

# KOS205

## PROGRAMMABLE PT-100 IN-HEAD TEMPERATURE TRANSMITTER

**Y2K**  
YEAR 2000  
COMPLIANT



kos205manualB.doc

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### WARRANTY



The instruments are warranted against defective materials and workmanship for a period of three years from date of delivery.

If a product appears to have a defect or fails during the normal use within the warranty period, please contact the distributor from which you purchased the product.

This warranty does not apply to defects resulting from action of the buyer such as mishandling or improper interfacing.

The liability under this warranty shall extend only to the repair of the instrument. No responsibility is assumed by the manufacturer for any damage which may result from its use.

# KOSMOS SERIES

### 1.0 GENERAL

The transmitter is a low cost "Smart" in head PT-100 temperature transmitter that converts the output to the industry standard 4-20mA transmission signal.

### 2.0 SPECIFICATIONS @20°C

#### 2.1 Input

Sensor	Pt 100 (2 or 3 wire).
Sensor range	-200 to 850°C (18 to 390Ω)
Minimum Span <sup>1</sup>	25°C
Linearisation	BS EN60751, BS1904, DIN43760
Basic Measurement Accuracy <sup>2</sup>	±0.1°C ±0.05% FRI (FRI="Full Range Input")
Thermal drift	Zero 0.008 °C / °C, Span 100 ppm / °C
Excitation Current	1mA MAX
Maximum Lead Resistance	50Ω / leg
Lead Resistance Effect	0.002°C / Ω

Notes

<sup>1</sup> Any Span may be selected, full accuracy is only guaranteed for spans greater than the minimum recommended.

<sup>2</sup> Basic Measurement Accuracy includes the effects of calibration, linearisation and repeatability.

#### 2.2 OUTPUT

Output Range	4-20mA (>3.8 to <20.2mA)
Maximum output	23mA
Accuracy	±5µA
Voltage effect	0.2µA / V
Thermal drift	1µA / °C
Supply voltage	10 to 35V
Maximum output load	$[(V_{\text{supply}} - 10) / 20] \text{ K}\Omega$ ie. 700Ω @ 24V

### 2.3 GENERAL

Protection	Reverse connection protected
Time constant (filter Off)	< 1 Sec (Time to reach 63% of the final value)
Filter factor programmable warm-up time	Off, 2 Sec, 10 Sec, or adaptive 2 minutes to full accuracy

#### Environmental

Ambient operating Range	-40 to 85°C
Ambient storage Temperature	-50 to 100°C
Ambient Humidity Range	10 to 90% RH non condensing

#### Approvals

Emissions	EN50081
Immunity	EN50082

#### Mechanical

Enclosure	DIN standard terminal block size
Material	NORYL™
Weight	25g
Flammability	SEI UL94 V1
Dimensions	43mm diameter x 21mm

#### Communications

PC interface	RS232 via configurator
Minimum output load	100Ω for in loop programming
Maximum cable length	1000m
Configurable parameters	Sensor Characteristics: Burnout: °C/°F: Output :Hi/L0: Filter: Tag: User offset

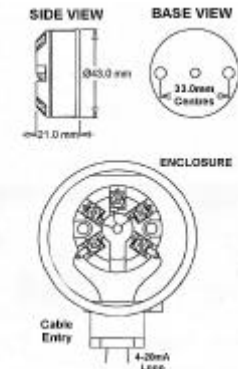
Comms Protocol	ANSI X3.28 1976
Data rate	1200 baud

### 3.0 INSTALLATION

#### 3.1 Mechanical

The transmitter is mounted using two 5.5mm diameter holes, on standard 33mm fixing centres and will fit a DIN standard termination head. The transmitter should be installed with adequate protection from moisture and corrosive atmospheres.

Care must be taken when locating the transmitter to ensure the ambient temperature remains within the specified operating range. Figure 1 shows the mechanical layout and a typical application of the transmitter mounted inside a termination head enclosure, with sensor wires entering through the centre of the transmitter body.

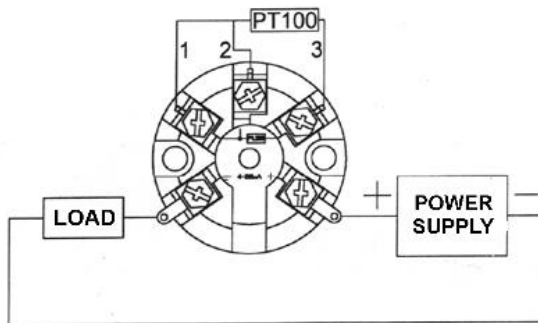


#### 3.2 Electrical

Connections to the transmitter are made to the screw terminals provided on the top face. No special wires are required for the output connections, but screened twisted pair cable are the most suitable for long runs. It is recommended that screened cable is used for the three input signal wires for cable runs greater than one metre. All three input wires must have the same core diameter to maintain equal lead resistance in each wire. A Ø4.5mm hole is provided through the centre of the transmitter to allow sensor wires to be threaded through the transmitter body direct to the input screw terminals. The screw terminals have been designed to allow all connection wires to enter from an inner or outer direction.

Figure shows the method of connection to provide a 4-20mA current loop output. The Pt-100 sensor shown would normally take the form of a probe assembly with a three wire connection. The output loop has voltage power supply used to provide loop excitation. The load symbol represents other equipment in the loop, normally indicators, controllers or loggers. Care must be taken when designing the 4-20mA circuit to ensure that the voltage requirements of all the equipment in the loop added together, does not exceed the power supply voltage. If a number of instruments are connected in the loop, ensure that only one instrument is tied to ground. Grounding the loop at two points will cause a short circuit of part of the loop leading to measurement errors.

To ensure CE compliance, sensor leads must be less than 3 metres long and the transmitter housing should prevent access to the transmitter during normal operation.



#### 4. CONFIGURATION

The transmitter can be completely reconfigured by the user, modifying the following parameters:

Sensor Characteristics	°C or °F
Low range (Lo)	Corresponds to 4mA output
High range (Hi)	Corresponds to 20mA output
Tag No	Transmitter reference details
Offset	User calibration adjustment
Burnout	High or Low
Filter	No Filter / 2Sec / 10Sec / Adaptive

Configuration of the transmitter is achieved by connecting a PC running RCPW configuration software to the transmitter via the Configurator unit.

##### 4.1 Connection of configuration module

When configuration is done using an existing loop, the loop power supply must be capable of supplying 30mA and the load resistor chosen so that at least 10V remains across the transmitter, taking into account all other volt drops within the loop.

##### 4.2 PC Installation of RCPW

Minimum PC operating system: Windows™ 3.1  
 Minimum PC requirement: IBM® compatible 386 or above 4Mb RAM and available serial port

To install RCPW, log File Manager on to drive A: (or as appropriate) and run the installation program. **Note: if no "Product Licence Number" is entered when prompted the program will operate in demonstration mode only.**

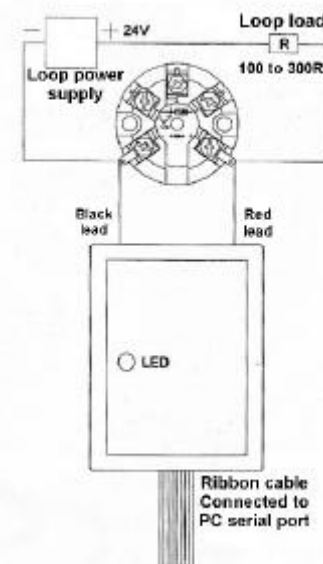
##### 4.3 Operation of RCPW

The configuration software has a list of main menu options which are: File, View, Option, Devices and Help. These options can be selected by the mouse or simultaneously depressing <ALT> and the letter underlined as above. Once a menu option has been selected, the status bar shows a brief description of functions.

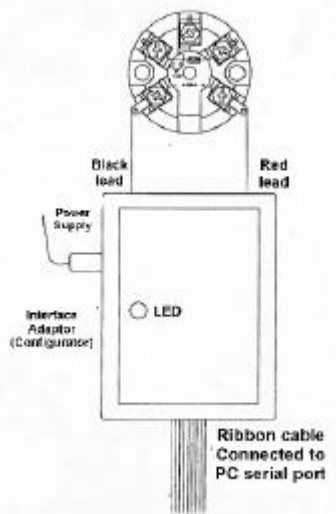
For more details see RCPW onscreen help.

There are two possible methods of connecting the PC and interface adaptor (Configurator) to the transmitter. Figure show the options.

##### Configuration In-Loop Programming



##### Configuration Powered Programming



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