



OMNITERM TXB Programmable Transmitter

Model C2401B 24Vdc powered Universal four-wire transmitter.

DATASHEET

- TC/mV/VC/RB universal input in one product
- 0-20mA / 0-±10V / 0-±10mA universal output
- 24Vdc powered
- Three port isolation to 1500Vac
- Software configurable
- Sensor linearisation standard
- Output overload detection
- Fully configurable with Omniset



Features

- DIN Rail or surface mountable
- Narrow 22.5mm module width
- 20 - 30V dc powered.
- 1500Vac Isolation Input/Output/Power Supply
- Output overload Indicator
- User friendly configuration software
- Wide operating temperature range
- Linearised for all standard input types
- Special function options included as standard
- Designed to meet IEC 61508 SIL1 criteria.

OVERVIEW

The OMNITERM TXB Universal four-wire transmitter is designed for the widest range of signal conditioning applications in a single off-the-shelf product, using advanced state-of-the-art digital measurement techniques, combined with extremely user friendly software configurability.

The input will accommodate most thermocouple and resistance bulb types, as well as voltages and currents from 1mV minimum to 10Vdc maximum input span and slidewire inputs. (Extended ranges are available – see Order Codes)

The output can be configured for unipolar or bipolar outputs of current or voltage from ±1mA to ±10mA; 0-20mA; or ±1V to ±10V.

Full isolation (input/output/power supply) to 1500Vac ensures trouble-free accurate measurement.

Combined with the **OMNISET Configuration** software package, this product provides extremely low life-cycle costs by reducing spares stock-holding requirements, and reducing specialist technical expertise required for field support, module replacement and field configuration. This new holistic approach to instrumentation asset

management ensures reliable performance and minimal down-time.

Using advanced sigma-Delta A/D technology combined with sophisticated digital filtering techniques, the TXB offers 16 bit measurement resolution with increased dynamic range, tailored for noisy plant environments.

CONFIGURATION MANAGEMENT

The powerful but intuitive Omniset configuration software ensures the maximum instrument flexibility with reliable configuration management to ensure all instruments on the plant are always correctly configured to the design requirements specification.

HIGH RELIABILITY

This product has been designed with high reliability applications in mind. The output stage has built in overload indication to detect overloaded output circuits – whether from a wire break or just excess resistance in the line.

This product has been designed to meet the criteria of IEC61508 for SIL1 applications.

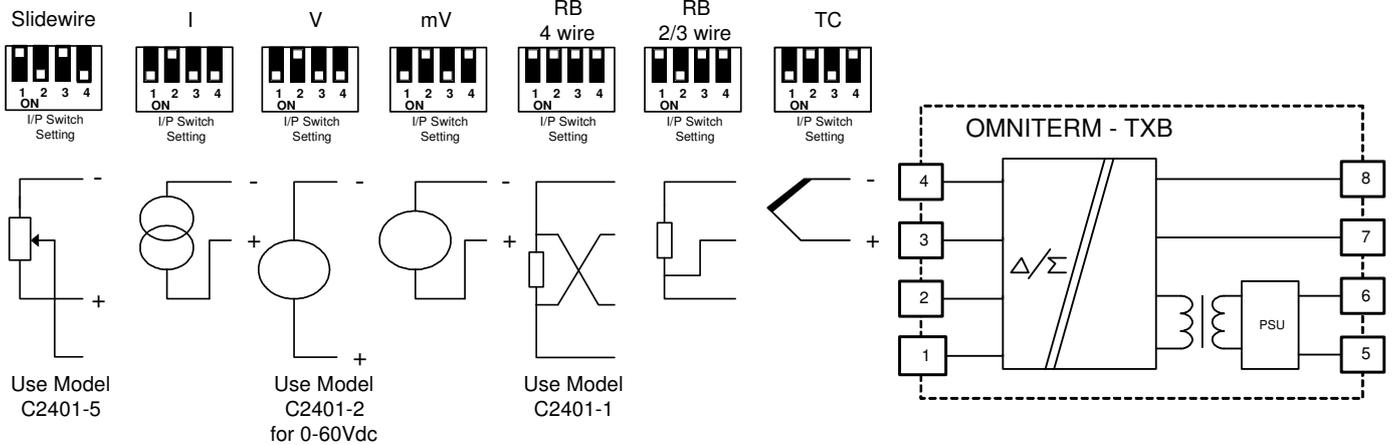




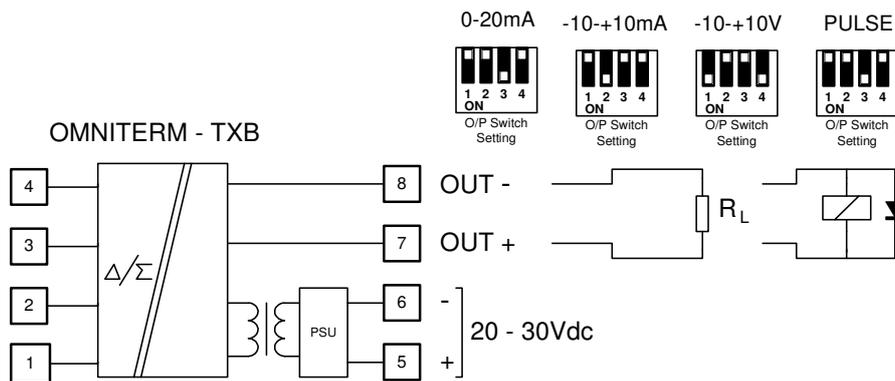
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Electrical Connections

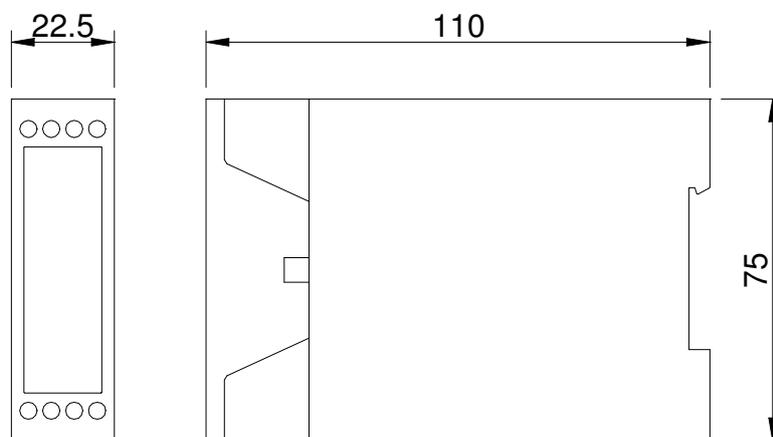


INPUT RANGE SELECTION AND CONNECTIONS



OUTPUT RANGE SELECTION AND CONNECTIONS

Mechanical Details





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Specifications

Input

Measurement Types and Ranges

Unless otherwise stated, all specifications refer to Model C2401-0

THERMOCOUPLES (TC Input Ranges covered)

Type B (Pt30Rh-Pt6Rh)	400 – 1820 °C (400 °C min. span*)
Type E (NiCr-CuNi)	-150 – 1000 °C (80 °C min. span*)
Type J (Fe-CuNi)	-210 – 1200 °C (100 °C min. span*)
Type K (NiCr-NiAl)	-270 – 1372 °C (100 °C min. span*)
Type N (NiCrSi-NiSiMg)	0 – 1300 °C (175 °C min. span*)
Type R (Pt13Rh-Pt)	-50 – 1767 °C (500 °C min. span*)
Type S (Pt10Rh-Pt)	-50 – 1767 °C (500 °C min. span*)
Type T (Cu-CuNi)	-270 – 400 °C (100 °C min. span*)
Type W ()	1000 – 2500 °C (1000 °C min. span*)
Type W5 (Re/W26-Re)	0 – 2320 °C (300 °C min. span*)
Type W3 (Re/W25-Re)	0 – 2500 °C (300 °C min. span*)
*Minimum Span	May be lower but with reduced accuracy overall

Cold Junction Compensation	Internal
CJC Accuracy	< 0.5 °C over 0 – +40 °C < 1 °C over –10 – +60 °C
TC Burnout Detection	Settable upscale or downscale

RESISTANCE THERMOMETERS (RB Input Ranges)

Model C2401-0	2 or 3 wire connection
Model C2401-1	True 4-wire connection
Measuring Current	200µA nominal 20µA for Model C2401-3 1000µA for Model C2401-4
Lead Resistance	≤ 100 ohms per lead
Pt100 (IEC60751/DIN43760)	-200 – 850 °C (50 °C min. span)
Pt500	-200 – 380 °C (50 °C min. span)
Pt500 (model C2401B-3)	-200 – 630 °C (50 °C min. span)
Pt1000 (model C2401B-3)	-200 – 630 °C (50 °C min. span)
Ni100 (DIN43760)	-60 – 250 °C (50 °C min. span)
Ni120	-80 – 320 °C (50 °C min. span)
Cu10 (model C2401B-4)	-100 – 260 °C (150 °C min. span)
Ni100 (DIN43760)	-60 – 250 °C (50 °C min. span)

POTENTIOMETER/SLIDEWIRE (Model C2401B-5)

Model C2401B-5	3 wire slide-wire connection
Excitation	100mV nominal
Potentiometer Resistance	100 ohms min; 10kOhms max
Minimum Span	10%
Maximum Zero	90%

VOLTS (V Input Ranges)

Model C2401-0	-1 – +10V (min. span 0.1V)
Model C2401-2	-1 – +60V (min. span 5V)
Input Impedance	> 1MΩ

MILLIVOLTS (mV Input Ranges)

Millivolts	-10 – 100mV (min. span 1mV)
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CURRENT (I Input Range)

Current	0 – 25mA (0.2 mA min. span)
Current Input Burden	<5 ohms

CUSTOM (Any Input Range)

Custom Sensor Ranging	Many additional ranges are User Configurable using the Configuration Software
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Output

Output Types and Ranges

VOLTAGE

Output Voltage Max. Range	-10 – +10V max (min span 1V)
Load Resistance	≥1kohm

UNIPOLAR CURRENT

Output Current Max. Range	0 – 20 mA (min span 1mA)
Load Resistance	≤1kohm

BIPOLAR CURRENT

Output Current Max. Range	-10 – +10 mA (min span 1mA)
Load Resistance	≤1kohm

PULSE

Pulse Rates available	Low Range: 100-1000 pulses/hr (pulse output width 500ms) High Range: 1000-10000 pulses/hr (pulse output width 60ms)
Transistor switched output	20V min; 30V max. designed to operate with a 24V relay or equivalent.
Load Resistance	≥ 860 ohms

Accuracy

Initial Error	<0.1%
Non-linearity	<0.1%
Temperature Drift	< 150ppm/°C
TC linearisation error (types B, E, J, K, N, T)	<0.25 °C or 0.1% of reading (whichever is greater) <0.5 °C below –100 °C
TC linearisation error (types R, S, W3, W5)	<2.0 °C
TC linearisation error (type W)	<2.5 °C

Power Supply

Supply Voltage	24 Volts –15% / +25% (20-30Vdc)
Current Consumption	65mA max. plus output current
Programming Power	Alternate power via programming cable.

Selectable Computation Functions

1. Signal Inversion
2. Square Root





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3. Integration output pulses instead of analogue output

Configuration

Input Type	Field selectable via 4 way DIP switch (Accessed from top of module)
Output Type	Field selectable via 4 way DIP switch (Accessed from bottom of module)
Range	Field selectable via programming port on front of unit with the aid of a PC and configuration software package.

Environmental Conditions

Operating Temperature	-10°C – 60 °C (+14°F – 140°F)
Storage Temperature	-25°C – 85 °C (-13°F – 185°F)

Compliance with Standards

Safety	EN 60950:1995
Emissions	EN 55011 EN50081-2:1994 Group I, Class A EN50082-2
Immunity – ESD	IEC 61000-4-2:1995, level 3
Immunity – RF Fields	IEC 61000-4-3:1995, level 3
Immunity – Fast Transients	IEC 61000-4-4:1995 2 kV – DC power port 1 kV – input/output lines
Insulation	Basic Insulation between isolated circuits per IEC950
Insulation Test Voltage	Input/Output/Supply 100% tested to 1500Vac

Mechanical

Width	22.5mm
Height	75mm
Depth	110mm

Mounting	Snaps on to DIN rail EN50022-35 Or screws to vertical surface
Housing	Shock resistant ABS
Flammability	UL94-HB (Housing) UL94-V0 (Terminals)
Terminal/wire size	0.14 – 2.5mm ² stranded

Weight

Unpacked	250gm approx.
Packed	350gm approx.

Ordering Information

ORDER CODE	DESCRIPTION
C2401-0	Omniterm TXB Universal Four-Wire Transmitter – Standard model
C2401-1	Omniterm TXB Four-Wire Transmitter with 4 wire RTD input
C2401-2	Omniterm TXB Four-Wire Transmitter with Hi Voltage Input Range
C2401-3	Omniterm TXB Four-Wire Transmitter with low current excitation for Pt1000 etc.
C2401-4	Omniterm TXB Four-Wire Transmitter with high current excitation for Cu10 etc.
C2401-5	Omniterm TXB Four-Wire Transmitter for 3 wire Slide-Wire Input

ACCESSORIES

C1168A	Omniflex Miniature Jack Programming Cable.
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