

# INSTRUCTION MANUAL

## MP - SERIES:

*MP82700 & Mp82700-H*  
*MP82800 & MP82800-R*  
*MP82850*  
*MP88700 & MP88700-H*  
*MP88800 & MP88800-R*



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 Instructions for all Mp type transmitters except Mp82850-R  
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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 "Point 'N Click" Software.

Type	headmount	railmount	2-wire	isolated	Pt100	Tc K/J/T/E	Other Tc	HART®	ATEX
Mp82700	•		•	•	•	•	•	•)	•
Mp82800	•		•		•	•			•
Mp82800-R	•		•		•				•
Mp82850	•		•		•				
Mp88700		•	•	•	•	•	•	•)	•
Mp88800		•	•		•	•			•
Mp88800-R		•	•		•				•
Mp87800		•			•	•			
Mp87700		•		•	•	•	•		

• ) = HART not yet in combination with ATEX



**Specifications**

Input

**Mp82800 / Mp88800**RTD: Pt100  
T/C: K, J, T, E**Mp82700 / Mp88700**RTD: Pt100, P1500, Pt1000  
Ni100, Ni500, Ni1000, Cu10, Cu100  
T/C: K, J, T, E, L, U, R, S, B, C, D, N  
Volt & Ohm

Minimum Span

RTD: 25 K  
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

10...40 VDC

10...40 VDC

Supply effect

0.001% / V

0.001% / V

Max. Ripple

10V PP; Min Vbat - 10 VDC

10V PP; Min Vbat - 10 VDC

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

 $\pm 0.005\%/^{\circ}\text{C}$  or  $\pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$  $\pm 0.005\%/^{\circ}\text{C}$  or  $\pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$ 

Long term Drift

 $\pm 0.05\%/year$  $\pm 0.05\%/year$ 

Cold Junction Drift

 $\pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$  $\pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$ 

Excitation Current RTD

0.1 mA

0.1 mA

Sensor Lead Resistance RTD

500 Ohm max.

500 Ohm max.

Sensor Lead Resistance Effect

0.001  $^{\circ}\text{C}/\text{Ohm}$ 0.001  $^{\circ}\text{C}/\text{Ohm}$ 

Sensor Lead Resistance T/C

10,000 Ohm max.

10,000 Ohm max.

Open Circuit Detection

Upscale / Downscale

Upscale 21.7mA / Downscale 3.7mA

Load Capability

Vbat-10V / 20mA

Vbat-10V / 20mA

Start Up Time

20 sec

20 sec

Warm Up Time

5 min

5 min

Isolation

none

1500 V AC

Ambient Operating Temperature

 $-40^{\circ}\text{C}...+85^{\circ}\text{C}$  $-40^{\circ}\text{C}...+85^{\circ}\text{C}$ 

Storage Temperature

 $-40^{\circ}\text{C}...+100^{\circ}\text{C}$  $-40^{\circ}\text{C}...+100^{\circ}\text{C}$ 

Response time

3 sec

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

Input

**Mp82800-R / Mp88800-R**

RTD: Pt100 3-wire

**Mp82850-R**

RTD: Pt100 3-wire

Minimum Span

25 K

25 K

Output

4...20 mA or 20...4 mA

4...20 mA or 20...4 mA

Linearization

On / Off

On

Supply \*)

11...40 VDC, Polarity Protected

12...36 VDC, Polarity Protected

Supply effect

0.02% / V

0.02% / V

Max. Ripple

10V PP; Min Vbat - 11 VDC

10V PP; Min Vbat - 12 VDC

Zero Drift

 $\pm 0.02\%/^{\circ}\text{C}$  or  $\pm 0.02^{\circ}\text{C}/^{\circ}\text{C}$  $\pm 0.02\%/^{\circ}\text{C}$  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  $\pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$ 

Long term Drift

 $\pm 0.1\%/year$  $\pm 0.1\%/year$ 

Excitation Current RTD

0.1 mA

0.1 mA

Sensor Lead Resistance RTD

500 Ohm max.

500 Ohm max.

Sensor Lead Resistance Effect

0.01  $^{\circ}\text{C}/\text{Ohm}$ 0.01  $^{\circ}\text{C}/\text{Ohm}$ 

Open Circuit Detection

Upscale or Downscale

Upscale or Downscale

Load Capability

Vbat-11V / 20mA

Vbat-12V / 20mA

Start Up Time

30 sec

30 sec

Warm Up Time

5 min

5 min

Isolation

none

none

Ambient Operating Temperature

 $-40^{\circ}\text{C}...+85^{\circ}\text{C}$  $-30^{\circ}\text{C}...+85^{\circ}\text{C}$ 

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

Housing Dimension 43mm Dia. x 27mm H.

Housing dimension with Read-Out 43mm Dia. x 36mm H.



# ATEX

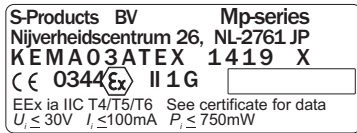
## GENERAL:

The MP series is available in an intrinsically safe version and meets the requirements of the ATEX directive 94/9/EC.



## MARKING:

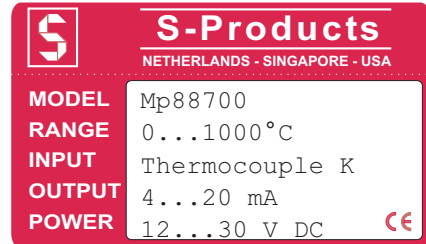
All ATEX approved units carry the following labels:



Year of production  
Serial No. i.e.:

+ **C05200** +

General product labels



**Certificate No.** Mp82700, Mp88700, Mp82800, Mp88800, Mp82800-R, Mp88800-R Display  
KEMA 03ATEX 1419 X

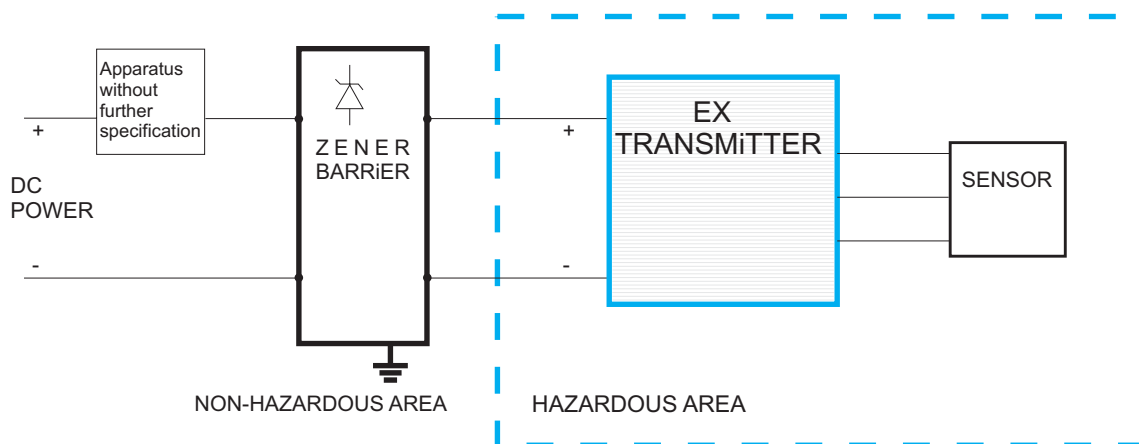
## Parameters:

Connect to a Zenerbarrier with the following maximum values:

$U_i = 30$  V DC  
 $I_i = 100$  mA  
 $P_i = 750$  mW  
 $L_i = 0$  mH  
 $C_i = 0$  nF

CE 0344 II 1 G  
EEx ia IIC  
T4 ( $T_{amb} -40...+85^{\circ}C$ )  
T5 ( $T_{amb} -40...+75^{\circ}C$ )  
T6 ( $T_{amb} -40...+60^{\circ}C$ )

CE 0344 = CE marking Notified Body  
 II = Group  
1 G = Category 1, Gas  
ia = intrinsic safe  
IIC = Hydrogen and Acetylene Gas  
T1...T6: Temperature Classification



## NORMATIVE REFERENCE:

The transmitters have an EC Type examination certificate issued by KEMA and have been approved to the following standards:

EN 50014  
EN 50020  
EN 50284



**S-Products B.V.** Nijverheidscentrum 26, NL-2761JP Zevenhuizen, The Netherlands, Tel: +31 180 633455, Fax: +31 180 633644  
**S-Products Inc.** 35, Kings Highway East, Fairfield, CT 06825, USA, Tel: +1 203 331 9546, Fax: +1 203 335 2723  
E-mail: info@s-products.com Internet: www.s-products.com

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## **NORMATIVE REFERENCE:**

The transmitters Mp82700, Mp82800, Mp88700 and Mp88800 have an EC Type examination certificate issued by KEMA and have been approved to the following standards:

EN 50014  
EN 50020  
EN 50284

## **SPECIAL CONDITIONS FOR SAFE USE:**

For electrical data and temperature data see EC-Type examination certificate KEMA 03ATEX1419 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.

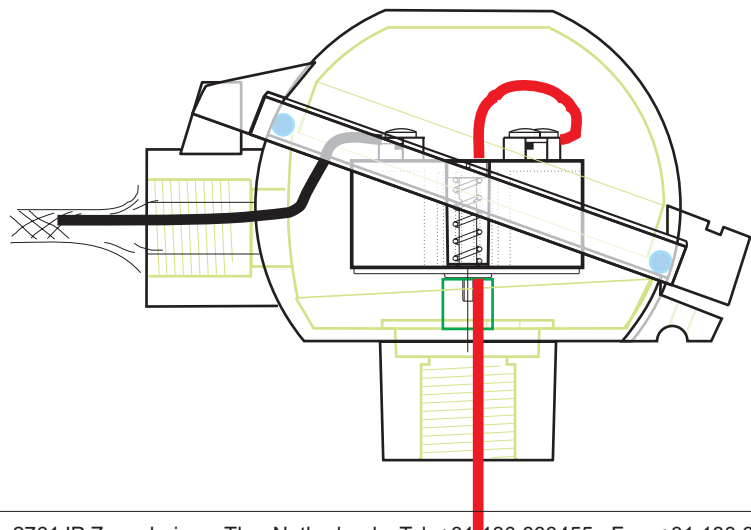
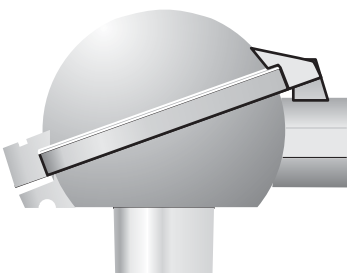
- All transmitters Mp82000 and Mp88000 have an ingress protection of IP20.

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

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

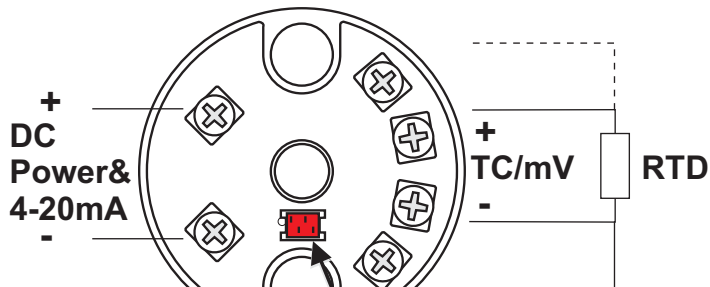


- It is preferred to use twisted pair, shielded cable to connect the transmitter to its power supply in order to obtain the best immunity to Electromagnetic signals. On the power supply side connect the shield to the power supply's earthing point, on the transmitter side connect the shield to the grounded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

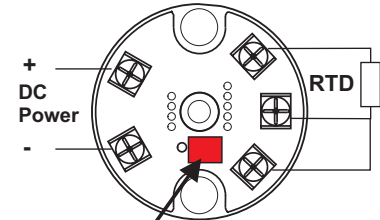


## CONNECTIONS

Mp82700 (H) / Mp82800

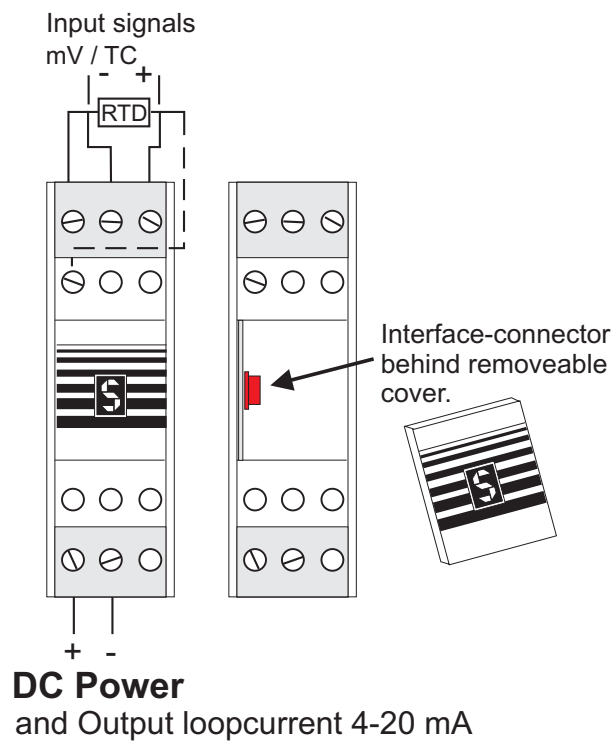


Mp82800-R / Mp82850-R



Interface-connector  
also used for connecting the optional display unit.

Mp88700 (H) / Mp88800 / Mp88800-R



### **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 SETUP.EXE)  
Just follow the on-screen instructions.  
Required is at least Windows 95 or NT and 1MB free space.

2. Connect the interface to the serial port of your computer.  
(Usually COM1 or COM2; Default is set to COM2)  
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.  
(Try again if you get a "communication error")  
Select the required parameters and download these into the transmitter.



**NOTE: SOME LAPTOP COMPUTERS CANNOT SUPPLY ENOUGH POWER TO PROGRAM THE TRANSMITTER. IN THESE CASES YOU WILL NEED OUR ALTERNATIVE Mp-INTERFACE WITH BATTERY SUPPORT!**

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, 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:

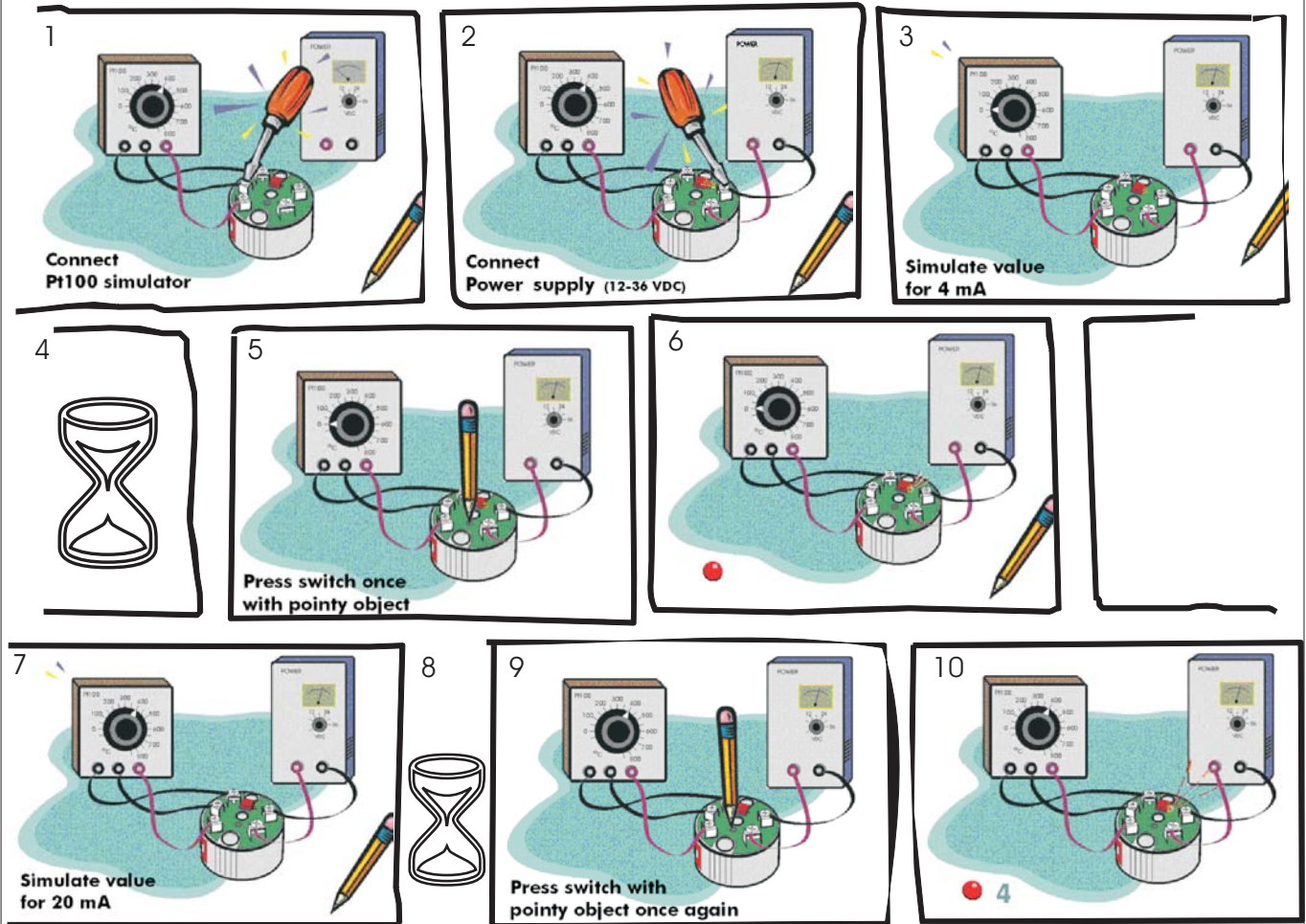
- 0 Read unique identifier (ID)
- 1 Read primary variable
- 2 Read current and % of range
- 3 Read current and 4 (2) dynamic var
- 6 Write polling address
- 11 Read unique ID associated with tag
- 12 Read message
- 13 Read tag, descriptor, date
- 14 Read PV sensor information
- 15 Read output information
- 16 Read final assembly number
- 17 Write message
- 18 Write tag, descriptor, date
- 19 Write final assembly number

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

- 34 Write damping value
- 35 Write range values
- 40 Enter/Exit fixed current mode
- 49 Write PV sensor
- 59 Write # of response preambles





**Calibration Instructions Mp82850-R**

1. Connect Pt100 simulator
2. Connect power supply (12-36 VDC)
3. Simulate calibration value for 4 mA  
(i.e. upper value in case of 20-4 mA output)
4. Wait for the input to stabilize (3-5 sec)
5. Press switch with pointy object once
6. The inside light emitting diode (LED) will start to flash slowly
7. Now simulate the calibration value for 20 mA  
note: minimum span must be 25°C
8. Wait for the input to stabilize
9. Press switch with pointy object once again
10. The inside LED will flash fast four times to indicate  
the calibration has been completed

Note: The red connector is to connect an optional display unit



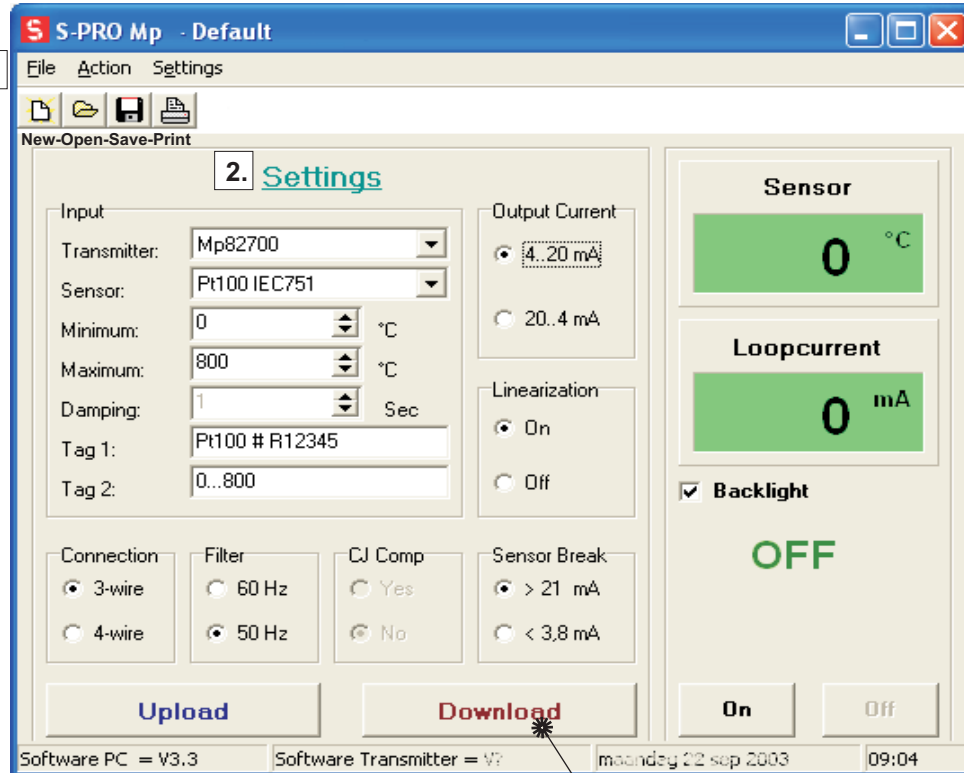
## S-PRO Mp Software

### 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 quit the on-screen display. You must quit 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 File or on one of the icons.

The large Upload and Download buttons are also located under Action.

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.

Settings is an important menu item. Here you can select °C or °F and the **C**OM port.

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

### 2. Settings

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

**Transmitter :** Select the transmitter type connected, or use Upload to find out.

**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.

**Damping :** For Hart-protocol transmitters only, to slow down the output signal.

**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.



