

# Operating Manual

## Digital Display

Type M2229



## Warranty

Mostec warrants this product to be free of manufacturing defects for a 2-year period after the original date of purchase. Within this period, defective products will be repaired free of charge provided that the defect occurred during normal operation. This warranty does not cover damage to the product resulting from ordinary usage such as front panel scratches, broken control elements and corrosion, etc. The customer is responsible for shipping and packing charges for products returned under warranty to Mostec. Mostec warrants this product beyond the 2-year warranty period for an additional 2 years in case of long term damages due to improper manufacturing. Such damages as poorly soldered joints or other assembly problems are also covered by the warranty. Transportation damages are not covered by the warranty and should be referred to the respective delivery service.

## Technical description

The digital display M2229 can be used to monitor or control any type of signal current or voltage. It converts the input signal to an internal standard signal of for example 0 to 100.0%. Within this range two alarm contacts can be set independently. A 4-digit LED display shows the actual value and setpoints or alarm values in the range of -1999 to 9999 units.

All settings as alarm values, hysteresis, range and operating mode of the floating contacts can be defined with a link cable, connected to a personal computer or a laptop. Both contacts can also be programmed with the keyboard. Power supply: Universal supply 20 to 253VAC/DC

A typical application would be to measure and monitor pressure in a process vessel. The pressure transmitter converts the pressure of 1 to 10 bar to a current signal of 4 to 20mA. The M2229 monitors under- and overpressure in the vessel. It converts the 4... 20mA signal current to 1.00...10.00bar. The alarm is set between 1.00bar and 10.00bar. With these floating alarm contacts, overpressure valves, compressors, etc. can be driven directly.

Options:

1. Pt-100, Pt-1000, Ni-200, Ni-1000 Temperature input.
2. Frequency input.
3. Conductivity, pH and rH input
4. Isolated output signal of 0...20mA, 4...20mA, 0 ... 10V or custom specifications.

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## A. Font panel controls



## B. Adjusting the limit contacts with the keyboard

The setpoint values of the limit contacts can be changed without programming Software and PC.

### 1. Unlock the user menu / insert or modify the menu protection access code:

The values of the user menu can be protected from unintended access using an access code. After activating the access code, menu values can be observed but no longer modified. To modify setpoints and other parameters, the access code has to be set to the value 0000. If the code has a value different from 0000, writing to the user menu is suppressed.

Set the access code:

1. Press and hold both buttons <ENTER> und <ESC> for 4 seconds.  
⇒ After 4 seconds The display shows SP\_1 indicating the user menu.
2. Now navigate to the Code menu item with the button <->, then press <ENTER>.
  - a) A code has already been entered: The display flashes between Code und 0. Enter now the valid access code with the buttons <+> and <-> and confirm with the <ENTER> key. If the code is wrong, the instrument quits the user menu (in case you do not know your code any more, call MOSTEC we have a unlock code). If the code is correct, it can be modified with the keys <+> and <->, or in order to make changes to the user menu, set to 0000.
  - b) No code has been entered: The display shows 0000. A code can be entered with the keys <+> and <-> then confirm with the <ENTER> key. If you do not need the user menu protection, leave the value 0000 unchanged and quit the code menu with the <ESC> key.

## 2. Adjust the limit contacts:

1. Press and hold the button <ENTER> and <ESC> for 4 seconds.  
⇒ The display shows SP\_1 indicating the user menu.
2. Move to menu item SP\_1 for limit contact #1 or SP\_2 for limit contact #2.  
To move, use the button <+> or <->, then press <ENTER>.  
⇒ The display indicates the actual value of the limit contact.
3. Change the value of the limit contact, using the button <+> or <->, then press <ENTER>.
4. Move to menu item HSt\_1 for limit contact #1 or HSt\_2 for limit contact #2.  
To move, use the button <+> or <->, then press <ENTER>.
5. Change the value of the hysteresis, using the button <+> or <->, then press <ENTER>.
6. Move to menu item LEd\_1 for limit contact #1 or LEd\_2 for limit contact #2.  
To move, use the button <+> or <->, then press <ENTER>.
7. Change the lamp status with the button <+> or <->, then press <ENTER>.  
"nor": LED lamp ON, when the input value exceeds the setpoint value.  
"Inr": LED lamp ON, when the input value under-runs the setpoint value.
8. Move to menu item rEL\_1 for limit contact #1 or rEL\_2 for limit contact #2.  
To move, use the button <+> or <->, then press <ENTER>.
9. Change the relay operating mode with the button <+> or <->, then press <ENTER>.  
"nor": Relay ON, when input value exceeds the setpoint value (normal mode)  
"Inr": Relay ON, when input value under-runs the setpoint value (fail-safe mode)
10. Press the button <ESC>  
⇒ the display shows the actual measuring value.

## C. Adjusting the limit contacts with Mpro

Connect the link cable with the Computer and the display. (see I, page 6)

1. start "Mpro"
2. Choose "M2229" in menu "Instrument" <A>
3. Choose "Linear conversion table" under "Range" <B>
4. Choose "Adjust the limit contacts" <C>
5. Enter the values for the limit contacts and all other settings (hysteresis etc.)
6. Choose "Program the limit contacts"

## D. Adjusting the display range with Mpro

Connect the link cable with the Computer and the display. (see I, page 6)

1. start "Mpro"
2. Choose "M2229" under "Instrument" <A>
3. Choose "Linear conversion table" under "Range" <B>
4. Enter the value for input range, output range and decimal place
5. Choose "Program"

## E. Adjusting a tare value

Note: The measuring range is reduced by the set tare!

### 1. Adjusting a tare value with the keyboard

1. Press and hold the button <ENTER> and <+>.
  - ⇒ The display shows *TARE* and the actual measuring value, after 3 seconds tare is adjusted.
  - ⇒ The display shows the actual measuring value.

### 2. Switch off tare with the keyboard

1. Press and hold the button <ENTER> and <+>.
  - ⇒ The display shows *TARE* and the actual measuring value, after 3 seconds tare is switched off.
  - ⇒ The display shows the actual measuring value.

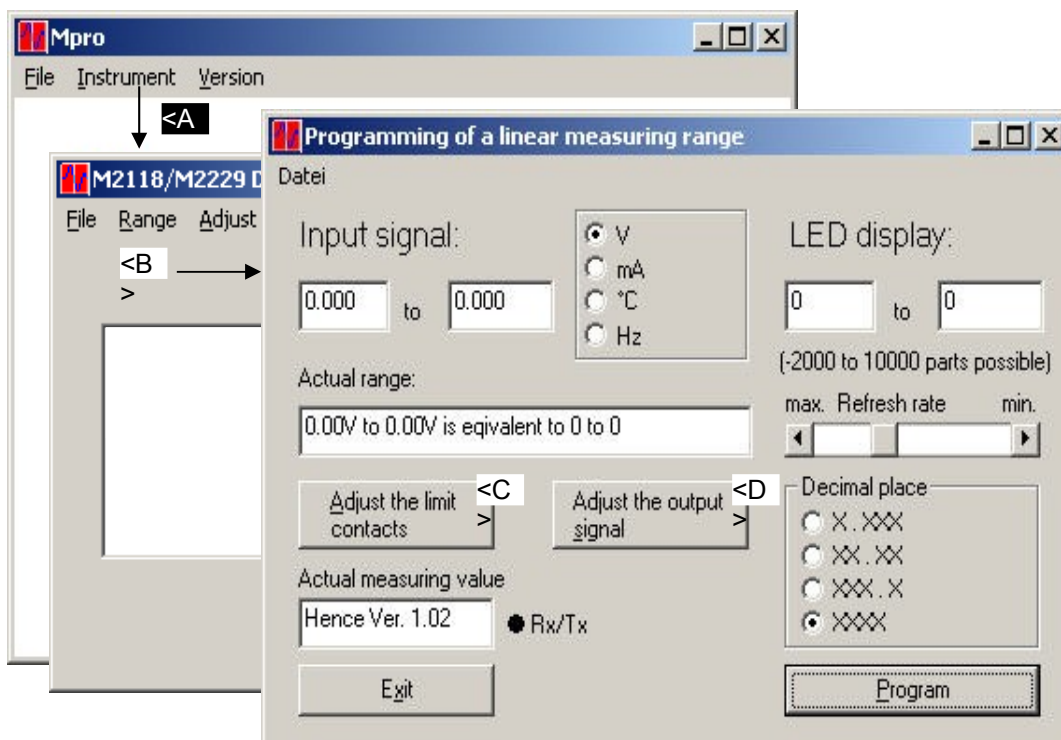
### 3. Adjusting a tare value with the menu

1. Press and hold the button <ENTER> and <ESC> for 4 seconds..
  - ⇒ The display shows *SP\_1* indicating the user menu.
2. Move to menu item TARE. To move, use the button <+> or <->, then press <ENTER>.
3. Switch on or switch off tare. To move, use the button <+> or <->, then press <ENTER>.
4. Press the button <ESC>
  - ⇒ the display shows the actual measuring value.

## F. Adjusting the output signal range with *Mpro*

Connect the link cable with the Computer and the display. (see I, page 6)

1. start "*Mpro*"
2. Choose "M2229" in menu "Instrument" <A>
3. Choose "Linear conversion table" under "Range" <B>
4. Choose "Adjust the output signal" <D>
5. Enter the values for the limit contacts and all other settings (hysteresis etc.)
6. Choose "Program the limit contacts"



## G. Fine-adjust the display/current output with the keyboard

The display and the current output can be changed without programming Software and PC.

### 1. Unlock the user menu / insert or modify the menu protection access code:

see B, page 3

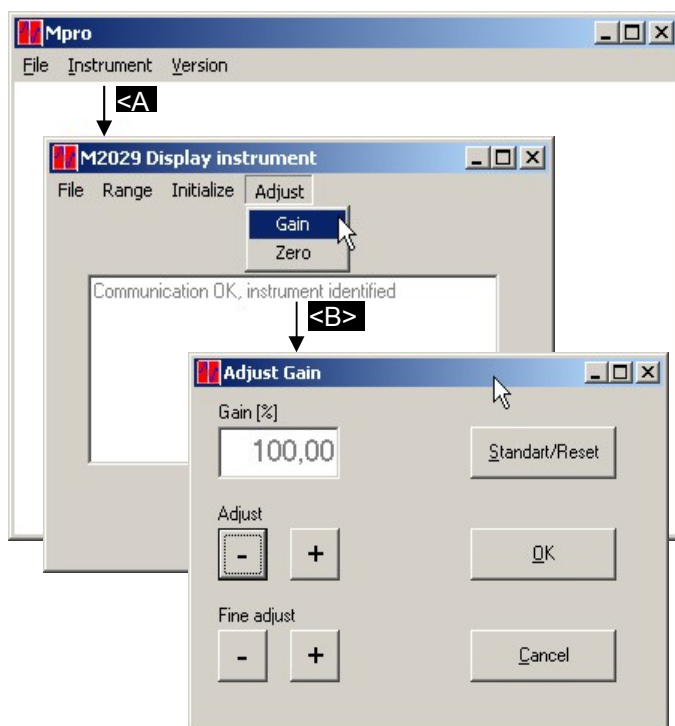
### 2. Adjust the limit contacts:

1. Press and hold the button <ENTER> and <ESC> for 4 seconds.  
⇒ The display shows 5P\_1 indicating the user menu.
2. Move to menu item d\_Zo for display min. and or d\_GA for display max. value, or I\_Zo for current output min. and I\_GA for current output max. value  
To move, use the button <+> or <->, then press <ENTER>.  
⇒ The display indicates the actual value of the limit contact.
3. Change the value, using the button <+> or <->, then press <ENTER>.
4. Press the button <ESC>  
⇒ the display shows the actual measuring value.

## H. Fine-adjust the display with Mpro

Connect the link cable with the computer and the display. (see I, page 6)

1. start "Mpro"
2. Choose "M2229" in menu "Instrument" <A>
3. Choose "Adjust" for fine-adjusting the "Gain" or "Zero" <B>.



## I. General references for using the Mpro

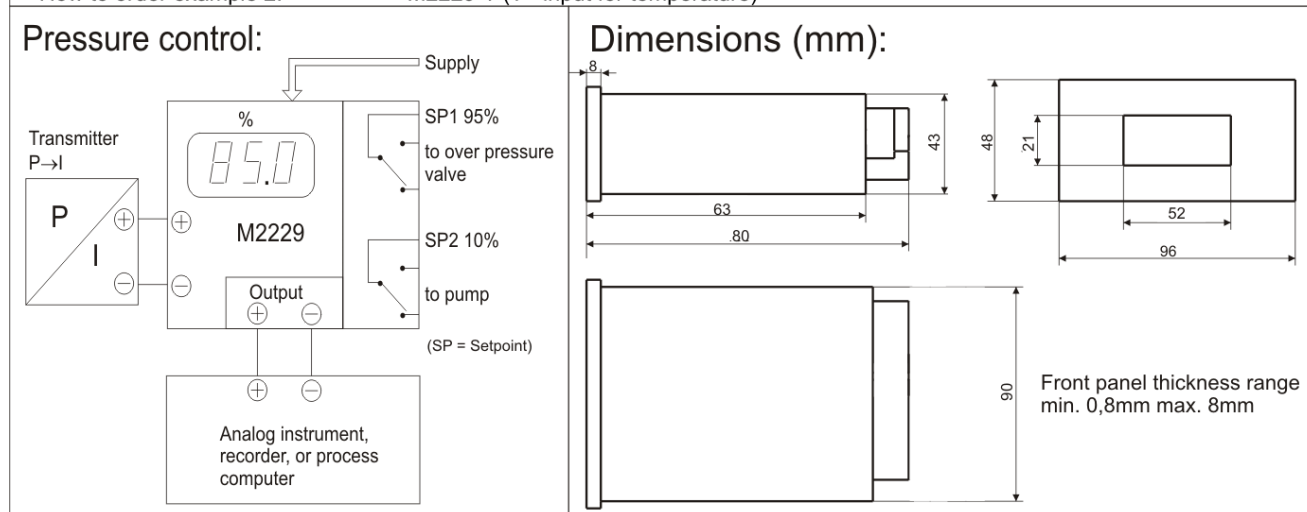
- The newest software may be downloaded any time and free of charge at [www.mostec.ch](http://www.mostec.ch).
- Connect the M2229 to the power supply for programming
- Be sure that the connected COM-port isn't used by any other peripheral device.
- If the PC or the corresponding COM-port is "grounded" by the power line cable or by other cabling, ground loops may interfere with the measuring signal. The use of a computer with battery power is recommended to avoid such problems.
- Contact us if there are problems or questions concerning the software.

### Non-liability

The company Mostec AG developed and tested the software "Mpro" with greatest care. Mostec is not responsible for any damages whatsoever, including loss of information, interruption of business, personal injury and/or any damage or consequential damage without limitation, incurred before, during or after the use of our products.

## J. Technical Data

Input signal:	M2229-A: 0/4...20mA/0...1V and 10V, programmable M2229-T: Platinum-nickel, with 100,200,500 or 1000Ω at 0°C (DIN 43 760), in 2- or 3-wire connection																		
Input load / impedance:	current signal=51Ω, voltage signal=1MΩ																		
2-Wire transmitter supply:	24VDC max. 25mA																		
Display:	4-digit, LED red, 14.2 mm																		
Display range:	-1999...9999																		
Accuracy:	±0.1% at 23°C ambient temperature																		
Reproducibility:	±0.1%																		
Temperature coefficient:	zero drift: 30ppM/°C typical, gain drift: 25ppM/°C typical																		
Long-term stability:	±0.1%																		
Working temperature range:	-5 to +45°C																		
Maximum humidity:	95%, non-condensing																		
Range adjustment:	by computer programmable, see manual																		
Zero-/Gain adjustment:	by computer programmable, see manual																		
Option alarm contacts:	two, adjustable between 0,0 and 100,0%																		
Hysteresis:	by computer programmable, factory set: ±5 digit, see manual																		
Contacts:	floating change over contacts																		
Max. contact load:	1A/230V resistive																		
Change alarm contacts:	by button switches or computer programmable, see manual																		
Display alarm contacts:	by button switches or computer programmable, see manual																		
Mode of the alarm contacts:	with two red LED-Lamps with one red LED-Lamp																		
Display unit:																			
Option signal output:	0/4...20mA, galvanically isolated																		
Max. load:	500Ω																		
Output impedance:	>1MΩ typical																		
Power supply:	20 to 253VAC or DC																		
Power supply load:	4.5 to 7.0W at 230VAC																		
CE-conformity:	fulfilled																		
Terminals:	plug-in screw terminals																		
Terminal description:	<table border="0"> <tr> <td>1 = supply voltage: AC~/DC(+)</td> <td>2 = supply voltage: AC~/DC(-)</td> </tr> <tr> <td>3 = supply voltage: PE</td> <td>4 = signal output (+)</td> </tr> <tr> <td>5 = signal output (-)</td> <td>6 = signal output PE</td> </tr> <tr> <td>7 = not used</td> <td>8 = 2-Wire transmitter supply +24V</td> </tr> <tr> <td>9 = signal input (-) / Sensor (-)</td> <td>10 = signal input voltage (+) / Sensor (+)</td> </tr> <tr> <td>11 = signal input current (+) / Sensor (-) Sense</td> <td>13 = alarm contact 1, c.o. contact</td> </tr> <tr> <td>12 = alarm contact 1, n.o. contact</td> <td>15 = alarm contact 2, n.o. contact</td> </tr> <tr> <td>14 = alarm contact 1, n.c. contact</td> <td>17 = alarm contact 2, n.c. contact</td> </tr> <tr> <td>16 = alarm contact 2, c.o. contact</td> <td></td> </tr> </table>	1 = supply voltage: AC~/DC(+)	2 = supply voltage: AC~/DC(-)	3 = supply voltage: PE	4 = signal output (+)	5 = signal output (-)	6 = signal output PE	7 = not used	8 = 2-Wire transmitter supply +24V	9 = signal input (-) / Sensor (-)	10 = signal input voltage (+) / Sensor (+)	11 = signal input current (+) / Sensor (-) Sense	13 = alarm contact 1, c.o. contact	12 = alarm contact 1, n.o. contact	15 = alarm contact 2, n.o. contact	14 = alarm contact 1, n.c. contact	17 = alarm contact 2, n.c. contact	16 = alarm contact 2, c.o. contact	
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16 = alarm contact 2, c.o. contact																			
c.o.= change over																			
n.o.= normally open																			
n.c.= normally closed																			
Mounting:	2 mounting clamps																		
Weight:	200g																		
Warranty:	2 years																		
Options:	- Link cable for programming with a computer: P/N M2029LAP - Programming software (free download: <a href="http://www.mostec.ch">www.mostec.ch</a> ) - Other input signal																		
How to order example 1:	M2229-ARS (A= input for current/voltage, R= alarm contacts, S= signal output), input 4...20mA, display 50...100,0%, SP1=2,00bar, SP2=9,50bar, hysteresis ±2digit, current output: 50...100,0% = 0...20mA																		
How to order example 2:	M2229-T (T= input for temperature)																		



## K. User menu

Menu access:

Navigation within the menu:

Select a menu item:

Leave a menu item:

Change a value:

press the button **(ENT)** and **(ESC)** for 4 seconds.

buttons **(+)** and **(-)**

button **(ENT)** (= ENTER)

button **(ESC)** (= ESCAPE)

buttons **(+)** and **(-)**

**(ENT)** & **(ESC)**

↓

→SP\_1

**(ENT)**→

←**(ESC)**/**(ENT)**  
\*\* \*

**(+)**/**(-)**

1.053

Adjust setpoint 1

↓ **(+)** / ↑ **(-)**

→HST1

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0.007

Adjust hysteresis 1

↓ **(+)** / ↑ **(-)**

→LED1

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

NOR / INR

LED 1 function normal/inverse

↓ **(+)** / ↑ **(-)**

→REL1

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

NOR / INR

Relay 1 function normal/inverse

↓ **(+)** / ↑ **(-)**

→SP\_2

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

1.053

Adjust setpoint 2

↓ **(+)** / ↑ **(-)**

→HST2

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0.007

Adjust hysteresis 2

↓ **(+)** / ↑ **(-)**

→LED2

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

NOR / INR

LED 1 function normal/inverse

↓ **(+)** / ↑ **(-)**

→REL2

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

NOR / INR

Relay 1 function normal/inverse

↓ **(+)** / ↑ **(-)**

→CODE

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0036

Change menu access code

↓ **(+)** / ↑ **(-)**

→D\_20

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0000

Fine-adjust display min. value

↓ **(+)** / ↑ **(-)**

→D\_GR

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0000

Fine-adjust display max. value

↓ **(+)** / ↑ **(-)**

→I\_20

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0000

Fine-adjust current output min. value

↓ **(+)** / ↑ **(-)**

→I\_GR

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

0000

Fine-adjust current output max. value

↓ **(+)** / ↑ **(-)**

→TARE

**(ENT)**→

←**(ESC)**/**(ENT)**

**(+)**/**(-)**

ON / OFF

Adjust tare

\*\* Leave the menu without saving the value

\* Leave the menu and save the value