

# Operating Manual

## pH/mV Controller Typ M2120



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 **MOSTEC**

## 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 pH/rH(mV)-controller type M2120 has been developed especially for applications which, until now, could not be monitored and controlled automatically due to cost.

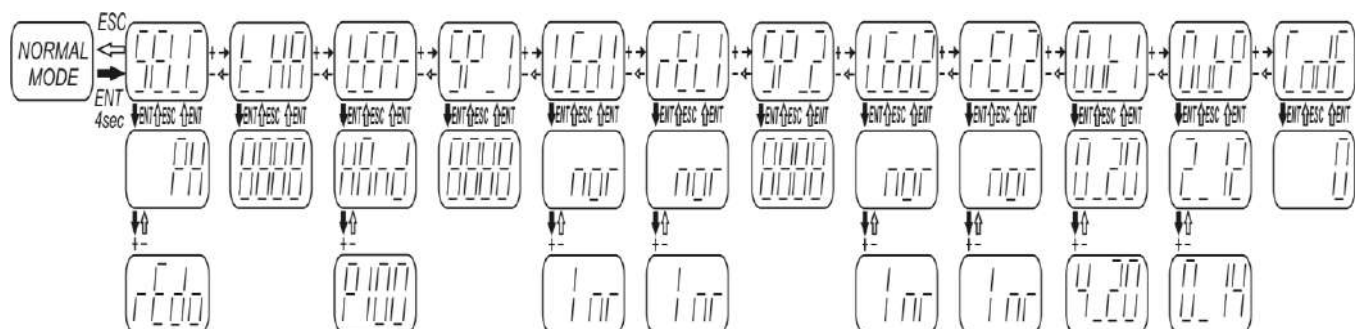
The two-point controller is a basically simple de-vice, consisting of an electrometer amplifier and two floating change-over contacts which are electronically adjustable over the entire measuring range. The instrument is used as a simple indicator by connecting electrodes. It has automatic temperature compensation with a Pt-100 platinum sensor and automatic pH-electrode calibration.

The galvanically isolated, programmable signal current output is connected to a remote display, recorder, computer, or any other desirable data sampling device. By using the alarm contacts, the controller activates dosing valves, pumps, alarm devices, etc. The switching relays withstands currents up to 1A. Power supply: Universal supply 20 to 253VAC/DC.

Typical applications for the M2120 controller:

- Simple monitoring with alarm annunciation when the preset threshold settings are exceeded.
- Non-critical controlling in water purification and waste water systems.
- Controller for water conditioning plants or swimming pools.
- Routine monitoring for environmental and pollution control etc.

The choice of probe electrodes for the controllers is not critical, but for each application the appropriate electrode must be chosen. Mostec is willing to evaluate and discuss any special requirements or customizing, independent of the amount of items to be purchased. Please contact us for any additional information or custom specific modification of the instruments.

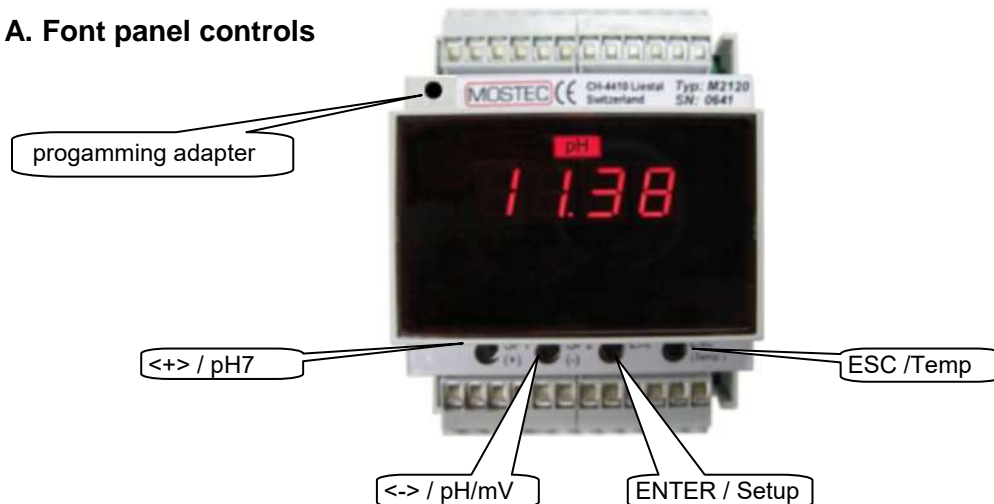


- ENT = Enter button
- ESC = Escape button
- nor = Normal
- inr = Inverse
- SELc = Measuring-range selector (Redox/pH)
- tEPr = Temperature manual/Pt-100
- t\_HA = manual temperature (0...130°C)
- SP\_1 = Setpoint #1 (-1000...1000 / 0...14.00)
- LEd\_1 = Led lamp #1
- rEL1 = Relais #1
- Out I = signal output 0/4...20mA
- Out P = pH-range for signal output (0...14/2...12)
- Code = Enter codes

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## A. Font panel controls



## B. Change pH/mV of the instrument

1. Push and hold the button <ENTER> for 5 seconds.  
⇒ The display will show up the program menu.
2. Change to menu SELEC, by the button <+> or <->, then press <ENTER>.  
⇒ The display shows the actual value.
3. Change to pH or rEdo (mV) by the button <+> or <->, then press <ENTER>.
4. Press button <ESC>  
⇒ The display shows the actual value.

## C. Select temperature mode with/without Pt-100 sensor

1. Push and hold the button <ENTER> for 5 seconds.  
⇒ The display will show up the program menu.
2. Change to menu tEPr, by the button <+> or <->, then press <ENTER>.  
⇒ The display shows the actual value.
3. Change to P100 (temperature compensation with Pt-100 sensor) or HAnd (temperature compensation with Pt-100 sensor) by the button <+> or <->, then press <ENTER>.
4. If HAnd is selected, the temperature must be set.  
Change to menu t\_HA, by the button <+> or <->, then press <ENTER>.
5. Change the value for the temperature by the button <+> or <->, then press <ENTER>.
6. Press button <ESC>  
⇒ The display shows the actual value.

## D. Calibrate the instrument

Select the correct temperature mode (see C, page 4)

1. Immerse the pH probe into buffer with pH-value=7.  
⇒ Wait until the indicated value is stable.
2. Press and hold the button pH7 (ca. 1 sec).  
⇒ the display flashes with the value 7.00
3. If necessary, the suggested value can be changed with the button <+> and <->.
4. Press button pH 7.0 to confirm the value.  
⇒ the adjusted value is stored.
5. Immerse the pH probe into buffer with pH value 4, 9 or others.  
⇒ Wait until the indicated value is stable.
6. Press and hold the button mV/pH (ca. 1 sec).  
⇒ the display flashes with the value, e.g. 4.00
7. If necessary, the suggested value can be changed with the button <+> and <->.
8. Press button pH/mV to confirm the value.  
⇒ The adjusted value is stored.

## E. Adjusting the limit contacts

Notice: The hysteresis can only adjusted by programming software Mpro (see H and I, page 6)

1. Push and hold the button <ENTER> for 5 seconds.  
⇒ The display will show up the program menu.
2. Change to menu SP\_1 for limit contact #1 or SP\_2 for limit contact #2, by the button <+> or <->, then press <ENTER>.  
⇒ The display shows the actual value of the limit contact.
3. Change the value for the limit contact by the button <+> or <->, then press <ENTER>.
4. Change to menu HST\_1 for the hysteresis of the limit contact #1 or HST\_2 for the hysteresis of the limit contact #2, by the button <+> or <->, then press <ENTER>.  
⇒ The display shows the actual value of the hysteresis.
5. Change the value for the hysteresis by the button <+> or <->, then press <ENTER>.
6. Change to menu LEd\_1 for limit contact #1 or LEd\_2 for limit contact #2, by the button <+> or <->, then press <ENTER>.
7. Change the lamp status by the button <+> or <->, then press <ENTER>.  
"nor": LED lamp ON, when input > setpoint  
"Inr": LED lamp ON, when input < setpoint
8. Change to menu rEL\_1 for limit contact #1 or rEL\_2 for limit contact #2, by the button <+> or <->, then press <ENTER>.
9. Change relay operating mode by the button <+> or <->, then press <ENTER>.  
"nor": Relay ON, when input > setpoint (normally open contact closed)  
"Inr": Relay ON, when input < setpoint (normally open contact open)
10. Press button <ESC>  
⇒ The display shows the actual value.

## F. Change current output

1. Push and hold the button <ENTER> for 5 seconds.  
⇒ The display will show up the program menu.
2. Change to menu OutI, by the button <+> or <->, then press <ENTER>.  
⇒ The display shows the actual value.
3. Change the value to 0\_20 or 4\_20 (for 4...20mA) by the button <+> or <->, then press <ENTER>.
4. Change to menu OutP, by the button <+> or <->, then press <ENTER>.  
⇒ The display shows the actual value.
5. Change the value to 2\_12 or 0\_14 (for 0...14pH) by the button <+> or <->, then press <ENTER>.
6. Press button <ESC>  
⇒ The display shows the actual value.

## G. Keyboard lock

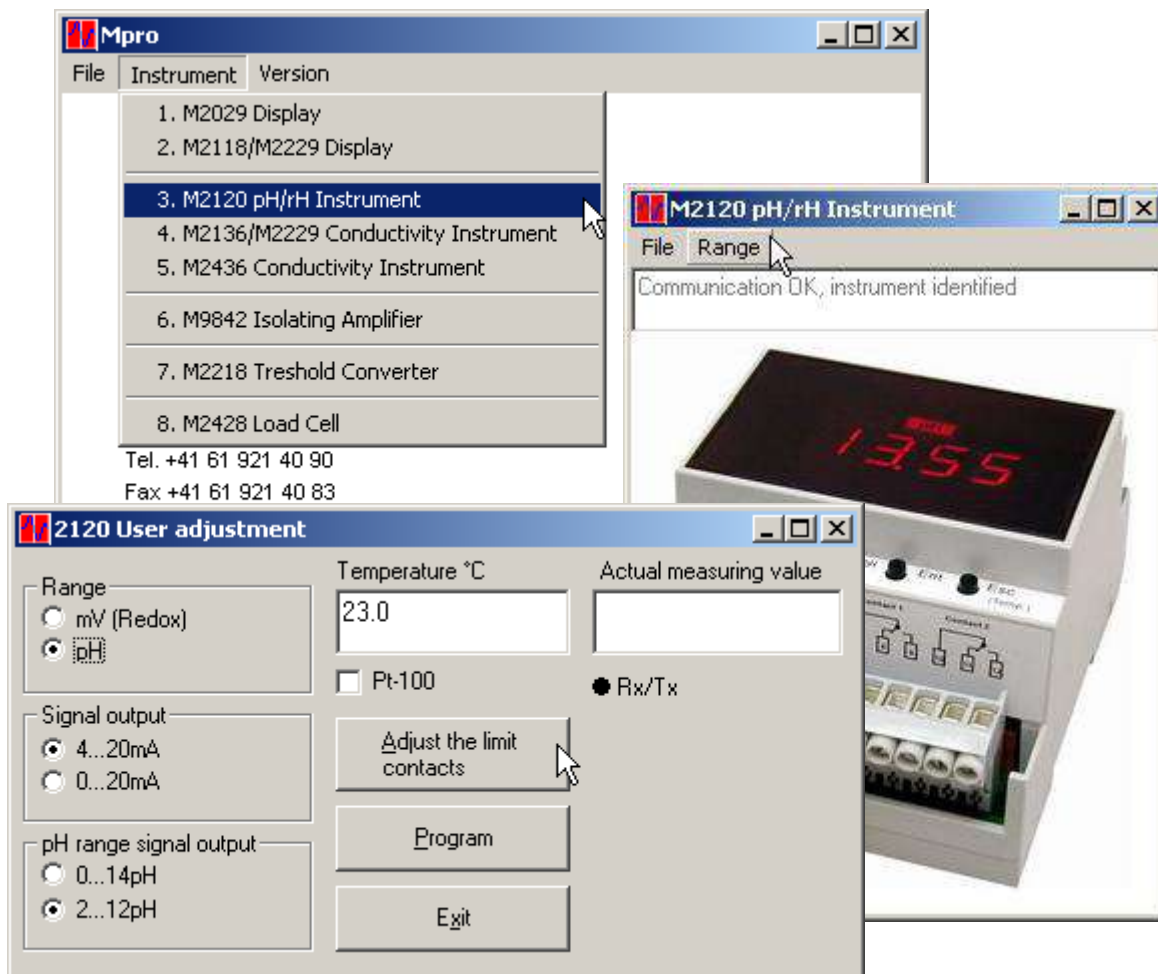
The values of the user menu can be protected from unintended access using an access code. After activating the access code, menu values can be observed but no longer modified. To modify setpoints and other parameters, the access code has to be set to the value 0000. If the code has a value different from 0000, writing to the user menu is suppressed. Did you forget your code? Call us we have a special unlock code available.

Set the access code:

1. Press and hold the button <ENTER> for 5 seconds.  
⇒ The display show up the program 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> button. 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 button <+> 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 button <+> and <-> then confirm with the <ENTER> button. If you do not need the user menu protection, leave the value 0000 unchanged and quit the code menu with the <ESC> button.

## H. Programming software

All settings of the instrument can be adjusted with the programming software Mpro (see I, page 6)



## I. General references for using the programming software

- The newest software may be downloaded any time and free of charge at [www.mostec.ch](http://www.mostec.ch).
- Connect the M2118 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

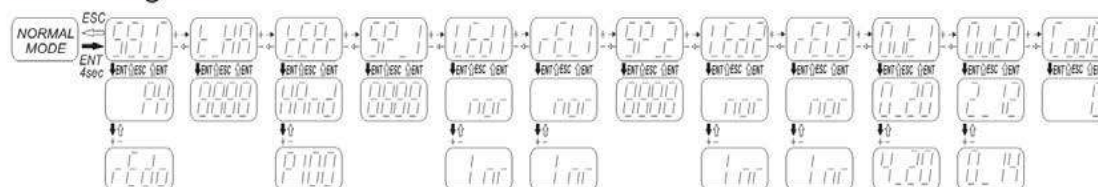
The company Mostec AG developed and tested the software "Mpro" with largest care. Mostec is not responsible for any damages whatsoever, including loss of information, interruption of business, personal injury and/or any damage or consequential damage without limitation, incurred before, during or after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



## J. Technical Data

Measuring range:	0,00 to 14,00pH	-1000 to +1000mV
Resolution:	0,01pH	1mV
Accuracy:	0,01pH	3mV
Long term stability, 1 year @23°C:	0,02pH	6m
VDisplay:	4-digit, LED red, 10mm	
Accuracy:	±0.1% at 23°C ambient temperature	
Reproducibility:	±0.1%	
Long-term stability (3 month):	±0.1%	
Working temperature range:	-5 to +45°C	
Maximum humidity:	95%, non-condensing	
Temperature drift:	Max. 50µV/°C	
Input impedance:	1000GΩ (10 <sup>12</sup> Ω)	
Input bias current:	Max. 1,5pA	
Temp. button:	Display the actual temperature	
+ / - button:	to increase or decrease values	
pH7 button:	calibrate the probe at isotherm 7pH	
mV/pH button:	calibrate the probe at straight pH values	
Programming functions:	see manual / menu diagram	
Range adjustment:	by computer programmable, see manual	
Zero-/Gain adjustment:	by computer programmable, see manual	
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	
Display unit:	with one red LED-Lamp	
Option current 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	
pH/mV-jack:	Coaxial bnc connector, 50Ω, IEC 60169-8	
Terminals:	3 x 6-pole plug-in screw terminals	
Terminal description:	1 = supply voltage: AC~/DC(+)	2 = supply voltage: AC~/DC(-)
	3 = supply voltage: PE	4 = signal output PE
	5 = signal output (+)	6 = signal output (-)
	7 = alarm contact 1, c.o. contact	8 = alarm contact 1, n.c. contact
	9 = alarm contact 1, n.o. contact	10 = alarm contact 1, c.o. contact
	11 = alarm contact 2, n.c. contact	12 = alarm contact 2, n.o. contact
	18 = Pt-100 PE	19 = Pt-100 (+)
	20 = Pt-100 (-)	21 = Pt-100 Sense (-)
c.o. = change over		
n.o. = normally open		
n.c. = normally closed		
Mounting:	35mm mounting rail, EN50022-35	
Weight:	200g	
Warranty:	2 years	
Options:	<ul style="list-style-type: none"> <li>- Link cable for programming with a computer: P/N M2029LAP</li> <li>- Programming software (free download: <a href="http://www.mostec.ch">www.mostec.ch</a>)</li> <li>- Other input/output signal</li> <li>- Customer tailored solutions</li> </ul>	
How to order:	M2120, 0...14pH = 4...20mA, GW1=2,00pH, GW2=9,50pH, Hysteresis ±15digit	

### Menu diagram:



- ENT = Enter button
- ESC = Escape button
- nor = Normal
- inv = Inverse
- SELc = Measuring-range selector (Redox/pH)
- TEPr = Temperature manual/Pt-100
- LHA = manual temperature (0...130°C)
- SP\_1 = Setpoint #1 (-1000...1000 / 0...14.00)
- LEd\_1 = Led lamp #1
- rEL1 = Relais #1
- Out I = signal output 0/4...20mA
- Out P = pH-range for signal output (0...14/2...12)
- Code = Enter codes

