

±100mV SHUNT 4-20mA TRANSDUCER

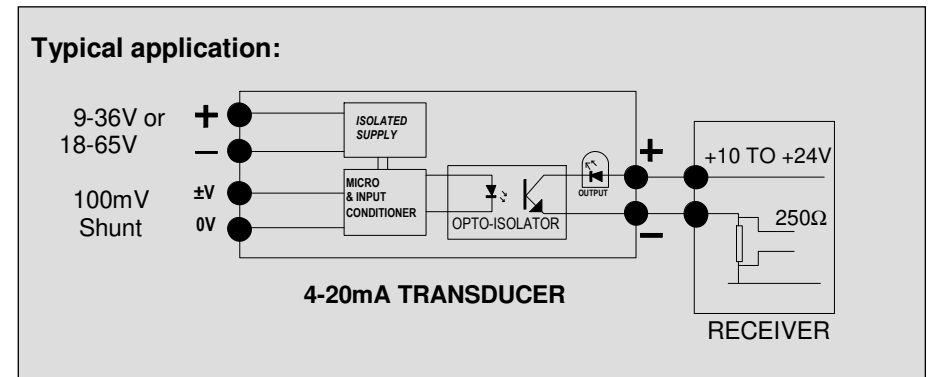


The **Micha Bipolar Shunt to 4-20mA Transducer** has been designed for use where a 4-20mA signal is required from a ±100mV shunt. The module is available in two supply-voltage versions, **PN 102074** is for use with a supply between 9VDC and 36VDC and **PN 102075** from 18V to 65VDC.

The control circuitry is powered from a separate power source allowing shunt measurement on positive or negative rails. As a loop-powered device, a suitable current source must be connected to the output as shown below.

The on-board microcontroller allows user-set offsets and ranges for maximum flexibility and two LEDs 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.



Connections and Setup:

The shunt voltage to be measured should be connected across terminals 5 & 6.

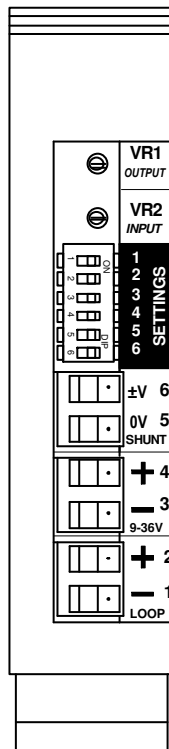
A suitable separate DC supply should be connected to pins 3 & 4. This supply voltage is fed to an isolating DC-DC converter, allowing the measured input voltage to be in either a positive or negative rail.

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

The range of the unit is set by selecting switches 1 to 3, with both unipolar and bipolar signals catered for. In bipolar mode, 'negative' current can be scaled for a lower ratio of the full scale, allowing - for example - a battery circuit with a high charge current and a low discharge current to be monitored.

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

WARNING: Do **NOT** exceed the rated shunt input voltage by more than 20%.



Micha +/-100mV to 4-20mA TRANSDUCER
9 to 36VDC Supply PN: 102074

VR1 : Calibrate 20mA Output
REFER TO MANUAL FOR FULL USER INSTRUCTIONS.

VR2 : Calibrate Input

DIP SWITCH SETTINGS:
0 = OFF 1 = ON
SET SWITCHES FOR REQUIRED SCALE:
EXAMPLE: 101 0 00
-50mV = 4mA : +100mV = 20mA : Normal
SWITCHES 5 & 6:
Set to xx.xx 11 for fixed 20mA output for calibration/test only.

STATUS LED

1 x OK
2 x UNDER-RANGE
3 x OVER-RANGE

123 : Range

000 0mV to 100mV
001 25mV to 100mV
010 50mV to 100mV
011 75mV to 100mV
100 -25mV to +100mV
101 -50mV to +100mV
110 -75mV to +100mV
111 -100mV to +100mV

4 : Test

0 Normal Operation
1 Test Mode

56 : Mode

00 Normal
01 Ext: <3mA to 20mA
10 Fixed 4mA
11 Fixed 20mA

SUPPLY: 9-36VDC - NOMINAL CURRENT: 20mA | LOOP VOLTAGE: 10-24VDC

Setting the Range:

The microprocessor allows the user to set a variety of ranges for both unipolar and bipolar inputs. For example, if monitoring a 100mV shunt, the user can select the 4-20mA output to cover an input range of -50mV to +100mV.

In unipolar mode, an offset can extend the range by giving a 4mA output offset.

Example 1: to set a range of 25-100mV (25mV = 4mA; 100mV = 20mA) for a 100mV transducer, the switches should be set as follows:

Sw1: 0	Sw2: 0	Sw3: 1	Sw4: 0	Sw5: 0	Sw6: 0
Offset = 25mV			Normal	Mode = Normal	

In bipolar mode, both negative and positive currents can be monitored, with the option to have a smaller negative than positive signal.

Example 2: to set a range of -50mV to +100mV (-50mV = 4mA; +100mV = 20mA) for a 100mV transducer, the switches should be set as follows:

Sw1: 1	Sw2: 0	Sw3: 1	Sw4: 0	Sw5: 0	Sw6: 0
-50mV to +100mV			Normal	Mode = Normal	

Note: Examples and setup table refer to a 100mV FS input.

Selection Switches

123 : Range
000 : 0mV to 100mV
001 : 25mV to 100mV
010 : 50mV to 100mV
011 : 75mV to 100mV

100 : -25mV to +100mV
101 : -50mV to +100mV
110 : -75mV to +100mV
111 : -100mV to +100mV

4 : Test
0 : Normal operation
1 : Test Mode

56 : Mode
00 : Normal
01 : Ext: <3mA to 20mA
10 : Fixed 4mA
11 : Fixed 20mA

1 = ON 0 = OFF

Mode:

For normal use, switches 5 - 6 should be set to **0 0**. If switches 5 & 6 are set to 'Extended Mode' **0 1** and if the input falls below the lower value as set in the Range configuration, the output will drop to approximately 3mA. The use of the fixed 4mA and 20mA modes are for calibration only.

Indicators and Test:

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. In **TEST** mode, the blue LED will be lit continuously if the input signal is outside the set range. This can be helpful when calibrating as an instant visual indication is given.

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

Calibration:

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

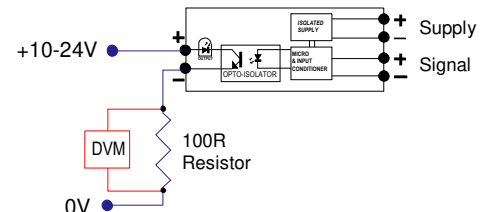
1] Set DIP Switches 5 - 6 to 1 1 (fixed 20mA output).

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). The 4mA output can be confirmed by setting switches 5 & 6 to **1 0** and checking for a voltage of 0.40V across the resistor.

2] Set DIP Switches 1 - 3 to 0 0 0; 4 to 1; 5 - 6 to 0 0

Apply a +100mV voltage to the Signal input terminals and adjust VR2 until the DVM just reads 2.00V. Note: if the input voltage exceeds the Span setting, the output will be limited to 20mA but the STATUS LED will glow continuously.

3] To set a Full Scale range other than 100mV: Apply the required voltage across pins 5 & 6 and adjust VR2 as in step 2 above. The nominal adjustable FS range is from 50mV to 100mV, and where the range is not 100mV, the settings apply pro-rata; e.g. with 60mV FS, switches 1-3 set to **1 0 1** would give a scale of -30mV to +60mV



General Specification:

- Supply Input Voltage Range : 9VDC to 36VDC at nominal 20mA : 18VDC to 65VDC at nominal 5mA
- 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 polyamide 6,8 (UL 94 v0)
- Dimensions : 22.5mm (W); 82mm plus terminals (D); 102mm above chassis