Battery Voltage 4-20mA Transducer
Datasheet 101920-DS

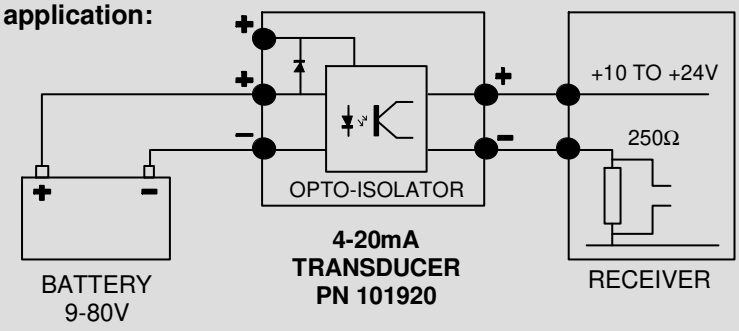
The **Micha Battery Voltage to 4-20mA Transducer** (PN: 101920) has been designed for use in any application where a 4-20mA signal is required from a DC voltage source. The control circuitry is powered from the input and, as a loop-powered device, it requires a suitable current source to be connected to the output.

The module will operate from any voltage between 9 and 80VDC, with the on-board microcontroller allowing user-set offsets and ranges for maximum flexibility.

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:



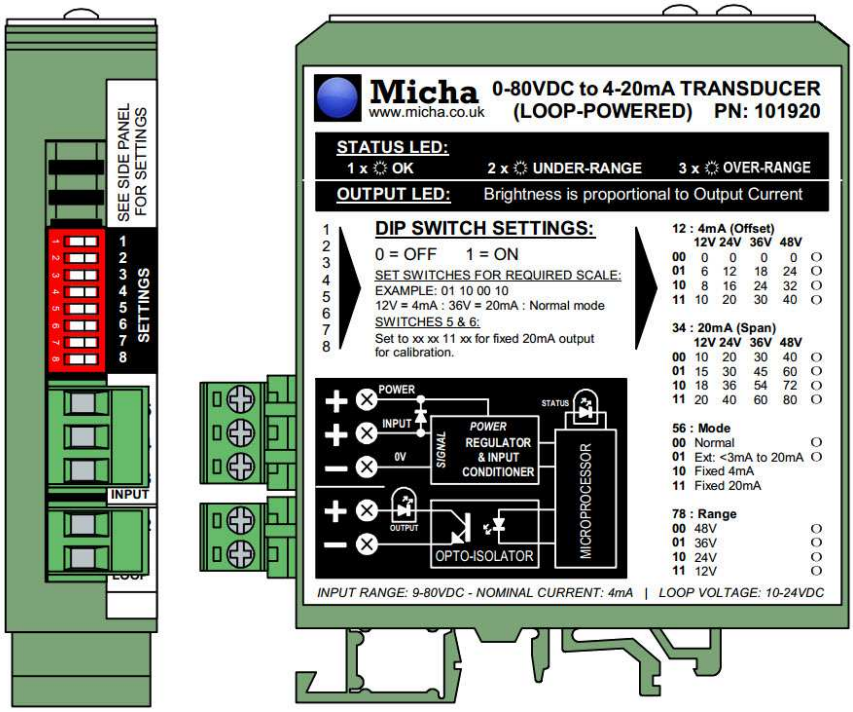
Connections and Setup:

The voltage to be measured is connected to terminals 3 & 4. If a voltage of less than 9.0V is to be measured, a separate supply of between 8-80V must be connected to terminal 5.
Note: these supplies must have a common 0V.

The 4-20mA loop 'receiver' should source a voltage of between 10-24V which should be connected across the output terminals 1 & 2.

The voltage range of the unit is selected using DIP switches 7 & 8. For example, to use offsets and spans in the 24V range, set switch 7 to the '1' position (ON) and switch 8 to the '0' position (OFF).

Note: a switch is set to '1' when moved to the right (ON) position.



Setting the Offset and Span:

The microprocessor allows the user to set a variety of offsets and spans, regardless of the input voltage. For example, if monitoring a 24V battery, the user can select the 4-20mA output to cover an input range of 20 to 30V.

Offset: Switches **1** & **2** set the offset (input voltage to give 4mA) depending on the voltage range selected with switches 7 & 8.

Span: Switches **3** & **4** set the span (input voltage to give 20mA) depending on the voltage range selected with switches 7 & 8.

Example: to set a range of 20-30V (20V = 4mA; 30V = 20mA), the switches should be set as follows:

Sw1: 1	Sw2: 1	Sw3: 0	Sw4: 1	Sw5: 0	Sw6: 0	Sw7: 1	Sw8: 0
Offset = 20V		*Span = 30V*		*Mode = Normal*		*Input Range: 24V*	

As the unit will operate on a voltage between 9 and 80V, it is permissible to set a voltage range that is more suitable to the output required.

Example: to set a range of 24 to 30V, the switches should be set as follows:

Sw1: 1	Sw2: 0	Sw3: 0	Sw4: 0	Sw5: 0	Sw6: 0	Sw7: 0	Sw8: 1
Offset = 24V		*Span = 30V*		*Mode = Normal*		*Input Range: 36V*	

Selection Switches

12 : 4mA (Offset)

	12V	24V	36V	48V
00	0	0	0	0
01	6	12	18	24
10	8	16	24	32
11	10	20	30	40

34 : 20mA (Span)

	12V	24V	36V	48V
00	10	20	30	40
01	15	30	45	60
10	18	36	54	72
11	20	40	60	80

56 : Mode

00 Normal (4-20mA)
01 Ext: <3mA-20mA
10 Fixed 4mA
11 Fixed 20mA

78 : Range

00 48V
01 36V
10 24V
11 12V

1 = ON 0 = OFF

Mode:

For normal use, switches 5 & 6 should be set to **0 0**. If the input voltage drops below the Offset value, the output will remain at 4mA. If switches 5 & 6 are set to **0 1**, the output can drop to approximately 3mA, which may be detected as a fault by the receiving transducer. Note: the maximum output is 20mA.

For uses of the fixed 4mA and 20mA modes, see the calibration section.

Indicators:

During normal operation, the blue **STATUS** LED on the top of the unit will flash once approximately once a second. If the input voltage drops below the Offset voltage, the **STATUS** LED will blink twice, and if the input voltage exceeds the Span voltage, the **STATUS** LED will blink three times.

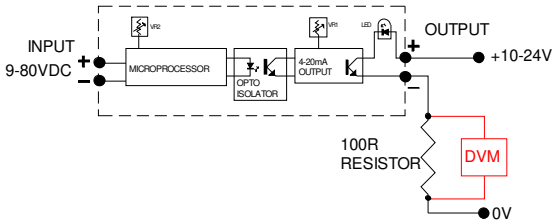
The **OUTPUT** LED is in series with the output loop and varies in intensity with the 4-20mA current.

Calibration:

If it is necessary to re-calibrate to unit, this can be done as follows:

Set DIP Switches 5 & 6 to **1 1**.

Fit a 100R resistor in series with the output and connect a voltmeter (DVM) across it. Adjust VR1 – accessible through the front panel - until the DVM reads 2.00V (representing 20mA). The 4mA output can be confirmed by setting switches 5 & 6 to **1 0** and checking a voltage of 0.40V across the resistor.



Note: if the input voltage exceeds the Span setting, the output will remain at the maximum of 20mA but the STATUS LED will flash three times.

General Specification:

Supply Input Voltage Range :	9VDC to 80VDC at nominal 4mA (8VDC to 80VDC into terminal 5)
Loop Voltage Range :	10VDC to 24VDC, maximum burden at 24V approx 560R
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; 0.1kg
Order code :	101920
Manufacturer/Country of Origin:	The Micha Design Company Ltd / U.K.
Commodity Code:	90328900