Micha
www.micha.co.uk

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 or 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 the user to set the required 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:
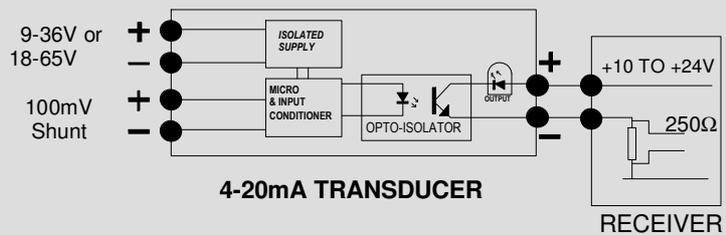
Connections and Setup:

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

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

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

The full range of the transducer is selected using DIP switches 1 and 2. In addition, the unit can be calibrated to a non-standard input if required - for examples see the Calibration section below.

During normal operation, the blue STATUS LED on the top of the unit will flash once per second. If the input voltage exceeds the range 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.

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

Micha www.micha.co.uk
SHUNT 4-20mA TRANSDUCER (LOOP-POWERED) PN: 103237

DIP SW. SETTINGS: 0 = OFF   1 = ON

Shunt mV:	50	60	75	100	Output:	Norm.	Cal.	4mA	20mA
1	0	1	0	1	1	x	x	x	x
2	0	0	1	1	2	x	x	x	x
3	x	x	x	x	3	0	0	1	1
4	x	x	x	x	4	0	1	0	1

50-100mV INPUT

CAL2

9-36VDC POWER

INPUT AMPLIFIER & CONDITIONER

OUTPUT   OPTO-ISOLATOR

MICROPROCESSOR

1 x ☼ = OK
3 x ☼ = OVER-RANGE

STATUS

REFER TO DATASHEET FOR CALIBRATION INSTRUCTIONS

CAL1

Supply: 9-36VDC / 20mA
External Loop Voltage: 12VDC Min / 24VDC Max

DO NOT EXCEED MAXIMUM INPUTS

Setting the Input Range:

The microprocessor allows the user to set four standard input ranges; 0-50mV, 0-60mV, 0-75mV and 0-100mV.

DIP switches 1 and 2 are used to set the fixed ranges as below. Note that '1' means the switch is set to the 'ON' position, and in calibration mode 'x' means the switch setting does not matter:

50mV	Sw1: 0	Sw2 : 0	Sw3: 0	Sw4: 0
60mV	Sw1: 1	Sw2 : 0	Sw3: 0	Sw4: 0
75mV	Sw1: 0	Sw2 : 1	Sw3: 0	Sw4: 0
100mV	Sw1: 1	Sw2 : 1	Sw3: 0	Sw4: 0

Test and Calibration:

The transducer can be set to output fixed values for test purposes, regardless of the input voltage as follows:

4mA	Sw1: x	Sw2 : x	Sw3: 1	Sw4: 0
20mA	Sw1: x	Sw2 : x	Sw3: 1	Sw4: 1

Over time, it may become necessary to recalibrate the transducer. This can be carried out using either an accurate ammeter, or passing the loop current through a precision resistor and measuring the voltage across the resistor with an accurate voltmeter. (A 100R resistor will give a voltage of 2.0V at 20mA.)
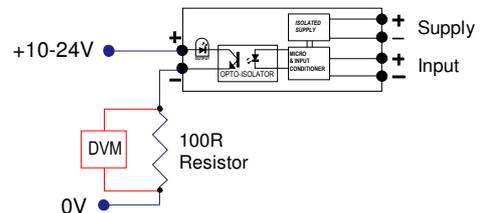
a) To recalibrate the 20mA OUTPUT, set **Sw3** to '1' and **Sw4** to '1'. Adjust '**CAL.1**' until the output is exactly 20mA.
b) To recalibrate in INPUT, first check that the 20mA output is accurate as a) above. Set **Sw3** to '0' and **Sw4** to '1'.
Connect a voltage of 100mV to the INPUT terminals and adjust '**CAL.2**' until the output is exactly 20mA.

Note: It is possible to calibrate the transducer for other full-scale ranges. For example, to set a full-scale input of 90mV, follow the calibration step as in b) above with an input of 90mV, adjusting 'CAL.2' until 20mA is output.

General Specification:

Part Numbers :	**103 237** : 50-100mV Shunt Transducer (V2) **9-36VDC** supply
	103 238 : 50-100mV Shunt Transducer (V2) **18-65VDC** supply
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 polyammide 6,8 (UL 94 v0)
Dimensions :	22.5mm (W); 82mm plus terminals (D); 102mm above chassis

Note: The above parts replace part numbers 101989 and 101990