

Thank you for choosing a NIVELCO instrument.
We are sure that you will be satisfied throughout its use.

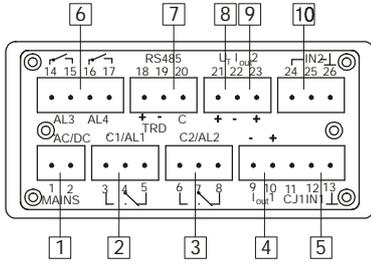


1. APPLICATION

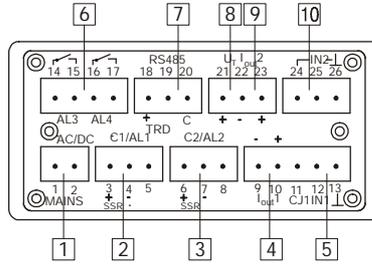
The UNICONT PMM-300 series is a universal display and controller. It can also be used as (one or two channel) display and limit-switch depending on the configuration of the instrument. For the complete range of the models, technical data and programming in detail see the INSTALLATION AND PROGRAMMING MANUAL.

The aim of this User's Manual is to give a concise guideline for applications of the UNICONT PMM as a process display and limit switch.

2. REAR PANELS



Rear panel for relay output

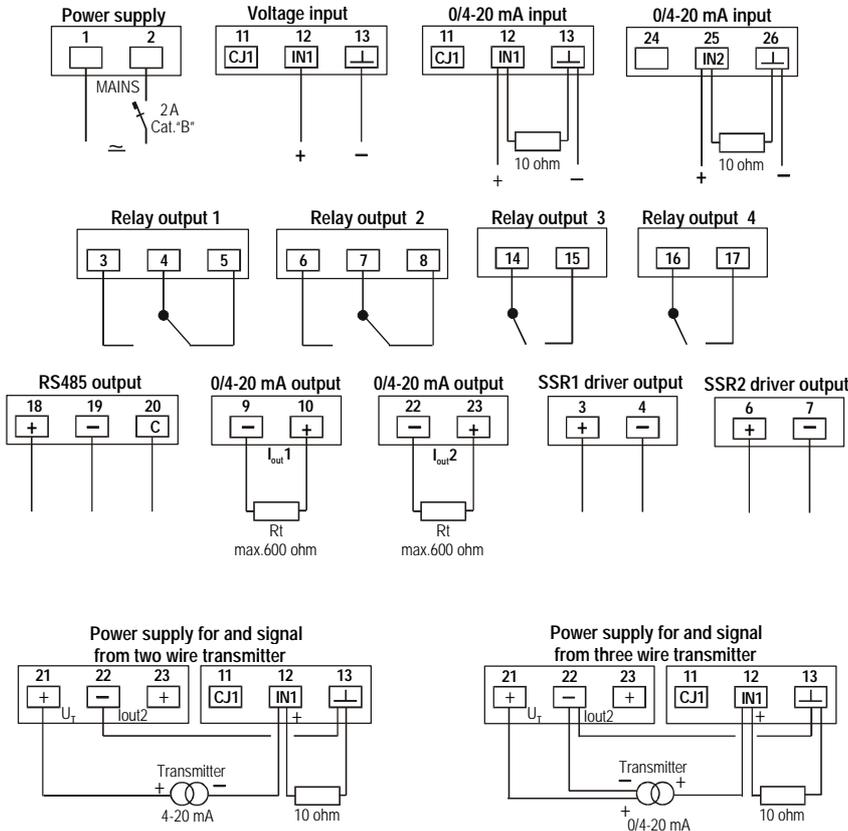


Rear panel for SSR driver output

- 1 — **MAINS:** Power supply
- 2 — **C1/AL1:** Control or alarm output from relay 1
- 3 — **C2/AL2:** Control or alarm output from relay 2
- 4 — **I_{out}1:** Analogue current output 1 (proportional to IN1)
- 5 — **IN1:** Universal input 1
- 6 — **AL3-AL4:** Contacts (output) of alarm relay 3 and 4
- 7 — **RS485:** Connector for RS485 interface
- 8 — **U_T:** Transmitter power supply
- 9 — **I_{out}2:** Analogue current output 2 (proportional to IN2)
- 10 — **IN2:** Universal input 2

3. WIRING EXAMPLES

Use wire of 0,5...2,5 mm² for wiring.



USER'S MANUAL

for applications as display and limit switch
valid from software version (indicated at S.PrG)
202 and higher

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4. ACCESSORIES

- 1 Installation and Programming Manual
- 1 User's Manual
- 2 Mounting brackets
- 1 KTY83 for cold junction compensation
- 1 Resistor for shunting the input with models configured for current input 10 Ohm MR-25, 1%, 0,25W (2 pcs with models with 2 inputs)
- 1 set Plug-in terminal box
- 1 set Measurement stickers

5. PUTTING INTO OPERATION

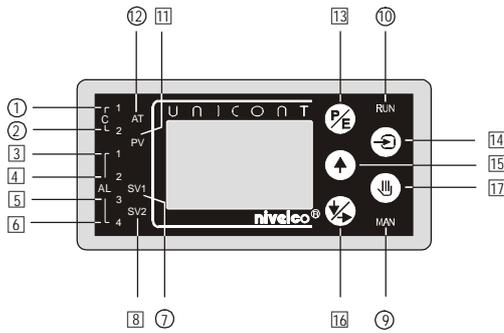
The Steps of putting into operation are:

- wiring
- switching on the instrument
- setting Factory Default (if necessary)
The PMM is delivered with (temperature control oriented) Factory Default A. Therefore you have to change over to Factory Default B (See Triple Push-Button Operation)
- changing parameters and Electronic Dip Switch (EDS) position (if necessary)

Programming will be carried out by the push-buttons on the front panel (see Point 6.)
The programming flow chart and the Menu/Submenu points are shown in Point 7. The Submenu points with grey background are not used in applications as indicator and limit-switch.

- With instruments with one input only, the lower (green) row will not be used as display but only for entering the values to be programmed.

6. FRONT PANEL



PUSH-BUTTONS

13 -	Enter Programming Mode Menus/Submenus Confirm flashing values and EDS settings (ENTER)
14 -	Exit Menus/Submenus Acknowledge error messages: Er4, Er5, Er6, Er7
15 -	Scrolling Menu/Submenu points Increasing the displayed "flashing" value Setting the EDS switches to the upper position (1= ON)
16 -	Decreasing the displayed flashing value Setting the EDS switches to the lower position (0= OFF)
17 -	Resetting the latched alarms after repeated power-up

Indicators LED status

- 3 — AL1: "ON": Relay 1. (programmed) is energised
 - 4 — AL2: "ON": Relay 2. (programmed) is energised
 - 5 — AL3: "ON": Relay 3. (programmed) is energised
 - 6 — AL4: "ON": Relay 4. (programmed) is energised
 - 8 — SV2: "ON": Second input (IN2) is displayed in green (lower row)
 - 11 — PV: "ON": First input (IN1) is displayed in red (upper row)
- 1 2 7 9 10 12 not applicable

DOUBLE PUSH-BUTTON OPERATION:

- Enable or disable of programming of Menu (Table) points by pressing over 25 sec.
- Acknowledgement of Er10 and Er11

TRIPLE PUSH-BUTTON OPERATION:

- Change over from Factory Default A to B
- Change over from Factory Default B to A

You can change over from one Factory Default to another one by disconnecting the instrument first. Push the three buttons simultaneously and at the same time reconnect it again to the main.

Note:

By changing over from one Default Program to another will represent reset of the programming performed by the customer i.e. it will result in return to the parameters and settings of the Factory Defaults.

7. STEPS OF PROGRAMMING

FUNCTION OF THE PUSH BUTTONS:

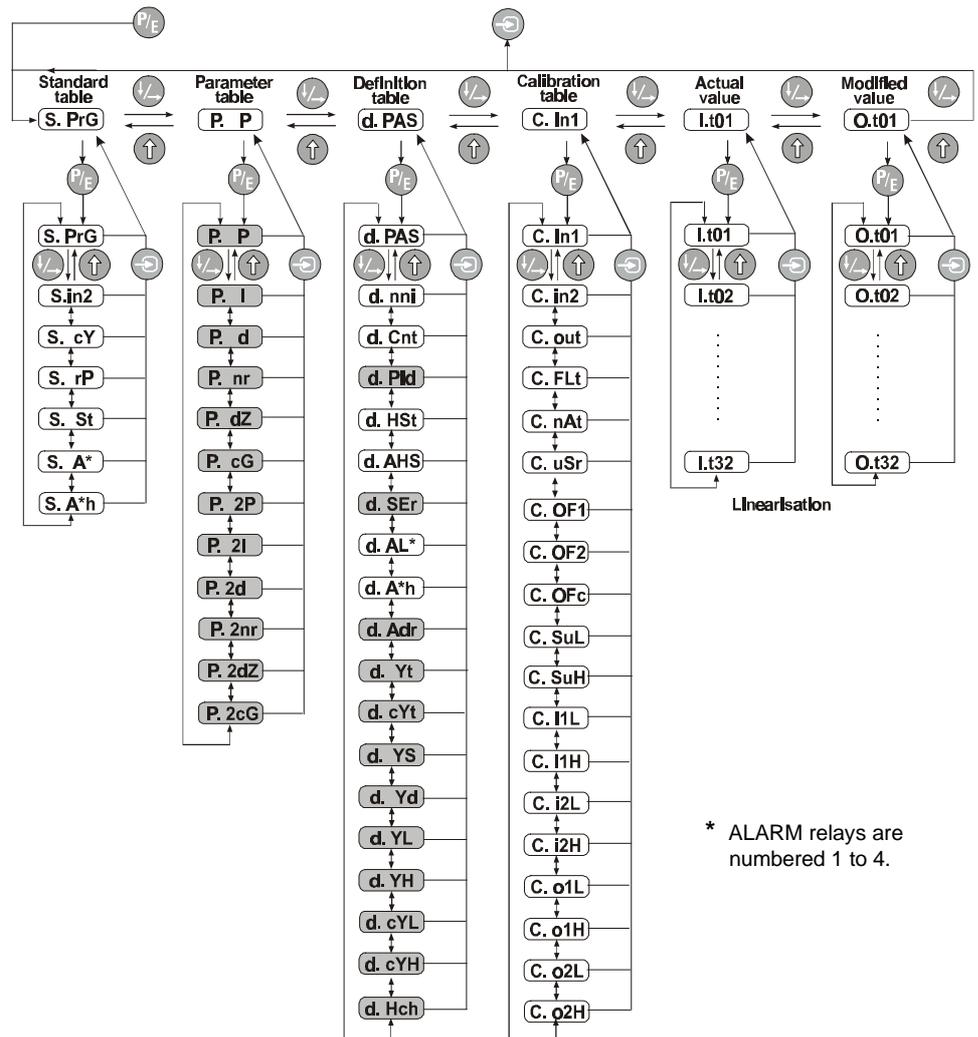
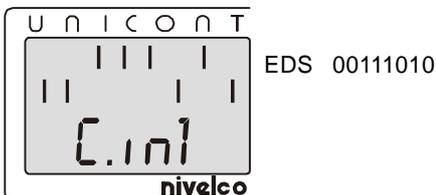
- Enter Menu (tables) left side of the green display is flashing
- Scroll (downstream) Menu (tables)
- Scroll (upstream) Menu (tables)
- Enter Submenu, right side of the green display is flashing
- Scroll (downstream) Submenu points
- Scroll (upstream) Submenu points
- Select Submenu points
- Select EDS or decrease value
- Set EDS (to upper/lower position) or increase value
- Confirm EDS setting or value
- Exit Submenu or Menu (Programming Mode)

EDS: Electronic Dip Switch: (symbolised by 8 red light bars on the display)

Settings:

- Red light bar in the upper position="1" (ON)
- Red light bar in the lower position="0" (OFF)

Example:



* ALARM relays are numbered 1 to 4.

Table 1.
Programming flow-chart

8. UNICONT PMM AS ONE-CHANNEL DISPLAY AND LIMIT-SWITCH

8.1 SETTING FACTORY DEFAULT AND PROGRAMMING

The instrument will be delivered with Factory Default A. The active Factory Default can be changed over by triple push-button operation and checked in the Submenu point C.in1 (if you can be sure that the Factory Default settings and parameters prevail).

C.in.1	Factory Default
xxx01110	"A" – Process control oriented
xxx11010	"B" – Process indicator with limit switch (4-20 mA input)

Note: "X" means that the position of EDS is irrelevant concerning Factory Default.

PARAMETERS OF FACTORY DEFAULT B:

Denomination	Function/Value	EDS/Parameter
Input	4-20mA	C.in1 : 00111010
Position of the decimal point	999.9	
Scaling	4mA=0,0% 20mA=100,0%	C.i1L : 0.0 C.i1H : 100.0
Operation mode	Display, 1 input	d.Cnt : 00000001
AL1 alarm relay operation	Energised under the lower alarm value	d.AL1 : 00000001
AL1 energised over the min value	10%	S.A1 : 10.0
AL2 alarm relay operation	Energised over the upper alarm value	d.AL2 : 10000001
AL2 energised over the min value	90%	S.A2 = 90.0
Current output	4-20mA proportional to the current input	C.out : 00001000
Output value assigned to the minimum input value	0%	C.o1L : 0.0 *
Output value assigned to the maximum input value	100%	C.o1H : 100.0 *
Operation of the buzzer	in line with AL2	d.HSt : 01010000
Filtering of the input signal	medium	C.Flt : 00110000

* This setting means that with input 4-20 mA the output will also be 4-20 mA, practically the input will be "retransmitted".

8.2 CHANGING PARAMETERS OF FACTORY DEFAULT:

- Set % value of energising relay AL1 at Submenu point S.A1
- Set % value of energising relay AL2 at Submenu point S.A2

-SETTING HYSTERESIS OF RELAY AL1

Set position of hysteresis (e.g. control of filling) at Submenu point d.AHS: (default parameter: 00000001)

Set value of hysteresis at Submenu point d.A1h e.g. 5%, d.A1h=5.0

- SETTING HYSTERESIS OF RELAY AL2

Set position of hysteresis (e.g. control of emptying) at Submenu point d.AHS: (default parameter: 00000000)

Set value of hysteresis at Submenu point d.A2h e.g. 5%, d.A2h=5.0

- SETTING BUZZER:

At Submenu point d-HSt. (default setting:00000000, out of work)

8.3 SCALING

Assign values (e.g. level in meter or % to be displayed) to the input signals

- Assign minimum value to the minimum input signal at C.i1L
- Assign maximum value to the maximum input signal at C.i1H

The displayed value will be proportional to the input signal.

For example: Input signal min: 4 mA C.i1L=100.0

Input signal max: 20 mA C.i1H=900.0

Is the input signal IN1=12 mA, the value of 500.0 will be displayed.

Note: Should the scaling be changed, the energising values of the ALARM relays have to be modified.

8.4 LINEARISATION

Linearisation will be needed if the relation between the measured value and the displayed value is not linear. This non-linear function can be approached by a series of data-pairs. This makes possible for example to display the volume of the medium in a horizontal cylindrical tank by measuring the level. The UNICONT PM-33_ and the PM-34_ can perform a linearisation of 32 data-pairs.

Steps of linearisation:

- The analogue signal arriving on IN1 has to be scaled. (See point 8.3)
- The enabling of linearisation and the modifiable analogue signal will be set at Submenu point C.uSr.

- After setting C.uSr the data-pairs are to be entered at the Submenu points I.t01 and O.t01.

The measured values and values to be displayed have to be entered at Submenu points I.tx (in the measurement units of the input) and Submenu points O.tx (in the measurement units of the output) respectively. For example should the value at the Submenu point I.t01 be 15 and the value at the Submenu point O.t01 be 18, that means that with the input signal reaching 15 the value of 18 will be displayed. The 32 point-pairs can be entered in optional order with the constraint that increasing values of I.tx should come with increasing values of O.tx.

9. UNICONT PMM-300 AS TWO-CHANNEL DISPLAY AND LIMIT-SWITCH

The UNICONT PMM-32_ and PMM-34_ are configured for applications with two-channel display and limit-switch.

9.1 PROGRAMMING:

To programme the second channel you have to take the same steps as described under 8.2. The setting of the decimal point will also be valid for the second channel. (See below the steps with parameters of the Factory Default B.)

- Selection of the input signal IN2 (4-20mA): C.in2: 00011010
- Scaling of the input signal IN2 4mA C.i2L: 0.0%
20mA C.i2H: 100.0%
- Display IN2 input signal in the bottom row set at d.Cnt: 00010001
- Alarm relay operation AL3: energised under the lower limit of IN2 set at d.AL3: 10000011
- Set energising value of relay AL3 (10%) at Submenu point S.A3:10.0
- Alarm relay operation AL4 energised above the upper limit of IN2, set at d.AL4: 10000011
- set energising value of relay AL4 (90%) at Submenu point S.A4:90.0

9.2 ARITHMETIC FUNCTION

Take following steps to make use of differential function

- Scale display of input signals IN1 and IN2.
- The enabling and the selection of the arithmetic function (difference, summarise or average) will be set at submenu point C.nAt.

C.nAt SETTING ARITHMETIC FUNCTIONS

EDS	Description	Remark
0000xxx	No arithmetic function	
1000xxx	Summarising active, result PV displayed in the upper row	PV=IN1+IN2
1100xxx	Summarising active, result PV2 not displayed, saved and readable at S.in2	PV2=IN1+IN2
100x0xxx	IN1 with positive (+) sign	PV=IN1+IN2
101x0xxx	IN1 with negative (-) sign	PV= - IN1+IN2
10x00xxx	IN2 with positive (+) sign	PV=IN1+IN2
10x10xxx	IN2 with negative (-) sign	PV=IN1-IN2
10001xxx	Providing average	PV=(IN1+IN2) / 2

Note: "X" means that the position of EDS is irrelevant concerning the arithmetic functions.

9.3 ROUNDING:

Rounding may be necessary in applications where due to the technology process the last digit displayed is fluctuating (waves on the surface of the liquid) that has to be eliminated. Rounding, set by the last three digits of the submenu point C.nAt will be performed according to the general rules of the rounding.

C.nAt

EDS	Description	Remark
xxxxx001	Rounding the last digit to an even number	Not depending on the position of the decimal point I
xxxxx010	Rounding the last digit to 0 or 5	
xxxxx011	Rounding the last digit to 0	
xxxxx100	Rounding the last 2 digits to 20-40-60-80	
xxxxx101	Rounding the last 2 digits to a number dividable by 25	
xxxxx110	Rounding the last 2 digits to a number dividable by 50	
xxxxx111	Rounding the last 2 digits to 00	

Note: "X" means that the position of EDS is irrelevant concerning the rounding.

10. SETS OF SELECTIONS

C.in1 Selection of the input signal, setting decimal point

EDS	Range
00000000	No decimal point
00100000	999.9
01000000	99.99
01100000	9.999
00011001	0-20.0 mA
00011010	4-20.0 mA
00011100	0-100.0 mV
00011101	0-500.0 mV

C.in2 Selection of the input signal (second channel)

EDS	Range
00011001	0-20.0 mA
00011010	4-20.0 mA
00011100	0-100.0 mV
00011101	0-500.0 mV

d. AL* Alarmrelays: function selection

EDS	Description
00000000	No alarm function
1xx00001	HIGH Alarm (Relay: NO) Alarm is triggered if the IN1 input signal exceeds upper limit value
0xx00001	LOW Alarm (Relay: NC) Alarm is triggered if the IN1 input signal exceeds lower limit value
1xx01001	HIGH Alarm (Relay: NC) Alarm relay is triggered if PV value exceeds the upper limit of the (SV) setpoint with a specified (X) value $AL=SV + X$
0xx01001	LOW Alarm (Relay: NO) Alarm relay is triggered if PV value exceeds the lower limit of the (SV) setpoint with a specified (X) value $AL=SV - X$

- Serial number of the alarm relays AL 1,2,3,4,5,6 depending on the configuration
- "X" means that the position is irrelevant concerning the alarm relays

d.HSt Internal buzzer (acoustic alarm)

EDS	Description
x1xxxxxx	Buzzer is disabled
0100xxxx	Buzzer operates simultaneously with AL1
0101xxxx	Buzzer operates simultaneously with AL2
1100xxxx	Buzzer operates simultaneously with AL3
1101xxxx	Buzzer operates simultaneously with AL4

"X" means that the position is irrelevant concerning the operation of the buzzer.

d.AHS Hysteresis type alarms relays

EDS	Description	Scheme
00000000	AL1 hysteresis is lower asymmetrical (Filling control)	
00000001	AL1 hysteresis is upper asymmetrical (Emptying control)	
00000010	AL1 hysteresis is symmetrical	
00000000	AL2 hysteresis is lower asymmetrical (Filling control)	
00000100	AL2 hysteresis is upper asymmetrical (Emptying control)	
00001000	AL2 hysteresis is symmetrical	
00000000	AL3 hysteresis is lower asymmetrical (Filling control)	
00110000	AL3 hysteresis is upper asymmetrical (Emptying control)	
00100000	AL3 hysteresis is symmetrical	
00000000	AL4 hysteresis is lower asymmetrical (Filling control)	
01000000	AL4 hysteresis is upper asymmetrical (Emptying control)	
10000000	AL4 hysteresis is symmetrical	

Note:

The hysteresis of the relays AL5 and AL6 is always symmetric. Set hysteresis at S.A*h.

11. DISABLING FUNCTIONS

The modifications of some parameters can be disabled by the use of an access code or at the Submenu point d.nni or by push-buttons on the front panel.

a, Disabling by access code

Modifications of the Submenu points under the Definition Table and the Calibration Table can be disabled by the access code (the Submenu points under the Parameter Table and the Standard Table can be accessed).

There is no access code given in the Factory Default. In the Submenu Point d.Pas (displaying 0) any four-digit access code chosen between 0001 and 8091 can be entered. Instruments with access code will display at d.Pas the number of 9999. After entering the correct access code it can be overwritten (giving either a new four-digit number or 0000 for erasing the access code).

Note: In case of access code forgotten or lost, make use of the general reset by repeated Triple Push-Button operation.

b, Disabling at Submenu point d.nni:

EDS	Description	Remark
xxxxxxx1	Alarm relays disabled	
xxxx0xxx	Display values settable by digits (spinning wheel)	
xxx1xxx	Display values settable in sequence (by scrolling)	Factory Default
xxxx1xx	After power supply failure the instrument will be switched out with Er5.	

c, Disabling by push-button (See Double Push-Button Operation)

Disabling access to the Menu point Definition (table) by simultaneous pressing of the push-buttons ⏏ and ⏏ over 25 sec. Repeated Double Push-Button operation will release disabling.

12. ERROR MESSAGES

In case of entering incorrect values or operation failure an error code will be displayed on the SV display.

Error message	Description	Remark
Er 1	Value entered (e.g. SV) is incorrect :outside of the range	Er 1 will be on display for 3 seconds
Er 4	Configuration error	Acknowledge with ⏏ key
Er 5	Mains power failure	Acknowledge with ⏏ key
Er 6	Unauthorised setting of Setpoint See Submenu point "d.nni"	Acknowledge with ⏏ key
Er 7	Program deleted: Re-programming is required	Acknowledge with ⏏ key
Er 10	Failure at the input, inverse connecting	Acknowledge with $\text{⏏} + \text{⏏}$ keys
Er 11	Connection to sensor is broken	Acknowledge with $\text{⏏} + \text{⏏}$ keys

Error messages Er10 and Er11 can also be acknowledged by switching off and on the power supply. Should the failure not be repaired, the error message will reappear after 2 minutes on the PV display.

Er 11 will only be displayed in RUN mode and with manual control enabled.

C.Flt Setting the filtering of In1 and In2 input signals

EDS	Description	Remark
00000000	No filtering	
00000000	A/D conversion optimised to mains for 50 Hz	
10000000	A/D conversion optimised to mains for 60 Hz	
00110000	Recommended value	
01111111	The strongest (longest) filtering time (approx. 50-70 sec)	

* Serial number of the alarm relays (AL1, AL2, AL3 and AL4), depending on the ordered configuration.