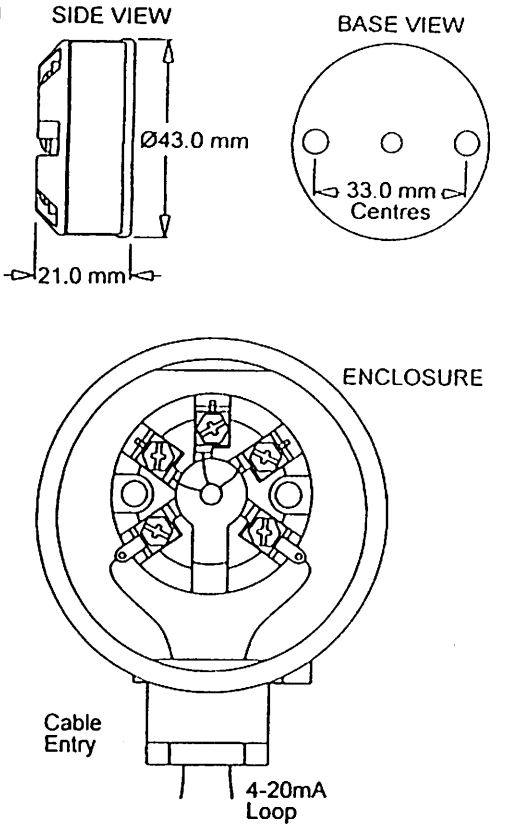
Figure 1



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 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 an outer direction.

Figure 2 shows the method of connection to provide a 4-20 mA current loop output. The Pt100 sensor shown would normally take the form of a probe assembly with a three wire connection. The output loop has a 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 total 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 guarantee CE compliance, sensor leads must be less than 3 metres long and the transmitter housing should prevent access to the transmitter during normal operation.

652-C

PROGRAMMABLE IN-HEAD TEMPERATURE TRANSMITTER

Stock code : 52-214-2169-01 Issue : 01

611 D

1.0 GENERAL

The transmitter is a second generation 'Smart' in head temperature transmitter that accepts any commonly used temperature sensor, slide wire transducer or millivolt signal and converts the output to the industry standard 4-20mA transmission signal

2.0 SPECIFICATION @ 20°C

2.11 RTD Input (PT100)

Sensor Range	-200 to +850°C (18 to 390 ohms)
Minimum Span[1]	25°C
Linearisation	BS1904 / DIN 43760 / EN60751 / JISC 1604 / CUSTOM [X][3]
Basic Measurement Accuracy[2]	±0.01% FRI ±0.05% Rdg (FRI = Full Range Input)
Thermal Drift	Zero 0.008 °C/°C, Span 100 ppm / °C
Excitation Current	300µA to 550µA
Maximum Lead Resistance	50 Ohms / leg
Lead Resistance Effect	0.002°C / Ohm

2.12 Thermocouple Input

Sensor Ranges	Thermocouple Type	Measuring Range °C[4]	Minimum Span[1] °C
	TC Type K	-200 to 1370	50
	TC Type J	-200 to 1200	50
	TC Type T	-210 to 400	25
	TC Type R	-10 to 1760	100
	TC Type S	-10 to 1760	100
	TC Type E	-200 to 1000	50
	TC Type F(L)	-100 to 600	25
	TC Type N	-180 to 1300	50
	TC Type [X][3]	± 9999	Custom
Linearisation	BS 4937 / IEC 584-3		
Basic Measurement Accuracy[2]	±0.04% FRI ±0.04% Rdg or 0.5°C (Which ever is greater)		
Thermal Drift	Zero 0.1µV/ °C, Span 100 ppm/°C		
Cold Junction Error	±0.5°C		
Cold Junction Tracking	0.05°C/ °C		
Cold Junction Range	-40 to 85 °C		

2.13 Millivolt Input

Input	Voltage Source
Range	-10 to +75 mV
Characterisation	Linear Custom [X][3], 5th order polynomial
Minimum Span[1]	5 mV
Basic Measurement Accuracy[2]	±10µV ±0.07% Rdg
Input Impedance	10 M Ohm
Thermal Drift	Zero 0.1µV/°C, Span 100 ppm / °C

Slidewire Input

Input	3 Wire potentiometer
Resistance Range	10 Ohm to 390 Ohm (End to End) Larger values can be accommodated by external resistor
Characterisation	Linear Custom [X][3], 5th order polynomial
Minimum Span[1]	5%
Basic Measurement Accuracy[2]	0.1% FRI
Temperature Drift	100 ppm / °C

Notes
1. Any span may be selected, full accuracy is only guaranteed for spans greater than the minimum recommended
2. Basic Measurement Accuracy includes the effects of calibration, linearisation and repeatability.
3. Customer linearisation is available preprogrammed at the factory, contact your supplier for details
4. Consult thermocouple reference standards for practical temperature spans

2.2 Output

Output Range	>3.8 to <20.2 mA
Maximum Output	23mA
Accuracy	±5µA
Voltage Effect	0.2µA /V
Thermal Drift	1µA / °C
Supply Voltage	10 to 35V
Maximum Output Load	[(V supply -10) /20] K ohms (700 ohms @ 24V)

2.3 General

Input/Output Isolation	500VAC rms
Update Time	250 mS Maximum
Time Constant (Filter Off)	< 1 Second (Time to reach 63% final value)
Filter Factor Programmable	Off, 2 seconds, 10 seconds or adaptive
Warm-up Time	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	EN50081-1
Immunity	EN50082-2
Mechanical	
Enclosure	DIN standard terminal block size
Material	NORYL™
Weight	25g
Flammability	SEI UL94 VI
Safety	IEC 1010-1
Dimensions	43mm diameter x 21mm
Communications	
PC Interface	RS232 via configurator
Minimum Output Load	100 ohms for 'In Loop' programming
Maximum Cable Length	1000m
Configurable Parameters	Sensor type: Burnout: °C/°F: Output: Hi/Lo: Filter: Tag: User Offset
Comms Protocol	ANSI X3.28 1976
Data Rate	1200 baud

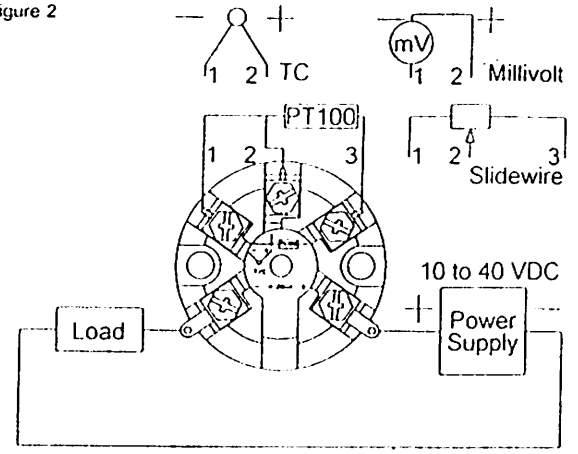
3.0 INSTALLATION

3.1 Mechanical

The transmitter is mounted using two 5.5mm diameter holes, on standard 33 mm 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.

Figure 2



4. CONFIGURATION

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

Units	°C, °F, mV or %
Low range	Corresponds to 4mA output
High range	Corresponds to 20mA output
Tag No	Transmitter reference details
Offset	User calibration adjustment

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 with 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 evaluation mode only.**

4.3 Operation of RCPW

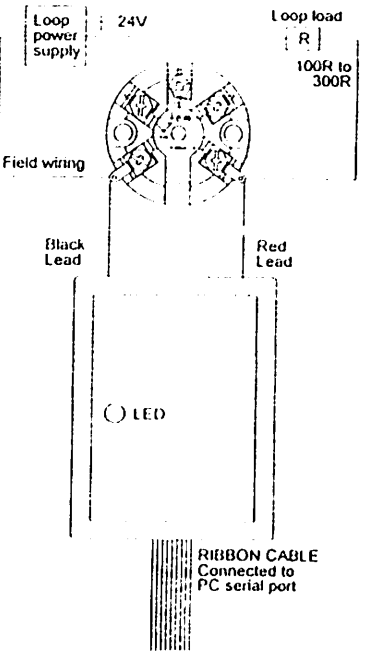
The configuration software has a list of main menu options which are: File, View, Option, Devices and Help. These options can be selected by the mouse or by simultaneously depressing <ALT> and the letter underlined as above. Once a menu option has been selected, the status bar shows a brief description 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 3 show the options.

Figure 3

Configuration In-Loop Programming



Configuration Powered Programming