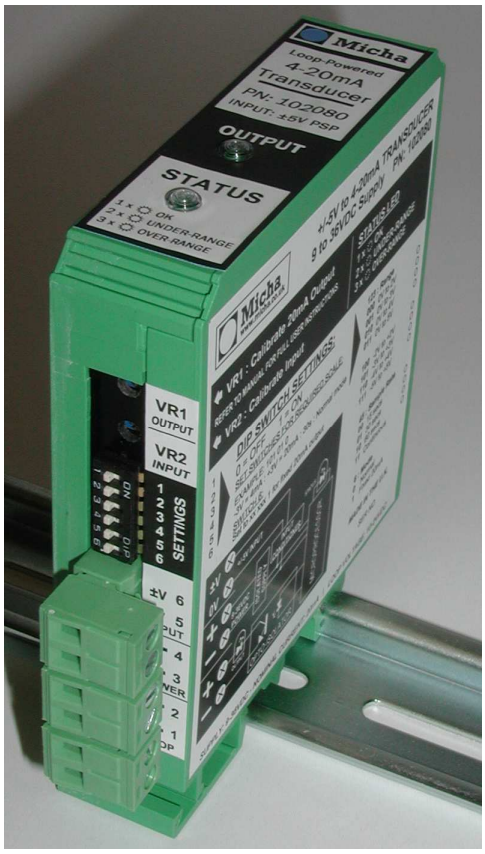
Reference Electrode to 4-20mA Transducer
Data Sheet 801658



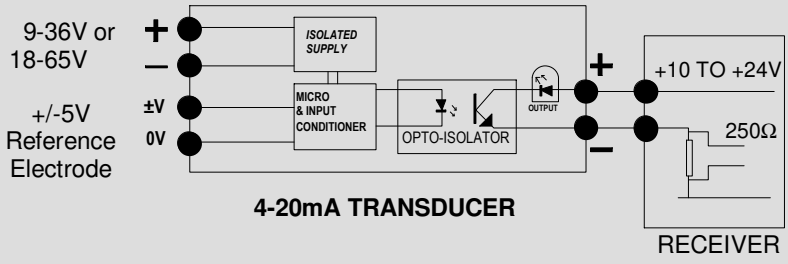
The **Micha Reference Electrode to 4-20mA Transducer** has been designed for use where a 4-20mA signal is required to monitor the Pipe-Soil Potential in conjunction with a reference electrode.

To ensure minimal loading, the input is sampled for less than 250ms into an impedance of >2MΩ at user-programmable intervals. To minimise errors, a total of four separate readings are made by the microprocessor, which are then averaged before being converted into an isolated 4-20mA signal.

The on-board microcontroller allows the selection of several ranges for maximum flexibility, and two LED's give continuous status; a Blue LED indicating operating status and a Green LED shows current flowing through the output loop.

The transducer is housed in a plastic enclosure with integral clips for symmetric (35 x 7.5mm) and asymmetric (32 x 15mm) DIN rails.

Typical application:



Connections and Setup:

A separate power supply of 9-36V or 18-65V is required to power the module, and should be connected to terminals 3 & 4. This is internally isolated from both the input and output signals.

The reference electrode is connected across terminals 5 & 6.

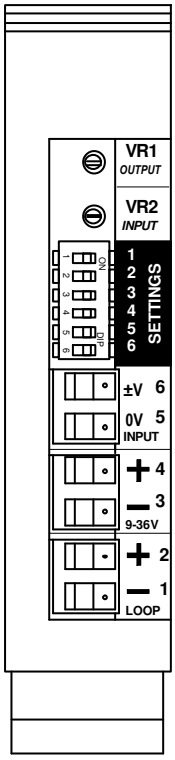
A loop voltage of between 10 and 24V should be connected across terminals 1&2. This provides power for the 4-20mA control and should have a maximum burden of 560R.

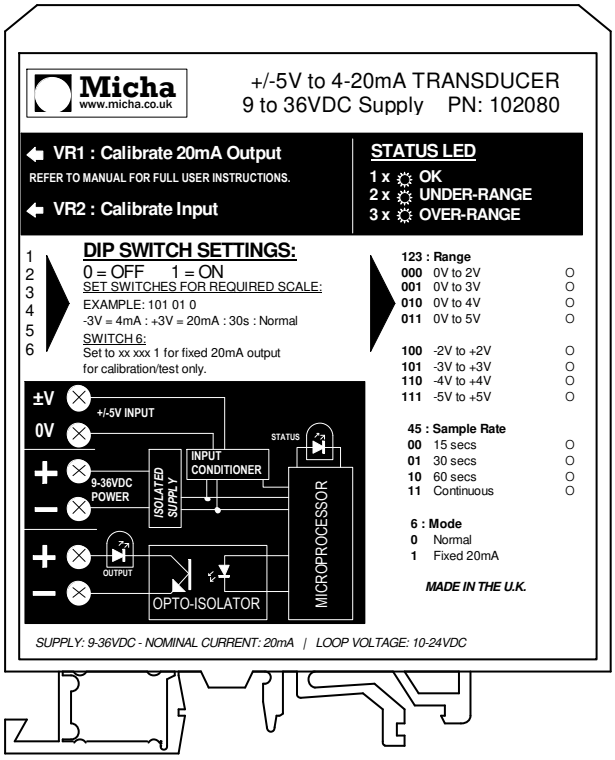
The required input voltage range is selected by setting switches 1 to 3 and the frequency of sampling - typically 30 seconds - being selected with switches 4 and 5. Continuous sampling of reference electrodes is not recommended.

Switch 6 sets the output to a fixed 20mA and is used for calibration purposes only.

Part Number 102080: 9-36V Transducer

Part Number 102081: 18-65V Transducer





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Setting the Range:

The microprocessor allows the user to set a variety of ranges for both unipolar and bipolar inputs to cover popular requirements. Typical switch settings are shown below:

Example 1: to set a range of 0V to +3V, sampling every 30 seconds:

Sw1: 0	Sw2: 0	Sw3: 1	Sw4: 0	Sw5: 1	Sw6: 0
Range = 0V to +3V			*Sample period: 30s*		*Normal*

Example 2: to set a range of -2V to +2V, sampling every 15 seconds:

Sw1: 1	Sw2: 0	Sw3: 0	Sw4: 0	Sw5: 0	Sw6: 0
Range = -2V to +2V			*Sample period: 15s*		*Normal*

Example 3: to set a range of -5V to +5V, sampling every 60 seconds:

Sw1: 1	Sw2: 1	Sw3: 1	Sw4: 1	Sw5: 0	Sw6: 0
Range = -5V to +5V			*Sample period: 60s*		*Normal*

Selection Switches

123 : Range
000 : 0V to 2V
001 : 0V to 3V
010 : 0V to 4V
011 : 0V to 5V
100 : -2V to +2V
101 : -3V to +3V
110 : -4V to +4V
111 : -5V to +5V

45 : Sampling Rate
00 : 15 secs
01 : 30 secs
10 : 60 secs
11 : Continuous

6 : Mode
0 : Normal
1 : Fixed 20mA

1 = ON 0 = OFF

Mode:

For **Normal** use, switch 6 should be set to **0**. If the input signal exceeds the upper setting, the output will be limited to 20mA, and if the input falls below the lower setting, the output will be fixed at 4mA.

In **Fixed 20mA** mode with switch 6 set to **1**, the output will be fixed at 20mA output regardless of the input or settings of switches 1 - 5.

Indicators:

During normal operation, the blue **STATUS** LED on the top of the unit will flash once approximately once a second. If the measured input drops below the lower range setting, the **STATUS** LED will blink twice, and if the measured input exceeds the higher range setting, the **STATUS** LED will blink three times. Additionally, the **STATUS** LED will glow for the duration of the 250mS sample period. Note that it will be continuously on if sampling is set to 'Continuous'

The **OUTPUT** LED is in series with the output loop and varies in intensity with the 4-20mA current.

Calibration:

Should it become necessary to re-calibrate to unit, this can be done as follows:

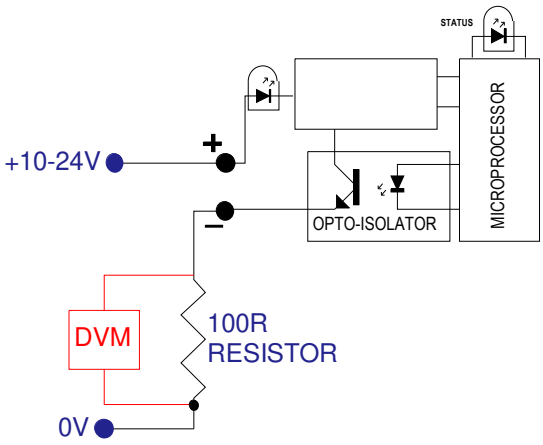
1] 20mA Output: Set DIP Switch 6 to **1** (Fixed 20mA output).

Fit a 100R resistor in series with the output and connect a voltmeter (DVM) across it. Adjust **VR1** until the DVM reads 2.00V (representing 20mA).

2] External Input: Set Sw. 1-3 to **0 1 1**, Sw. 4-5 to **1 1** and Sw. 6 to **0**

Apply +5V across the input terminals 5 & 6. Adjust **VR2** until the DVM reads 2.00V (representing 20mA).

(A 5V reference voltage for calibration is recommended for maximum accuracy but other voltages may be used with appropriate settings.)



General Specification:

Loop Voltage Range :	10VDC to 24VDC, maximum burden at 24V approx 560R
Input impedance :	2.47MΩ during sampling, at other times, $>10^{10}\Omega$
Connectors :	2-part, rising-clamp, maximum cable size: 2.5mm²
Accuracy/Linearity :	Better than 1%
Operating Temperature Range :	-5°C to +55°C
Enclosure :	Self-extinguishing polyammide 6,8 (UL 94 v0)
Dimensions :	22.5mm (W); 82mm plus terminals (D); 102mm above chassis
Manufacturer:	The Micha Design Company Limited
Country of Origin/HS Code:	United Kingdom / Commodity Code: 90328900