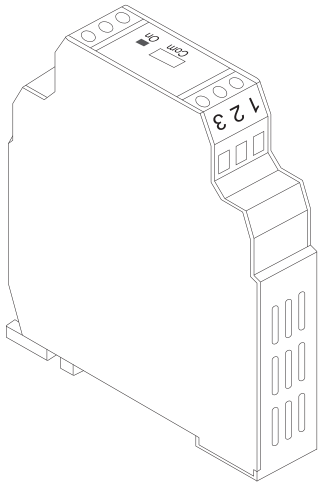
Michshur s.z. (1984) LTD.

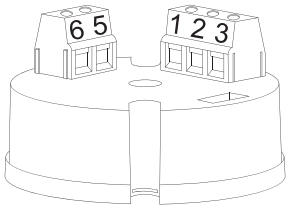
Microprocessor Based
Programmable Isolated Signal Transmitter

Model **M-422**
Model **M-355**

Installation and Operation Guide



M-422



M-355

The transmitters are 2-wire loop-powered isolated signal transmitter. It converts input signal into a scalable linear 4~20mA output current. Microprocessor based designed make it flexible to accept various input signals including mV, V, mA, PT100 and 9 different thermocouples. The measuring unit and range are also configurable with a user-friendly software via PC.

Features

- DIN rail mount (M-422) and Head mount (M-355) available
- Programmable for various input signals, measuring range
- Easy Configuration without external Loop Power Connected
- Input **:**
  Resistance thermometer (Pt100)
  Thermocouple (J, K, T, E, B, R, S, N, C)
  Voltage/Current transmitter (mV/V/mA) - Not selectable for M-355
- Output **:**
  2-wire loop-power technology, 4 to 20mA analogue output.
- Fault signal on sensor break presettable.

Specification

Input signal : User programmable. refer to table 1.

- Thermocouple (T/C) : industry standard thermocouple types, J, K, T, E, B, R, S, N, C (ITS-90).
- Pt100 : Excitation 180uA. 2 or 3 wire connection (ITS-90 α=0.00385).
- Voltage : -60mVdc to 60mVdc or -10Vdc to 10Vdc.
- Current : 0mA to 24mA

Measuring range : User programmable. Maximum range refer to table 1.
Measuring accuracy : refer to Table 1. the accuracy is tested under the operating condition of 24°C±3°C.
Input sampling rate : 200mS.

Input signal	Maximum Range	Accuracy
Thermocouple J	-50 to 1000°C (-58 to 1832°F)	±1°C
Thermocouple K	-50 to 1370°C (-58 to 2498°F)	±1°C
Thermocouple T	-270 to 400°C (-454 to 752°F)	±1°C
Thermocouple E	-50 to 700°C (-58 to 1832°F)	±1°C
Thermocouple B	0 to 1750°C (32 to 1832°F)	±2°C (Note1)
Thermocouple R	-50 to 1750°C (-58 to 1832°F)	±2°C
Thermocouple S	-50 to 1750°C (-58 to 1832°F)	±2°C
Thermocouple N	-50 to 1300°C (-58 to 1832°F)	±2°C
Thermocouple C	-50 to 1800°C (-58 to 1832°F)	±2°C
Pt100*	-200 to 600°C (-58 to 1832°F)	±0.2°C
mV	-60.00 to 60.00mV	±0.01mV
Voltage (Note2,3)	-10.000 to 10.000Vdc	±1mV
Current (Note2,3)	0.000 to 24.000mAdc	±3μA

***Factory Setting**

Note 1 : Accuracy is not guaranteed between 0 and 400°C (0 and 752°F) for type B.
Note 2 : An internal jumper in M-422 should be set. See Table 2 in detail.
Note 3 : Not selectable for M-355 type, Please contact supplier for special request.

Table 1 Input Signal

Output signal : Analogue 4 to 20mA, 20 to 4mA.
Output resolution : 0.6uA.
Output response time : <200mS.
Load : Max. (VPower supply - 10 V) / 0.020
Power supply : 12 to 35 V, internal protection against polarity inversion.
Common mode rejection ratio : >80dB.
Galvanic isolation : 3.75 KVrms. between input and output
Input current required ≧3.8mA
Current limit ≦23mA
Operating temperature : 0 to 55°C
Humidity : 0 to 90% RH
Electromagnetic compatibility (EMC) : En 50081-2, En 50082-2
Dimension : shown in Figure 1.
Housing material : ABS plastic. UL 94V0
Weight :M-422 65g, M-355 19g.

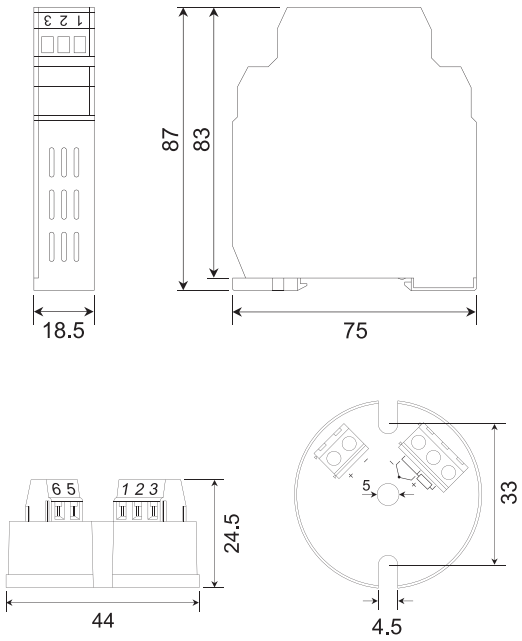
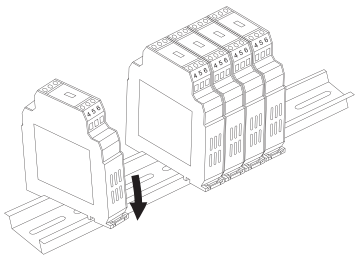
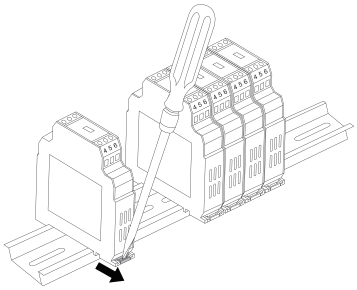


Figure 1. Dimension in mm

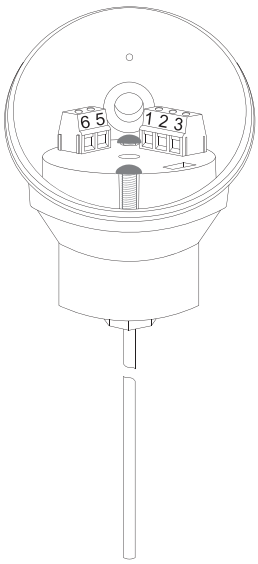
Installation



Mounting



Removing



Mounting

Electrical Connection

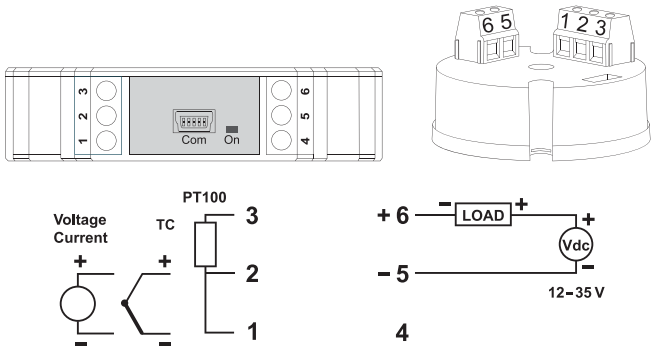


Figure 2. Terminal connections

Wiring Specification :

Srew tightening torque : M-422 4.3 lb-in, M-355 3.5 lb-in

Wire range : M-422 12~30 AWG. M-355 16~26 AWG

Wire strip length :M-422 6~7mm,M-355 5~6mm

Wiring Precaution :

1. Always keep signal wires away from power or contactor wires.
2. The power supply of the transsmiter should not be shared with contactors, electrical motor and other inductive devices.

The various input signals of M-422 are divided into three groups.

1. TC/RTD/mV: Thermocouple type (J, K, T, E, B, R, S, N, C), Pt100 and voltage input in the range of -60mVdc~60mVdc.
2. Current : 0~24 mA. (not selectable for M-355)
3. Voltage : -10~10Vdc. (not selectable for M-355)

For the three different groups of input signal type, An internal DIP switch SW1 on M-422 should be set according to the Table 2.

	1	2	3
TC/RTD/mV*	OFF	OFF	ON
0~24mA	ON	OFF	ON
-10V~10V	OFF	ON	OFF

*Factory Setting

Note : Special request of 0~24mA and -10~10Vdc input for M-355, Please contact your supplier.

Table 2. Internal DIP switch setting

To change the SW1on M-422, please open the cover as shown in Figure 3.

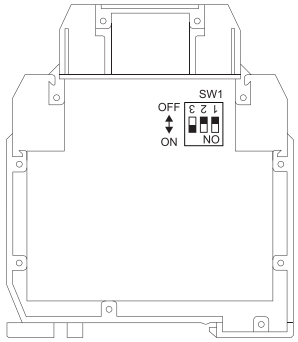


Figure 3. Internal DIP switch

Operation

All input signals and the output current are calibrated within the specified accuracy at factory. However, a recalibration is implemented to provide fine adjustments to the input and output signal in the field. This is accomplished by the PC software.

Configuration

The M-422 and the M-355 transmitters are user configurable with the PC software and the PC interface cable.

- The PC software user-friendly software. For latest release please contact the supplyer
- **The PC Interface cable** consist of interface converter and USB plug. It can be purchased separately from the supplier.

During configuration the transmitter can work alone with or without connecting to a power source. The configuration connection is shown in Figure 4.

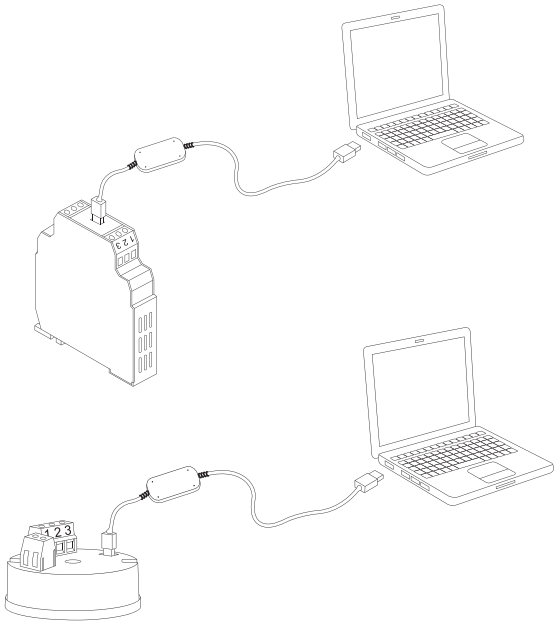


Figure 4. Configuration connection

Figure 5 show the configuration screen of the PC SW. The help menu provides further detail information about the transmitter and the software. The Configurable parameters are :

1. **Input signal type :** Various input signal type can be selected among the available options.
2. **Unit :** Select the unit (°C or °F) of temperature measurement. For linear input (voltage or current), it doesn't effect the measurement.
3. **Measuring range :** Defines the lowest and highest value of measuring range. Within the range, the transsmiters converting input signals into an scalable 4 to 20mA analogue output signal.

4. **Output direction :** Defines the scalable analogue output signal to be 4 to 20mA or 20 to 4mA.
5. **Fault signal on sensor break :** Defines the output signal to be
   (1) Downscale (<4mA).
   (2) upscale (>20mA).
   (3) Cut. Limit the output signal within the output range when the input is out of measuring range.
6. **Offset Correction :** Allows to eliminate the offset error of measuring value.
7. **4~20mA Output Signal Calibration :** Zero and Span adjustment of output signal. A power source shoule be connected as Figure 6.
8. **Measuring value :** Read the measuring value from transmitter continually.
9. **Device information :** Indicate the device model, firmware version, series number and communication status.

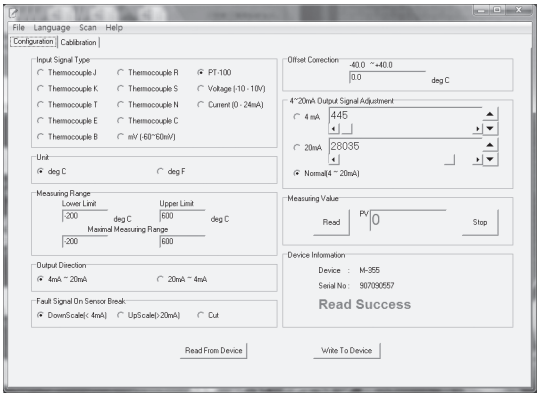


Figure 5. Configuration screen

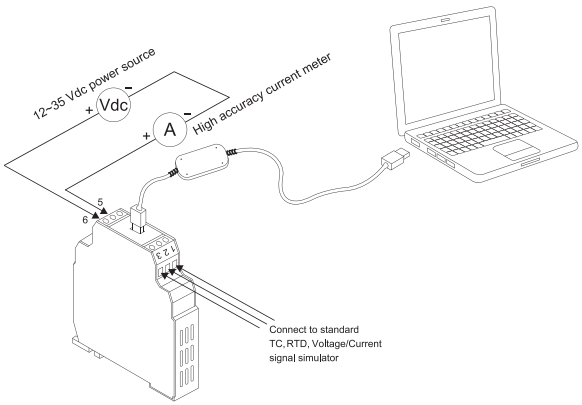
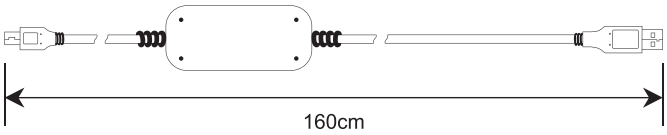


Figure 6. Calibration connection

Accessary

PC-Interface cable and PC softaware



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