCON-6 MATHSCON-6 ISOLIN-6

DUALCON

ISOLATING SIGNAL CONVERTER – 2 OUTPUTS

- Universal configurable input
- 2 Configurable Outputs
- Full 3-Port Isolation
- Wide range AC or DC Supply
- Isolated Transmitter Supply
- Very High Accuracy, Low Cost
- Only 17.5mm Wide on DIN rail

Description

The new **DUALCON** Isolating Signal Converter can accept a wide range of inputs including 4-20mA, thermocouple, RTD and voltage signals. The units produce two high level DC outputs of either voltage or current.

Full 3 port isolation is standard as is an isolated transmitter supply which can be used to power any standard 2-wire 4-20mA transmitter.

The input type and range can be user selected using simple DIL switches inside the unit. All RTD and Thermocouple inputs can be fully linearised.

Non-interactive zero and span controls make adjustment of the unit quick and simple.

Other features include optional inversion of the input signal, on either one or both of the outputs

The unit is supplied with two power supply options, either wide ranging ac or dc. The ac version operates from any supply from 90 to 264 Vac and the dc version operates from 12 to 36 Vdc.

For specials such as custom linearisation etc please contact the sales office.

Inputs

Standard Ranges are shown below - contact Sales for others.

DC/AC Current & Voltage
0-20mA, 4-20mA, 0-10mA into 15Ω
0-1V, 0-10V, 1-5V into 1MΩ

Min & Max Full Scale Ranges are:

DC Current	0 - 1mA	0 - 5A
Bipolar DC Current	±5mA	±10mA
DC Voltage	0 - 1V	0 - 300V*
Bipolar DC Voltage	±5V	±10V
2 Wire Pot	0 - 125Ω	0 - 1kΩ
3 Wire Pot	0 - 1kΩ	0 - 100kΩ

* Note: For input voltages greater than 60Vdc a Divider unit must be specified.

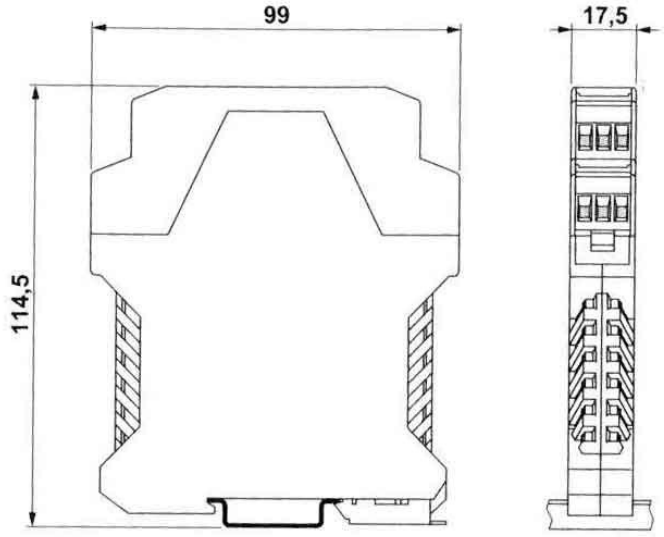
Thermocouples
Types E,J,K,N,R,S,T,B linearised or non-linearised
Ranges: Wide range of inputs
Cold junction compensation (can be turned off)
Upscale or downscale t/c burnout options

Resistance Thermometers
2, 3 or 4 wire PT100 or PT1000, linearised or non-linearised
Ranges: Wide range of inputs
Upscale or downscale RTD burnout options

Outputs

DC Current and Voltage
0-20mA, 4-20mA, 0-10mA into 750Ω
0-1V, 0-10V, 1-5V into a minimum 100kΩ
Others available up to a maximum of:
Current: 0-20mA. Voltage: 0-20Vdc

Parameter	Min	Typ	Max	Comments
Supply Voltage	16Vdc/18Vac	24V	36Vdc/32Vac	90 to 264 for ac input version
Supply Current (mA)		95	120	For 24 V dc supply (280mA for 75ms on start up)
Input Impedance (Volt)		1MΩ		Dependent on range (Typ=10V)
Input Impedance(mA)		15Ω		Dependent on range (Typ=20mA)
Volt drop (mA input)		0.3		At 20mA input
Output Linearity Error		±0.01%	±0.05%	
Temp Coefficient			±50ppm/ºC	
Time Constant (10-90%)	25ms (fast)	60ms (normal)		Selectable fast/normal response
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage see note 1	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Accuracy figures based on 24Vdc supply, 4-20mA output with 250Ω load and 20ºC ambient. Device is protected against reverse polarity connection. 1/ DUALCON does NOT provide safety isolation when the input is connected to the mains.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 115g

Connection Details

1.	Power Input -ve		
2.	Power Input +ve		
4.	Process Input -ve	T/C -ve	RTD -ve
5.	Process Input +ve	T/C +ve	RTD +ve
3.	Trans supply +ve		RTD 4th Wire
6.		T/C Shield	RTD 3rd Wire
10.	Output 2 –ve	7.	Output 1 -ve
12.	Output 2 +ve	9.	Output 1 +ve

Ordering Information

Please supply:

Part Number:	DUALCON
Input Type:	e.g mA, Volt, T/C, RTD
Input Range:	e.g 4-20, 0-10, 0-500≡C
Output 1 Type:	e.g 4-20mA, 0-10V
Output 2 Type::	e.g 4-20mA, 0-10V
Power Supply:	-6 (DC) or –3 (AC)
Isolation:	Full 3-Port

VCON-HL

ISOLATING SIGNAL CONVERTER

- Wide Range of Inputs Available
- AC current and voltage inputs
- Zero & Span Pots For Output
- Optional Isolated Transmitter Supply
- High Accuracy, Low Cost
- Only 12.5mm Wide on DIN Rail

Description

The VCON family of Isolating Signal Converters can accept a wide range of inputs including 4-20mA, 0-10V and other DC voltage and current signals. The units produce a high level DC output of either voltage or current.

Full 3 port isolation is standard but the unit can be supplied as Non-Isolated
Input Only Isolation
Output Only Isolation
Full 3-Port Isolation

The NEW VCON can be user configured to accept a standard current or voltage input and provide a current or voltage output.

There is also an isolated excitation option. This can be user configured to provide an isolated 24Vdc supply which can be used to excite any standard transmitter. Alternatively it can be user configured to provide either a voltage or current excitation for a potentiometer or bridge input

The unit may be powered from a wide range of power supplies, ranging from 12Vdc to 24Vac.

Inputs

Standard User Configurable Ranges
0-20mA, 4-20mA, 0-10mA into 5Ω/10Ω
0-1V, 1-5V, 0-10V into 100kΩ/500kΩ/1MΩ

Min & Max Full Scale Ranges are:

DC Current	0 to 50mA	0 to 5A
DC Voltage	0 to 100mV	0 to 300V
2 Wire Pot	0 to 10Ω	0 to 10MΩ
3 Wire Pot	100Ω	10MΩ

Note: For input voltages greater than 60Vdc a Divider unit must be specified.

Factory Configured inputs for AC Current & Voltage

Min & Max Full Scale Ranges are:

AC Current	0 to 100mA rms	0 to 5A rms
AC Voltage	0 to 200mV rms	0 to 250V rms

Note: For input voltages greater than 30Vac a Divider unit must be specified.

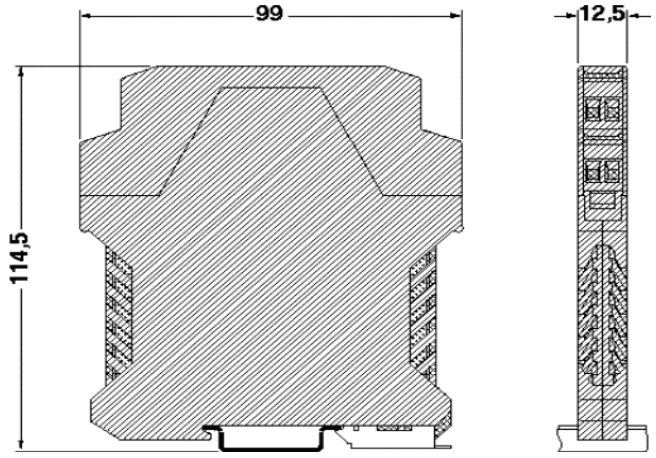
Outputs

Standard User Configurable Ranges:
0-20mA, 4-20mA into 750Ω max
0-5V, 0-10V into a 100kΩ min

Factory configured ranges up to a maximum of:
Current: 0-20mA. Voltage: 0-15Vdc

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage (V)		24V		Options: 12,24Vdc 24Vac
Supply Current (mA)		45	100	Based on 24 V dc supply
Input Impedance (Volt)	100kΩ	1MΩ	10MΩ	Dependent on range (Typ=10V)
Input Impedance(mA)	0.02Ω	5Ω	2kΩ	Dependent on range (Typ=20mA)
Volt drop (mA input)		0.1	0.15	At 20mA input
Output Linearity Error		±0.03%	±0.1%	R_L = 250Ω (1% for sinusoidal ac inputs)
Temp Coefficient			±100ppm/ºC	
Load Resistance Error			-20ppm/Ω	0 < R_L < 750Ω
Time Constant (10-90%)		30ms		Damping option can be selected
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage see note 1	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Accuracy figures based on 24Vdc supply, 4-20mA output with 250Ω load and 20ºC ambient. Device is protected against reverse polarity connection. VCON-HL does NOT provide safety isolation when the input is connected to the mains.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 95g

Connection Details

1.	Power Input	-ve
2.	Power Input	+ve
4.	Process Input	-ve
5.	Process Input	+ve
3.	Trans supply	+ve
6.	Trans supply	-ve
10.	Output -ve	
12.	Output +ve	

Ordering Information

Please supply:

Part Number:	VCON-HL
Input Type:	e.g mA, Volt
Input Range:	e.g 4-20, 0-10
Output Type:	e.g mA, Volt
Output Range:	e.g 4-20mA, 0-10V
Power Supply:	e.g 24Vdc
Isolation:	Full 3-Port
Transmitter Supply:	Yes / No

TC-TC

THERMOCOUPLE ISOLATOR

- Provides an isolated thermocouple mV signal from a non-isolated thermocouple
- High Accuracy, Low Cost
- Ultra compact DIN Rail Mount Enclosure
- Prevents earth loop & sensor failure problems in multi-thermocouple installations

Description

The TC-TC isolator accepts a mV signal from virtually any type of thermocouple and provides an identical isolated mV signal.

Typically used where non-isolated thermocouples are monitored by a multi input channel device with no channel to channel isolation, the unit can eliminate earth loop effects and prevents the failure of one sensor affecting the other sensors.

The unit is housed in a DIN-Rail mounting enclosure which is just 12.5mm wide. It has two power supply options operating either from a 12 to 36Vdc supply or 90 to 264Vac supply.

Inputs

Standard Ranges are shown below - contact Sales for others.

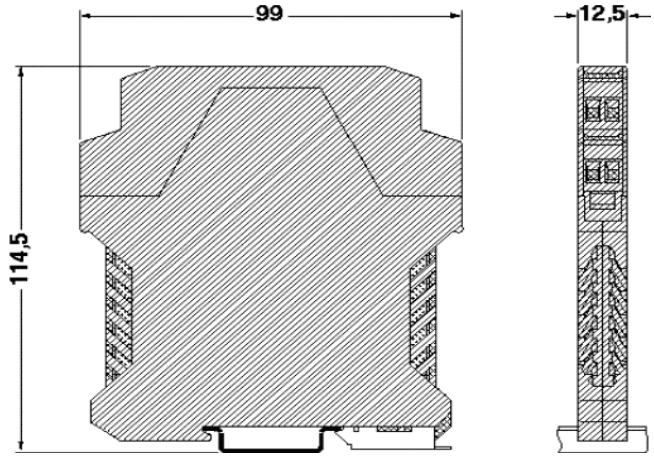
Thermocouples
Types E,J,K,N,R,S,T,B linearised or non-linearised
Ranges: A wide range of input ranges.
Cold junction compensation (can be turned off)
Upscale or downscale t/c burnout options

Outputs

Re-transmission of input value in mV
Selectable linearisation options

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	12	24V	36Vdc/32Vac	90 to 264 for ac input version
Supply Current (mA)		45	85	For 24 V dc supply (260mA for 50mS on start up)
Input Impedance (Volt)		>10MΩ		Dependent on range (Typ=10V)
Output Linearity Error		±0.01%	±0.05%	
Temp Coefficient			±50ppm/ºC	
Load Resistance Error			-	Not applicable
Time Constant (10-90%)	25mS (fast)	60ms (normal)		Selectable fast/normal response
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage see note 1	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Accuracy figures based on 24Vdc supply, Device is protected against reverse polarity connection. ISOCON does NOT provide safety isolation when the input is connected to the mains.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 95g

Connection Details (Low Voltage Supply Version)

1. Power Input -ve
2. Power Input +ve

4. Process Input -ve
5. Process Input +ve

6. T/C Shield

10. Output -ve
12. Output +ve

Ordering Information

Please supply:

Part Number:	TC-TC
Input Type:	e.g Type K T/C
Input Range:	e.g 0-500ºC
Power Supply:	-6 (DC) or -3 (AC)
Isolation:	Full 3-Port
Output Linearisation:	Yes / No

STRAIN

UNIVERSAL STRAIN GAUGE TRANSMITTER

- Isolated Bridge Excitation Voltage
- User configurable Isolated Output
- Switchable 110/240 Vac Supply or 24Vdc supply option
- 1500V 3-Port Isolation
- Remote Calibration Feature

Description

The STRAIN Universal Strain Gauge transmitter is suitable for use with the majority of strain gauges, load cells and pressure transducers. The unit provides a high stability excitation voltage which is isolated from both the high level output and the power supply.

Front panel mounted trim pots allow adjustment of the output zero and span settings and output monitoring terminals allow the output to be measured without breaking the instrument loop. This is especially useful for the initial calibration and set-up of the bridge and measuring system.

The output required may be user-reconfigurable using internal switches if requested at point of order. The options include 0-10V dc, 0-20mA and 4-20mA. The power supply requirement is also user selectable between 110 and 240 Vac. A 24Vdc powered unit is also available.

The unit is housed in a compact DIN rail mounting enclosure.

General Specifications

Recommended operating Conditions

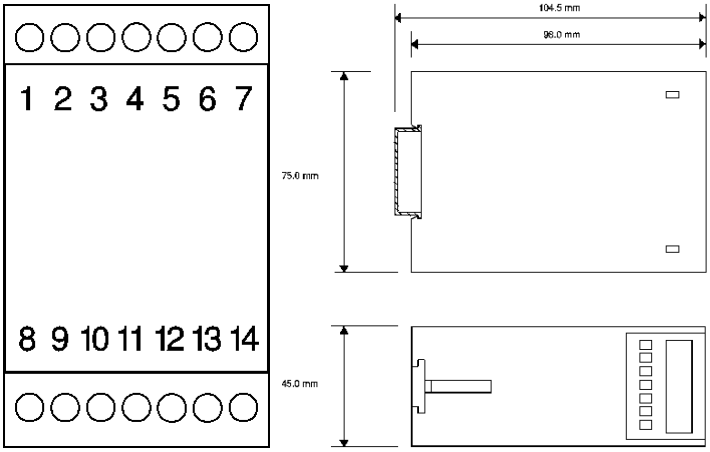
Bridge Supply Current	28mA into 350Ω
Bridge Excitation Voltage	10 Vdc, others available
Output Resistance	0-600Ω for mA o/p

Environment Conditions

Storage Temperature	-40 to 100 ºC
Operating Ambient	0 to 55 ºC
Relative Humidity	0-90% RH

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage AC Version		115V/230V		±10% Voltage switch selectable
Supply Current AC Version		50 / 25 mA		Upscale Output
Supply Voltage DC Version	21.6V	24V	26.4V	
Supply Current DC Version		150mA		Upscale output
Bridge Excitation Voltage		10V		Others Available.
Bridge Output Signal	1mV/V		4mV/V	Others Available
Output Linearity Error			±0.1%	
Temp Coefficient		±100ppm/ºC		
Load Resistance Error			-10ppm/Ω	$0 < R_L < 600\Omega$
Time Constant (10-90%)		30ms		
Operating Ambient	-15ºC		60ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			Signal input to output
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection. Accuracy figures based on an ambient temperature of 20ºC. Device incorporates a non-resettable thermal cut-out in the mains input. IMPORTANT: Mains input should be protected by a 100mA anti-surge fuse (T100mA) with a voltage rating of 250Vac and a breaking capacity of 35A at 250Vac placed in series with the live connector.			



Installation Data

Mounting	DIN Rail TS32/35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 340g
Max Terminal Torque	0.4Nm

Connection Details

1. Not Used	8. Bridge Cal Resistor
2. Not Used	9. Bridge Cal Resistor
3. Output -ve	10. Bridge Output -ve
4. Output +ve	11. Bridge Output +ve
5. Earth	12. Not Used
6. PSU (Neutral / DC-ve)	13. Bridge Excitation -ve
7. PSU (Live / DC +ve)	14. Bridge Excitation +ve

Ordering Information

Please supply:

Part Number:	STRAIN - (AC or DC)
Power Supply:	e.g. 115Vac, 24Vdc
Bridge Excitation:	e.g. 10V
Bridge Output Signal:	e.g. 4mV/V
Output Type:	e.g. mA, Volt
Output Range:	e.g. 4-20mA, 0-10V

INTELLIGENT TRANSMITTERS

FREQCON Programmable Frequency to Analogue

- Input range anywhere from 0 to 250kHz
- DC Current or DC Voltage Output
- Easy to Use but Sophisticated Configuration Options
- Input Averaging with QuickStep Option

FREQCON-6

MATHSCON Programmable Mathematics Unit

- Two Isolated Inputs – 1 Universal, 1 Current/Voltage
- Maths Result Output as DC Current or DC Voltage
- Wide Range of Maths Functions + - x ÷ √ High Low Average
- Easy to Use but Sophisticated Linearisation Options
- User Configurable Input & Output Scaling

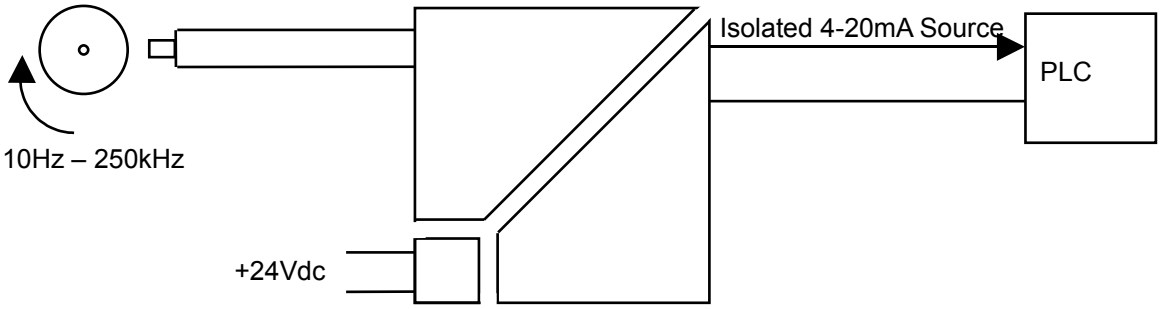
MATHSCON-6

CHAMELEON Programmable Function Converter

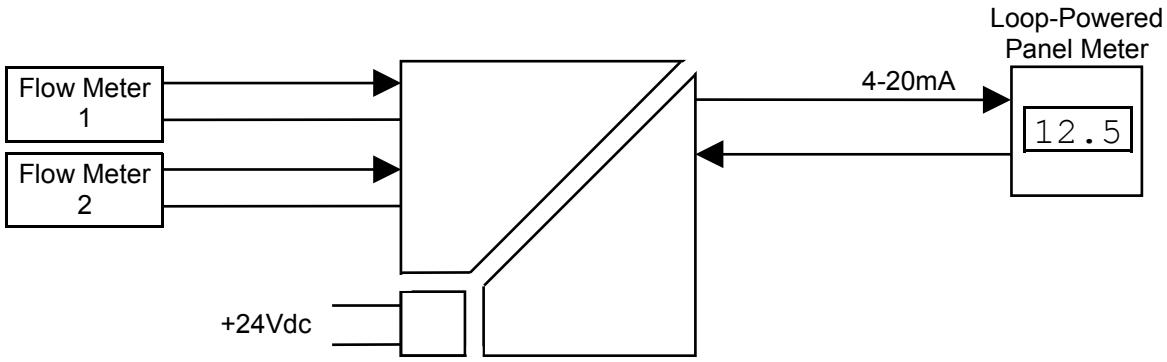
- 3 Analogue In, 2 Analogue Out, 2 Digital In, 2 Digital Out
- Analogue I/O Configurable as Current or Voltage
- Extensive Maths and Logic Functions using Spreadsheet
- Integration, Linearisation, PID Loops, Frequency In & Out
- RS232 / 485 Communications Interface
- A Real Problem Solver

CHAMELEON-6

TYPICAL APPLICATIONS



FREQCON used to convert 10Hz to 250kHz Frequency signal from an inductive pick up and provide an isolated 4-20mA output



MATHSCON used to provide an isolated 4-20mA signal of the difference between flow and return meters on a burner's oil line.

FREQCON

CONFIGURABLE FREQUENCY TO ANALOGUE CONVERTER

- 0 – 250kHz Programmable Input Stage
- 3-Port Isolation to 1000Vdc
- Very High Accuracy
- Wide Range of Input Types
- Low Cost of Ownership
- Ultra-Compact, only 12.5mm Wide!

Description

The FREQCON is a frequency to analogue converter which can be configured using switches to perform any frequency to analogue converting function.

The range of frequency input available is 0 – 250kHz and any offset can be introduced on the input. The input can be averaged over a period between 0 and 45 seconds with a quickstep option available to respond quickly to sudden changes in input frequency.

Typical applications include the conversion and linearisation of the frequency output from a turbine meter, or the conversion of an optical sensor on rotating machinery to a 4-20mA output of r.p.m.

The operational status of the unit is indicated by the front panel LED. The unit can be powered by any supply from 12-36 Vdc and 12-32Vac.

Inputs

The inputs types and ranges included below are our standard ones only. Please contact our sales department for details on any application not specified below.

2-Wire Proximity
Volt Free Contact
Open Collector NPN or PNP
5V Logic TTL
24V Logic
Inductive / Magnetic Pickup

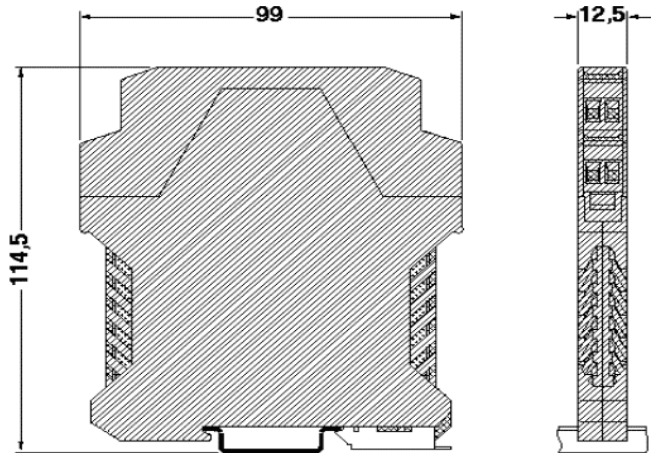
Outputs

DC Current (Source or Sink) and Voltage

0-20mA, 4-20mA, 0-10mA into 750Ω maximum.
0-1V, 0-10V, 1-5V into a minimum 100kΩ

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	12V	24V	36V	
Supply Current		110mA	134mA	Max with 22V Transmitter Supply @ 24mA
Input Voltage Logic 0	-30V		+0.1V	
Input Voltage Logic 1	+0.1V		+30V	
Frequency Resolution			1.333 µs	
Overall Accuracy		±0.01%	±0.06%	Input to Analogue Output
Input Accuracy		±0.01%		
Temp Coefficient			±50ppm/ºC	
Load Resistance Error			±5ppm/Ω	$0 < R_L < 750\Omega$ (mA Output)
Time Constant (10-90%)		50ms	60ms	
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection. Accuracy figures based on an ambient temperature of 20ºC. The Time Constant is dependent on which processing options have been selected and the applied frequency.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 95g
Max Terminal Torque	0.4Nm

Connection Details

1. Power Input -ve
2. Power Input +ve

7. Input Ground
9. Frequency Input +ve
10. +8V or +24V Transmitter Supply

4. Output -ve
5. Output +ve

Ordering Information

Please supply:

Part Number:	FREQCON-6
Configuration Options:	e.g. Open Collector NPN
Input Freq Range:	e.g. 0 to 100Hz
Output Type:	e.g. mA, Volt
Output Range:	e.g. 4-20mA, 0-10V
Power Supply:	24Vdc

MATHSCON

PROGRAMMABLE MATHEMATICS UNIT

- User Configurable Maths Function
- Two Isolated Inputs and One Isolated Output
- 3-Port Isolation to 1000Vdc
- High Accuracy, Low Cost
- Ultra Compact, only 17.5mm Wide
- 1 Universal & 1 Voltage/Current Input

Description

The MATHSCON Isolating Signal Converter can be user configured to carry out a wide range of mathematical functions on two isolated input channels. One input is a universal current, voltage, thermocouple or RTD input, and the other can be either voltage or current.

Each channel can be multiplied by a factor or linearised and then any of the following functions can be performed on those input channels.

Addition	Output = A + B
Subtraction	Output = A - B
Multiplication	Output = A x B
Division	Output = A / B
Square Root	Output = √(A-B)

High Signal Select
Low Signal Select
Average of the two signals

The unit provides an isolated, scaleable current or voltage output corresponding to the result of the required function.

The power supply requirement is 16 to 32V dc.

Inputs

The input types and ranges below are our standard ones only. Please contact our sales department for details on any application not specified below.

DC Current

0-20mA, 4-20mA, 0-10mA all into 10Ω

DC Voltage

0-1V, 0-10V, 1-5V all into 1MΩ

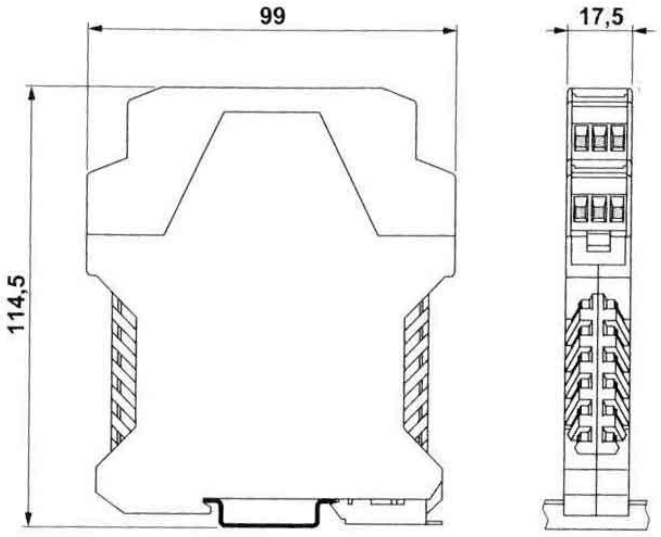
Outputs

DC Current Source and Voltage

0-20mA, 4-20mA, 0-10mA into 750Ω maximum.
0-1V, 0-10V, 1-5V into a minimum 100kΩ

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	16V	24V	36V	
Supply Current		95mA	134mA	Max with transmitter supply
Input Impedance (Volt)		1MΩ		
Input Impedance (mA)		15Ω		
Volt Drop (mA Input)		0.3V		At 20mA Input
Overall Accuracy		±0.01%	±0.05%	
Input Accuracy		±0.01%		
Temp Coefficient			±50ppm/ºC	
Load Resistance Error			±5ppm/Ω	$0 < R_L < 750Ω$
Time Constant (10-90%)		100ms	180ms	See Note
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. Device is protected against reverse polarity connection. Accuracy figures based on an ambient temperature of 20ºC. The Time Constant is dependent on which processing options have been selected.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 100g
Max Terminal Torque	0.4Nm

Connection Details

1. Power Input -ve
2. Power Input +ve
9. Output (mA, V) +ve
7. Output -ve

12. Input 2 (mA, V) +ve
10. Input 2 -ve

3. Tx Supply +ve, 4th Wire RTD

5. Input 1 (mA, V, T/C, RTD) +ve
4. Input 1 -ve
6. 3rd Wire RTD

Ordering Information

Please supply:

Part Number:	MATHSCON-6
Configuration Options:	
Input 1 Type:	e.g. 4-20mA, 0-10V
Input 2 Type:	e.g. 4-20mA, 0-10V
Output Type:	e.g. mA, Volt
Output Range:	e.g. 4-20mA, 0-10V
Maths Function:	e.g. +, -, x, /, average

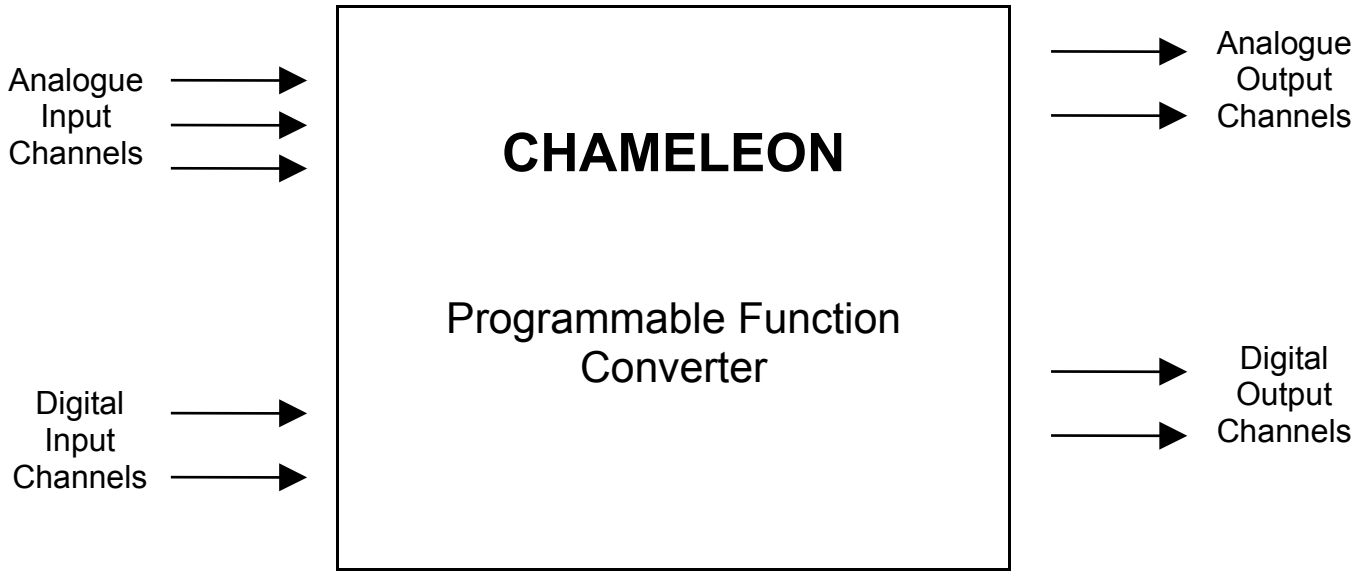
CHAMELEON

PROGRAMMABLE FUNCTION CONVERTER

- Completely user configurable in spreadsheet format
- 3 Analogue In, 2 Analogue Out Fully Configurable mA or Voltage
- 2 Digital In, 2 Digital Out
- Extensive Maths & Logic Capability
- Full 3-Port Isolation
- RS232 / 485 Comms including MODBUS protocol
- Mass and Energy Flow for Steam, Gases and Liquids
- Integration, Frequency Measuring and Frequency Generation
- Intelligent Trip Applications
- Linearisation of Signals
- Timing and Dosing Control
- PID Control

The Chameleon programmable function converter is a microprocessor based signal conditioning unit which allows the linearisation and conversion of multiple input channels. The Chameleon has three analogue input channels, two digital input channels, two digital output channels and two analogue output channels. The unit has a wide range of computational functions which are user selected to generate the required outputs.

The Chameleon can be factory set for dedicated applications or be configured by the end user. This configuration can be done using a variety of terminals, examples being any IBM compatible PC, a PSION II organiser, or any dumb terminal. The configuration is fully menu driven with a spreadsheet style format, allowing the Chameleon to be tailored very quickly and easily to each application.



In the simplest configuration the Chameleon could be used to linearise a single analogue input, invert it and re-transmit it in standard form and provide high and low alarm relay outputs. More complex operations are also possible. For example, the Chameleon could accept any input from a differential pressure transducer, extract the square root, linearise the result according to a second input (temperature for instance) and output this in both pulse and analogue outputs proportional to flow. A relay output would also be available for either a high or low alarm output.

Additionally information can be relayed by RS485 or RS232 data communication channels for remote monitoring and configuration.
The functions are pre-programmed and structured so that some may be combined with others to provide a very powerful and flexible solution to process computing problems. These functions include PID algorithms and timer functions.
The Chameleon is housed in an ultra compact custom enclosure which allows the device to be DIN-Rail or surface mounted in two different orientations.

CHAMELEON

Input Channels

Analogue

Number of Channels:	3
Types:	0-20mA 4-20mA 0-10V Software Selectable
Impedance:	Current - 300Ω Voltage - 100KΩ
Resolution:	10 bit or 0.1% of F.S.D.
Accuracy:	±0.15% of F.S.D.
Temperature Stability:	100ppm / ºC
Transmitter Supplies:	20V ±15% @22mA per channel

Digital

Number of Channels:	2
Types:	Volt Free Contacts Open Collector Others Available - Contact Sales
Operating Modes:	Logic, Frequency, Pulse Count Software Selectable
Frequency Range:	0 to 1kHz
Measured Resolution:	1.333 µsec
Resolution Error:	0.0013% @ 10Hz 0.13% @ 1kHz
Temperature Stability:	50ppm / ºC
Wetting Voltage:	22Vdc @ 5mA

Output Channels

Analogue

Number of Channels:	2
Types:	0-20mA 4-20mA 0-10V Software Selectable
Load Impedance:	Current - 500Ω Maximum Voltage - 1000Ω Minimum
Resolution:	11 bit or 0.05% of F.S.D.
Accuracy:	±0.2% of F.S.D.
Temperature Stability:	150ppm / ºC

Digital

Number of Channels:	2
Types:	Volt Free Contacts -Standard Open Collector (Optional)
Operating Modes:	Logic, Frequency Software Selectable
Frequency Range:	0.0002 to 1kHz (50Hz Relay)
Output Resolution:	2.666 µsec
Resolution Error:	0.0026% @ 10Hz 0.26% @ 1kHz
Temperature Stability:	50ppm / ºC
Relay Rating:	3A @ 240Vac

Communications

RS232 or RS485

Comms Type:	Half Duplex
Baud Rate:	9600 Baud
Data Bits:	8 (7 in Modbus Mode)
Parity:	None (Even in Modbus Mode)
Start Bits:	1
Stop Bits:	1
Protocols:	Proprietary Text Protocol Modbus ASCII Protocol

Other

Isolation

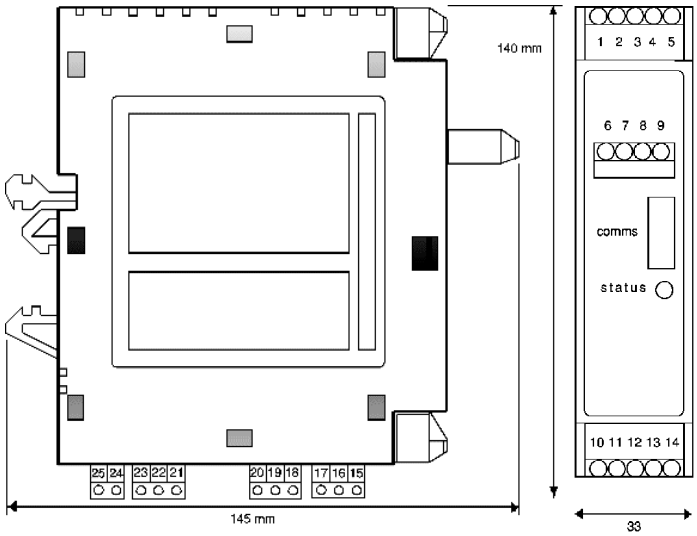
Full 3 Port Isolation to 500V
Inputs & RS232 / Outputs / PSU / RS485

Power Requirements

24Vdc ±10% at up to 350mA (Max Load Conditions)

TYPICAL SPREADSHEET FORMAT

	A	B	C	D
1	SAI(1,VOLT0.10,0,14)	pH Input Value:	ALG.IN1	310
2	SAI(2,VOLT0.10,0,14)	Setpoint:	ALG.IN2	TIMER1
3	SAI(3,VOLT0.10,0,600)	Gain:	ALG.IN3	T1.STATUS
4				D7 OR D10 OR D11
5	SAO(1,VOLT0.10,0,14)	PID Loop:	PID(1,C1)	RST.TIMER(1,D4)
6	SAO(2,VOLT0.10,0,14)	Low Time:	300-(2.9*C5)	RUN.TIMER(1,D1)
7		High Time:	1+(0.198333*C3)	(D14=0)AND(D2>C6)
8	SDO(1,LOGIC)			(D14=1)AND(D2<=C7)
9	SDO(2,LOGIC)	pH Output:	ALG.OUT(1,C1)	
10		Setpoint Output:	ALG.OUT(2,C2)	(D14=1)AND(D2>C7)
11	SET.PID(1,C2,4,0,0)	Alarm Condition:	(C1<4.0)OR(C1>10.0)	(D3=3)OR(D2>300)
12		Alarm Output:	DIG.OUT(2,C11)	
13				
14			Pulse Mode:	IF(D7 OR D8,1,0)
15			Pulse Output:	DIG.OUT(1,D14)



Installation Data

Mounting	DIN Rail TS32/35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 180g
Max Terminal Torque	0.4Nm

Connection Details

Digital Inputs

10. Digital Input 1 Ground
11. Digital Input 1
12. N/C
13. Digital Input 2 Ground
14. Digital Input 2

Digital Outputs

1. Digital Output 1 Ground
2. Digital Output 1
3. N/C
4. Digital Output 2 Ground
5. Digital Output 2

Analogue Inputs

15. Analogue Input 1Ground
16. Analogue Input 1 +ve
17. 24V Tx Supply
18. Analogue Input 2 Ground
19. Analogue Input 2 +ve
20. 24V Tx Supply
21. Analogue Input 3 Ground
22. Analogue Input 3 +ve
23. 24V Tx Supply

Analogue Outputs

6. Analogue Output 1 Ground
7. Analogue Output 1 +ve
8. Analogue Output 2 Ground
9. Analogue Output 2 +ve

Power Supply

24. Power Supply -ve
25. Power Supply +ve

TRIP AMPLIFIERS

20-ALM Loop Powered Trip Amplifier

- Single Setpoint 4-20mA Input
- Switchable Action
- Measurable Setpoint on Front Panel

20ALM

2002-ALM Powered Dual Trip Amplifier

- 3 Versions, Voltage/Current, Thermocouple, RTD Inputs
- 2 Independent Configurable Trips
- Measurable Setpoint on Front Panel
- LED Indication of Alarm Status

2002ALMHL Current & Voltage Input

2002ALMTC Thermocouple Input
2002ALMRTD RTD Input

4002 Powered Dual Trip Amplifier

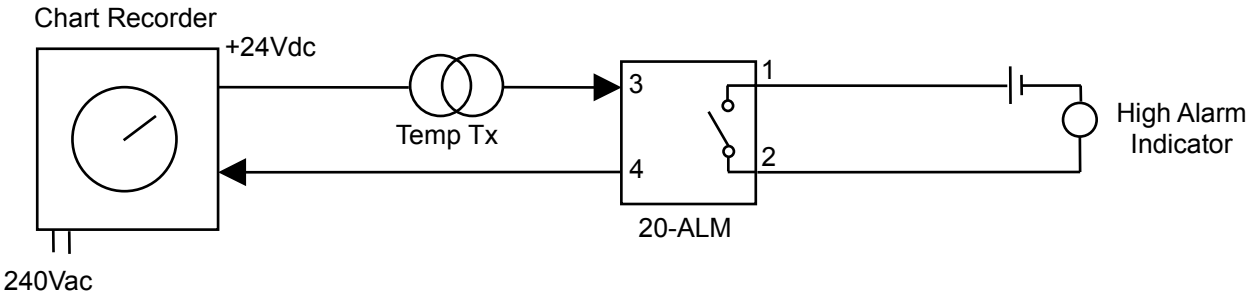
- DC Powered with Universal Input
- 2 Independent Configurable Trips
- Isolated Current / Voltage Re-transmission
- LED Display of Input and Setpoint Values
- LED Indication of Alarm Status

4002ALM-6

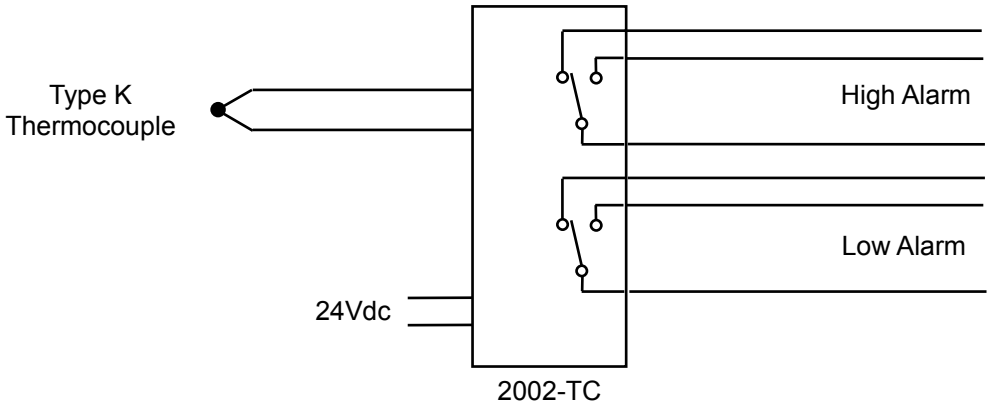
- AC/DC Powered in 3 Versions:
- Voltage/Current, Thermocouple, RTD Inputs
- 2 Independent Configurable Trips
- Optional Isolated Current / Voltage Re-transmission
- Optional LED Display of Input and Setpoint Values
- LED Indication of Alarm Status

4002ALMHL Current & Voltage Input
4002ALMTC Thermocouple Input
4002ALMRTD RTD Input

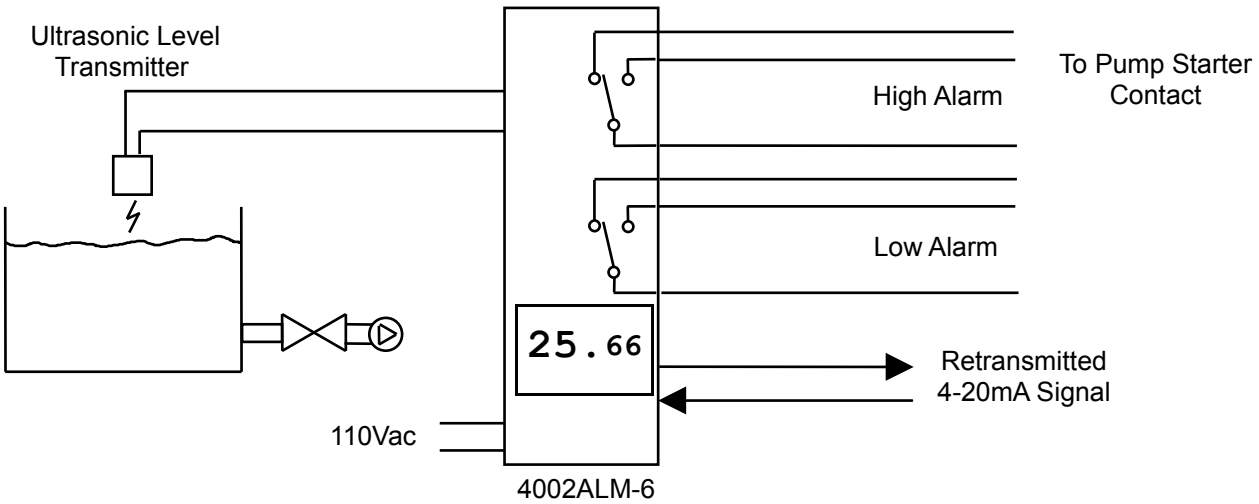
TYPICAL APPLICATIONS



20-ALM used to provide a High Alarm output from an existing 4-20mA Temperature Loop



2002-ALM-TC used to provide High and Low Alarm relay outputs from a type K Thermocouple



4002ALM-6 used in latching mode to start pump when high level is reached and stop pump when the low level is reached. The LED display indicates the actual level in the tank and the two setpoints

20-ALM

LOOP POWERED TRIP AMPLIFIER

- High or Low Alarm Option
- Low Voltage Drop
- Setpoints Available on Front Panel as 0.4 to 2V Signal (4 to 20mA)
- LED Indication of Alarm
- Unique Low Cost Solution

Description

The 20-ALM is a 4-20mA direct current loop powered trip amplifier. The device derives its power from the input signal and therefore requires no external power supply.

The output of the 20-ALM is a single pole, normally open, solid state relay which can be configured to close either above or below the adjustable setpoint. The switched output can be connected to any potential within 1kV of the transmitter supply, while transients of 2.5kV can be withstood.

The relay is designed to switch AC or DC.

The trip amplifier is typically used to activate a warning or control system override when a sensor output goes above or below a pre-set limit. Alternatively, the unit can be used for simple on/off control, having a built in switching hysteresis.

The device is housed in an ultra-compact DIN rail mounted enclosure, only 18mm wide.

For further technical information and ordering details please see overleaf.

General Specifications

Recommended Operating Conditions

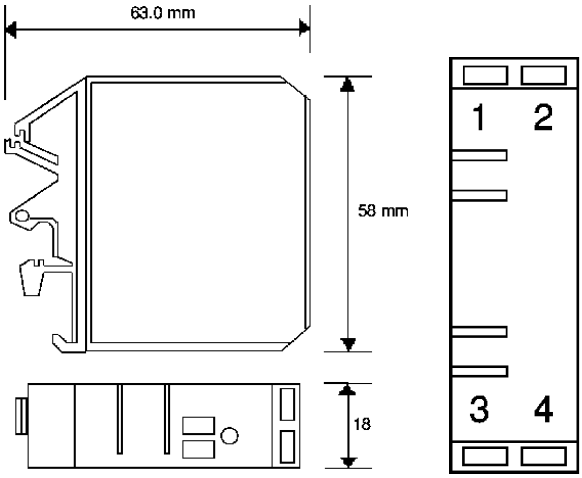
Input Current	4-20mA
Relay Contact Voltage	110Vac
Relay Current (max)	130mA @ 110Vac / 24Vdc
Output Resistance	24 Ω (on) 110Vac Type

Environmental Conditions

Storage Temperature	-40 - 70 ºC
Operating Ambient	0 - 55 ºC
Relay Humidity	0 - 90 % RH

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage		Loop Power		
Supply Current	4mA		20mA	
Full Scale Volt Drop		3.4V	3.5V	At 20mA Input
Relay Current			130mA	Rated at 110Vac
Output Resistance 'ON'			24Ω	110Vac Relay Type
Setpoint Hysteresis		50µA		Other values available
Trip Point Accuracy			±0.25%	
Temp Coefficient		±100ppm/°C		
Trip Point Drift		±100ppm/°C		
Relay Time Response		10ms		
Operating Ambient	0°C		55°C	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Setpoint is adjusted by 20 turn potentiometers on the front panel. Setpoint can be checked by measuring the 0.4 to 2V (4 to 20mA) voltage on the front panel terminals. High or Low Alarm is selectable using internal link. Closed output contact is indicated by a red LED on the front panel.			



Installation Data

Mounting	DIN Rail TS32/35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 45g

Connection Details

1. Relay Output -ve
2. Relay Output +ve

3. Input Channel +ve
4. Input Channel -ve

Ordering Information

Please supply:

Part Number:	20-ALM
Trip Action 1:	High / Low
Relay Voltage Rating:	110Vac / 24Vdc
Further Notes:	

NEW 2002ALM-HL

DUAL TRIP AMPLIFIER

- Wide Range of User Configurable Inputs
- Configurable Trip Action and Fail-safe Mode using internal switches
- Isolated Input Stage
- Setpoints Available as 0-10V (0-100%) on terminals 9 & 12
- D.C or A.C. Power Supply Options See 4002-ALM for Mains Version

Description

The NEW 2002-HL trip amplifier can accept a wide range of user configurable inputs including 4-20mA, 0-20mA, 0-5V and 0-10V. The unit can have up to two relay outputs and each can operate as a high or a low trip; alternatively latching operation using both trip points can be configured.

The relay outputs are single pole change-over relays with mains voltage rating. Each trip can be configured so that the alarm condition can be above or below setpoint. The relays can be energised or de-energised in the alarm condition, satisfying fail-safe and non-fail-safe applications. In addition the alarm LEDs can be selected to light when the relay is either on or off. All these options may be specified at point of order but are user configurable using internal DIP switches. This minimises the number of spare units required.

The input stage is fully isolated as an option and the high level input current or voltage and range may be configured. Separate products are available for thermocouple and RTD inputs.

It is also possible to specify a latching function on the relay outputs, making the unit ideal for lock-out applications.

The unit can be powered from a wide range of power supplies, ranging from 12Vdc to 24Vac; please specify with order.

Inputs

The input types and ranges included below are our standard ones only. Contact Sales for others.

NEW 2002-HL Standard Ranges
0-20mA, 4-20mA, 0-10mA into 12Ω/15Ω/24Ω
0-5V, 0-10V into 1MΩ
Min and Max Full Scale Ranges available to order:

DC Current	0 to 1mA	0 to 5A
DC Voltage	0 to 100mV	0 to 300V

Note: For input voltages greater than 60Vdc a Divider unit must be specified.

2002-ALM-TC for Thermocouples
Refer to 2002-ALM datasheet

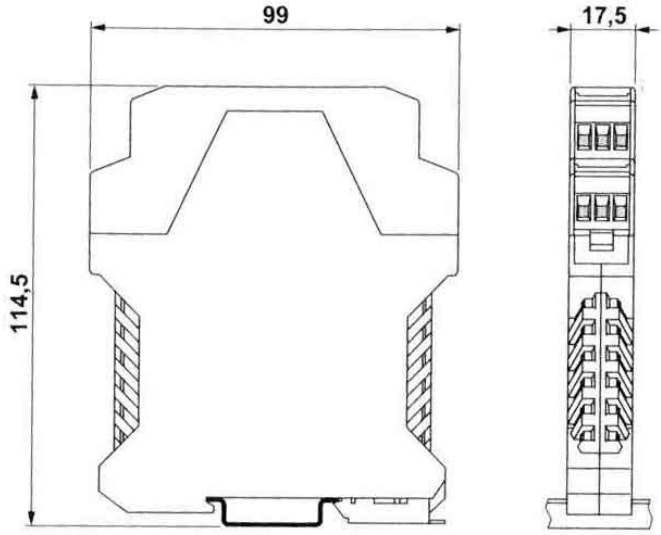
2002-ALM-RTD for Resistance Thermometers
Refer to 2002-ALM datasheet

Outputs

Mains Rated Relays	3A resistive at 240V ac

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage		24Vdc		Options: 12, 24Vdc, or 24Vac
Supply Current			45mA	24V Supply, Both Relays Energised
Input Impedance (Volt)	100kΩ	1MΩ	10MΩ	Dependent on range (Typ = 0-10V)
Input Impedance(mA)	0.02Ω	15Ω	5kΩ	Dependent on range (Typ = 4-20mA)
Volt drop (mA input)		0.3	0.35	At 20mA input
Trip Point Accuracy			±0.25%	
Temp Coefficient			±100ppm/ºC	
Trip Point Drift			±100ppm/ºC	
Hysteresis		1% Span		Other values to order
Time Constant (10-90%)		10ms		
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Setpoints are adjusted by 20 turn potentiometers on the front panel. Setpoints can be checked by measuring the 0-10V (0-100%) voltage on terminals 9 &12 H/H,H/L, L/H, LL, fail-safe, non-fail safe and LED options are user selectable using internal links. Hysteresis is set at 1.0% but other values are possible, please specify if required. Figures based on 24Vdc supply, 20≡C ambient			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 120g

Connection Details

10.	Power Input -ve		
11.	Power Input +ve		
7.	Process Input -ve and Setpoint common		
8.	Process Input +ve		
9.	Setpoint 1 (0-10V = 0-100%)		
12.	Setpoint 2 (0-10V = 0-100%)		
1.	Relay 1 Common	4.	Relay 2 Common
2.	Relay 1 N/C	5.	Relay 2 N/C
3.	Relay 1 N/O	6.	Relay 2 N/O

Ordering Information

Please supply:

Part Number:	2002-HL
Input Type:	e.g mA, Volt
Input Range:	e.g 4-20, 0-10
Trip Action 1:	e.g RLY1>SP1<LED1
Trip Action 2:	e.g RLY2<SP2>LED2
Power Supply:	e.g 24Vdc
Isolation:	Input
Further Notes:	

2002-ALM-TC/RTD

DUAL TRIP AMPLIFIER

- Wide Range of Configurable Inputs
- Configurable Trip Action and Failsafe Mode
- Isolated Input Stage
- Setpoints Available on Front Panel
- D.C or A.C. Power Supply Options
  See 4002-ALM for Mains Version

Description

The 2002-ALM family of trip-amplifiers can accept a wide range of inputs including thermocouple and RTD. The unit can have up to two relay outputs and each can operate as a high or a low trip.

The relay outputs are single pole change-over relays with mains voltage rating. Each trip can be configured so that the alarm condition can be above or below setpoint. The relays can be energised or de-energised in the alarm condition, satisfying fail-safe and non-fail-safe applications. In addition the alarm LED's can be selected to light when the relay is either on or off. All these options may be specified at point of order but are user configurable using internal link selectors. This minimises the number of spare units required.

The input stage is fully isolated as an option and the input type can be user-configured. For the thermocouple and RTD input versions the device type and range are selectable. Again these can also be specified at point of order.

It is also possible to specify a latching function on the relay outputs, making the unit ideal for lock-out applications.

The unit can be powered from a wide range of power supplies, ranging from 12Vdc to 24Vac, please specify with order.

Inputs

The input types and ranges included below are our standard ones only. Contact Sales for others.

2002-ALM-TC for Thermocouples
Types E,J,K,N,R,S & T non-linearised
Ranges 0-250, 0-500, 0-1200ºC (Others available)
Auto cold junction compensation. Open cct t/c can drive either upscale or downscale.

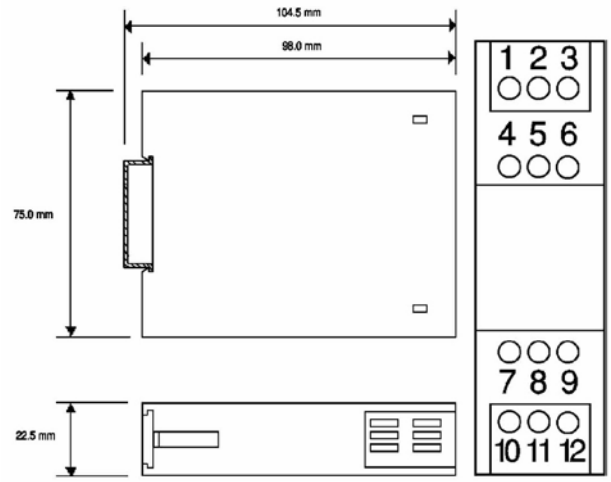
2002-ALM-RTD for Resistance Thermometers
2 or 3 wire PT100 or other, linearised output
Ranges 0-250, 0-500, -100-100ºC (Others available)

Outputs

Mains Rated Relays 3A resistive at 240V ac
Note: If one relay is switching > 115Vac the isolation between the two relay outputs is not safety isolation.

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage		24Vdc		Options: 12, 24Vdc, or 24Vac
Supply Current			45mA	24V Supply, Both Relays Energised
Input Impedance (T/C)		1MΩ		
Trip Point Accuracy			±0.25%	
Temp Coefficient			±100ppm/ºC	
Trip Point Drift			+100ppm/ºC	
Time Constant (10-90%)		10ms		
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Setpoints are adjusted by 20 turn potentiometers on the front panel. Setpoints can be checked by measuring the 0-1V (0-100%) voltage on the front panel terminals. H/H,H/L, L/H, LL, fail-safe, non-fail safe and LED options are user selectable using internal links. Hysteresis is set at 1.0% but other values are possible, please specify if required. The process input level is available as 0-1V (0-100%) on terminal 9.			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 120g

Connection Details

10.	Power Input -ve		
11.	Power Input +ve		
7.	T/C -ve	RTD -ve	
8.	T/C +ve	RTD +ve	
9.	Signal O/p (0-1V)	T/C Shield	RTD 3rd Wire
12.	Setpoint -ve		
1.	Relay 1 Common	4.	Relay 2 Common
2.	Relay 1 N/C	5.	Relay 2 N/C
3.	Relay 1 N/O	6.	Relay 2 N/O

Ordering Information

Please supply:

Part Number:	2002- (TC or RTD)
Input Type:	e.g T/C, RTD
Input Range:	e.g 0-500ºC
Trip Action 1:	e.g RLY1>SP1<LED1
Trip Action 2:	e.g RLY2<SP2>LED2
Power Supply:	e.g 24Vdc
Isolation:	Input
Further Notes:	

4002ALM-6

24VDC DUAL TRIP AMPLIFIER

- Wide Range of Configurable Inputs
- Configurable Trip Action and Failsafe Modes
- Isolated Re-Transmission
- Isolated Input Stage and Isolated Transmitter Supply
- LED display of Input, Setpoints and Configuration

Description

The 4002-ALM trip-amplifier can accept a wide range of inputs including 4-20mA, thermocouple, RTD and voltage types. The unit can have up to two relay outputs and each can operate as a high or low trip. The unit also produces an isolated high level output.

The relay outputs are single pole change-over relays with mains voltage rating. Each trip can be configured so that the alarm condition can be above or below the setpoint. The relays can be energised or de-energised in the alarm condition, satisfying fail-safe and non-fail safe applications. In addition the alarm LED's can be selected to light when the relay is either on or off.

The input stage can be isolated as an option and the inputs can be user-reconfigured for several different ranges if specified at point of order. In addition there is an optional isolated transmitter supply of 24Vdc, suitable for exciting most standard transmitters.

The following applications are also possible:

One output relay is energised when the input reaches the high setpoint and is latched on until the lower setpoint is reached. The reverse operation is also possible. This is ideal for applications such as pumping out.. All the above options are user-configurable but can be specified at point of order. The power supply is 24Vdc.

Inputs

The input types and ranges included below are our standard ones only. Contact Sales for others.

4002-ALM-6 for DC Current and Voltage
0-20mA, 4-20mA, 0-10mA into 15Ω / 30Ω
0-1V, 0-10V, 1-5V into 100kΩ / 1MΩ
Min and Max Full Scale Ranges:

DC Current	0 to 1mA	0 to 5A
DC Voltage	0 to 100mV	0 to 300V

Note: For input voltages greater than 60Vdc a Divider unit must be specified.

4002-ALM-6 for Thermocouples
Types E,J,K,N,R,S,T & B linearised or non-linearised
Ranges Wide range of inputs
Auto cold junction compensation.
Upscale or downscale t/c burnout options.

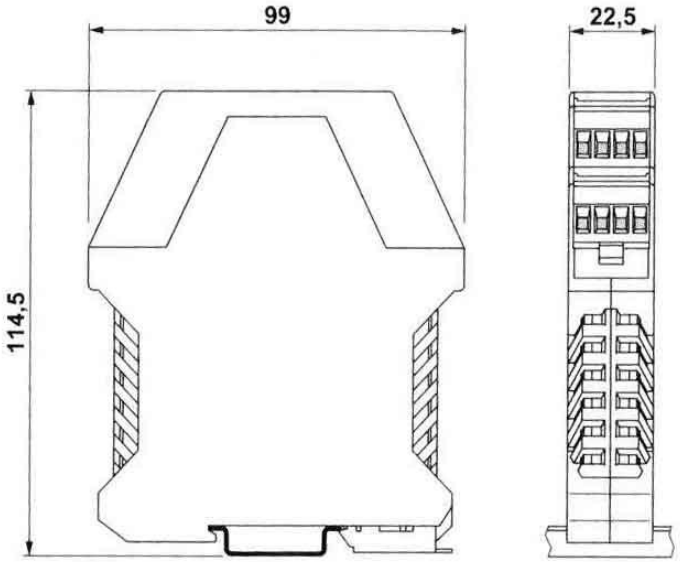
4002-ALM-6 for Resistance Thermometers
2, 3 or 4 wire PT100 or PT1000, linearised (or not)
Ranges Wide range of inputs (Up or downscale b/o)

Outputs

Mains Rated Relays
3A resistive at 240V ac
DC Current and Voltage
0-20mA, 4-20mA, 0-10mA into 750Ω
0-1V, 0-10V, 1-5V into a minimum 2kΩ

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	16V	24V	30V	Options: 24Vdc
Supply Current	24mA		110mA	24V Supply, (Max if both relays energised)
Input Impedance (Volt)		1MΩ		
Input Impedance(mA)		15Ω		
Volt drop (mA input)		3V		At 20mA input on 0-20mA range
Temp Coefficient			±100ppm/ºC	
Relay Response Time		10ms		
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Setpoints are configured on the LED display on the front panel. H/H,H/L, L/H, LL, fail-safe, non-fail-safe and hysteresis options are set using the display. The process input level is shown on the 4 digit LED Display Figures based on 24Vdc supply, 20≡C ambient			



Installation Data

Mounting	DIN Rail TS35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 140g

Connection Details

3.	Tx Supply +ve, RTD 4th Wire		
5.	Input mA, V, T/C, RTD +ve		
4.	Input mA, V, T/C, RTD -ve		
6.	RTD 3rd Wire		
10.	Output -ve	18.	Relay 1 N/C
12.	Output +ve	19.	Relay 1 N/O
		20.	Relay 1 Common
1.	Power Input -ve	15.	Relay 2 N/C
2.	Power Input +ve	16.	Relay 2 N/O
		17.	Relay 2 Common

Ordering Information

Please supply:

Part Number:	4002ALM-6
Input Type:	e.g mA, Volt, T/C, RTD
Input Range:	e.g 4-20, 0-10, 0-500≡C
Trip Action 1:	e.g RLY1>SP1<LED1
Trip Action 2:	e.g RLY2<SP2>LED2
Power Supply:	e.g 24Vdc, 240Vac

4002-ALM

DUAL TRIP AMPLIFIER

- Wide Range of Configurable Inputs
- Configurable Trip Action and Failsafe Modes
- Optional Isolated Re-Transmission
- Optional Isolated Input Stage and Isolated Transmitter Supply
- Optional LED display or 0-10V Signal of Input and Setpoints,

Description

The 4002-ALM trip-amplifier can accept a wide range of inputs including 4-20mA, thermocouple, RTD and voltage types. The unit can have up to two relay outputs and each can operate as a high or low trip. The unit can also produce an isolated high level output.

The relay outputs are single pole change-over relays with mains voltage rating. Each trip can be configured so that the alarm condition can be above or below the setpoint. The relays can be energised or de-energised in the alarm condition, satisfying fail-safe and non-fail safe applications. In addition the alarm LED's can be selected to light when the relay is either on or off.

The input stage can be isolated as an option and the inputs can be user-reconfigured for several different ranges if specified at point of order. In addition there is an optional isolated transmitter supply of 24Vdc, suitable for exciting most standard transmitters.

The following applications are also possible:

One output relay is energised when the input reaches the high setpoint and is latched on until the lower setpoint is reached. The reverse operation is also possible. This is ideal for applications such as pumping out.. All the above options are user-configurable but can be specified at point of order. The power supply is 110 / 240 Vac.

Inputs

The input types and ranges included below are our standard ones only. Contact Sales for others.

4002-ALM-HL for DC Current and Voltage
0-20mA, 4-20mA, 0-10mA into 15Ω / 30Ω
0-1V, 0-10V, 1-5V into 100kΩ / 1MΩ
Min and Max Full Scale Ranges:

DC Current	0 to 50µA	0 to 10A
DC Voltage	0 to 100mV	0 to 300V

Note: For input voltages greater than 30Vac or 60Vdc an IIR-Divider unit must be specified.

4002-ALM-TC for Thermocouples
Types E,J,K,N,R,S & T non-linearised
Ranges 0-250, 0-500, 0-1200ºC (Others available)
Auto cold junction compensation. Open cct t/c can drive either upscale or downscale.

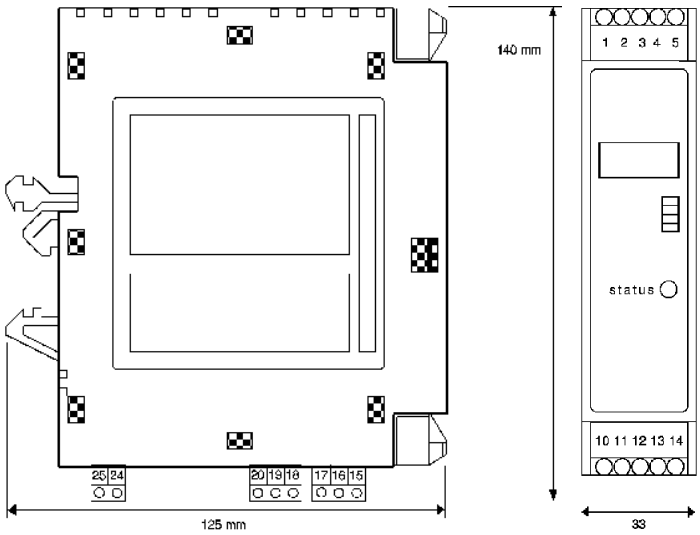
4002-ALM-RTD for Resistance Thermometers
2 or 3 wire PT100 or other, linearised output
Ranges 0-250, 0-500, -100-100ºC (Others available)

Outputs

Mains Rated Relays
3A resistive at 240V ac
DC Current and Voltage
0-20mA, 4-20mA, 0-10mA into 750Ω
0-1V, 0-10V, 1-5V into a minimum 2kΩ

Performance Characteristics

Parameter	Min	Typ	Max	Comments
Supply Voltage	110Vac		240Vac	
Input Impedance (Volt)	100kΩ	1MΩ	10MΩ	Dependent on range (Typ=10V)
Input Impedance(mA)	0.02Ω	15Ω	5kΩ	Dependent on range (Typ=20mA)
Volt drop (mA input)		0.3	0.35	At 20mA input on 0(4) to 20mA Range
Trip Point Accuracy			±0.25%	
Temp Coefficient			±100ppm/ºC	
Trip Point Drift			±100ppm/ºC	
Relay Response Time		10ms		Signal Response 300ms for T/C, 30ms others
Operating Ambient	0ºC		55ºC	
Relative Humidity	0%		90%	
Isolation Voltage	1kV			
Surge Voltage	2.5kV for 50µS			Transient of 10kV/µS
Notes	Setpoints are adjusted by 20 turn potentiometers on the front panel. Setpoints can be checked by measuring 0-10V (0-100%) voltage on the front panel terminals. H/H,H/L, L/H, LL, fail-safe, non-fail safe and LED options are user selectable using internal links. Hysteresis is set at 1.0% but other values are possible, please specify if required. The process input level is available as 0-1V (0-100%) on front panel or on 3 digit LED Display Figures based on HL version, 20≡C ambient			



Installation Data

Mounting	DIN Rail TS32/35
Orientation	Any
Connections	Screw Clamp with pressure plate
Conductor size	0.5-4.0mm
Insulation Stripping	12mm
Weight	Approx 360g mains version

Connection Details

10.	Input -ve	T/C -ve	RTD -ve
11.	Input +ve	T/C +ve	RTD +ve
12.		T/C Shield	RTD 3rd Wire
1.	Output -ve	15.	Relay 1 N/C
2.	Output +ve	16.	Relay 1 N/O
		17.	Relay 1 Common
24.	Power Input -ve		
25.	Power Input +ve		
		18.	Relay 2 N/C
13.	Trans Supply -ve	19.	Relay 2 N/O
14.	Trans Supply +ve	20.	Relay 2 Common

Ordering Information

Please supply:

Part Number:	4002- (HL or TC or RTD)
Input Type:	e.g mA, Volt, T/C, RTD
Input Range:	e.g 4-20, 0-10, 0-500≡C
Trip Action 1:	e.g RLY1>SP1<LED1
Trip Action 2:	e.g RLY2<SP2>LED2
Power Supply:	e.g 240Vac
Retransmission:	Yes / No (e.g. 4-20mA)
LED Display:	Yes / No
Further Notes:	