PROCESS INSTRUMENT INSTRUCTIONS MANUAL

DMP 02

2 LIMITS   4 LIMITS

A. BASIC PREVIEW OF MENU ADDRESSES AND SUB-ADDRESSES

Address **)	Description	Sub-addresses
A_01	**INPUT SIGNAL** type selection Indicator measure in range : - 200.0 až +800.0 °C	0 : PT xxx Ω: 2- wires, 4- wires
		1 : PT xxx Ω: 3- wires
A_02	**SENSOR TYPE** selection	0 : PT 100 Ω
		1 : PT 1000 Ω
A_03	**LINE RESIST** compensation	In range: **0.00 to 99.99** Ω
A_04	Type of **ANALOG OUTPUT REACTION** on PT xxx sensor malfunction (disconnect or short circuit)***)	0: w/out reaction – follows measured value of PTxxx
		1: signal drop to 2mA (only if 4-20mA ouput selected)
		2: maximum output signal (approx. 22mA or 10,7V)
A_05	Type of **OUTPUT RELAYS REACTION** on PT xxx sensor malfunction (disconnect or short circuit) **NOTICE**: Relays close or open immediately and ignore TIME HYSTERESIS and RELAY FUNCTION set on addresses A_18, A_23, A_48, A_53	0: w/out reaction – follows measured value of PT xxx
		1: relays are opens (static state)
		2: relays are closed
A_06	LED display **BRIGHTNESS**	0 : 100%
		1 : 50%
A_07	Output signal LIMITATION if temperature range od analogue output (A_26) is exceed	0 : disabled
		1 : enabled
A_14	Set limit L1 in main display *)	0 : disabled
		1 : enabled
A_15	Limit **L1 numeral** setting	in full range of scale
A_16	Limit **L1 HYSTERESIS numeral** setting	positive range of scale
A_17	Limit **L1 HYSTERESIS timing**	from 0 to 299.9 s, step: 0.1 s
A_18	L1 relay output function: direct: relay closes, inverted: relay opens	0 : inverted
		1 : direct
A_19	Set limit L2 in main display *)	0 : disabled
		1 : enabled
A_20	Limit **L2 numeral** setting	in full range of scale
A_21	Limit **L2 HYSTERESIS** numeral setting	positive range of scale
A_22	Limit **L2 HYSTERESIS** timing	from 0 to 299.9 s, step: 0.1 s
A_23	L2 relay output function: direct: relay closes, inverted: relay opens	0 : inverted
		1 : direct
A_24	**Output signal TYPE** selection	0 : 0 – 20 mA DC
		1 : 4 – 20 mA DC
		2 : 0 – 10 V DC
A_25	**TEMPERATURE RANGE settings** for analogue output	beginning of temperature range
A_26	**TEMPERATURE RANGE settings** for analogue output	end of temperature range
A_44	Set limit L3 in main display *)	0 : disabled
		1 : enabled
A_45	Limit **L3 numeral** setting	in full range of scale
A_46	Limit **L3 HYSTERESIS** numeral setting	positive range of scale
A_47	Limit **L3 HYSTERESIS** timing	from 0 to 299.9 s, step: 0.1 s
A_48	L3 relay output function: direct: relay closes, inverted: relay opens	0 : inverted
		1 : direct
A_49	Set limit L4 in main display ***)	0 : disabled
		1 : enabled
A_50	Limit **L4 numeral** setting	in full range of scale

A_51	Limit **L4 HYSTERESIS** numeral setting	positive range of scale	
A_52	Limit **L4 HYSTERESIS** timing	from 0 to 299.9 s, step: 0.1 s	
A_53	L4 relay output function: direct: relay closes, inverted: relay opens	0 : inverted	
		1 : direct	

*) enabling this feature provides full access to the value of limits without password protection !
**) the number of displayed addresses dependes on instrument configuration
***) **NOTICE:** the settings on address A_04 and address A_24 are automatically controlled. Eg.: It is not possible to set output signal type 0-10V on A_24 and on A_04 set signal drop to 2mA. This combination is not saved and error message is displayed: **„ErrA_04"** or **„ErrA_24"**, dependes on which address you have done last change!
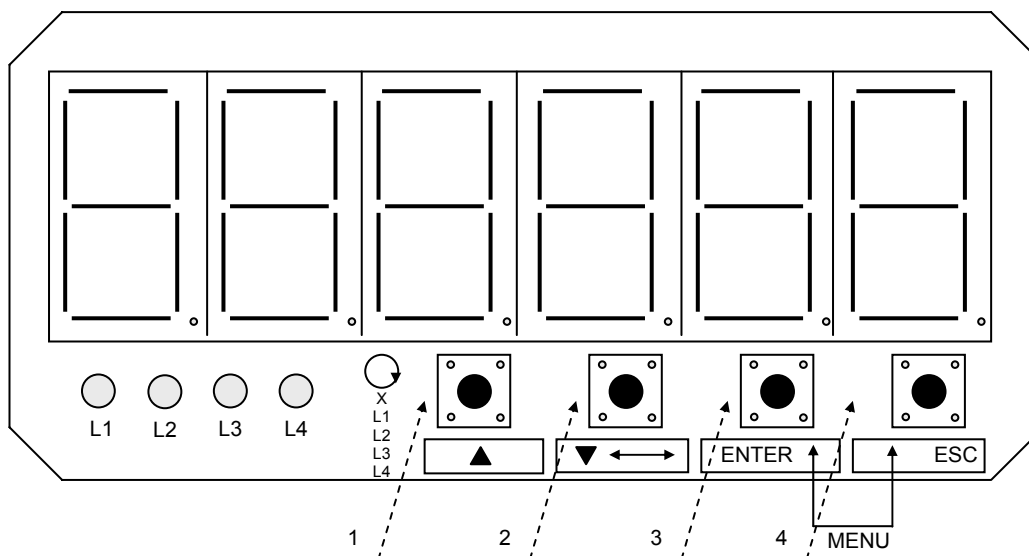
B. DETAIL DESCRIPTION OF EACH ADDRESS FUNCTION

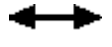| Address	Description
A_01	**INPUT SIGNAL** type selection - user can choose from 2 and 4 wires or 3 wires PT xxx sensor connection
A_02	**SENSOR TYPE** selection - user can choose between PT 100 Ω and PT 1000 Ω sensors
A_03	**LINE RESIST** compensation: - user can set the line resist compensation upto : **99.99** Ω - eg.: PT xxx sensor is connected in 3-wires mode (line resist is compensated automatically) and set the internal line resist of PT xxx sensor to : 3.48 Ω.
A_04	Type of **ANALOG OUTPUT REACTION** on PT xxx sensor malfunction (disconnect or short circuit)
A_05	Type of **OUTPUT RELAYS REACTION** on PT xxx sensor malfunction (disconnect or short circuit)
A_06	**level of LED display BRIGHTNESS** - 0 means 100% BRIGHTNESS and 1 means 50% BRIGHTNESS
A_07	**Output signal LIMITATION** If measured temperatured is out of temperature range set on addresses A_25 and A_26, output signal will be limited to 0/4mA (0V) if lower then A_25 and 20mA (10V) if higher then A_26.
A_14	**Set limit L1 in main display** 0 - no direct access of L1 in main display , 1 - direct access L1 in main display this selection enables setting of limit L1 in main display, instead of entering menu (by typeing password) and accessing the address 15. You can simply list L1 in main display (by button no. 1) and by pressing enter button you can setup the value of limit L1.
A_15	**Limit L1 numeral setting** - when the measured value reach the L1,relay RE1 will open/close(depends on value on A_18) - the value of L1 could be set in full range of scale (max. –200 to +800)
A_16	**limit L1 HYSTERESIS (dL1) numeral setting**: - this address provides limit L1 HYSTERESIS numeral setting - the value of dL1 could be set in positive range of scale - the value of dL1 is symetric in both direction (for ex.: L1=100 ; dL1=10 ; first point of L1 will be 90 and second point will be 110)
A_17	**Limit L1 HYSTERESIS timing: dtL1** - this address provides limit L1 HYSTERESIS timing - the value od dtL1 could be set from 0 to 299.9 s (step: 0.1 s) - description: if the input signal reach the value of L1, relay closes/opens (see address 18) after the time of dtL1 countdown. (from 0s to 299,9s) - if the input signal overloads the value of L1, dtL1 count down is activated. If the input signal falls under the value of L1 during the dtL1 count down is timing, the relay RE1 will not be activated and the dtL1 count down timing is reseted.
A_18	**Selection of function RE1 when the measured value reach limit L1 :** - direct function: when relay RE1 reach L1 opens /the hook contact of RE1 is activated/ - indirect function : when relay RE1 reach L1 closes /the unhook contact of RE1 is activated/
A_19	**Set limit L2 in main display** 0 - no direct access of L2 in main display , 1 - direct access L2 in main display this selection enables setting of limit L2 in main display, instead of entering menu (by typeing

	password) and accessing the address 20. You can simply list L2 in main display (by button no. 1) and by pressing enter button you can setup the value of limit L2.
A_20	**Limit L2 numeral setting** - when the measured value reach the L2,relay RE2 will open/close(see address 22) - the value of L2 could be set in full range of scale (max. –200 to +800)
A_21	**limit L2 HYSTERESIS (dL2) numeral setting**: - this address provides limit L2 HYSTERESIS numeral setting - the value of dL2 could be set in positive range of scale - the value of dL2 is symetric in both direction (for ex.: L2=100 ; dL2=10 ; first point of L2 will be 90 and second point will be 110)
A_22	**Limit L2 HYSTERESIS timing: dtL2** - this address provides limit L2 HYSTERESIS timing - the value od dtL2 could be set from 0 to 299.9 s (step: 0.1 s) - description: if the input signal reach the value of L2, relay closes/opens (see address 23) after the time of dtL2 countdown. (from 0s to 299,9s) - if the input signal overloads the value of L2, dtL2 count down is activated. If the input signal falls under the value of L2 during the dtL2 count down is timing, the relay RE2 will not be activated and the dtL2 count down timing is reseted.
A_23	**Selection of function RE2 when the measured value reach limit L2 :** - direct function: when relay RE2 reach L2 opens /the hook contact of RE2 is activated/ - indirect function : when relay RE2 reach L2 closes /the unhook contact of RE2 is activated/
A_24	**Output signal TYPE selection** - user can choose between standard signals: 0-20 mA, 4-20 mA, 0-10 VDC
A_25	**TEMPERATURE RANGE settings** for analogue output: - beginning of temperature range, which is assigned to beginning of analogue output - eg.: output signal 0-20 mA (0 on A_24) is assigned to 100°C. So the output signal 0mA represents temperature 100°C.
A_26	**TEMPERATURE RANGE settings** for analogue output: - end of temperature range, which is assigned to end of analogue output - eg.: output signal 0-20 mA (0 on A_24) is assigned to 200°C. So the output signal 20mA represents temperature 200°C.
A_44	**Set limit L3 in main display** 0 - no direct access of L3 in main display , 1 - direct access L3 in main display this selection enables setting of limit L3 in main display, instead of entering menu (by typeing password) and accessing the address 45. You can simply list L3 in main display (by button no. 1) and by pressing enter button you can setup the value of limit L3.
A_45	**Limit L3 numeral setting** - when the measured value reach the L3,relay RE3 will open/close(see address 48) - the value of L3 could be set in full range of scale (max. –200 to +800)
A_46	**limit L3 HYSTERESIS (dL3) numeral setting**: - this address provides limit L3 HYSTERESIS numeral setting - the value of dL3 could be set in positive range of scale - the value of dL3 is symetric in both direction (for ex.: L3=100 ; dL3=10 ; first point of L3 will be 90 and second point will be 110)
A_47	**Limit L3 HYSTERESIS timing: dtL3** - this address provides limit L3 HYSTERESIS timing - the value od dtL3 could be set from 0 to 299.9 s (step: 0.1 s) - description: if the input signal reach the value of L3, relay closes/opens (see address 48) after the time of dtL3 countdown. (from 0s to 299,9s) - if the input signal overloads the value of L3, dtL3 count down is activated. If the input signal falls under the value of L3 during the dtL3 count down is timing, the relay RE3 will not be activated and the dtL3 count down timing is reseted.
A_48	**Selection of function RE3 when the measured value reach limit L3 :** - direct function: when relay RE3 reach L3 opens /the hook contact of RE3 is activated/ - indirect function : when relay RE3 reach L3 closes /the unhook contact of RE3 is activated/

A_49	**Set limit L4 in main display** 0 - no direct access of L4 in main display , 1 - direct access L4 in main display this selection enables setting of limit L4 in main display, instead of entering menu (by typeing password) and accessing the address 50. You can simply list L4 in main display (by button no. 1) and by pressing enter button you can setup the value of limit L4.
A_50	**Limit L4 numeral setting** - when the measured value reach the L4, relay RE4 will open/close (see address 53) - the value of L4 could be set in full range of scale (max. –200 to +800)
A_51	**limit L4 HYSTERESIS (dL4) numeral setting**: - this address provides limit L4 HYSTERESIS numeral setting - the value of dL4 could be set in positive range of scale - the value of dL4 is symetric in both direction (for ex.: L4=100 ; dL4=10 ; first point of L4 will be 90 and second point will be 110)
A_52	**Limit L4 HYSTERESIS timing: dtL4** - this address provides limit L4 HYSTERESIS timing - the value od dtL4 could be set from 0 to 299.9 s (step: 0.1 s) - description: if the input signal reach the value of L4, relay closes/opens (see address 53) after the time of dtL4 countdown. (from 0s to 299,9s) - if the input signal overloads the value of L4, dtL4 count down is activated. If the input signal falls under the value of L4 during the dtL4 count down is timing, the relay RE4 will not be activated and the dtL4 count down timing is reseted.
A_53	**Selection of function RE4 when the measured value reach limit L4 :** - direct function: when relay RE4 reach L4 opens /the hook contact of RE4 is activated/ - indirect function : when relay RE4 reach L4 closes /the unhook contact of RE4 is activated/

NOTICE:

List of error messages:
01___A – Error in interfacing internal IC, please contact manafuctarer.
Err Pt – measured resistance from PT xxx sensor is greater than 390,48 Ω, or the measuring loop is disconnected
Err–Pt – measured resistance from PT xxx sensor is lesser than 18,52 Ω or the measuring loop is short-cutted
ErrA_04, ErrA_24 – the settings on address A_04 and address A_24 are automatically controlled.
Eg.: It is not possible to set output signal type 0-10V on A_24 and on A_04 set signal drop to 2mA. This combination is not saved and error message is displayed: „ErrA_04" or „ErrA_24", dependes on which address you have done last change!

C. DETAIL DESCRIPTION OF BUTTONS USAGE

1	⟳ **X** **L1*** **L2*** **L3*** **L4***	**1. function**: in measuring state this button provides cycle showing of L3 and L4 when is button pressed the value on display is shown in this direction: **- measured value** : the device automatically shows measured value on each power on and automatically returns in less than 10 s from L1, L2, L3 or L4 - **limit L1**: symbol ' L1 ' is shown for less than 10 s and then if no button pressed returns to the measured value, if enter button is pressed the value of limit will be shown. By pressing enter button again, you will access setting value of limit L1. - **limit L2, L3, L4**: same as limit L1 Then the set of L1, L2, L3 or L4 is standart as a normal access to the L1, L2, L3 or L4 from the menu. Anytime you can exit by pressing ESC button without changes. * displayed symbols L1, L2, L3 or L4 dependes on actual configuration of process meter and on settings on address A_14, A_19, A_44 or A_49.
	▲	**2. function**: in programming state this button provides increasing the value on the selected digit of display.(xxx(x)xx highlited 'x' is blinking and button ^ increase value): - to setup numeral data in basic addresses : A_01 - A_53 - to setup the selection in SUB-ADDRESSES - to setup all numeral values (eg. L1,L2, L3, L4 etc...)
2	←→	**1. function**: in programming state this button provides switching the highlighted (blinking) digit on display (eg. xxx(x)xx, <-> , xxxx(x)x , <-> , xxxxx(x) ,<-> (x)xxxxx) - valid only for setup in addresses where is the numeral value setuped. - not valid for setting SUB-ADDRESSES switches / "program switches" / (for ex.: A_01, A_53)
	▼	**2. function**: in menu this button provides decreasing numeral value of address A_01 - A_53 . (for ex. A_15 button pressed A_14 , Butt Pressed , A_13) notice: if you press the button and the numeral value of adress is 1 (A_01) the next value will be 53 (A_53) -> cycle
3+4	ENTER + ESC	pressing together button "ENTER" and "ESC" provides entering to the password protected menu. - by pressing ENTER+ESC together, on display apears " 0 0 0 0 " and device is waiting for the password. (if no button pressed in 5 second the device returns back) - user password : provides access to the address A_01 - A_53 ('user setup area') - with buttons n.1 and n.2 write the password and then confirm by pressing ENTER button. notice: the password cannot be change so be careful and hide the password from any unauthorized person
3	ENTER	ENTER provides confirm and saving values - by confirm (pressing ENTER butt) address (eg. A_10) you enter the programming state - now you can set the value or exit by pressing ESC button. - by next pressing ENTER the setuped value is saved into EEPROM memory and on display appears message 'hotouo' - Confirm this message by pressing ESC button
4	ESC	ESC provides escaping the programing state , menu , etc...

D. SAFETY OPERATIONS

1. SETTING IN OPERATION
Device doesn't require any before running procedures and is ready to use after unpacking. Make sure that proper supply voltage is set and all input and outputs are connected correctly before connection to supply system.

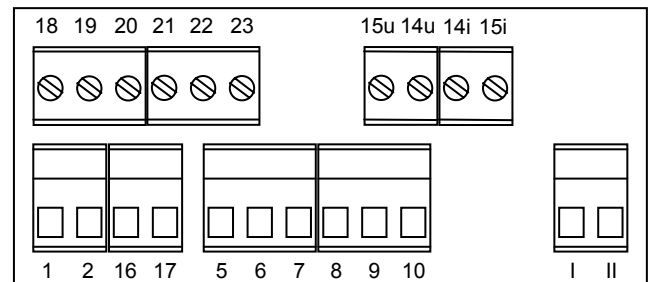Device is factory pre-seted, if no other specifications were received: *)
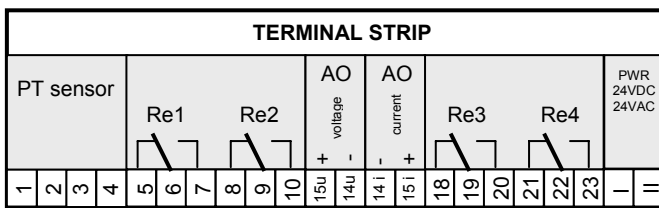Input: 4 wires PT100 line resist compensation: 0.00 Ω
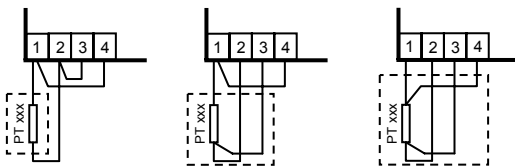Output: 4-20mA DC   limits: L1 = 20.0°C, L2 = 40.0°C, L3 = 60.0°C, L4 = 80.0°C

*) available functions may vary due to device configuration

Electrical wiring has to be done by skilled person, device setup can be done by instructed person.

2. TERMINAL STRIP

3. PT XXX SENSOR WIRING

2 wires, 3 wires and 4 wires connection.

4. INSTALLATION AND MAINTAINANCE INSTRUCTIONS
Instrument is continuos run device and doesn't have own power-off switch. Installation must contains some power-off switch or building distribution circuit-breaker (e.g. power-off switch in switchboard or main distribution circuit-breaker). It has to be easy accessible by operating staff and has to be marked as cutting-off element.

DMP02 is constructed to require minimal maintainance. Front panel with foil keypad isn't resistant to organic solvents (e.g. toluene, acetone etc...)
Use only suitable non-agresive cleaners for cleaning front panel (e.g. industrial alcohol).
To prevent long-term failure-free operation, is recommned to use device in specified temperature range and not expose it to extreme climatic condition, which have effect to longtime lifecycle of electronic components.

5. REPAIR INSTRUCTIONS
Each device was subjected to components quality check control, pre-setting circuits and 24 hours burn-in on power supply. After 24 hours burn-in, was made pre-set parametres check. If device failure occurs (e.g. by overvoltage, mechanical damage, device malfunction ...), that impact its own functionality, it is necessary to contact manufacturer, which will provide appropriate repair.

6. WARRANTY
Manafacturer quarantees in accordance with §429 Commercial code (Czech Republic) for technical and operating characteristics , specified in accompanying technical documentation. Device has 36 months warranty and after warranty service is provided. This warranty does not apply: (a) to damage caused by accident, abuse, misuse, misapplication; (b) to unauthorized repair or modification or (c) if serial number has been removed or defaced.