



50mV-100mV SHUNT 4-20mA TRANSDUCERS



The **Micha** range of **Shunt to 4-20mA Transducers** have been designed for use where a 4-20mA signal is required from a 50mV, 60mV, 75mV and 100mV shunt. The modules come in two supply-voltage versions: one will operate from 9VDC to 36VDC and the other from 18V to 65VDC. (See the table at the end of the datasheet for part numbers.)

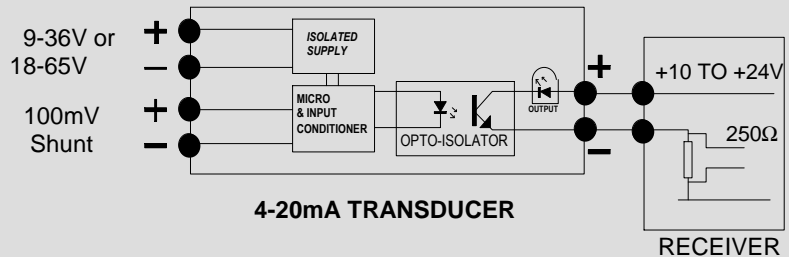
The control circuitry is powered from a separate power source allowing shunt measurement on positive or negative rails and, as a loop-powered device, a suitable current source is required to be connected to the output.

The on-board microcontroller allows 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 shunt voltage to be measured is connected across terminals 5 & 6.

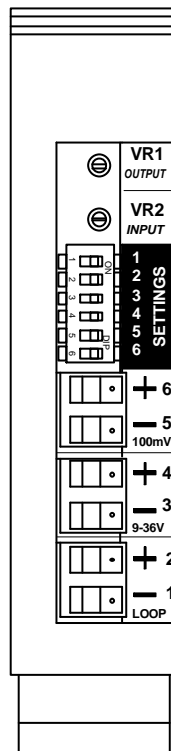
A separate supply of between 9-36VDC or 18-65VDC must be connected across pins 3 & 4. This supply voltage is fed to an isolating DC-DC converter and so a shunt being measured can be either in the positive or negative rail.

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

The Offset and Span of the unit is selected using DIP switches 1 to 4 - for examples see the Calibration section below.

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
18 to 65VDC Supply PN: 101990

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

← VR2 : Calibrate Input

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

DIP SWITCH SETTINGS:
 0 = OFF 1 = ON
 SET SWITCHES FOR REQUIRED SCALE:
 EXAMPLE: 01 10 00
 30mV = 4mA : 90mV = 20mA : Normal mode
 SWITCHES 5 & 6:
 Set to xx.xx 11 for fixed 20mA output for calibration/test only.

12 : 4mA (Offset)	
00 0 mV	○
01 30 mV	○
10 40 mV	○
11 50 mV	○
34 : 20mA (Span)	
00 50 mV	○
01 75 mV	○
10 90 mV	○
11 100 mV	○
56 : Mode	
00 Normal	○
01 Ext: <3mA to 20mA	○
10 Fixed 4mA	
11 Fixed 20mA	

Mode 01 applies only if input voltage is below any offset applied with SW1&2.

SUPPLY: 18-65VDC - NOMINAL CURRENT: 5mA | LOOP VOLTAGE: 10-24VDC

Specification liable to change.

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 100mV shunt, the user can select the 4-20mA output to cover an input range of 30mV to 90mV.

Offset: Switches **1 & 2** set the offset (input voltage to give 4mA) - see the table right for the available settings.

Span: Switches **3 & 4** set the span (input voltage to give 20mA).

Example 1: to set a range of 24-60mV (24mV = 4mA; 60mV = 20mA) for a 60mV transducer, the switches should be set as follows:

Sw1: 1	Sw2: 0	Sw3: 1	Sw4: 1	Sw5: 0	Sw6: 0
Offset = 24mV		Span = 60mV		Mode = Normal	

Example 2: to set a range of 30-90mV (30mV = 4mA; 90mV = 20mA) for a 100mV transducer, the switches should be set as follows:

Sw1: 0	Sw2: 1	Sw3: 1	Sw4: 0	Sw5: 0	Sw6: 0
Offset = 30mV		Span = 90mV		Mode = Normal	

Selection Switches

12 :	4mA (Offset)			
	50mV	60mV	75mV	100mV
00	0.0	0.0	0.0	0.0
01	15.0	18.0	22.5	30.0
10	20.0	24.0	30.0	40.0
11	25.0	30.0	37.5	50.0

34 :	20mA (Span)			
	50mV	60mV	75mV	100mV
00	25.0	30.0	37.5	50.0
01	37.5	45.0	56.3	75.0
10	45.0	54.0	67.5	90.0
11	50.0	60.0	75.0	100.0

56 :	Mode
00	Normal (4-20mA)
01	Ext: <3mA-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 an offset is applied using Switches **1 & 2**, the output will not drop below at 4mA in 'Normal Mode' regardless of input voltage. If switches 5 & 6 are set to 'Extended Mode' **0 1**, and the input falls below any offset, the output will 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:

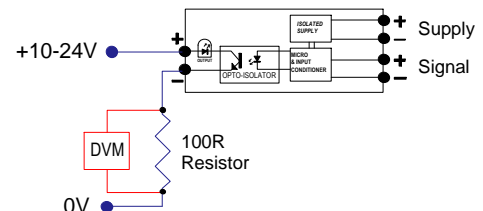
If it is necessary to re-calibrate to unit, this can be done as follows:

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 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.

Set DIP Switches 5 & 6 to **0 0**

With the Span set to the required voltage, apply that voltage to the Signal input terminals (e.g. Switches 3&4 = **11** on a 100mV transducer, Input = 100mV). Adjust VR2 until the DVM just reads 2.00V. 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 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

Order Codes:

Supply \ Scale	50mV	60mV	75mV	100mV
9 to 36VDC	102 017	102 014	102 019	101 989
18 to 65VDC	102 018	102 015	102 020	101 990