Model CALOG 9000 / 9240

MINIATURE DIN-RAIL MOUNT
PROGRAMMABLE ISOLATED TRASNMITTER



Software download

The CALOG 9000 and CALOG 9240 are compact, DIN rail-mounted universal programmable transmitters designed for flexible industrial signal conditioning. Measuring just 92 × 92 × 26 mm, they provide 3-way galvanic isolation between the power supply, input and output for reliable signal integrity. Both units can be easily configured and field-calibrated via the onboard USB-C interface using the free CALOG SmartView software, available for download from www.instrotech.co.za/software-downloads/. The software allows users to configure input and output types, scaling and device behaviour. Optional RS-232 / RS-485 communication using the ASCIIBUS protocol supports connection to computers and control systems for setup, monitoring and diagnostics. With support for thermocouples, RTDs, millivolt, 0–10 V, 0–20 mA, 4–20 mA, potentiometer and frequency inputs, the CALOG 9000 and 9240 provide a versatile, space-saving platform for a wide range of industrial measurement and control applications.

CALOG 9000

The Calog 9000 provides full 3-way isolation between the power supply, input, and output.
Input capabilities (fully programmable):

- Thermocouples: Types J, K, N, R, S, T, W5(C)
- RTDs: Pt100, Ni100 (PT500 & PT1000 optional)
- mV inputs: up to 52mV
- Current inputs: 0–20mA / 4–20mA
- Voltage inputs: up to 10V
- Potentiometer inputs
- Frequency inputs from NPN / PNP proximity switches
- ASCII (See options CAL3002PX and CAL3013PX)

Key features:

- Integral 2-wire transmitter power supply (standard)
- Precision reference for potentiometer inputs
- Programmable analogue output: 0–20mA / 4–20mA or 0–10V
- Power supply: 95–265 VAC/DC (standard)
- Compatible with SCADA systems via ASCII bus protocol
- Optional RS-232 serial interface for communication with remote systems
- Optional RS-485 interface allowing up to 99 transmitters on a single bus
- Ability to accept ASCII-based serial input signals for conversion to analogue output
- Programmable zero and span → scaling the output to match the process (e.g. map temperature range to output signal)

Linearisation options (standard):

- S-curve
- Sphere
- Square-root extraction
- Off (no linearisation)

CALOG 9240

The Calog 9240 offers identical functionality and features to the Calog 9000, with the following difference:

- Power supply: 8-30Vdc (isolated) instead of 95–265 V AC/DC.

SPECIFICATIONS

OPTIONS

CAL3001PX	Two solid state relay set points
CAL3002PX	RS-485 Serial Output
CAL3004PX	One solid-state relay set points
CAL3013PX	RS-232 Serial Output

TEMPERATURE INPUT RANGES

The temperature probes are accurately linearised in the following temperature ranges.

Note 1: When the instrument is first installed, it may take a few minutes before accurate readings are shown. This is normally due to the differing temperatures between the instrument, panel and thermocouple cable and these temperatures have to stabiise for the cold junction compesation circuit to measure the correct temperature.

*** This instrument is designed for non-grounded thermocouple probes only***

Type J	-25°C to +900°C
Type K	-25°C to +1275°C
Type N	+200°C to +1200°C
Type S	+625°C to +1750°C
Type R	+625°C to 1750°C
Type T	-35.0°C to 330.0°C
Type W5 (C)	+1150°C to +2050°C
PT100	-165.0°C to +600.0°C
PT500 (optional)	-165.0°C to +600.0°C (max 999.9°F)
PT1000 (optional)	-165.0°C to +600.0°C (max 999.9°F)
Internal TC resolution	1°C or 0.1°C

Note 2: Overall accuracy is dependent on the thermocouple type. The table below lists the designated minimum standard error of some thermocouple types:

Type:	J	K	R	S	T
Minimum Std Error:	±2.2°C	±2.2°C	±1.4°C	±1.4°C	±0.8°C

ANALOGUE INPUT RANGES

Note 3: Lineariser feature is standard for s-curve, sphere, square root extraction and off (no linearisation)

0 - 20mA / 4 - 20mA	Input impedance 100Ω
0 - 52mV	Input impedance >1MΩ
0 - 10V	Input impedance 500kΩ
Potentiometer	Input impedance 500kΩ

Note 4: All measuring ranges are programmable for non-standard inputs. E.g. 10mV - 45mV can be programmed as the zero and full scale values respectively.

FREQUENCY INPUT RANGES

1Hz - 20000Hz, 5V nominal, 24V maximum, 1Hz resolution maximum

NPN / PNP proxies selectable via jumper links on board

GENERAL SPECIFICATIONS

Thermocouple input accuracy	0.5°C, ± 1 display count (note 1 above)
RTD input accuracy	0.3°C, ± 1 display count
Analogue & frequency input accuracy	0.05% of full scale, ± 1 display count
TC and RTD sample rate	12.5 SPS
mV, V and mA sample rate	1200 SPS
A/D Type & resolution	24 bit delta-sigma
A/D conversion rate	153k SPS
Temperature coefficient	20ppm / °C typically
Settling time (temperature inputs)	1 second
Settling time (process inputs)	0.5 seconds

GENERAL SPECIFICATIONS CONTINUES	
Settling time (frequency input)	5 msec (no averaging)
Memory retention	Full non-volatile operation
Power-up / self-test time	1 - 3 seconds
Warm-up time	15 minutes typically
RS-232 isolation to input	No

EXCITATION: FOR EXTERNAL TRANSMITTERS, PROXIES & POTENTIOMETERS
Link selectable
24Vdc current limited. For 2-wire transmitters, proximity switches or encoders.
2.5 Vdc precision reference, 2mA maximum for potentiometer (2kΩ pot minimum).

ANALOGUE OUTPUT RANGES	
Analogue output isolation	1000V input/output/power isolation (3-way)
Analogue output accuracy	0.1% of full scale, 16-bits
Analogue output temp. coefficient	20 ppm / °C typically
Current analogue output load	500Ω maximum (current is source, not sink)
Voltage analogue output load	5kΩ minimum

SETPOINT OPTIONS	
Solid-state relay rating	400V AC/DC, 0.5A, power factor 1
Form type	Form A (normally open contact)

ENVIROMETENTAL	
Operating temperature range	-10 to +50°C
Service temperature range	-15 to +60°C
Storage temperature range	-40 to +80°C
Humidity	< 85% non-condensing

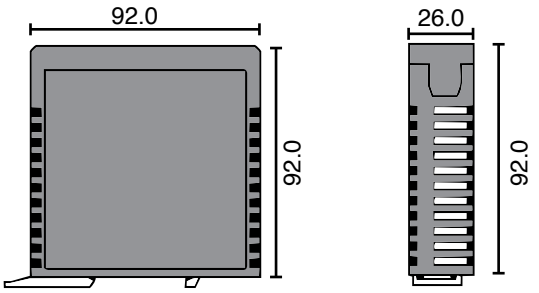
MECHANICAL	
Dimensions	DIN rail mount 92 x 92 x 26 mm enclosure, IP40 rating
Protection	Industrial strength, UL 94 V-0 flame retardant ABS plastic

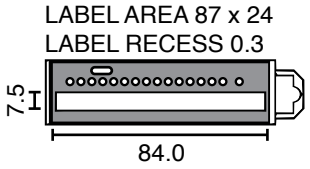
POWER SUPPLY	
Calog 9000	95V-265V ac/dc isolated supply, 5VA typical
Calog 9240	8-30Vdc isolated supply, 5VA typical

PROGRAMMABLE SETTINGS			
VOLTAGE & CURRENT INPUTS		TEMPERATURE INPUTS	
Input types	mA, mV, V	Units	°C, °F, or Kelvin
Zero & span setting	-1999 to 20000	Broken TC	Selectable high or low
		Broken RTD	Selectable high or low
FREQUENCY INPUT		ANALOGUE OUTPUT	
Scale factor	0.01 to 99.99	Output type	0-20mA/4-20mA/0-10V
Filter	0, 0.5, 1.1 & 4.5 sec	Zero & span setting	-1999 to 20000
Mode	Hz or RPM	OPTIONS	
SERIAL INTERFACE		Alarm values	-1999 to 20000
Bus address	0 to 99	Alarm hysteresis	1 to 255 (default 1)
Baud rate	2400, 4800, 9600, 19k2	Alarm delay	0 to 255 seconds (default 0)
		Alarm relay settings	Selectable HI or LO alarm
		Alarm relay state	Selectable NO or NC

CONNECTION DIAGRAM

HOUSING

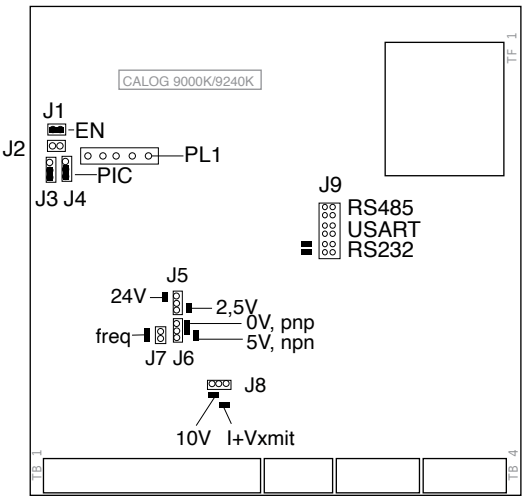


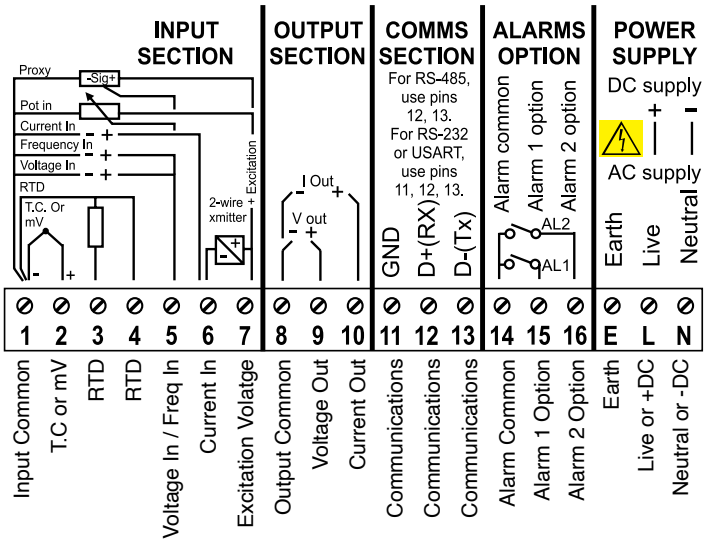


Dimension in mm.
IP40 rating Industrial strength single piece housing.

INTERNAL LINKS AND CONNECTION DIAGRAM

- *Note: DO NOT remove Jumpers J1, J3 & J4 are these are factory defaults. J2 is not used.*
- *Note: J5 is set to 24V excitation (default) for loop-powered transmitter inputs.*
- *Alternatively, set J5 to 2.5V reference voltage when using a potentiometer input.*
- *Note: J6 is set to PNP (0V) by default. • Alternatively, set J6 to NPN (5 V) if required.*
- *Note: J8 must be set to 10V for 0–10 V DAC output (Volt Out pin 9).*
- *If J8 is set to I+Vxmit, then Volt Out pin 9 functions as an additional excitation output, current-limited to approximately 0.5 A.*
- *To increase excitation current beyond 24mA contact suppiler.*





WARRANTY

The product is warranted against faulty workmanship or defective materials for a period of two years from the date of delivery by Calog Instruments or an authorised distributor. During the warranty period, Calog Instruments will replace defective equipment returned with transportation costs prepaid, provided there is no evidence of abuse or mishandling. Calog Instruments reserves the right to alter specifications without notice.

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