

# INSTRUCTION MANUAL

## MP - SERIES:

**MP82710H & MP88710H**

**MP82710 & MP88710**

**MP82810 & MP88810**

**MP82820-R & MP88820-R**

**Mp82830-R**

**Mp82820-T & Mp88820-T**

**Mp82830-T**



## CONTENTS

Type overview  
 Specifications  
 ATEX  
 Safety instructions  
 Connection diagram  
 Instructions for all Mp type transmitters  
 Programming instructions Mp Software  
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## WARRANTY

Our transmitters have a 5 year warranty.  
 Follow usage instruction in this manual.  
 In case of malfunction return to your supplier.

## SPECIFICATIONS

### GENERAL INTRODUCTION:

Our Microprocessor based transmitters are divided in the 2 wire headmount series Mp82000, the rail mount series Mp88000 and the 4 wire Mp87000. NOTE: The 4 wire transmitters are not described in this manual! All models are easily programmed via a personal computer with our software and interface.

| Model     | Headmount | Railmount | 2-wire | 4-wire | RTD only | T/C only | All inputs | Isolated | Hart® | ATEX |
|-----------|-----------|-----------|--------|--------|----------|----------|------------|----------|-------|------|
| Mp82820-R | •         |           | •      |        | •        |          |            |          |       |      |
| Mp82830-R | •         |           | •      |        | •        |          |            |          |       |      |
| Mp82820-T | •         |           | •      |        |          | •        |            |          |       |      |
| Mp82830-T | •         |           | •      |        |          | •        |            |          |       |      |
| Mp82810   | •         |           | •      |        |          |          | •          |          |       |      |
| Mp82710   | •         |           | •      |        |          |          | •          | •        |       | *    |
| Mp82710-H | •         |           | •      |        |          |          | •          | •        | •     | *    |
| Mp88820-R |           | •         | •      |        | •        |          |            |          |       |      |
| Mp88820-T |           | •         | •      |        |          | •        |            |          |       |      |
| Mp88810   |           | •         | •      |        |          |          | •          |          |       |      |
| Mp88710   |           | •         | •      |        |          |          | •          | •        |       | *    |
| Mp88710-H |           | •         | •      |        |          |          | •          | •        | •     | *    |
| Mp87800   |           | •         |        | •      |          |          | •          |          |       |      |
| Mp87700   |           | •         |        | •      |          |          | •          | •        |       |      |

\* ATEX certification optionally available



**Specifications**

|                               |  |  |
|-------------------------------|--|--|
| Input                         | <b>Mp82810 / Mp88810</b><br>RTD: Pt100, Pt250, Pt500, Pt1000<br>Ni100, Ni500, Ni1000, Cu10, Cu100<br>T/C: K, J, T, E, L, U, R, S, B, C, D, N<br>Volt & Ohm | <b>Mp82710(H) / Mp88710(H)</b><br>RTD: Pt100, Pt250, Pt500, Pt1000<br>Ni100, Ni500, Ni1000, Cu10, Cu100<br>T/C: K, J, T, E, L, U, R, S, B, C, D, N<br>Volt & Ohm |
| Minimum Span                  | RTD: 25 K<br>T/C: 50 K   | RTD: 25 K<br>T/C: 50 K   |
| Output                        | 4...20 mA / 20...4 mA  | 4...20 mA / 20...4 mA  |
| Linearization                 | On / Off   | On / Off   |
| Supply *) Polarity protected  | 5...40 VDC   | 5...40 VDC (H 12...40VDC)  |
| Supply effect                 | 0.001% / V   | 0.003% / V   |
| Zero Drift                    | $\pm 0.01\%/^{\circ}\text{C}$ or $\pm 0.02^{\circ}\text{C}/^{\circ}\text{C}$   | $\pm 0.01\%/^{\circ}\text{C}$ or $\pm 0.02^{\circ}\text{C}/^{\circ}\text{C}$   |
| Span Drift                    | $\pm 0.01\%/^{\circ}\text{C}$ or $\pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$   | $\pm 0.01\%/^{\circ}\text{C}$ or $\pm 0.02^{\circ}\text{C}/^{\circ}\text{C}$   |
| Long term Drift               | $\pm 0.05\%/year$  | $\pm 0.05\%/year$  |
| Cold Junction Drift           | $\pm 0.03^{\circ}\text{C}/^{\circ}\text{C}$  | $\pm 0.03^{\circ}\text{C}/^{\circ}\text{C}$  |
| Excitation Current RTD        | 0.1 mA   | 0.1 mA   |
| Sensor Lead Resistance RTD    | 500 Ohm max.   | 500 Ohm max.   |
| Sensor Lead Resistance Effect | 0.005 $^{\circ}\text{C}/\text{Ohm}$  | 0.005 $^{\circ}\text{C}/\text{Ohm}$  |
| Sensor Lead Resistance T/C    | 10,000 Ohm max.  | 10,000 Ohm max.  |
| Open Circuit Detection        | Upscale / Downscale  | Upscale / Downscale  |
| Load Capability               | Vbat-5V / 20mA   | Vbat-5V / 20mA (H: Vbat-12V / 20mA)  |
| Start Up Time                 | 5 sec  | 5 sec  |
| Warm Up Time                  | 2 min  | 2 min  |
| Isolation                     | none   | 1500 V AC / 1 min.   |
| Ambient Operating Temperature | -40 $^{\circ}\text{C}$ ...+85 $^{\circ}\text{C}$   | -40 $^{\circ}\text{C}$ ...+85 $^{\circ}\text{C}$   |
| Storage Temperature           | -40 $^{\circ}\text{C}$ ...+100 $^{\circ}\text{C}$  | -40 $^{\circ}\text{C}$ ...+100 $^{\circ}\text{C}$  |

|                          |                                    |
|--------------------------|------------------------------------|
| Housing Material Mp82    | Zinc Alloy (ZAMAK 5), Epoxy coated |
| Dimensions               | 43mm Dia. x 27mm H.                |
| Dimensions With Read-out | 43mm Dia. x 36mm H.                |

|                       |                              |
|-----------------------|------------------------------|
| Housing Material Mp88 | Makrolon                     |
| Dimensions            | 75mm H. X 22.5mm W x 99mm D. |

\*) NOTE: For ATEX approved equipment different power requirements may apply!

**Specifications**

|                               |  |  |
|-------------------------------|--|--|
| Input                         | <b>Mp82820-R / Mp82830-R / Mp88820-R</b><br>RTD: Pt100, Pt250, Pt500, Pt1000,<br>Ni100, Ni500, Ni1000, Ohm | <b>Mp82820-T / Mp82830-T / Mp88820-T</b><br>T/C: K,J,T,E,N |
| Minimum Span                  | 25 K   | 50 K   |
| Output                        | 4...20 mA or 20...4 mA   | 4...20 mA or 20...4 mA                                     |
| Linearization                 | On / Off   | On / Off   |
| Cold junction compensation    | On / Off   | On / Off   |
| Supply *) Polarity protected  | 5...40 VDC   | 5...40 VDC   |
| Sensor Lead Resistance RTD    | 500 Ohm max.   | 500 Ohm max.   |
| Sensor Lead Resistance T/C    | 10,000 Ohm max.  | 10,000 Ohm max.  |
| Open Circuit Detection        | Upscale / Downscale  | Upscale / Downscale  |
| Load Capability               | Vbat-5V / 20mA   | Vbat-5V / 20mA   |
| Start Up Time                 | 5 sec  | 5 sec  |
| Warm Up Time                  | 2 min  | 2 min  |
| Isolation                     | none   | none   |
| Ambient Operating Temperature | -40 $^{\circ}\text{C}$ ...+85 $^{\circ}\text{C}$   | -40 $^{\circ}\text{C}$ ...+85 $^{\circ}\text{C}$           |
| Storage Temperature           | -40 $^{\circ}\text{C}$ ...+100 $^{\circ}\text{C}$  | -40 $^{\circ}\text{C}$ ...+100 $^{\circ}\text{C}$          |
| Housing Material Mp82820/30   | Makrolon   |  |
| Dim. Mp82820                  | 43mm Dia. x 23mm H.  |  |
| Mp82830                       | 43mm Dia. x 21mm H.  |  |
| Housing Dim. with cover       | 49mm Dia. x 25mm H.  |  |
| Housing Material Mp88         | Makrolon   |  |
| Dimensions                    | 75mm H. X 22.5mm W x 99mm D.   |  |



# ATEX

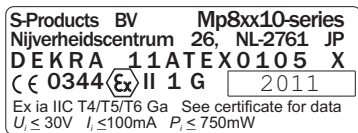
## GENERAL:

Some models of the MP series are available in an intrinsically safe version and meet the requirements of the ATEX directive 94/9/EC.



## MARKING:

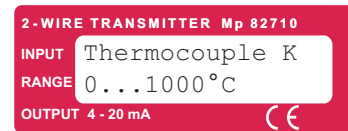
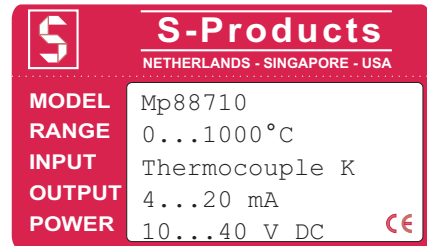
All ATEX approved units carry the following labels:



Year of production  
Serial No. i.e.:

+ C04164 +

General product labels



## Certificate Number

Mp82710, Mp82710H, Mp88710, Mp88710H, Mp82000D  
DEKRA 11ATEX0105 X

## Parameters for products certified with certificate DEKRA 11ATEX0105 X:

### Mp82710, Mp82710H, Mp88710, Mp88710H and Mp82000D:

Supply circuit:

$U_i = 30$  V DC

$I_i = 100$  mA

$P_i = 750$  mW

$L_i = 0$  mH

$C_i = 0$  nF

Input circuit:

$U_o = 6,3$  V DC

$I_o = 165$  mA

$P_o = 242$  mW

$L_o = 1$  mH

$C_o = 34,5$   $\mu$ F

CE 0344 Ex II 1 G

Ex ia IIC Ga

T4 ( $T_{amb}$  -40...+85°C)

T5 ( $T_{amb}$  -40...+75°C)

T6 ( $T_{amb}$  -40...+60°C)

CE 0344 = CE marking Notified Body



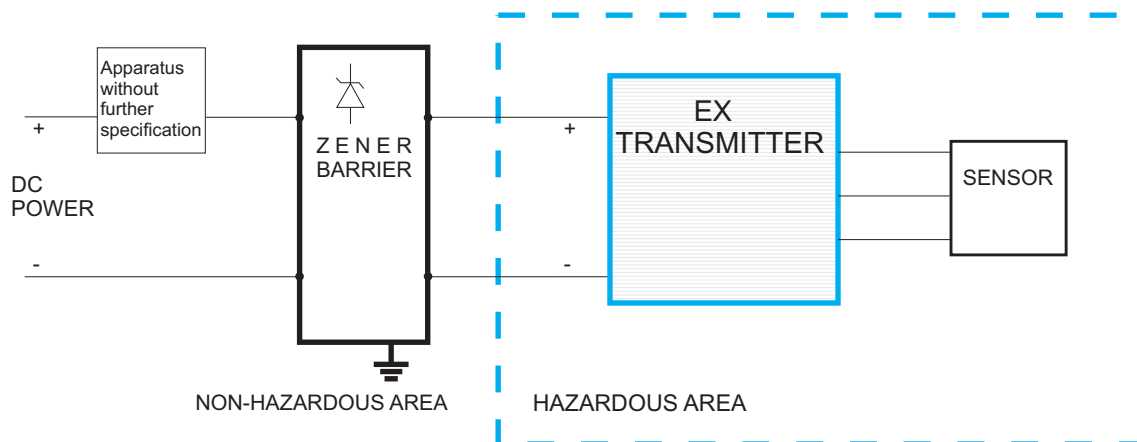
II = Group

1 G = Category 1, Gas

ia = intrinsic safety

IIC = Hydrogen and Acetylene Gas

T4...T6: Temperature Classification



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Document No. Manual MP 2-wire.cdr - Issue 230713

**NORMATIVE REFERENCE:**

The transmitters Mp82710, Mp82710H, Mp88710, Mp88710H and plug-in display Mp82000D have an EC Type examination certificate issued by DEKRA and have been approved to the following standards:

- EN 60079-0 : 2012
- EN 60079-11 : 2012
- EN 60079-26 : 2007

**SPECIAL CONDITIONS FOR SAFE USE:**

For electrical data and temperature data see EC-Type examination certificate DEKRA 11ATEX0105 X

**INSTALLATION REQUIREMENTS:**

- ATEX approved equipment is only to be connected to a Zenerbarrier.

The Temperature Transmitter must be mounted in an enclosure providing a degree of ingress protection of at least IP20 per EN 60529.

This enclosure must be in conformance with Clauses 4.3 and 4.4 of EN 50284, when the Temperature Transmitter is mounted in an area where the use of category 1 G apparatus is required.

This enclosure must be in conformance with Clauses 7.3 and 8.1 of EN 50014, when the Temperature Transmitter is mounted in an area where the use of category 2 G apparatus is required.

The mentioned Clauses describe how to avoid danger of ignition due to electrostatic charges.

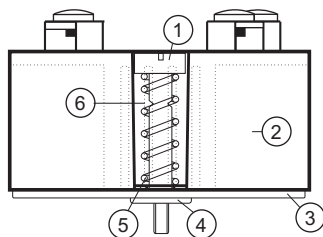
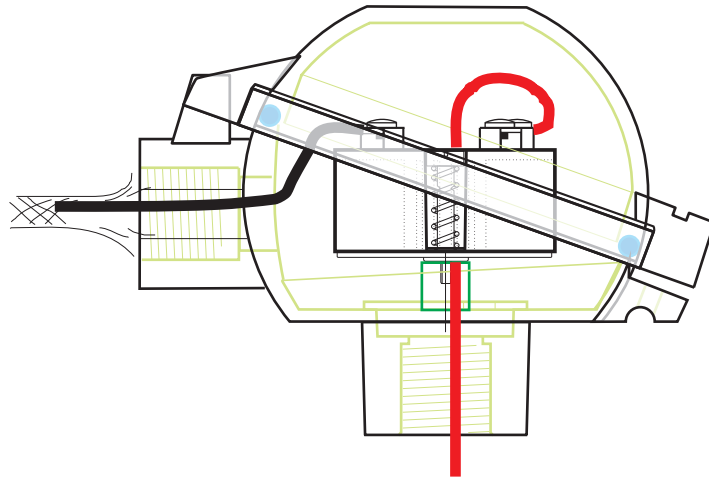
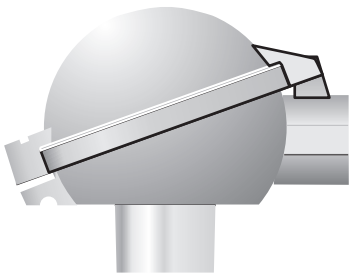
- All transmitters Mp82000 and Mp88000 have an ingress protection of IP20.

This requires usage in a dry, clean and well controlled environment.

Mount the Mp82000 transmitter in a (DAN) head as described below..

- It is preferred to use twisted pair, shielded cable to connect the transmitter to its power supply in order to obtain the best immunity to Electromagnetic signals. On the power supply side connect the shield to the power supply's earthing point, on the transmitter side connect the shield to the grounded head somewhere close to the transmitter.

Make sure the transmitter is firmly connected to the head.



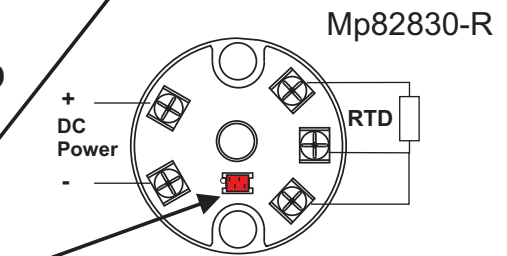
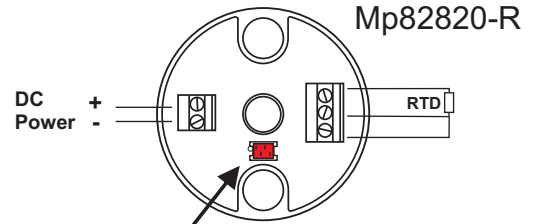
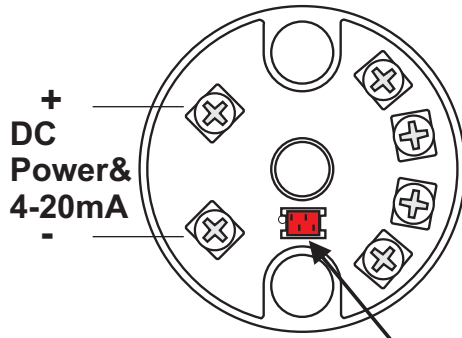
**MOUNTING in CONNECTION HEAD**

- 1. Screw M4
- 2. Transmitter
- 3. Measuring insert plate
- 4. Ferrule
- 5. Spring
- 6. Notch



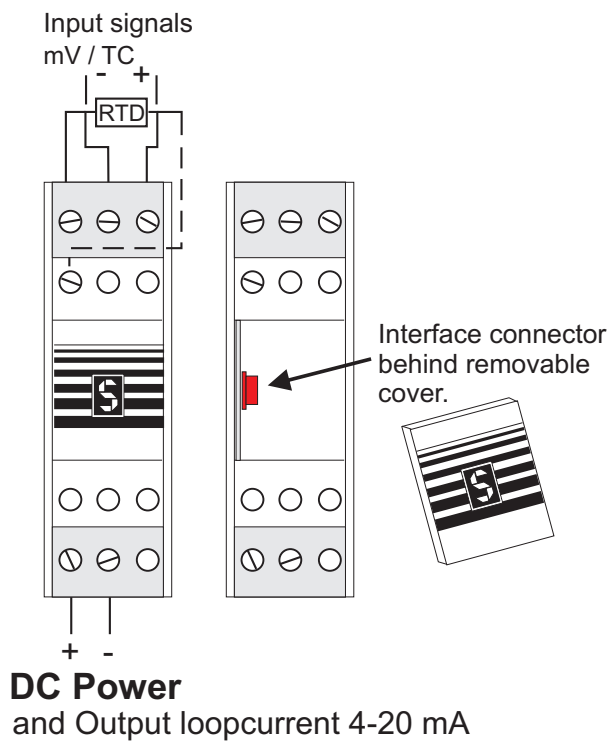
## CONNECTIONS

Mp82710(H) / Mp82810



Interface connector  
also used for connecting the optional display unit (Mp82810 / Mp82710(H) only).

Mp88820-R / Mp88820-T / Mp88810 / Mp88710(H)

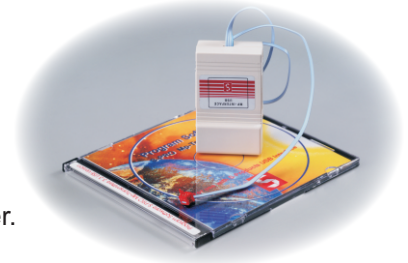


### **General Instructions for the user**

(not required for factory calibrated transmitters)

1. Insert the CD-ROM into your computer.  
The Software will start automatically. (Or you may run MpUser\_Setup\_V44.exe)  
Just follow the on-screen instructions.  
Required is at least Windows 98 or NT and 1MB free space.

2. Connect the interface to the USB port of your computer.  
Attach the interface to the transmitter.  
Start the installed S-PRO Mp - software by clicking the "S"-icon.  
First click Upload to read the settings from your transmitter.  
Select the required parameters and download these into the transmitter.



3. After programming you may connect the transmitter as shown in the connections drawing.

4. An optional display unit may be connected to the interface connector (Mp82 and Mp87 series), after connecting power and a sensor.

### **HART® protocol transmitters**

Selecting sensor and range can be done exactly the same as described before for all our transmitters with the MP software.

In order to use HART protocol you need a HART compatible interface and software or a handheld terminal.

Connect with a resistor in the loop as required by HART.

The transmitters know 14 universal commands and 5 common-practice commands:

- 0 Read unique identifier (ID)
- 1 Read primary variable
- 2 Read current and % of range
- 3 Read current and 4 (2) dynamic var
- 6 Write polling address
- 11 Read unique ID associated with tag
- 12 Read message
- 13 Read tag, descriptor, date
- 14 Read PV sensor information
- 15 Read output information
- 16 Read final assembly number
- 17 Write message
- 18 Write tag, descriptor, date
- 19 Write final assembly number
  
- 34 Write damping value
- 35 Write range values
- 40 Enter/Exit fixed current mode
- 49 Write PV sensor
- 59 Write # of response preambles

Note:  
It is not possible to change °C into °F  
or vice versa with a HART command.

Use the S-Pro Mp software to program  
the transmitter



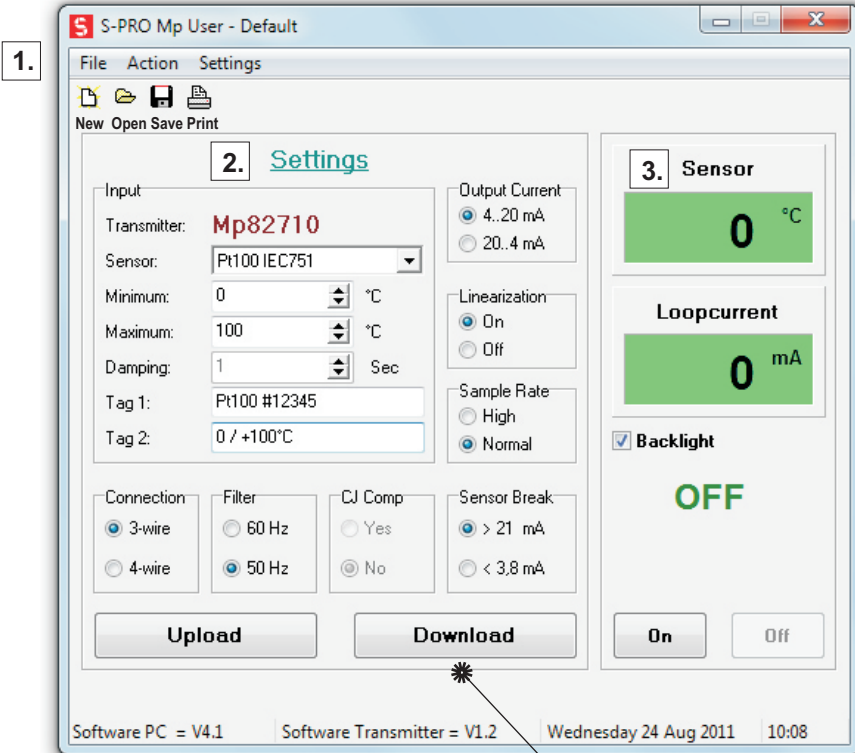
## S-PRO MpUser Software

### General

This program uses the basic Windows® features like Save, Print, and Exit.

We refer to the Windows Help Manual for file handling.

Without a mouse you can reach the menu-items pressing both ALT and the underlined key. You can jump between the settings with TAB.



Note that you will only get a Sensor / Loopcurrent readout on screen if the transmitter is connected to a sensor.

### 3. On-Screen Readout

In the Sensor display you'll see the actual input value provided the programmed sensor is connected. Loopcurrent is a calculated value.

Click On to start and Off to stop the on-screen display. You must turn the on-screen display off before changing settings.

### 1. File - Action - Settings

It is possible to save your settings for later use, to open a previous configuration or to print the present configuration. Either click on **F**ile or on one of the icons.

The large **U**pload and **D**ownload buttons are also located under **A**ction.

With a transmitter connected use **U**pload to find out the settings of your transmitter.

After you made the required selections use **D**ownload to program the transmitter.

**S**ettings is an important menu item. Here you can select °C or °F and the **C**OM port. You can check which COM-port has been assigned to the interface in your Windows Hardware Configuration Screen.

### 2. Settings

**NOTE:** Make sure to switch the on-screen readout Off, otherwise you can't alter the settings!

**Transmitter :** Use Upload to automatically detect transmitter model connected (connect transmitter first).

**Sensor :** You may select the input sensor from a list. The choice is limited by the transmitter type. Thermocouple alloys are mentioned.

**Minimum and Maximum :** Input values for output current start and end. Default are the range minimum and maximum of the selected sensor.

**Tag 1 and Tag 2 :** Any comment you'd like to add. (max. 16 characters)

**Connection :** The number of lead wires on your RTD sensor (i.e. Pt100).

**Filter :** Set to 50 Hz for Europe and 60 Hz for USA.

**CJ Comp :** Cold Junction Compensation for Thermocouples.

**Sensor Break :** Fixation of the loopcurrent on sensor malfunction.

**Output Current :** Choose min...max = 4...20 mA or 20...4 mA (Mp87000: The 0..1V/10V/0..20mA is automatic)

**Linearization :** Select On to linearize the input curve, or Off if you require the output curve to be the same as the input.

**Sample Rate :** Select High for high sample rate, or Normal for standard sample rate.

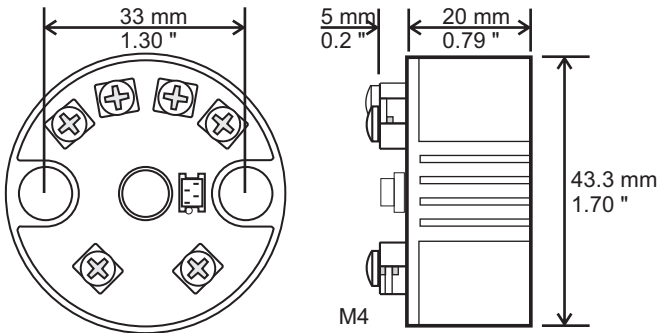
**U**pload : Read the configuration from the transmitter.  
**D**ownload : Write your settings to the transmitter.



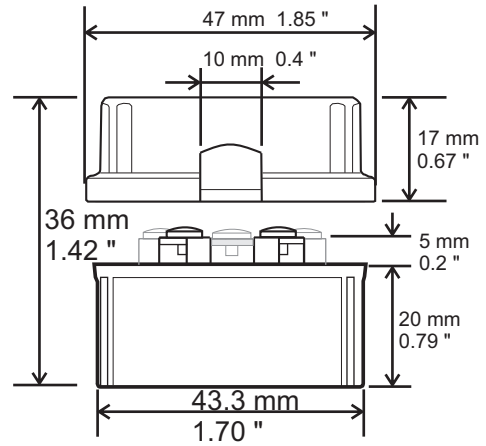


# DIMENSIONS

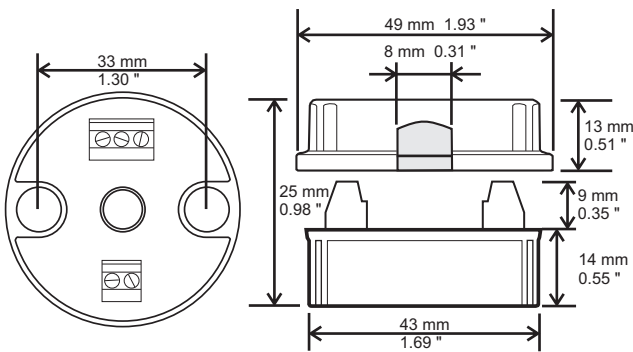
Mp82710(H)  
Mp82810



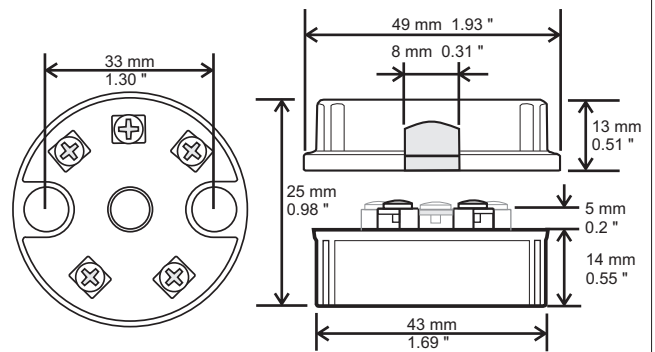
Mp82710(H) with display  
Mp82810 with display



Mp82820-R



Mp82830-R



Mp88710(H)  
Mp88810  
Mp88820-R  
Mp88820-T

