USER MANUAL

OMB 412UNI

3 DIGIT PROGRAMMABLE
UNIVERSAL BARGRAPH

DC VOLTMETER/AMMETER
PROCESS MONITOR
OHM METR
TEMPERATURE DISPLAY FOR PT 100/500/1 000
TEMPERATURE DISPLAY FOR NI 1 000/10 000
TEMPERATURE DISPLAY FOR THERMO COUPLES
DISPLAY FOR LINEAR POTENTIOMETERS

orbit merret

Outstanding Measurement Value

SAFETY INSTRUCTIONS

Please read and observe the enclosed safety instructions carefully!

Installation, all operations, maintenance and service must be carried out by qualified personnel only and in accordance with the enclosed information and safety regulations.

The manufacturer is not responsible for any damage caused by improper installation, configuration, maintenance and service of the device.

The device must be installed correctly according to the actual application. Improper installation may cause malfunction, which may result in damage to the unit or an accident.

The device uses dangerous voltage that can cause a fatal accident. The unit must be disconnected from the power supply before starting troubleshooting (in case of malfunction) or before dismantling the unit. For safety information, EN 61 010-1 + A2 must be observed.

When removing or inserting an electronics card, observe the safety instructions and follow the recommended procedures. Disconnect the unit from power supply before inserting / extracting any electronics cards.

Do not attempt to repair or modify the device yourself. In case of malfunction the device must be dismounted and submitted to the manufacturer for repair.

These devices should be protected by either individual or shared fuses (circuit breakers)!

The device is not intended for installation in explosive areas. Use the device only outside the explosive areas.

TECHNICAL SPECIFICATIONS

Instruments of the OMB 412 series comply with the EU 2014/30/EU a 2014/35/EU directive and meet the following European standards:

EN 61010-1	Electrical safety
EN 61326-1	Electrical measuring, control and laboratory equipment - EMC requirements „Industrial Area“
IEC/IEEE 60980-344	Seismic qualification
EN 60068-2-6	Mechanical resistibility

The device is suitable for unlimited use in agricultural and industrial areas.

DANGER	WARNING	ATTENTION
RISK OF ELECTRIC SHOCK - Disconnect all power supply and live wires before servicing.	**RISKS ASSOCIATED WITH USE** - Do not use this product in a safety critical system. - Do not disassemble, repair or modify the product. - Do not use the product outside the recommended operating conditions.	**RISKS ASSOCIATED WITH USE** - Install a 100 mA fuse
Failure to follow this instruction will result in death or serious injury.	**Failure to follow these instructions may result in death, serious injury, or damage to the equipment**	**Failure to observe this precaution could result in personal injury or equipment damage.**

This electrical equipment may be installed, operated and maintained only by qualified personnel.
ORBIT MERRET assumes no responsibility for any consequences arising from the use of this equipment.

2. INSTRUMENT DESCRIPTION

2.1 DESCRIPTION

The OMB 412 model series are 24 LED, 3-colour panel programmable horizontal bargraph designed for maximum efficiency and user comfort while maintaining their favourable price. Two models are available: UNI and PWR.

Type OMB 402UNI is a multifunction instrument with the option of configuration for 8 various input options, easily configurable in the instrument menu. By further options of input modules it is feasible to measure larger ranges of DC voltage and current or increase the number of inputs up to 4 (applies for PM).

The instrument is based on an 8-bit microcontroller with a multichannel 24-bit sigma-delta converter, which secures high accuracy, stability and easy operation of the instrument.

TYPES AND RANGES

UNI	DC:	0...60/150/300/1200 mV
	PM:	0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/±40 V
	OHM:	0...100 Ω/0...1 kΩ/0...10 kΩ/0...100 kΩ/Automatická změna Rangeu
	RTD-Pt:	Pt 50/100/Pt 500/Pt 1000
	RTD-Cu:	Cu 50/Cu 100
	RTD-Ni:	Ni 1 000/Ni 10 000
	T/C:	J/K/T/E/B/S/R/N/L
	DU:	Linear potentiometer (min. 500 Ω)
UNI - A	DC:	±0,1 A/±0,25 A/±0,5 A/±2 A/±5 A/±100 V/±250 V/±500 V

PROGRAMMABLE PROJECTION

Selection:	of type of input and measuring range
Measuring range:	adjustable as fixed or with automatic change
Setting:	manual, optional projection on the display may be set in the menu for both limit values of the input signal, e.g. input 0...20 mA > 0...850
Projection:	24-segment LED 3-color bargraph + 3-digit display -99...999

COMPENSATION

of conduct:	in the menu it is possible to perform compensation for 2-wire connection
of conduct in probe:	internal connection (conduct resistance in measuring head)
of CJC (T/C):	manual or automatic, in the menu it is possible to perform selection of the type of thermocouple and compensation of cold junctions, which is adjustable or automatic (temperature at the brackets)

LINEARIZATION

Linearization:*	by linear interpolation in 50 points (solely via OM Link)

DIGITAL FILTERS

Floating average:	from 2...30 measurements
Exponen. average:	from 2...100 measurements
Arithmetic average:	from 2...100 measurements
Rounding:	setting the projection step for display

MATHEMATIC FUCTIONS

Min/max. value:	registration of min./max. value reached during measurement
Tare:	designed to reset display upon non-zero input signal
Peak value:	the display shows only max. or min. value
Mat. operations:	polynome, 1/x, logarithm, exponential, power, root, sin x

** only for types DC, PM, DU*

EXTERNAL CONTROL

Lock:	control keys blocking
Hold:	display/instrument blocking
Tare:	tare activation/resetting tare to zero
Resetting MM:	resetting min/max value
Memory:	data storage into instrument memory

2.2 OPERATION

The instrument is set and controlled by five control keys located on the front panel. All programmable settings of the instrument are performed in three adjusting modes:

LIGHT **Simple programming menu**
- contains solely items necessary for instrument setting and is protected by optional no. code

PROFI **Complete programming menu**
- contains complete instrument menu and is protected by optional number code

USER **User programming menu**
- may contain arbitrary items selected from the programming menu , which determine the right (see or change), acces without password

All programmable parameters are stored in the EEPROM memory (they hold even after the instrument is switched off).

Complete instrument operation and setting may be performed via OM Link communication interface, which is a standard equipment of all instruments.
The operation program is freely accessible (www.orbit.merret.eu) and the only requirement is the purchase of OML cable to connect the instrument to PC. It is manufactured in version RS 232 and USB and is compatible with all ORBIT MERRET instruments.
The program OM LINK in „Basic" version will enable you to connect one instrument with the option of visualization and archiving in PC. The OM Link „Standard" version has no limitation of the number of instruments connected.

2.3 OPTIONS

Excitation is suitable for supplying power to sensors and transmitters. It has a galvanic separation.

Comparators are assigned to monitor one, two, three or four limit values with relay output. The user may select limits regime: LIMIT/DOSING/FROM-TO. The limits have adjustable hysteresis within the full range of the display as well as selectable delay of the switch-on in the range of 0...99,9 s. Reaching the preset limits is signalled by LED and simultaneously by the switch-on of the relevant relay.

Data outputs are for their rate and accuracy suitable for transmission of the measured data for further projection or directly into the control systems. We offer an isolated RS232 and RS485 with the ASCII or DIN MessBus protocol.

Analog outputs will find their place in applications where further evaluating or processing of measured data is required in external devices. We offer universal analog output with the option of selection of the type of output - voltage/current. The value of analog output corresponds with the displayed data and its type and range are selectable in Menu.

Measured data record is an internal time control of data collection. It is suitable where it is necessary to register measured values. Two modes may be used. FAST is designed for fast storage (40 records/s) of all measured values up to 8 000 records. Second mode is RTC, where data record is governed by Real Time with data storage in a selected time segment and cycle. Up to 250 000 values may be stored in the instrument memory. Data transmis sion into PC via serial interface RS232/485 and OM Link

3. INSTRUMENT CONECTION

The instrument supply leads should not be in proximity of the incoming low-potential signals.

Contactors, motors with larger input power should not be in proximity of the instrument.

The leads into the instrument input (measured quantity) should be in sufficient distance from all power leads and appliances. Provided this cannot be secured it is necessary to use shielded leads with connection to ground (bracket E).

The instruments are tested in compliance with standards for use in industrial area, yet we recommend to abide by the above mentioned principles.

MEASURING RANGES

TYPE	INPUT I	INPUT U
DC		0...60/150/300/1 200 mV
PM	0...5/20 mA/4...20 mA	±2/±5/±10/±40 V
OHM	0...100 Ω/1 kΩ/10 kΩ/100 kΩ/Auto	
RTD-PT	Pt 50/100/Pt 500/ Pt 1 000	
RTD-CU	Cu 50/100	
RTD-NI	Ni 1 000/10 000	
T/C	J/K/T/E/B/S/R/N/L	
DU	Linear potentiometer (min. 500 Ω)	

OPTION "A"

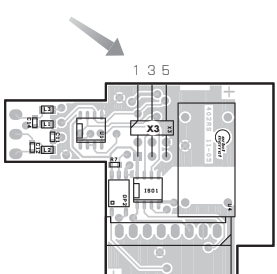
TYPEE	INPUT I	INPUT U
DC	±0,1 A/±0,25 A/±0,5 A to GND (C) ±2 A/±5 A to GND (B)	±100 V/±250 V/±500 V to GND (C)

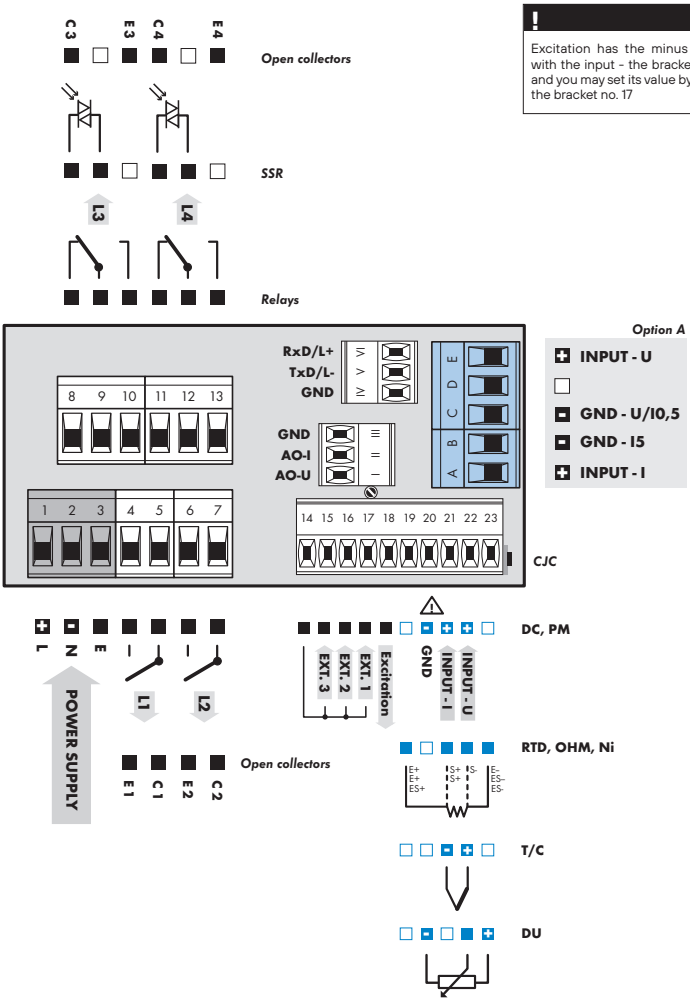
Termination of RS 485 communication line

X3 - Termination of commuication line RS 485

Full	Significance	Default	Recomendation
1-2	connect L+ to (+) source	terminalconnected	
3-4	termination of line 120 Ohm	disconnected	connect at the end of line
5-6	connect L- to (-) source	terminalconnected	do not disconnect

RS 485 line should have a linear structure - wires (ideally shielded and twisted) should lead from one device to another.



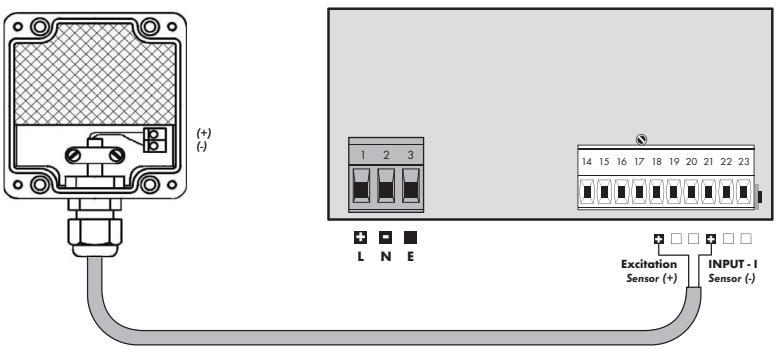


!

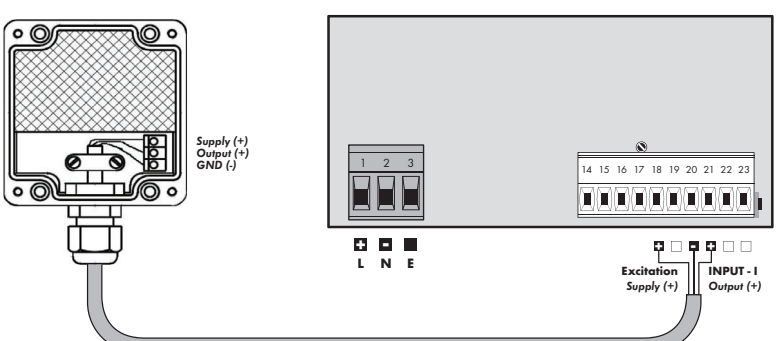
Excitation has the minus pole common with the input - the bracket no. 20 - GND and you may set its value by trimmer above the bracket no. 17

Maximum of 250 mA may be connected to "INPUT - I" (bracket no. 21) , i.e. 10-times range overload.
Mind the correct connection/mistaking of current - voltage input.
Destruction of measuring resistance in current input (15R) may occur.

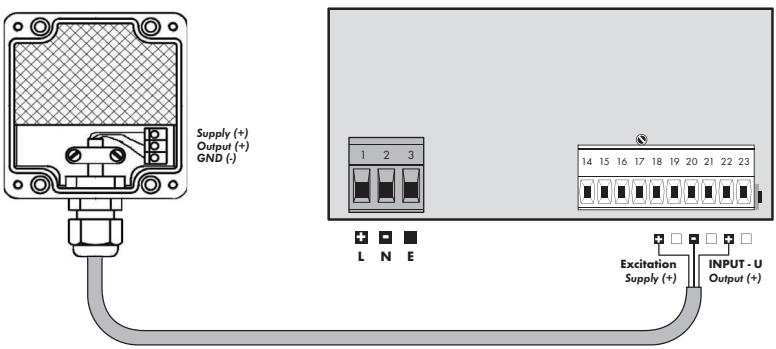
Example connection of a 2-wire sensor with current signal output powered by excitation



Example connection of a 3-wire sensor with current signal output powered by excitation

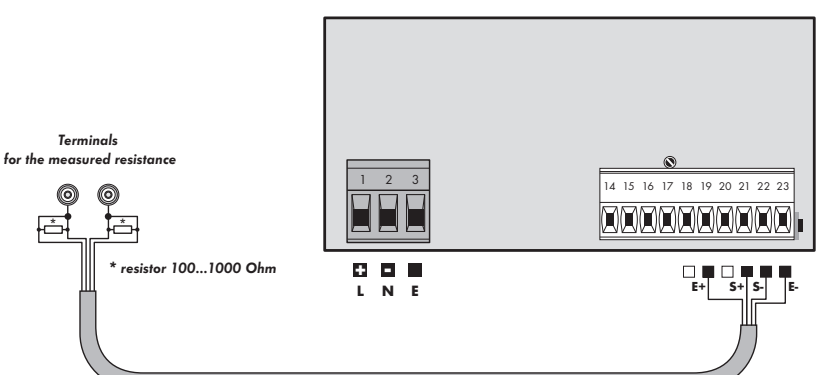


Example connection of 3-wire sensor with voltage signal output powered by excitation



Example connection of resistance measurement using 4 wires

By connecting resistor R* we elimintate error message E. I.Ov. (input overflow) when the measured resistance is disconnected



SETTING **PROFI**

For expert users
Complete instrument menu
Access is password protected
Possibility to arrange items of the **USER MENU**
Tree menu structure

SETTING **LIGHT**

For trained users
Only items necessary for instrument setting
Access is password protected
Possibility to arrange items of the **USER MENU**
Linear menu structure

SETTING **USER**

For user operation
Menu items are set by the user (Profi/Light) as per request
Access is not password protected
Optional menu structure either tree (PROFI) or linear (LIGHT)

4.1 SETTING

The instrument is set and controlled by five control keys located on the front panel. All programmable settings of the instrument are performed in three adjusting modes:

LIGHT **Simple programming menu**
- contains solely items necessary for instrument setting and is protected by optional number code

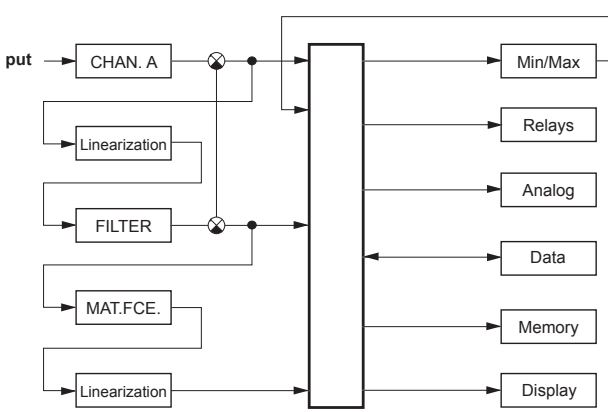
PROFI **Complete programming menu**
- contains complete instrument menu and is protected by optional number code

USER **User programming menu**
- may contain arbitrary items selected from the programming menu (LIGHT/PROFI), which determine the right (see or change)
- acces without password

All programmable parameters are stored in the EEPROM memory (they hold even after the instrument is switched off).

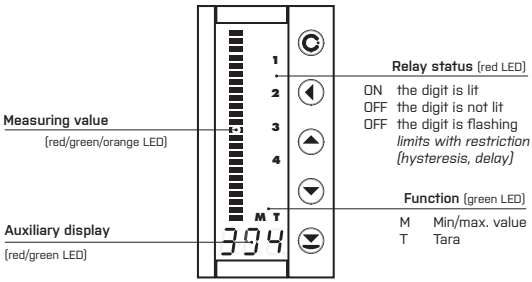
Complete instrument operation and setting may be performed via OM Link communication interface, which is a standard equipment of all instruments.
The operation program is freely accessible (www.orbit.merret.eu) and the only requirement is the purchase of OML cable to connect the instrument to PC. It is manufactured in version RS 232 and USB and is compatible with all ORBIT MERRET instruments.
Another option for connection is with the aid of data output RS 232 or RS 485 (without the need of the OML cable).

Scheme of processing the measured signal



4. INSTRUMENT SETTING

Setting and controlling the instrument is performed by means of 5 control keys located on the front panel. With the aid of these keys it is possble to browse through the operation menu and to select and set required values



Symbols used in the instructions

DC PM
DU OHM RTD T/C Indicates the setting for given type of instrument

DEF values preset from manufacture

symbol indicates a flashing light (symbol)

inverted triangle indicates the item that can be placed in USER menu

roken line indicates a dynamic item, i.e. it is displayed only in particular selection/version


after pressing the key the set value will not be stored


after pressing the key the set value will be stored

30 continues on page 30

Setting the decimal point and the minus sign

Decimal point
Its selection in the menu, upon modification of the number to be adjusted it is performed by the control key ◀ with transition beyond the highest decade, when the decimal point starts flashing . Positioning is performed by ▲/▼.

The minus sign
Setting the minus sign is performed by the key ▼ on higher decade. When editing the item substraction must be made from the current number (e.g.: 013 > ▼ , on class 100 > -87)

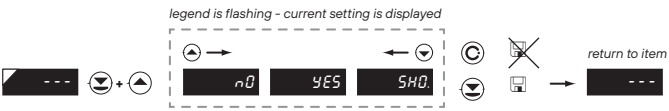
Control keys functions

KEY	MEASUREMENT	MENU	SETTING NUMBERS/SELECTION
C	access into USER menu	exit menu	quit editing
◀	programmable key function	back to previous level	move to higher decade
▼	programmable key function	move to previous item	move down
▲	programmable key function	move to next item	move up
▼	programmable key function	confirm selection	confirm setting/selection
▲ + ▼			numeric value is set to zero
C + ▼	access into LIGHT menu		
C + ▼	access into PROFI menu		
▼ + ▲		configuration of an item for "USER" menu	
▼ + ▼		determine the sequence of items in USER - LIGHT" menu	

Setting items into „USER" menu

- in **LIGHT** or **PROFI** menu
- no items permitted in **USER** menu from manufacture
- on items marked by inverted triangle

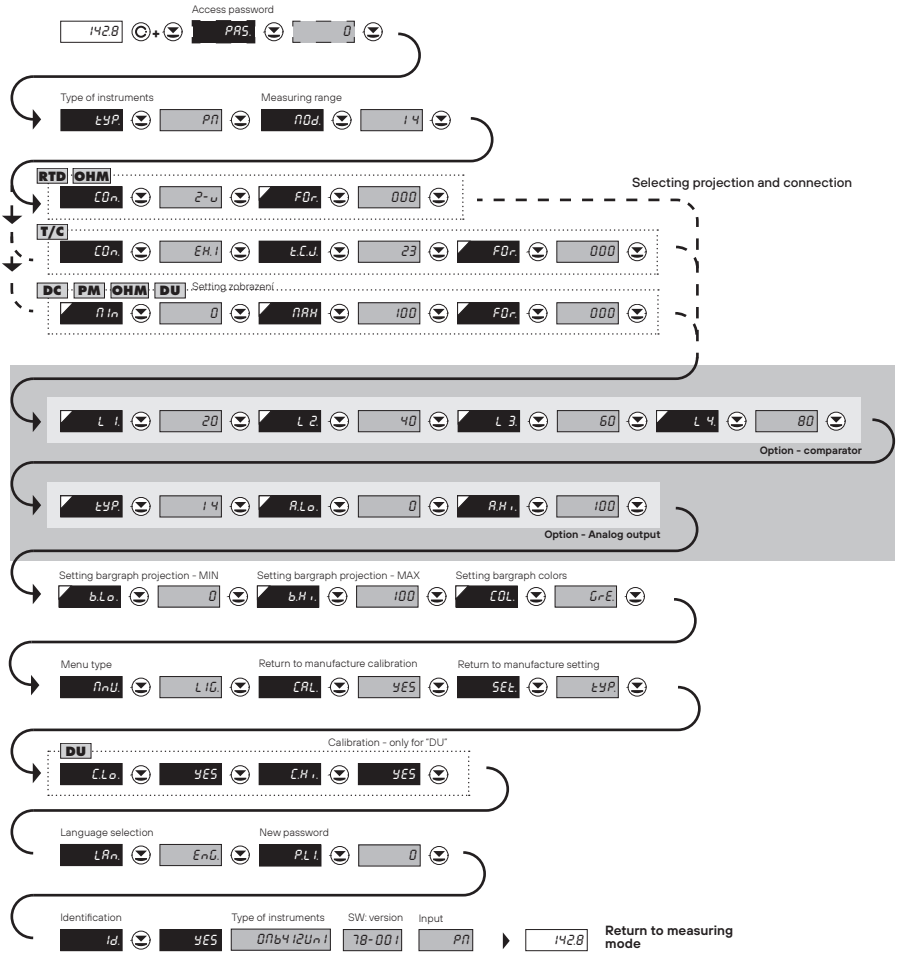
USER



nO	item will not be displayed in USER menu
YES	item will be displayed in USER menu with the option of setting
SHO.	item will be solely displayed in USER menu

SETTING **LIGHT**

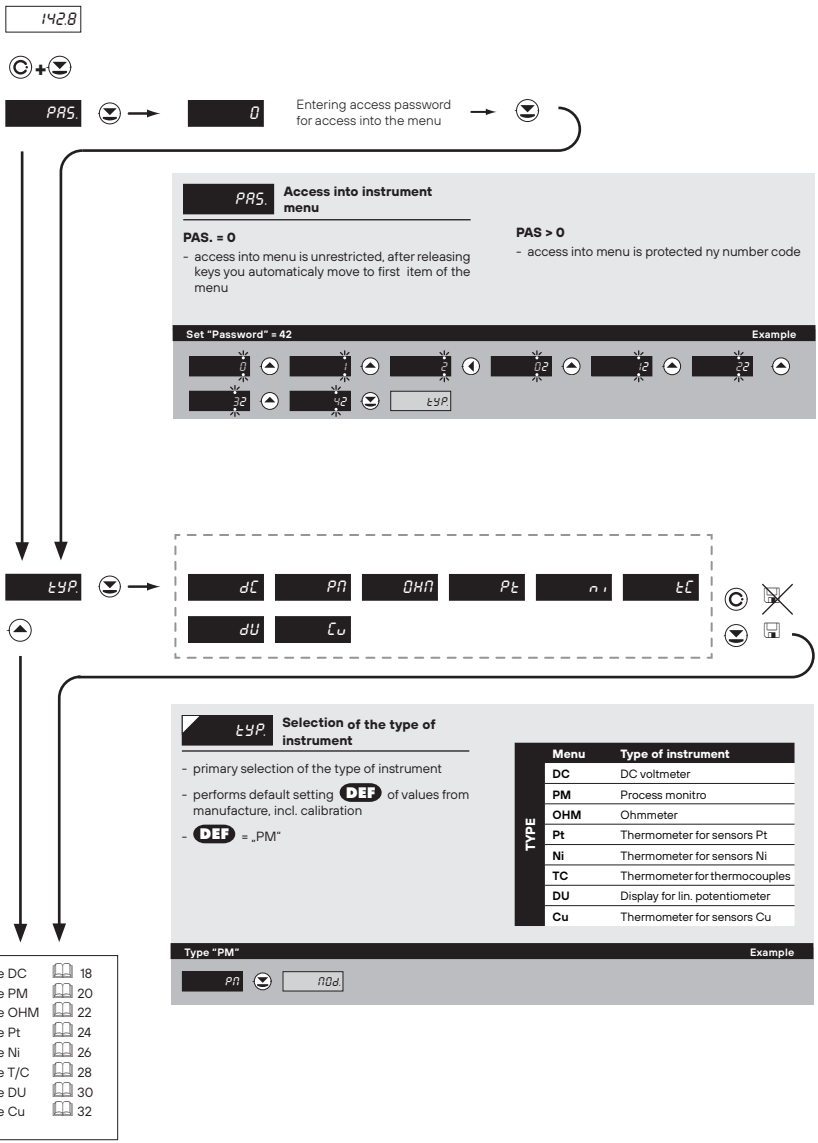
For trained users
Only items necessary for instrument setting
Access is password protected
Possibility to arrange items of the **USER MENU**
Linear menu structure



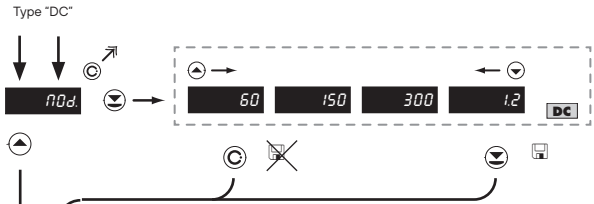
Preset from manufacture	
Password	"0"
Menu	LIGHT
USER menu	off
Setting the items	DEF

!

Upon delay exceeding 60 s the programming mode is automatically discontinued and the instrument itself restores the measuring mode



Type DC 18
Type PM 20
Type OHM 22
Type Pt 24
Type Ni 26
Type T/C 28
Type DU 30
Type Cu 32



nOd. **Selection of the instrument measuring range**

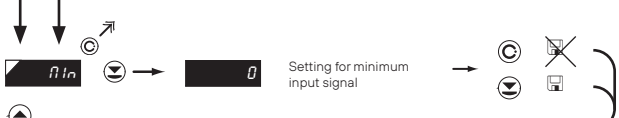
DEF = 60 mV

DEF = 500 V*

*only for option "A"

	Menu	Measuring range
MOD.	60	±60 mV
	150	±150 mV
	300	±300 mV
	1.2	±1,2 V
MOD. - A	100	±100 V
	250	±250 V
	500	±500 V
	0.10	±0,1 A
	0.25	±0,25 A
	0.50	±0,5 A
	1.00	±1 A
	5.00	±5 A

Range ±150 mV **Example**

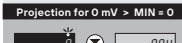


Min **Setting display projection for minimum value of input signal**

- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 0

Projection for 0 mV > MIN = 0 **Example**

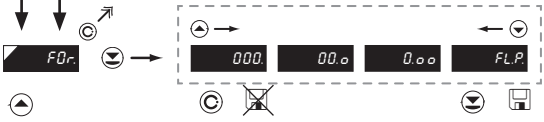


nAH **Setting display projection for maximum value of input signal**

- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100

Projection for 150 mV > MAX = 300 **Example**



FOr **Setting projection of the decimal point**

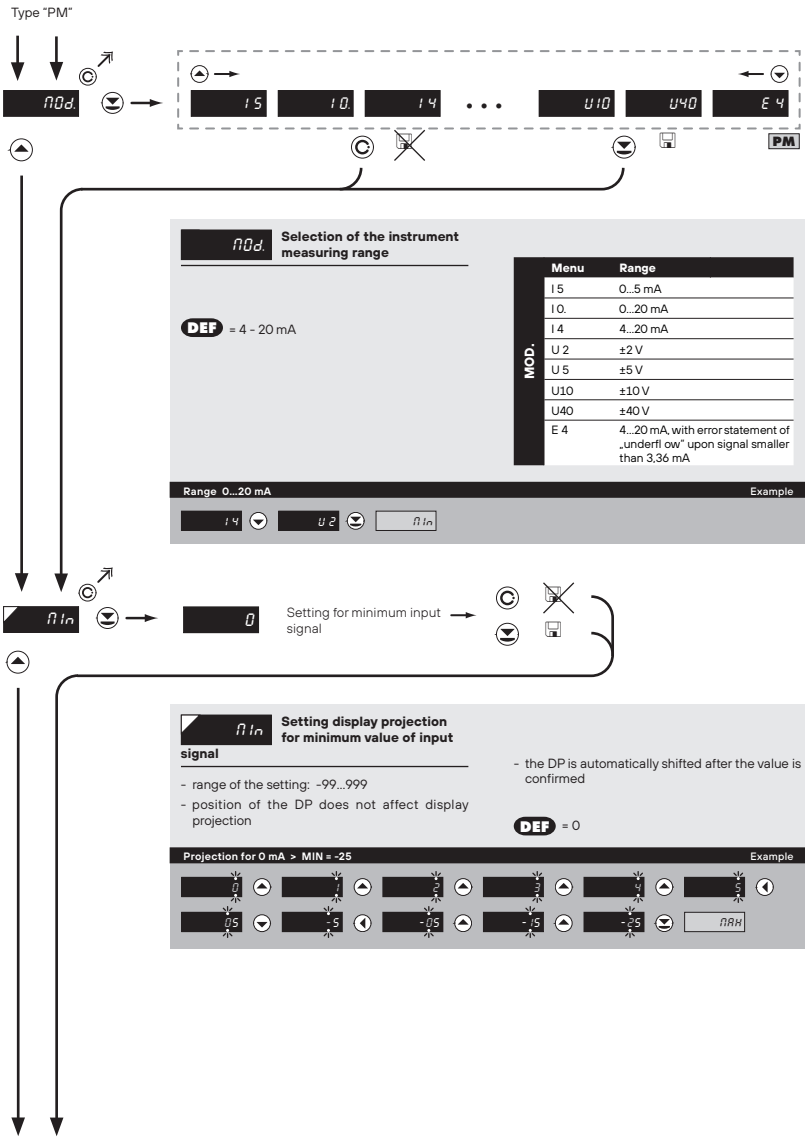
- positioning of the DP is set here in the measuring mode

DEF = 000

Projection of DP on display > 00.0 **Example**

*subsequent item on the menu depends on instrument equipment

34

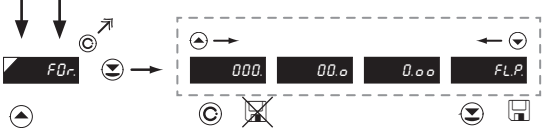

Type "PM"
nOd.
I 5
I 0.
I 4
U10
U40
E 4
PM
nOd. Selection of the instrument measuring range
DEF = 4 - 20 mA
MOD.
Menu
Range
I 5 0...5 mA
I 0. 0...20 mA
I 4 4...20 mA
U 2 ±2 V
U 5 ±5 V
U10 ±10 V
U40 ±40 V
E 4 4...20 mA, with error statement of „underfl ow" upon signal smaller than 3,36 mA
Range 0...20 mA
Example
I 4
U 2
nIn
nIn
0
Setting for minimum input signal
nIn Setting display projection for minimum value of input signal
- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed
DEF = 0
Projection for 0 mA > MIN = -25
Example
0
1
2
3
4
5
05
-5
-05
-15
-25
nAH

nAH **Setting display projection for maximum value of input signal**

- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100

Projection for 20 mA > MAX = 500 **Example**



FOr **Setting projection of the decimal point**

- positioning of the DP is set here in the measuring mode

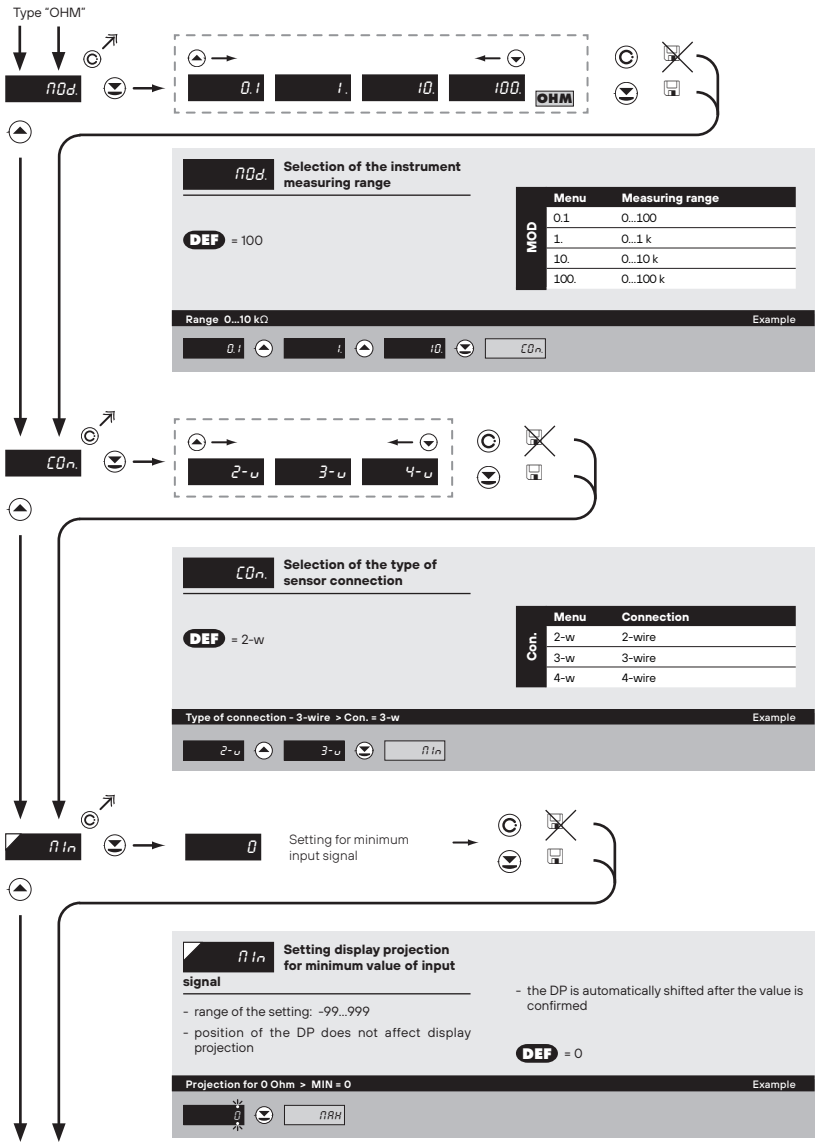
DEF = 000

Projection of DP on display > 00.0 **Example**

*subsequent item on the menu depends on instrument equipment

34

MEASURING MODE > **OHM**

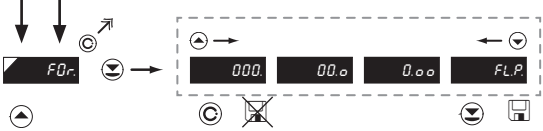


nAH **Setting display projection for maximum value of input signal**

- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100

Projection for 10 kOhm > MAX = 500 Example



FOr **Setting projection of the decimal point**

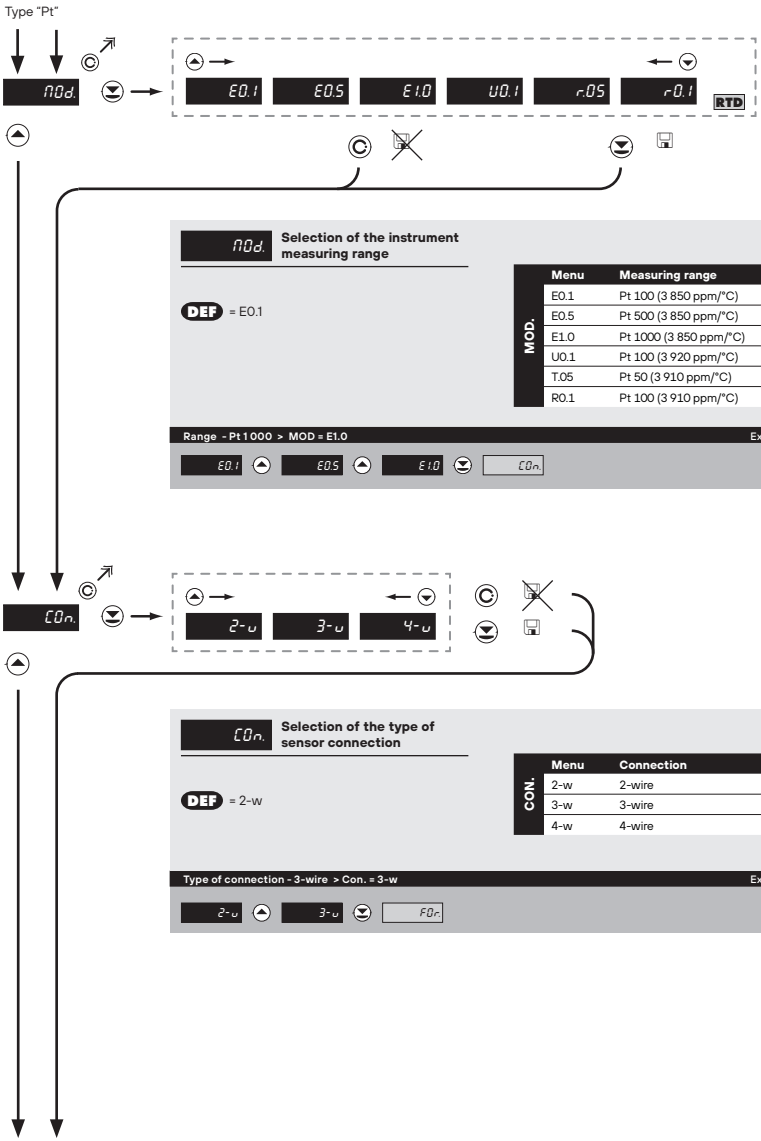
- positioning of the DP is set here in the measuring mode

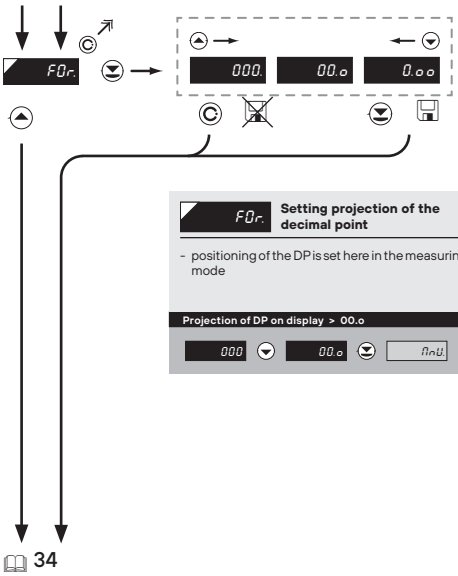
DEF = 000

Projection of DP on display > 00.0 Example

*subsequent item on the menu depends on instrument equipment

34


Type "Pt"
nOd.
E0.1
E0.5
E1.0
U0.1
r.05
r0.1
RTD
nOd. Selection of the instrument measuring range
DEF = E0.1
MOD.
Menu | Measuring range
E0.1 | Pt 100 (3 850 ppm/°C)
E0.5 | Pt 500 (3 850 ppm/°C)
E1.0 | Pt 1000 (3 850 ppm/°C)
U0.1 | Pt 100 (3 920 ppm/°C)
T.05 | Pt 50 (3 910 ppm/°C)
R0.1 | Pt 100 (3 910 ppm/°C)
Range - Pt 1000 > MOD = E1.0
Example
E0.1
E0.5
E1.0
CON.
CON.
2-u
3-u
4-u
CON. Selection of the type of sensor connection
DEF = 2-w
CON.
Menu | Connection
2-w | 2-wire
3-w | 3-wire
4-w | 4-wire
Type of connection - 3-wire > Con. = 3-w
Example
2-u
3-u
FOr



FDr. **Setting projection of the decimal point**

- positioning of the DP is set here in the measuring mode

DEF = 000

Projection of DP on display > 00.o **Example**

000 00.o nnU.

*subsequent item on the menu depends on instrument equipment

34

nOd. **Selection of the instrument measuring range**

DEF = Ni 1 000 - 5 000 ppm/°C

MOD	Menu	Measuring range
	5-1	Ni 1 000 (5 000 ppm/°C)
	6-1	Ni 1 000 (6 180 ppm/°C)
	510	Ni 10 000 (5 000 ppm/°C)
	610	Ni 10 000 (6 180 ppm/°C)

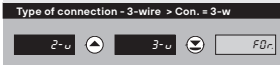
Range - Ni 10 000, 5 000 ppm > MOD = 5.0-10k Example

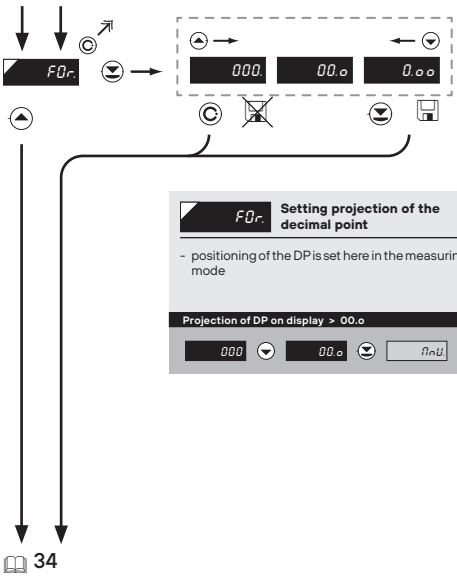
CON **Selection of the type of sensor connection**

DEF = 2-w

Con.	Menu	Connection
	2-w	2-wire
	3-w	3-wire
	4-w	4-wire

Type of connection - 3-wire > Con. = 3-w Example





FOr. Setting projection of the decimal point

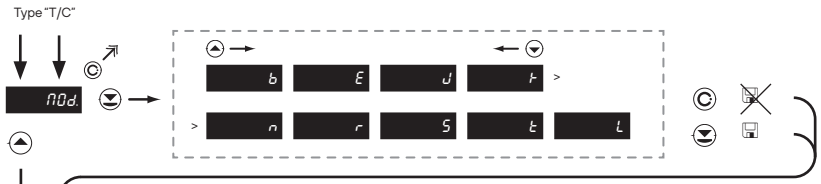
- positioning of the DP is set here in the measuring mode

DEF = 000

Projection of DP on display > 00.o **Example**

000 00.o AnU.

*subsequent item on the menu depends on instrument equipment



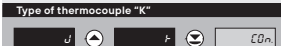
MOd. **Selection of the type of thermocouple**

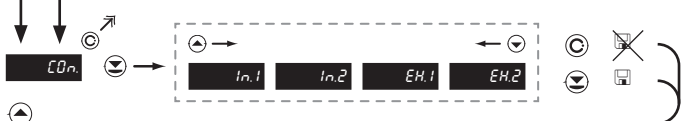
- nastavení vstupního Rangeu je závislé na objednaném měřicím Rangeu

DEF = Type "J"

MOD.	Menu	Type of thermocouple
	B	B
	E	E
	J	J
	K	K
	N	N
	R	R
	S	S
	T	T
	L	L

Type of thermocouple "K" Example





CON. **Selection of the type of sensor connection**

DEF = EX. 1

CON.	Menu	Connection	Ref. T/C
	IN.1	measuring C.J. at instrument brackets	×
	IN.2	measuring C. J. at instrument brackets with anti-series connected ref. TC	✓
	EX.1	the entire measuring set is working under invaried and constant temperature	×
	EX.2	when using compensation box	✓

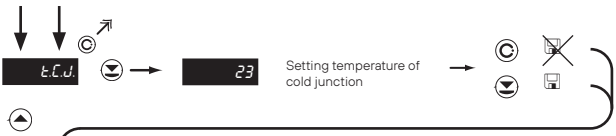
Type of connection > Con. = EX.2 Example

!

For thermocoule type "B" the items "**Con.**" and "**T.C.J.**" are not available

!

Method and procedure of setting the cold junctions is described in separate chapter on page 84

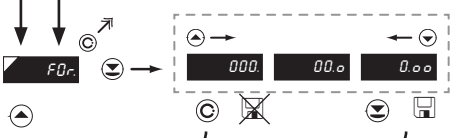


t.C.J. **Setting temperature of cold junction**

- range 0...99°C with compensation box

DEF = 23

Setting temperature of cold junction > T.C.J. = 35 Example

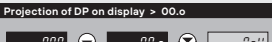


FOr. **Setting projection of the decimal point**

- positioning of the DP is set here in the measuring mode

DEF = 000

Projection of DP on display > 00.o Example



*subsequent item on the menu depends on instrument equipment

34

Type "DU"

MIn **Setting display projection for minimum value of input signal**

- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 0

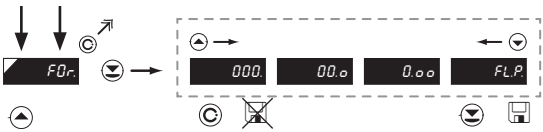
Projection for počátek > MIN = 0 Example

MAX **Setting display projection for maximum value of input signal**

- range of the setting: -99...999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100

Projection for konec > MAX = 500 Example



FOr. **Setting projection of the decimal point**

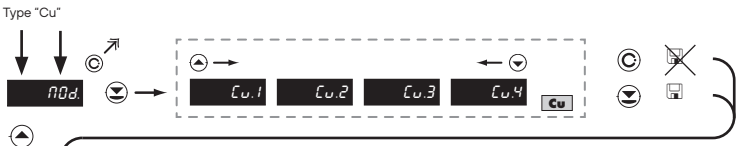
- positioning of the DP is set here in the measuring mode

DEF = 000

Projection of DP on display > 00.o **Example**

*subsequent item on the menu depends on instrument equipment

34 Calibration of the beginning and the end of range of linear potentiometer is on page 41



nOd. **Selection of the instrument measuring range**

DEF = Cu.1

MOD	Menu	Measuring range
	Cu.1	Cu 50 (4 285 ppm/°C)
	Cu.2	Cu 100 (4 285 ppm/°C)
	Cu.3	Cu 50 (4 260 ppm/°C)
	Cu.4	Cu 100 (4 260 ppm/°C)

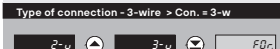
Range - Cu.1 > MOD = Cu.3 Example

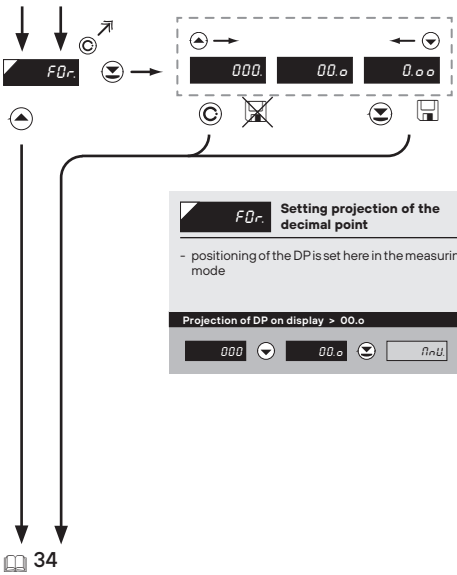
COn. **Selection of the type of sensor connection**

DEF = 2-w

CON.	Menu	Connection
	2-w	2-wire
	3-w	3-wire
	4-w	4-wire

Type of connection - 3-wire > Con. = 3-w Example





FOr. **Setting projection of the decimal point**

- positioning of the DP is set here in the measuring mode

DEF = 000

Projection of DP on display > 00.o **Example**

000 00.o nnU.

*subsequent item on the menu depends on instrument equipment

DISPLAYED ONLY WITH OPTIONS > **COMPARATORS**

n. 1 **Setting boundary for limit 1**

- range of the setting: -99...999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 20

DEF „Hystresis"=0, „Delay"=0

Setting limit 1 > M. 1 = 32 Example

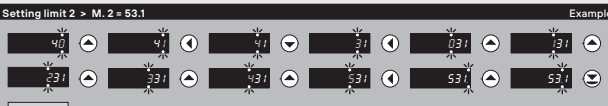
n. 2 **Setting boundary for limit 2**

- range of the setting: -99...999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 40

DEF „Hystresis"=0, „Delay"=0

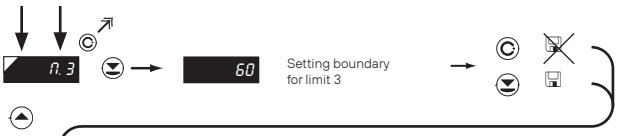
Setting limit 2 > M. 2 = 53.1 Example



*subsequent item on the menu depends on instrument equipment

!

Items for "Limits" and "Analog output" are accessible only if incorporated in the instrument.



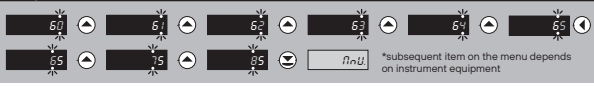
n. 3 **Setting boundary for limit 3**

- range of the setting: -99...999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

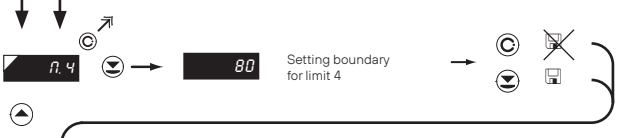
DEF = 60

DEF „Hystresis"=0, „Delay"=0

Setting limit 3 > M. 3 = 85 Example



*subsequent item on the menu depends on instrument equipment



n. 4 **Setting boundary for limit 4**

- range of the setting: -99...999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

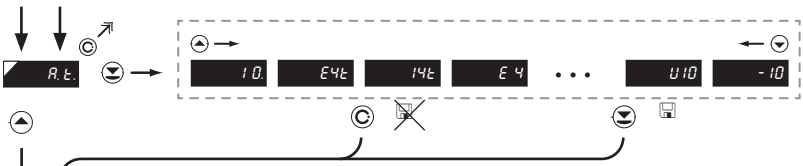
DEF = 80

DEF „Hystresis"=0, „Delay"=0

Setting limit 4 > M. 4 = 103 Example

*subsequent item on the menu depends on instrument equipment

DISPLAYED ONLY WITH OPTIONS > **ANALOG OUTPUT**

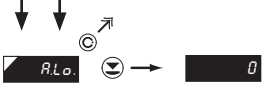


A.t. Setting the type of analog output

	Menu	Range	Description
A.t.	I 0.	0...20 mA	
	E4T	4...20 mA	with error message indication and broken loop indication (<3,6 mA)
	I4T	4...20 mA	with broken loop indication (<3,6 mA)
	E 4	4...20 mA	with indication of error statement (<3,6 mA)
	I 4	4...20 mA	
	I 5	0...5 mA	
	U 2	0...2 V	
	U 5	0...5 V	
	U10	0...10 V	
	-10	±10 V	

DEF = 4...20 mA

Type of analog output - 0...10 V > A. t. = U 10 Example



Assigning the display value to the beginning of the AO range

A.Lo. Assigning the display value to the beginning of the AO range

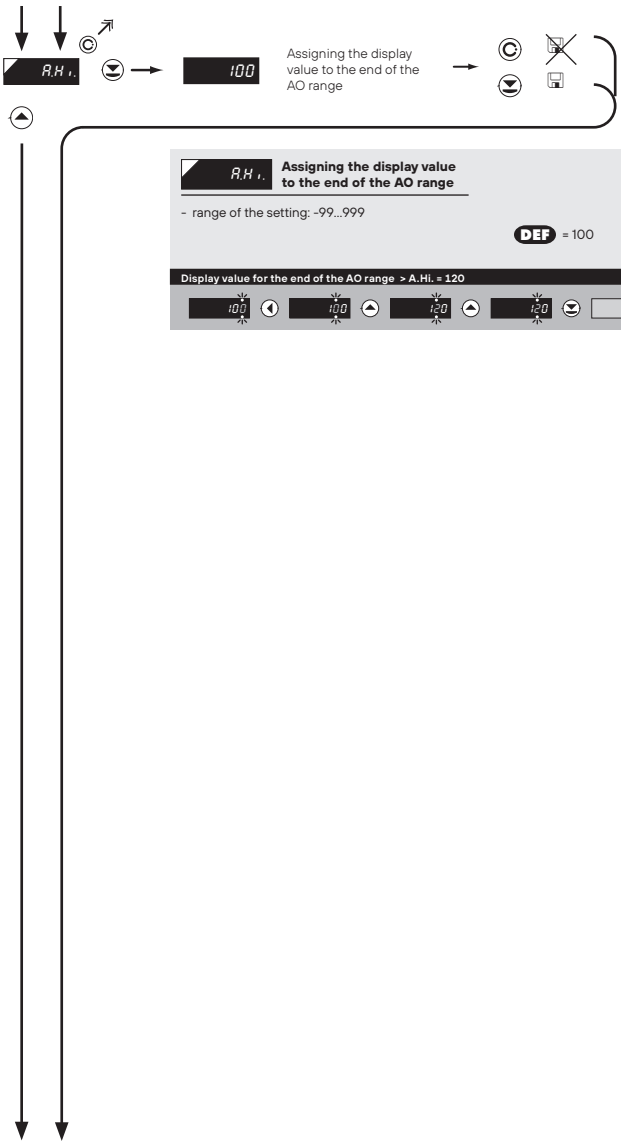
- range of the setting: -99...999

DEF = 0

Display value for the beginning of the AO range > A.Lo = 0 Example

!

Items for "Limits" and "Analog output" are accessible only if incorporated in the instrument.

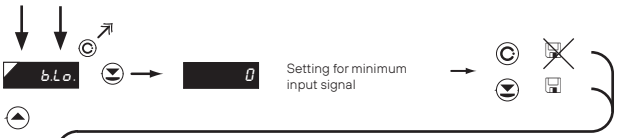


A.Hi. Assigning the display value to the end of the AO range

- range of the setting: -99...999

DEF = 100

Display value for the end of the AO range > A.Hi. = 120 Example

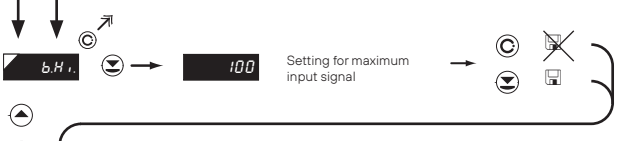


b.Lo. Setting bargraph projection for minimum input value

- range of the setting: -99...999

DEF = 0

Projection for the beginning > B.Lo. = 0 — Example



b.Hi. Setting bargraph projection for maximum input value

- range of the setting: -99...999

DEF = 100

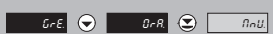
Projection for end > B.Hi. = 500 — Example

COL. **Select bargraph color**

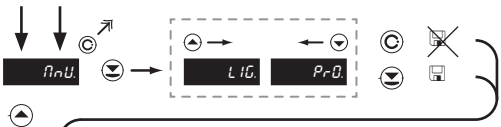
- the color for bargraph in basic mode "**Column**" is set here
- for other bargraph working modes it is necessary to switch to the "**PROFI**" menu

DEF = Green

Selection of bargraph color > Orange — Example



5. SETTING **LIGHT**



MNU. **Setting the menu type LIGHT/PROFI**

LIG. > menu LIGHT, a simple menu, which contains only the most essential items necessary for instrument setting

> linear tree structure

PRO. > menu PROFI, a complete menu for complete instrument setting

> tree menu structure

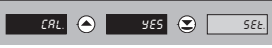
DEF = LIGHT

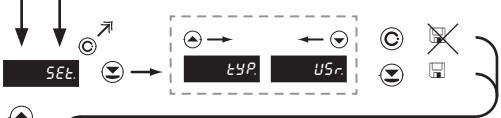
Menu LIGHT > MENU = LIG. Example

CAL. **Restoration of manufacture calibration**

- in the event of error calibration it is feasible to restore manufacture calibration
- Prior to execution of any modifications you will be asked to confirm your selection (**YES**)

Restoration of manufacture calibration > YES Example

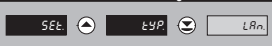




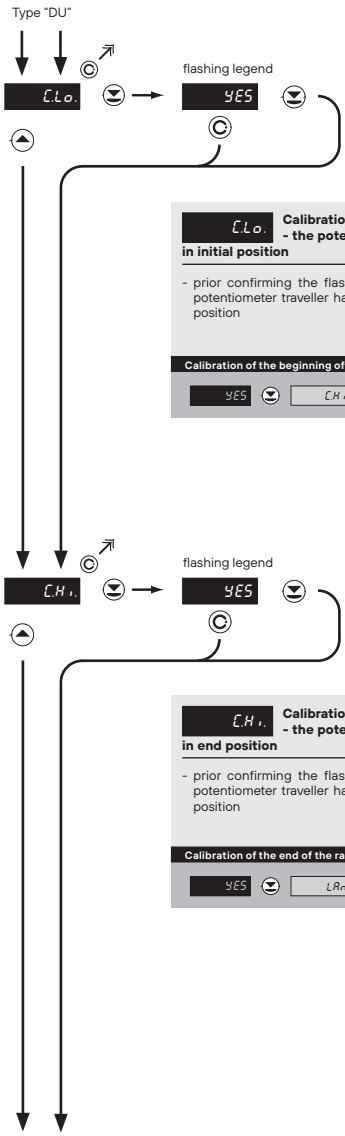
SEt. **Restoration of manufacture instrument setting**

- in the event of error setting the manufacture setting may be restored
- restoration is performed for the currently selected type of the instrument input (select "TYP.")
- provided you stored your user setting in the "PROFI" menu, it may also be restored (select "USR.")
- loading manufacture calibration and primary setting of items on the menu (**DEF**)

Restoration of manufacture setting > FIREM. Example



* subsequent item on the menu depends on instrument equipment



C.Lo. **Calibration of input range - the potentiometer traveller in initial position**

Only for type "DU"

- prior confirming the flashing "**YES**" sign the potentiometer traveller has to be in given idle position

Calibration of the beginning of the range > C.Li. Example

YES → C.Hi.

C.Hi. **Calibration of input range - the potentiometer traveller in end position**

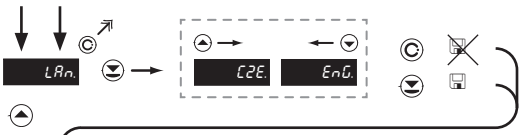
Only for type "DU"

- prior confirming the flashing "**YES**" sign the potentiometer traveller has to be in given idle position

Calibration of the end of the range > C.Hi. Example

YES → LAn.

5. SETTING **LIGHT**

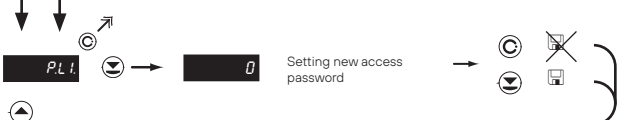


LAn. **Selection of language in instrument menu**

- selection of language version of the instrument menu

DEF = English

Language selection - ENGLISH > LAN. = ENG. Example

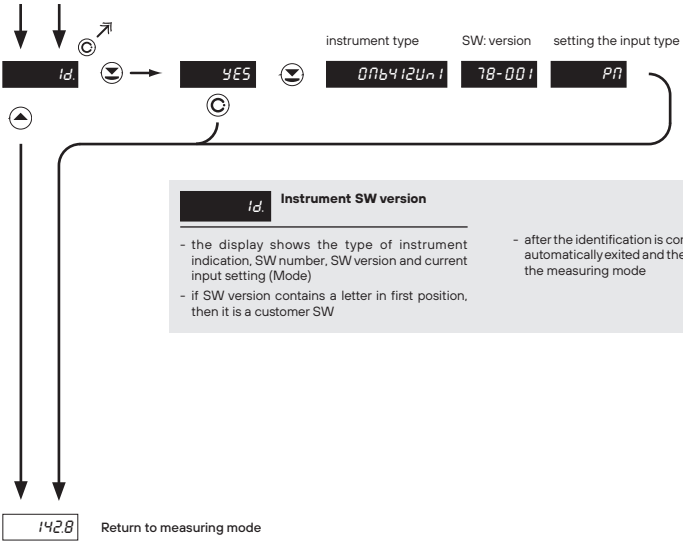


PLI. **Setting new access password**

- access password for menu **LIGHT**
- range of the number code 0...999
- upon setting the password to "**000**" the access to menu **LIGHT** is free without prompt to enter it
- in case the password is lost, please contact the adminstrator of this device

DEF = 0

New password - 341 > P.LI. = 341 Example



Id. **Instrument SW version**

- the display shows the type of instrument indication, SW number, SW version and current input setting (Mode)
- if SW version contains a letter in first position, then it is a customer SW
- after the identification is completed the menu is automatically exited and the instrument restores the measuring mode

SETTING **PROFI**

For expert users
Complete instrument menu
Access is password protected
Possibility to arrange items of the **USER MENU**
Tree menu structure

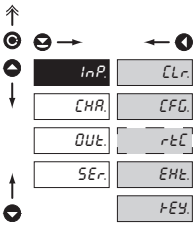
6.0 SETTING "PROFI"

PROFI **Complete programming menu**
- contains complete instrument menu and is protected by optional number code
- designed for expert users

Access to „PROFI" menu

C + ▼
- access to **PROFI** menu
- password protected access (unless set as follows under the item SER. > N.PA. > PRO =0)

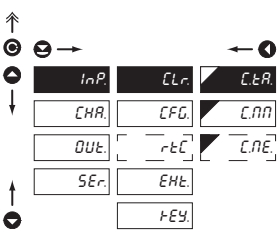
6.1 SETTING "PROFI" - INPUT



The primary instrument parameters are et in this menu

- CLr. — Resetting internal values
- CFG. — Selection of measuring range and parameters
- rtC — Setting date and time for option with RTC
- EHt. — Setting external inputs functions
- FEY. — Assigning further functions to keys on the instrument

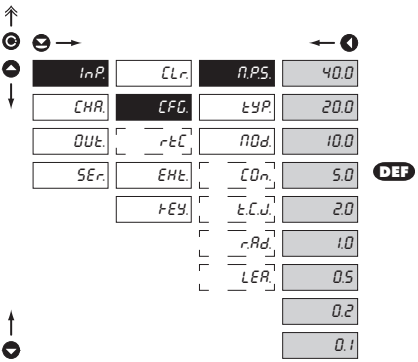
6.1.1 RESETTING INTERNAL VALUES



CLr. Resetting internal values

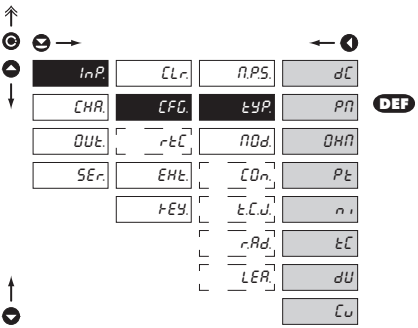
- C.tA. — Tare resetting
- C.mM — Resetting min/max value
  - resetting memory for the storage of minimum and maximum value achieved during measurement
- C.nE. — Resetting the instrument memory
  - resetting memory with data measured in the "**FAST**" or "**RTC**" modes
  - not in standard equipment

6.1.2a SELECTION OF MEASURING RATE



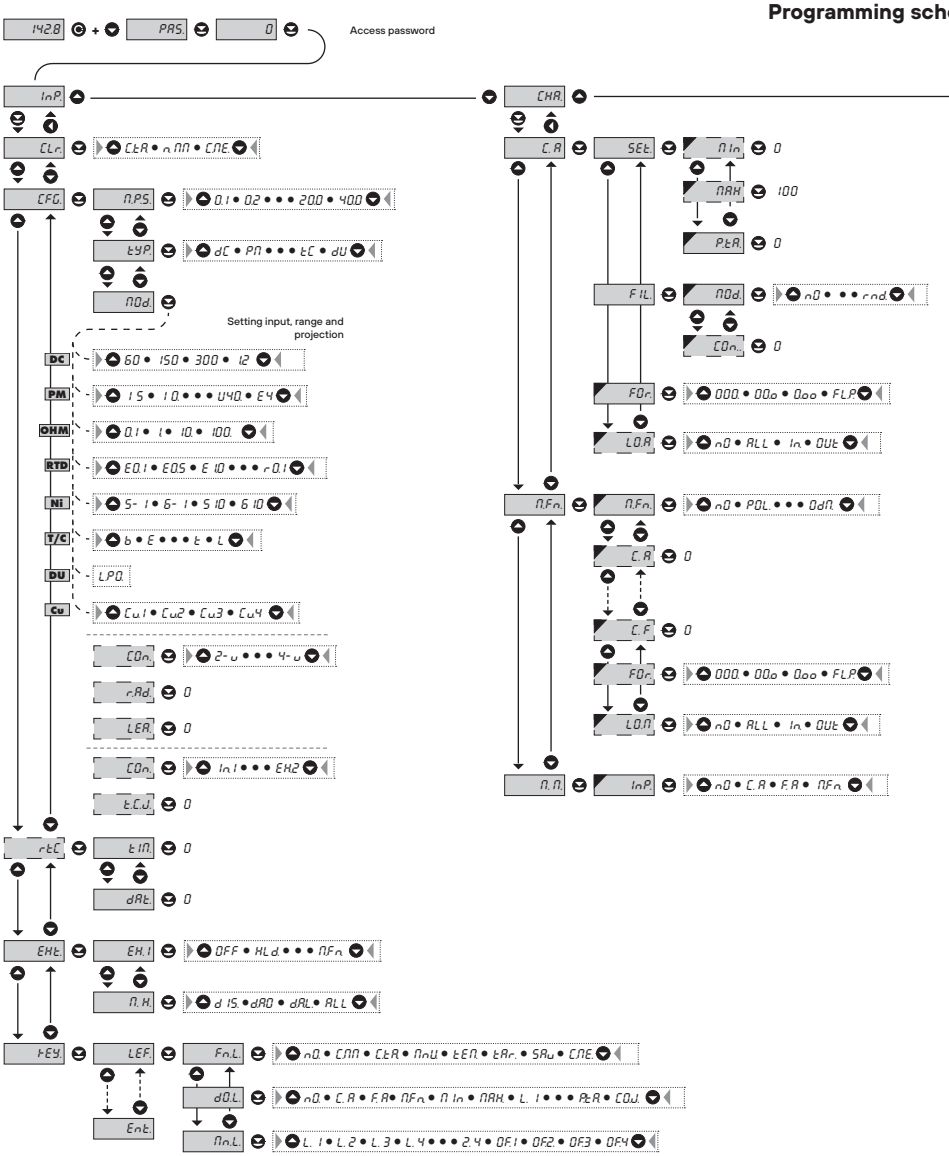
n.P.S.	**Selection of measuring rate**
40.0	40,0 measurements/s
20.0	20,0 measurements/s
10.0	10,0 measurements/s
5.0	5,0 measurements/s
2.0	2,0 measurements/s
1.0	1,0 measurements/s
0.5	0,5 measurements/s
0.2	0,2 measurements/s
0.1	0,1 measurements/s

6.1.2b SELECTION OF „INSTRUMENT" TYPE

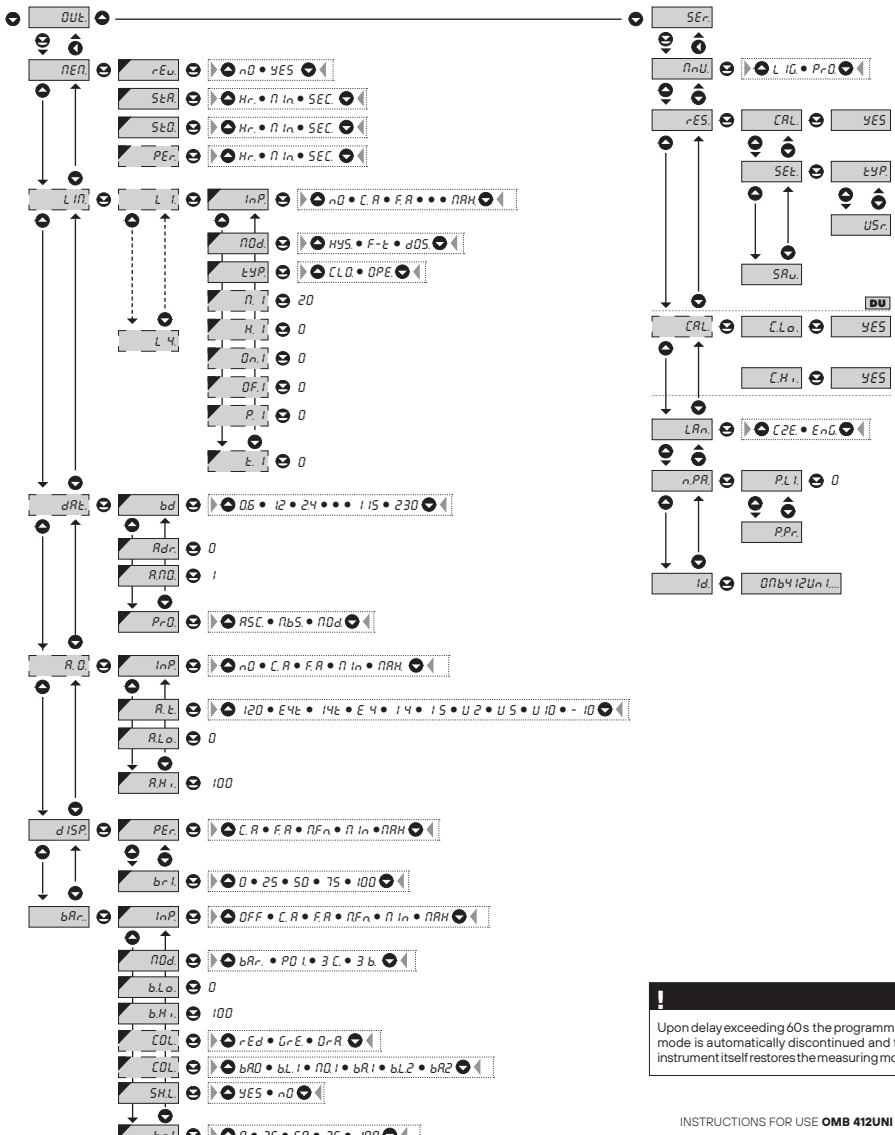


tYP.	**Selection of „instrument" type**
	- selection of particular type of "instrument" is bound to relevant dynamic items
dC	DC voltmeter
PM	Process monitor
OHM	Ohmmeter
Pt	Thermometer for Pt xxx
n.i	Thermometer for Ni xxxx
tC	Thermometer pro thermocouples
dU	Display for linear potentiometers
Cu	Thermometer for Cu xxx

Programming sch



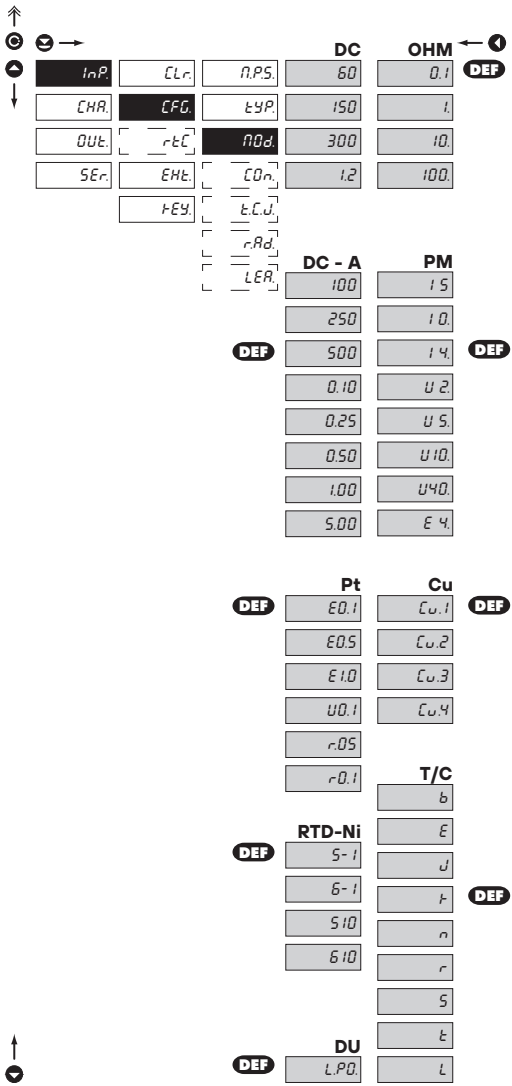
eme PROFI MENU



!

Upon delay exceeding 60s the programming mode is automatically discontinued and the instrument itself restores the measuring mode

6.1.2c SELECTION OF MEASURING RANGE



nOd. **Selection of instrument measuring range**

	Menu	Measuring range
DC	60	±60 mV
	150	±150 mV
	300	±300 mV
	1.2	±1,2 V
DC - A	100	±100 V
	250	±250 V
	500	±500 V
	0.10	±0,1 A
	0.25	±0,25 A
	0.50	±0,5 A
	1.00	±1 A
	5.00	±5 A

	Menu	Measuring range
PM	I 5	0...5 mA
	I 0.	0...20 mA
	I 4.	4...20 mA
	U 2.	±2 V
	U 5.	±5 V
	U10.	±10 V
	U40.	±40 V
	E 4.	4...20mA, with error statement of „underflow" upon signal smaller than 3,36 mA

	Menu	Measuring range
OHM	0.1	0...100
	1.	0...1 k
	10.	0...10 k
	100.	0...100 k

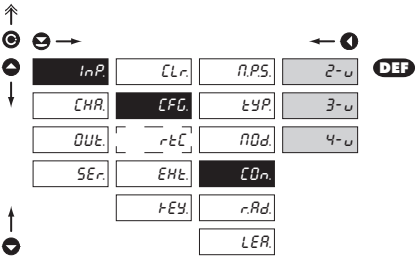
	Menu	Measuring range
Pt	E0.1	Pt 100 (3 850 ppm/°C)
	E0.5	Pt 500 (3 850 ppm/°C)
	E1.0	Pt 1000 (3 850 ppm/°C)
	U0.1	Pt 100 (3 920 ppm/°C)
	R.05	Pt 50 (3 910 ppm/°C)
	R0.1	Pt 100 (3 910 ppm/°C)

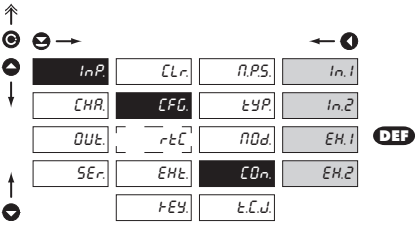
	Menu	Measuring range
NI	5.0-1k	Ni 1 000 (5 000 ppm/°C)
	6.2-1k	Ni 1 000 (6 180 ppm/°C)
	5.0-10k	Ni 10 000 (5 000 ppm/°C)
	6.2-10k	Ni 10 000 (6 180 ppm/°C)

	Menu	Measuring range
CU	5-1	Cu 50 (4 280 ppm/°C)
	6-1	Cu 1 00 (4 280 ppm/°C)
	510	Cu 50 (4 260 ppm/°C)
	610	Cu 100 (4 260 ppm/°C)

	Menu	Type of thermocouple
T/C	B	B
	E	E
	J	J
	K	K
	N	N
	R	R
	S	S
	T	T
	L	L

6.1.2d SELECTION OF TYPE OF SENSOR CONNECTION **RTD** **OHM** **T/C**





Con. **Selection of type of sensor connection**

RTD **OHM**

2-u 2-wire connection

3-u 3-wire connection

4-u 4-wire connection

T/C

In.1 **Measurement without reference thermocouple**

- measuring cold junction at instrument brackets

In.2 **Measurement with reference thermocouple**

- measuring cold junction at instrument brackets with anti-series connected reference thermocouple

EH.1 **Measurement without reference thermocouple**

- the entire measuring set is working under invaried and constant temperature

EH.2 **Measurement with reference thermocouple**

- when using compensation box

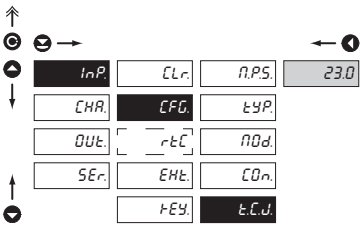
!

Method and procedure of setting the cold junctions is described in separate chapter on page 84

!

For thermocoule type "**B**" the items "**Con.**" and "**T.C.J.**" are not available

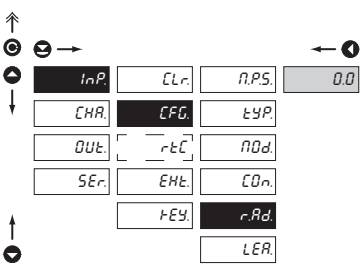
6.1.2e SETTING TEMPERATURE OF COLD JUNCTION T/C



t.C.J. Setting temperature of cold junction

- range 0...99°C with compensation box
- DEF = 23°C

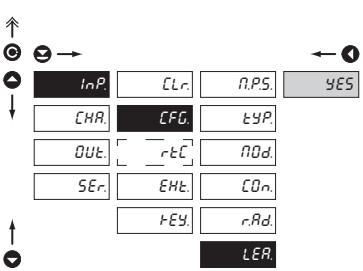
6.1.2f ZERO OFFSET OF THE MEASUREMENT RANGE RTD OHM



r.Ad. Offset of the beginning of the measuring range

- in cases when it is necessary to offset the beginning of the range by certain value, e.g. while using sensor in measuring head
- entered directly in Ohm (0...999)
- DEF = 0

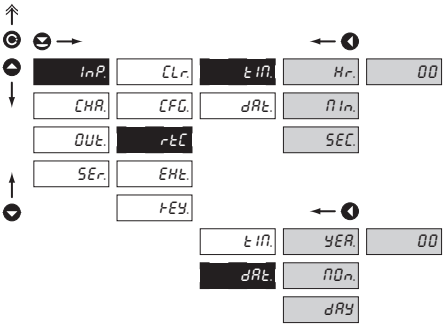
6.1.2g COMPENSATION OF 2-WIRE CONDUCT RTD OHM



LEA. Compensation of 2-wire conduct

- for measurement accuracy it is necessary to perform compensation of conduct always in case of 2-wire connection
- prior confirmation of the displayed prompt "**YES**" it is necessary to substitute the sensor at the end of the conduct by a short-circuit
- DEF = 0

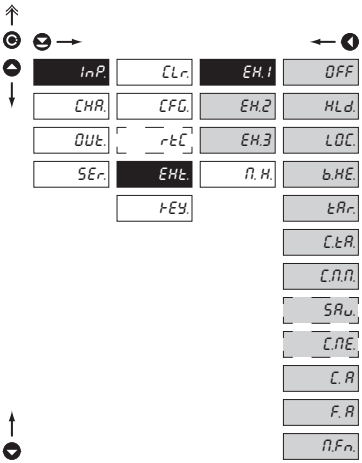
6.1.3 SETTING THE REAL TIME CLOCK



rtC Setting the real time clock (RTC)

- **t IN.** Time setting
  - format 23.59.59
- **dAt.** Date setting
  - format DD.MM.YY

6.1.4a EXTERNAL INPUT FUNCTION SELECTION



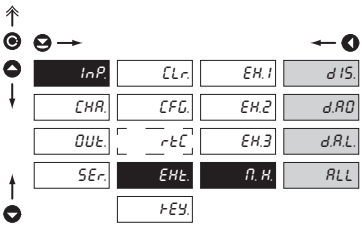
EHt. External input function selection

- **OFF** Input is off
- **HLd.** Activation of HOLD
- **LOC.** Locking keys on the instrument
- **b.PA.** Activation of locking access into programming menu LIGHT/PROFI
- **tAr.** Tare activation
- **C.tA.** Tare resetting
- **C.M.M.** Resetting min/max value
- **SAv.** Activation of measured data record in instrument memory
- **C.ME.** Clearing memory for option FAST/RTC
- **C. A** Displaying value of "Channel A"
- **F. A** Displaying value of "Channel A" after being processed by digital filters
- **M.Fn.** Displaying value of "Mathematical function"

*****

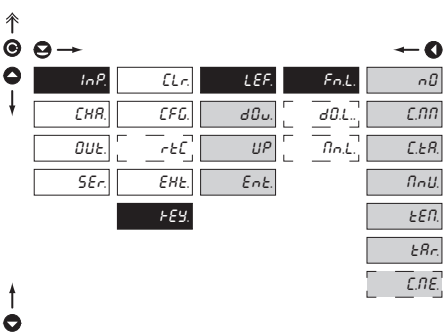
- DEF EXT. 1 > HLD.
- DEF EXT. 2 > LOC.
- DEF EXT. 3 > TAR.

6.1.4b SELECTION OF FUNCTION "HOLD"



n.H.	**Selection of function "HOLD"**
d15.	"HOLD" locks only the value displayed
d.A0	"HOLD" locks the value displayed and on AO
d.A.L.	"HOLD" locks the value displayed, on AO and limit evaluation
ALL	"HOLD" locks the entire instrument

6.1.5a OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS



Fn.L.	**Assigning further functions to instrument keys**

- „FN. L." > executive functions

n0	Key has no further function
C.AA	Resetting min/max value
C.tA.	Tare resetting
MnU.	Direct access into menu on selected item

- after confirmation of this selection the "**MN.L.**" item is displayed on superior menu level, where required selection is performed

tEn.	Temporary projection of selected values

- after confirmation of this selection the item "**TM.L.**" is displayed on superior menu level, whererequired selection is performed

tAr.	Tare function activation
C.nE.	Clearing memory

- clearing memory with data measured in modes "**FAST**" or "**RTC**"

!

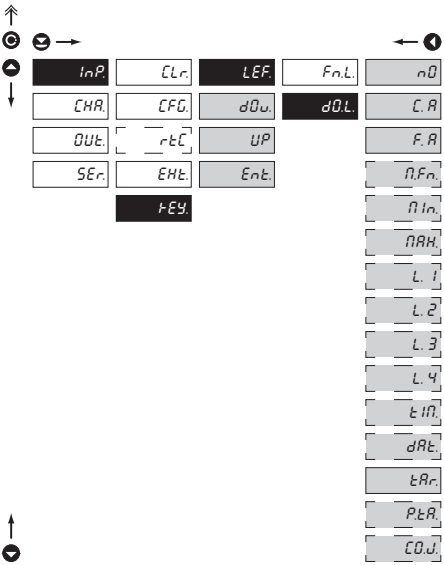
Setting is identical for **LEFT**, **DOWN**, **UP** and **ENTER**

!

Preset values of the control keys **DEF**

LEFT	Show Tare
UP	Show Max. value
DOWN	Show Min. value
ENTER	w/o functione

6.1.5b OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS - TEMPORARY PROJECTION



dO.L. Temporary projection of selected item

- „**TM.L.**" > temporary projection of selected values
- "Temporary" projection of selected value is displayed for the time of keystroke
- "Temporary" projection may be switched to permanent by pressing + "Selected key", this holds until the stroke of any key

nO Temporary projection is off

C.A Temporary projection of "Channel A" value

F.A Temporary projection of "Channel A" value after processing digital filters

n.Fn. Temporary projection of "Mathematic functions" value

n.In. Temporary projection of "Min. value"

MAX. Temporary projection of "Max. value"

L. 1 Temporary projection of "Limit 1" value

L. 2 Temporary projection of "Limit 2" value"

L. 3 Temporary projection of "Limit 3" value"

L. 4 Temporary projection of "Limit 4" value

t IM. Temporary projection of "TIME" value

dAt. Temporary projection of "DATE" value

tAr. Temporary projection of "TARE" value

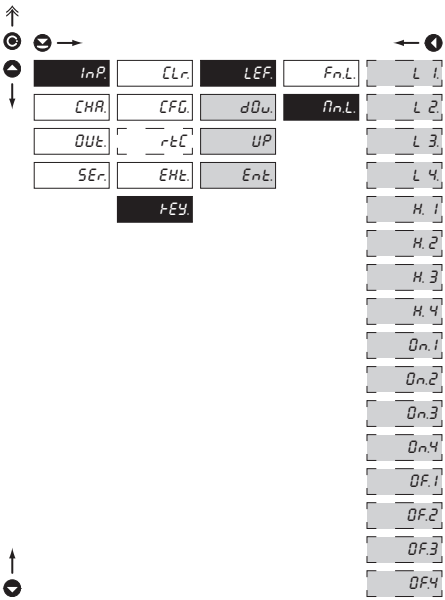
P.tA. Temporary projection of "P. TARE" value

CO.J. Temporary projection of "CJC" value

!

Setting is identical for **LEFT**, **DOWN**, **UP** and **ENTER**

6.1.5c OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS - DIRECT ACCESS TO ITEM



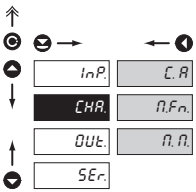
An.L. **Assigning access to selected menu item**

- L 1. Direct access to item "L.1"
- L 2. Direct access to item "L.2"
- L 3. Direct access to item "L.3"
- L 4. Direct access to item "L.4"
- H. 1 Direct access to item "H.1"
- H. 2 Direct access to item "H.2"
- H. 3 Direct access to item "H.3"
- H. 4 Direct access to item "H.4"
- On.1 Direct access to item "On.1"
- On.2 Direct access to item "On.2"
- On.3 Direct access to item "On.3"
- On.4 Direct access to item "On.4"
- OF.1 Direct access to item "OF.1"
- OF.2 Direct access to item "OF.2"
- OF.3 Direct access to item "OF.3"
- OF.4 Direct access to item "OF.4"

!

Setting is identical for **LEFT**, **DOWN**, **UP** and **ENTER**

6.2 SETTING "PROFI" - CHANNELS

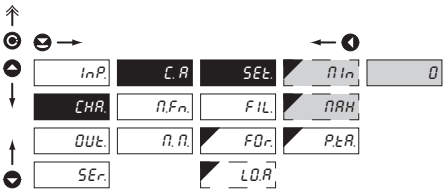


The primary instrument parameters are set in this menu

- C.A — Setting parameters of measuring "Channel A"
- n.Fn. — Setting parameters of mathematic functions
- n.n. — Selection of access and evaluation of Min/max value

6.2.1a DISPLAY PROJECTION

DC PM DU OHM



SEt. Setting display projection

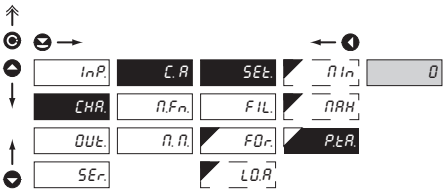
n.in Setting display projection for minimum value of input signal

- range of the setting: -99...999
- DEF = 0

nAX Setting display projection for maximum value of input signal

- range of the setting: -99...999
- DEF = 100

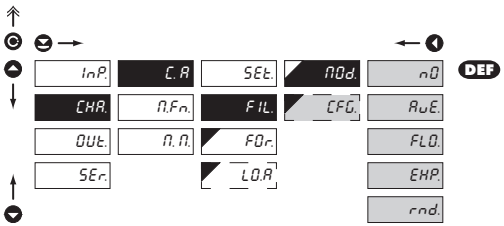
6.2.1b SETTING FIXED TARE

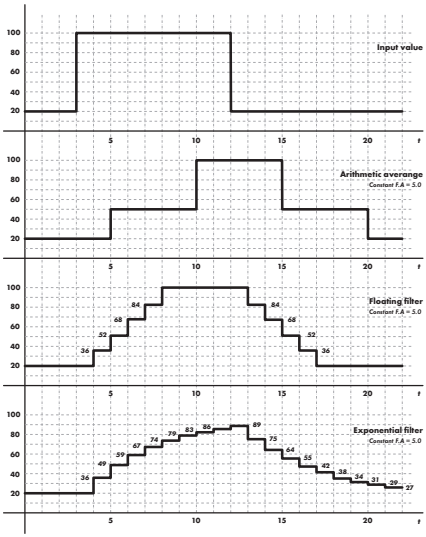


PtA. Setting fixed tare

- setting is designed for the event when it is necessary to firmly shift the beginning of the range by known size
- when setting (**P.TA. A**≠ 0) is in effect, display does not show the "**T**" symbol
- range of the setting: -99...999
- DEF = 0.00

6.2.1d DIGITAL FILTERS





nOd. Selection of digital filters

- at times it is useful for better user projection of data on display to modify it mathematically and properly , wherefore the following filters may be used

nO Filters are off

AvE. Measured data average

- arithmetic average from given number („**CON.**") of measured values
- range 2...100

FLO. Selection of floating filter

- floating arithmetic average from given number („**CON.**") of measured data and updates with each measured value
- range 2...30

EXP. Selection of exponential filter

- integration filter of first prvního grade with time constant („**CON.**") measurement
- range 2...100

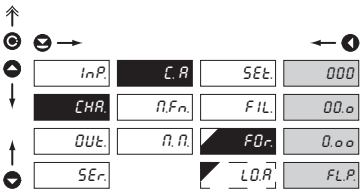
rnd. Measured value rounding

- is entered by any number, which determines the projection step (e.g: „**CON.**" = 2,5 > display 0, 2.5, 5,...)

CFG. Setting constants

- this menu item is always displayed after selection of particular type of filter
- **DEF** = 2

6.2.1e PROJECTION FORMAT - POSITIONING OF DECIMAL POINT



FOr. Selection of decimal point

- the instrument allows for classic projection of a number with positioning of the DP as well as projection with floating DP, allowing to display a number in its most exact form „FL. P."

000. Setting DT - XXX.

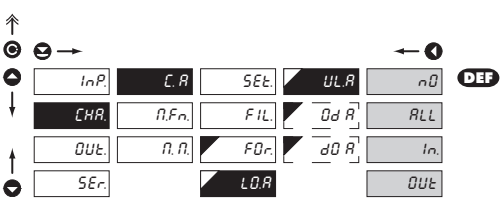
- DEF

00.o Setting DT - XX.x

0.oo Setting DT - X.xx

FL.P. Floating DP

6.2.1f SELECTION OF STORING DATA INTO INSTRUMENT MEMORY



LO.A Selection of storing data into instrument memory

- by selection in this item you allow to register values into instrument memory
- another setting in item "**OUT.** > **MEM.**" (not in standard experiment)

nO Measured data is not stored

ALL Measured data is stored in memory

In. Only data measured within the set interval is stored in memory

OUt Only data measured outside the set interval is stored in memory

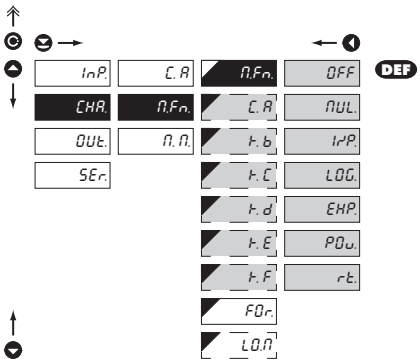
FrA Setting the initial interval value

- range of the setting: -99...999

tO.A Setting the final interval value

- range of the setting: -99...999

6.2.2a MATHEMATIC FUNCTIONS



n.Fn. **Selection of mathematic functions**

OFF Mathematic functions are off

nUL. Multinominal

$Ax^5 \square Bx^4 \square Cx^3 \square Dx^2 \square Ex \square F$

1/P 1/x

$\frac{A}{x^5} \square \frac{B}{x^4} \square \frac{C}{x^3} \square \frac{D}{x^2} \square \frac{E}{x} \square F$

LOG. Logarithm

$A \square \ln \frac{\square Bx \square C \square}{\square Dx \square E \square} \square F$

EXP. Exponential

$A \square e^{\square \frac{Bx \square C}{Dx \square E} \square} \square F$

POw. Power

$A \square \square Bx \square C \square^{\square Dx \square E \square} \square F$

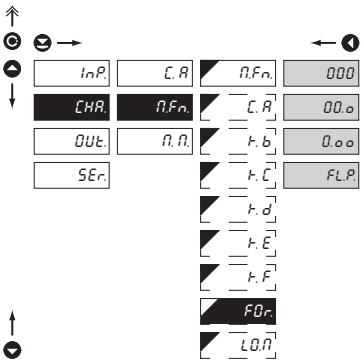
rt. Root

$A \square \sqrt{\frac{Bx \square C}{Dx \square E}} \square F$

C.- Setting constants for calculation of mat.functions

- this menu is displayed only after selection of given mathematic function

6.2.2b MATHEMATIC FUNCTIONS - DECIMAL POINT



FOr. Selection of decimal point

- the instrument allows for classic projection of a number with positioning of the DP as well as projection with floating DP, allowing to display a number in its most exact form „FL. P."

000. Setting DT - XXX.

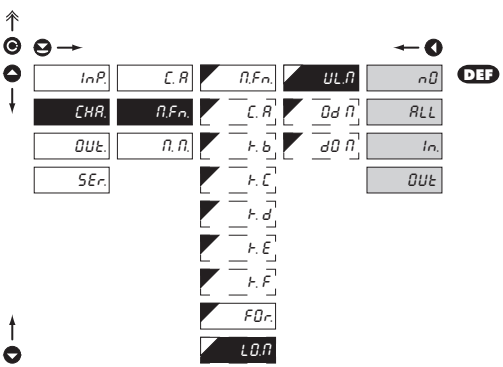
00.o Setting DT - XX.x

0.oo Setting DT - X.xx

FL.P. Floating DP

- DEF

6.2.2c MATHEMATIC FUNCTIONS - SELECTION OF STORING DATA INTO INSTRUMENT MEMORY



LO.n Selection of storing data into instrument memory

- by selection in this item you allow to register values into instrument memory
- another setting in item "**OUT.** > **MEM.**" (not in standard experiment)

nO Measured data is not stored

ALL Measured data is stored in memory

In. Only data measured within the set interval is stored in memory

OUt Only data measured outside the set interval is stored in memory

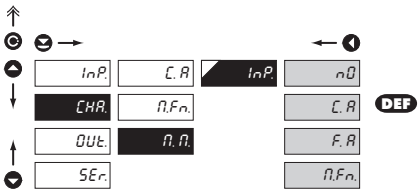
Fr.n Setting the initial interval value

- range of the setting: -99...999

to.n Setting the final interval value

- range of the setting: -99...999

6.2.3 SELECTION OF EVALUATION OF MIN/MAX VALUE

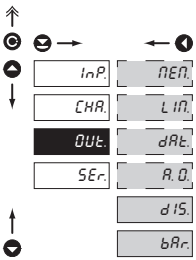


InP. Selection of evaluation of min/max value

- selection of value from which the min/max value will be calculated

nO	Evaluation of min/max value is off
C.A	From "Channel A"
F.A	From "Channel A" after digital filters processing
M.Fn.	From "Mathematic functions"

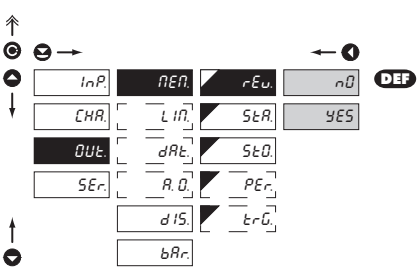
6.3 SETTING „PROFI" - OUTPUTS



In this menu it is possible to set parameters of the instrument output signals

- MEM. — Setting záznamu dat do paměti
- LIM. — Setting type and parameters of limits
- dAt. — Setting type and parameters of data output
- A.O. — Setting type and parameters of analog output
- dIS. — Setting display projection and brightness
- bAr. — Setting bargraph projection and brightness

6.3.1a SELECTION OF MODE OF DATA LOGGING INTO INSTRUMENT MEMORY

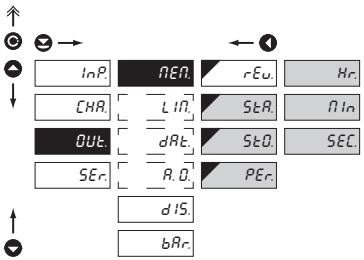


rEu. Selection of the mode of data logging

- selection of the mode in the event of full instrument memory

- nO — Rewriting values prohibited
- YES — Rewriting values permitted, the oldest get rewritten by the latest

6.3.1b SETTING DATA LOGGING INTO INSTRUMENT MEMORY - RTC



StA. **tart of data logging into instrument memory**

- time format HH.MM.SS

StO. **Stop data logging into instrument memory**

- time format HH.MM.SS

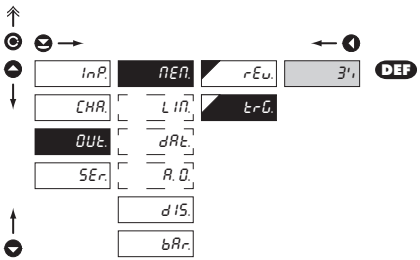
PEr. **Period of data logging into instrument memory**

- determines the period in which values will be logged in an interval delimited by the time set under items **STA.** and **STO.**
- time format HH.MM.SS
- records are made on a daily basis in selected interval and period
- item not displayed if "**SAV.**" is selected in menu (**INP.** > **EXT.**)

RTC

The lowest recording rate possible is once a day, the highest is every second. Under exceptional circumstances it is possible to set the rate to 8 times per second by entering the recording period as 00:00:00. However, this mode is not recommended due to the memory overload. Recordings are realised in a timeframe of one day and are repeated periodically every following day. Recordings can take place either inside or outside of selected time intervals. The duration of re-writing can be determined by the number of channels recorded as well as by the recording rate.

6.3.1c SETTING DATA LOGGING INTO INSTRUMENT MEMORY - FAST



trG. **Setting logging data into inst. memory**

- logging data into inst. memory is governed by the folowing selection, which determines how many percent of the memory is reserved for data logging prior to initiation of trigger impulse
- initialization is on ext. input or button
- setting in range 1...100 %
- when setting 100 %, datalogging works in the mode **ROLL** > data keep getting rewritten in cycles

1. Memory initialization

- clear memory (ext.input, button)
- LED "**M**" flashes, after reading **TRG.** (%) memory is permanently shining. In ROLL flashes constantly.

2. Triggering

- external input, button
- after the memory LED is full "**M**" turns off
- in the **ROLL** mode the trigger ends datalogging and LED turns off

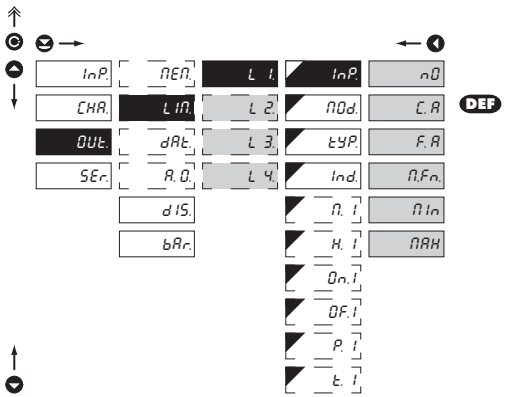
3. Termination

- ext. input, button or reading data via RS

FAST

The memory operates on the basis of memory oscilloscope. Select an area of 0...100% of the memory capacity (100% represents 8 192 individual recordings for a single channel measurement). This area is filled cyclically up to the point when the recording starts (activated by the front panel button or by an external input). When the remaining memory capacity fills up the recording stops. A new recording is possible after the deletion of the latest recording. It is possible to abort a recording before its completion by reading out the data.

6.3.2a SELECTION OF INPUT FOR LIMITS EVALUATION



inP. Selection evaluation of limits

- selection of value from which the limit will be evaluated

nO Limit evaluation is off

C.A Limit evaluation from "Channel A"

F.A Limit evaluation from "Channel A" after digital filters processing

n.Fn. Limit evaluation from "Mathematic functions"

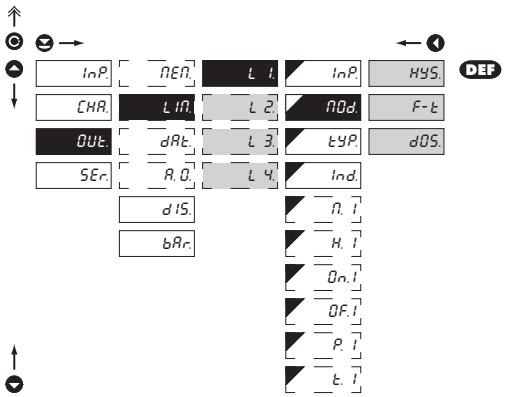
n.In. Limit evaluation from "Min. value"

MAX Limit evaluation from "Max. value"

!

Setting is identical for **L 1**, **L 2**, **L 3** and **L 4**

6.3.2b SELECTION OF TYPE OF LIMIT



mOd. Selection the type of limit

HYS. Limit is in mode "Limit, hysteresis, delay"

- for this mode the parameters of "**L. 1**" are set, at which the limit will shall react, "**H. 1**" the hysteresis range around the limit (LIM ±1/2 HYS) and time "**T. 1**" determining the delay of relay switch-on

F-t Frame limit

- for this mode the parameters are set for interval "**ON.1**" the relay switch-on and "**OF.1**" the relay switch-off

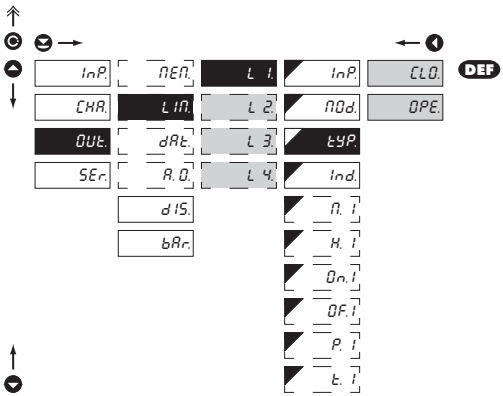
dOS. Dose limit (periodic)

- for this mode the parameters are set for "**P. 1**" determining the limit value as well as its multiples at which the output is active and "**T. 2**" indicating the time during which is the output active

!

Setting is identical for **L 1**, **L 2**, **L 3** and **L 4**

6.3.2c SELECTION OF TYPE OF OUTPUT



tYP. Selection of type of output

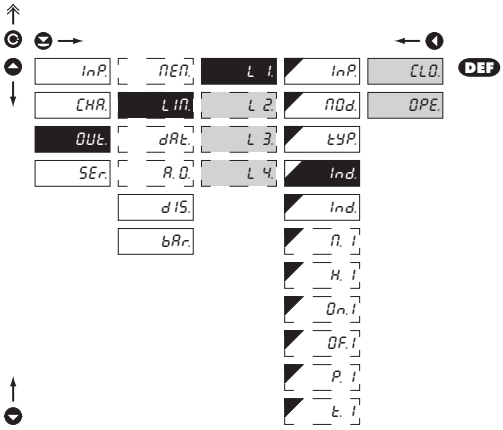
CLO. Selection of type of output

OPE. Output switches off when condition is met

!

Setting is identical for L 1, L 2, L 3 and L 4

6.3.2d SSETTING OF SIGNALING LEDS FOR LIMITS



tYP. Setting of signaling LEDs for Limits

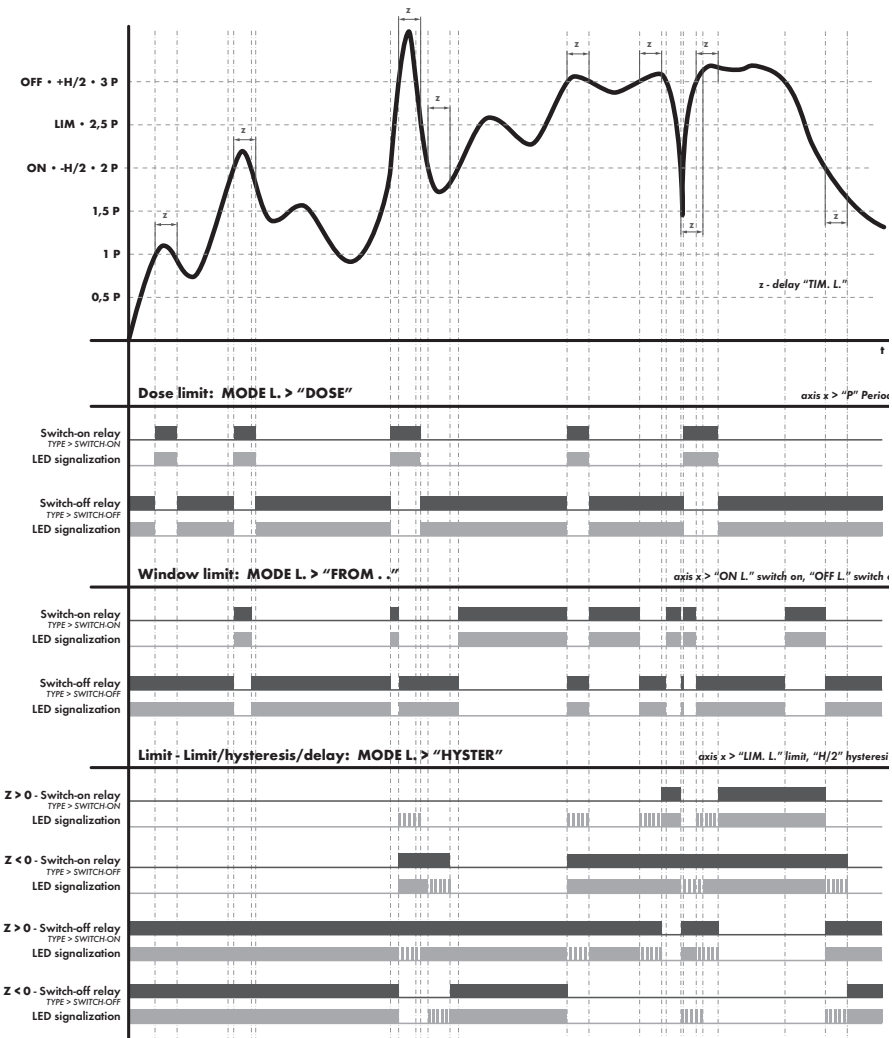
CLO. The LED lights up when the output is switched on

OPE. The LED lights up when the output is opened

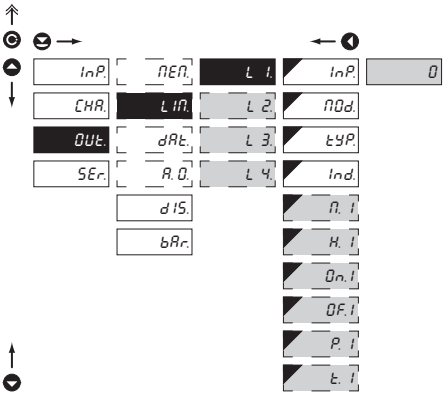
!

Setting is identical for L 1, L 2, L 3 and L 4

DESCRIPTION OF RELAY FUNCTION



6.3.2e SETTING VALUES FOR LIMITS EVALUATION



!

Setting is identical for **L 1**, **L 2**, **L 3** and **L 4**

n. 1 — **Setting limit for switch-on**

- for type "HYS."

H. 1 — **Setting hysteresis**

- for type "HYS."
- indicates the range around the limit (in both directions, LIM. ±1/2 HYS.)

On.1 — **Setting the outset of the interval of limit switch-on**

- for type "F-T"

OF.1 — **Setting the end of the interval of limit switch-on**

- for type "F-T"

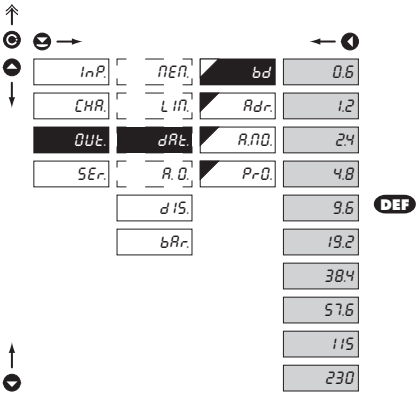
P. 1 — **Setting the period of limit switch-on**

- for type "DOS."

t. 1 — **Setting the time switch-on of the limit**

- for type "HYS." a "DAV."
- setting within the range: ±0...99,9 s
- positive time > relay switches on after crossing the limit (**L. 1**) and the set time (**T. 1**)
- negative time > relay switches off after crossing the limit (**L. 1**) and the set negative time (**T. 1**)

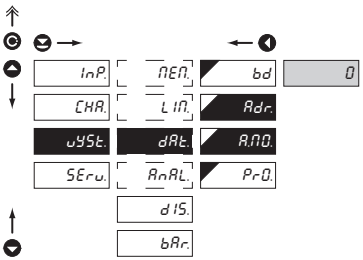
6.3.3a SELECTION OF DATA OUTPUT BAUD RATE



bd — **Selection of data output baud rate**

- **0.6** — 600 Baud
- **1.2** — 1 200 Baud
- **2.4** — 2 400 Baud
- **4.8** — 4 800 Baud
- **9.6** — 9 600 Baud
- **19.2** — 19 200 Baud
- **38.4** — 38 400 Baud
- **57.6** — 57 600 Baud
- **115** — 115 200 Baud
- **230** — 230 400 Baud

6.3.3b SETTING INSTRUMENT ADDRESS



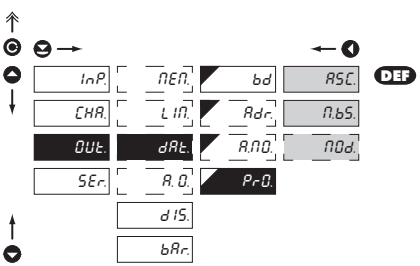
Adr. Setting instrument address

- setting in range 0...31
- DEF = 00

A.nO. Setting instrument address - MODBUS

- setting in range 1...247
- DEF = 01

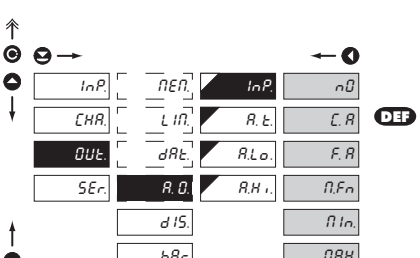
6.3.3c SELECTION OF DATA OUTPUT PROTOCOL



Pr0. Selection of the type of analog output

- ASC. Data protocol ASCII
- n.bS. Data protocol DIN MessBus
- nOd. Data protocol MODBUS - RTU
- option is available only for RS 485

6.3.4a SELECTION OF INPUT FOR ANALOG OUTPUT

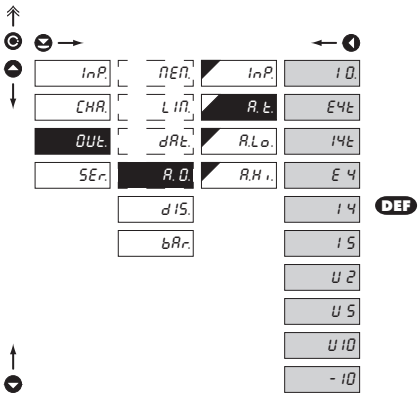


InP. Selection evaluation analog output

- selection of value from which the analog output will be evaluated

- nO AO evaluation is off
- C. A O evaluation from "Channel A"
- F. A AO evaluation from "Channel A" after digital filters processing
- n.Fn. AO evaluation from "Math. functions"
- n.in. AO evaluation from "Min. value"
- nAH. AO evaluation from "Max. value"

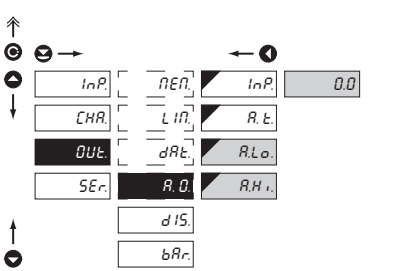
6.3.4b SELECTION OF THE TYPE OF ANALOG OUTPUT



A.t. Selection of the type of analog output

- **10.** Type: 0...20 mA
- **E4t** Type: 4...20 mA with indication
  - with broken loop detection and indication of error statement (< 3,6 mA)
- **14t** Type: 4...20 mA with indication
  - with broken loop detection (< 3,6 mA)
- **E 4** Type: 4...20 mA with indication
  - with indic. of error statement (< 3,6 mA)
- **1 4** Type: 4...20 mA
- **1 5** Type: 0...5 mA
- **U 2** Type: 0...2 V
- **U 5** Type: 0...5 V
- **U10** Type: 0...10 V
- **- 10** Type: ±10 V

6.3.4c SETTING THE ANALOG OUTPUT RANGE



A.0. Setting the analog output range

- analog output is isolated and its value corresponds with displayed data. It is fully programmable, i.e. it allows to assign the AO limit points to two arbitrary points of the entire measuring range

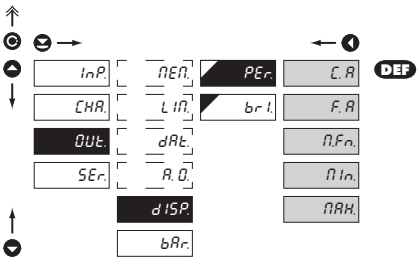
A.Lo. Assigning the display value to the beginning of the AO range

- range of the setting: -99...999
- DEF = 0

A.Hi. Assigning the display value to the end of the AO range

- range of the setting: -99...999
- DEF = 100

6.3.5a SELECTION OF INPUT FOR DISPLAY PROJECTION



PEr. Selection display projection

- selection of value which will be shown on the instrument display

C.A — Projection of values from "Channel A"

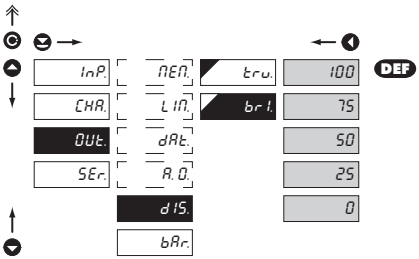
F.A — Projection of values from "Channel A" after digital filters processing

M.Fn. — Projection of values from "Math. functions"

M In. — Projection of values From "Min. value"

MAX. — Projection of values from "Max. value"

6.3.5b SELECTION OF DISPLAY BRIGHTNESS



brI. Selection of display brightness

- by selecting display brightness we may appropriately react to light conditions in place of instrument location

0 — Display is off

- after keystroke display turns on for 10 s

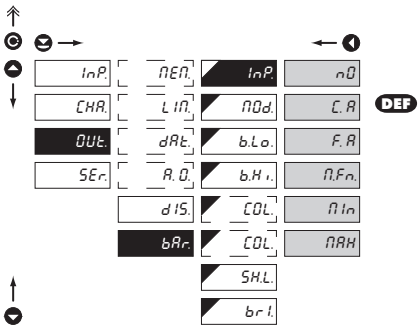
25 — Display brightness - 25%

50 — Display brightness - 50%

75 — Display brightness - 75%

100 — Display brightness - 100%

6.3.6a BARGRAPH - SELECTION OF PROJECTION INPUT

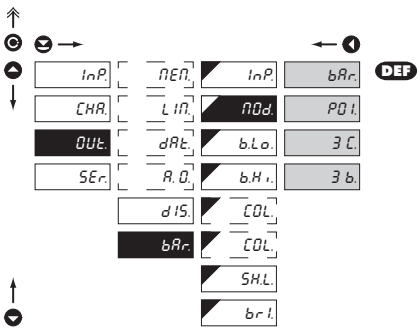


InP. Selection of bargraph evaluation

- selection of value from which the analog output will be evaluated

nO	Analog evaluation is off
C.A	From "Channel A"
F.A	From "Channel A" after digital filter modification
n.Fn.	From "Mathematic function"
MIn	From "Minimum value"
MAX	From "Maximum value"

6.3.6b BARGRAPH - SELECTION OF PROJECTION MODE



MOd. Selection of bargraph projection mode

bAr.	Column projection

- the display shows only a column in one color

PO I.	Point projection

- the display shows one point in one color

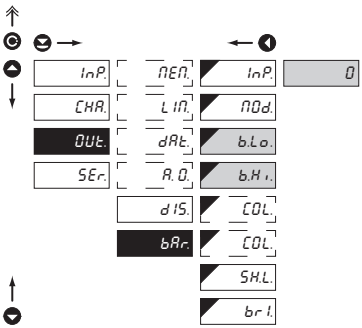
3 C.	3-colored column projection

- change of color is determined by set limits (COL. > bA.0; bA.1; bA.2)
- upon exceeding the limit the color of the entire display, i.e. there is always only one column of one color lit

3 b.	3-colored bar projection, cascade

- change of color is determined by the said limits (COL. > bA.0; bA.1; bA.2)
- upon exceeding a limit color of the given display section is changing, i.e. the display may shine up to three colors at a time

6.3.6c BARGRAPH - SETTING THE PROJECTION RANGE



COL. Setting the bargraph projection range

- setting is the same as the setting for main display projection

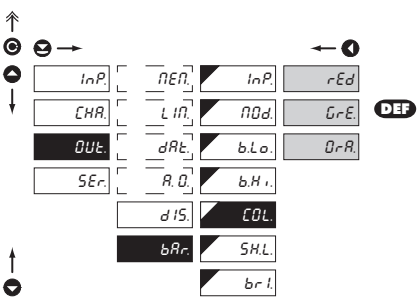
b.Lo. Setting bargraph projection for minimum input signal value

- range of the setting je -99...999
- DEF = 0

b.Hi. Setting bargraph projection for maximum input signal value

- range of the setting je -99...999
- DEF = 100

6.3.6d BARGRAPH - SETTING COLOR



COL. Selection of bargraph color

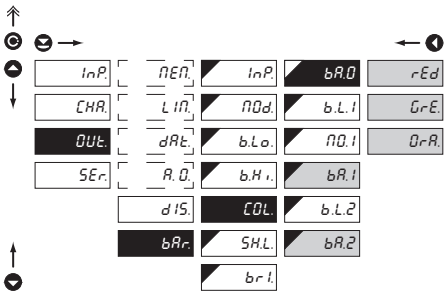
- the item "COL." is displayed only with selected mode ("BAR. > MOD.") "BAR." or "POI."

rEd Red color

GrE. Green color

OrA. Orange color

6.3.6e BARGRAPH - COLOR SETTING



bA.0 **Selection of bargraph color**

- the item "**COL.**" is displayed only with selected mode ("**BAR.** > **MOD.**") "**3 C.**" or "**3 B.**"

rEd — Red color

GrE. — Green color

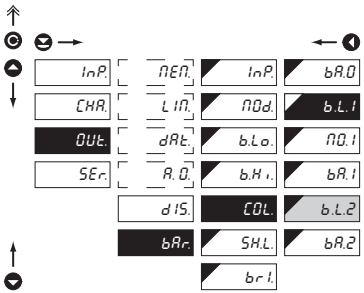
OrA. — Orange color

- DEF = Green (Band 0)
- DEF = Orange (Band 1)
- DEF = Red (Band 2)

!

Setting is identical for **bA.1** and **bA.2**

6.3.6f BARGRAPH - SETTING THE COLOR CHANGES BANDS



b.L.1 **Setting color limits for color projection**

- the item "**COL.**" is displayed only with selected mode ("**BAR.** > **MOD.**") "**3 C.**" or "**3 B.**"
- items „**b.L.1**" and „**b.L.2**" determine the borders of the bargraph color changes

b.L.1 — Boundary between bands 0 - 1

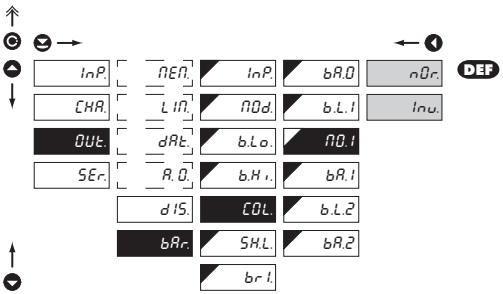
b.L.2 — Boundary between bands 1 - 2

- DEF = 33 (b.L.1))
- DEF = 66 (b.L.2)

!

Setting is identical for **b.L.2**

6.3.6g BARGRAPH - SELECTION OF INVERSE PROJECTION

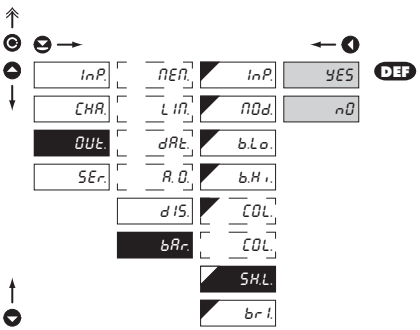


MO.1 Selection of inverse projection of "Band 0"

- the item "COL. is displayed only with selected mode ("BAR. > MOD.") "3 C." or "3 B.."
- setting „MO.1" is designed for projection where indication of zero center is required

nOr.	Column in "bA.0" moves from left to right
Inv.	Column in "bA.0" moves from right to left

6.3.6h BARGRAPH - SELECTION OF LIMITS PROJECTION

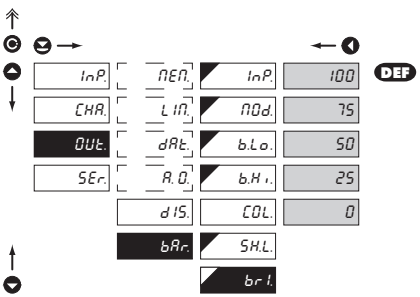


SH.L. Selection of limit projection on the bargraph

- limits are always displayed orange, always by one degree lighter or darker

YES	Limits are projected
nO	Limity are not projected

6.3.6i BARGRAPH - SELECTION OF DISPLAY BRIGHTNESS



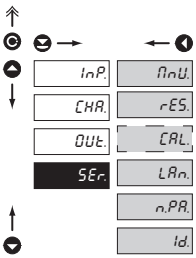
br I. Selection of bargraph brightness

0	Bargraph is off

- after pres. the key the display lights up for 10s

25	Brightness - 25%
50	Brightness - 50%
75	Brightness - 75%
100	Brightness - 100%

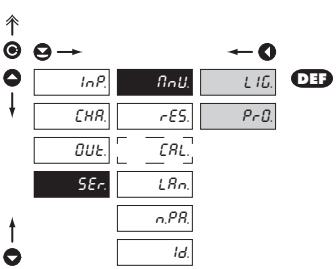
6.4 SETTING "PROFI" - SERVICE



The instrument service functions are set in this menu

- AnU. Selection of menu type LIGHT/PROFI
- rES. Restore instrument manufacture setting and calibration
- CAL. Input range calibration for „DU" version"
- LAn. Language version of instrument menu
- n.PA. Setting new access password
- Id. Instrument identification

6.4.1 SELECTION OF TYPE OF PROGRAMMING MENU



AnU. Selection of menu type - LIGHT/PROFI

- enables setting the menu complexity according to user needs and skills

LIG. Active LIGHT menu

- simple programming menu, contains only items necessary for configuration and instrument setting
- linear menu > items one after another

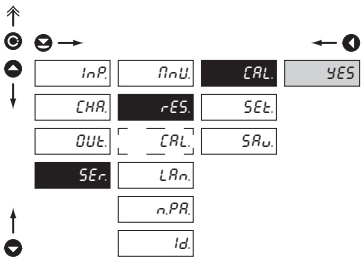
PrO. Active PROFI menu

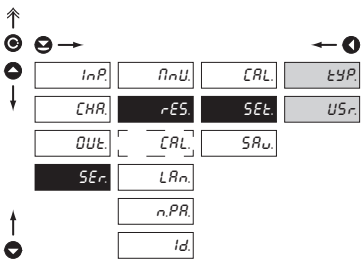
- complete programming menu for expert users
- tree menu

!

Change of setting is valid upon next access into menu

6.4.2 RESTORATION OF MANUFACTURE SETTING





rES. Restoration of manufacture setting

- in the event of error setting or calibration, manufacture setting may be restored

CAL. Restoration of manufacture calibration of the instrument

- prior executing the changes you will be asked to confirm you selection „YES"

SEt. Restoration of instrument manufacture setting

tYP. Restoration of instrument manufacture setting

- generating the manufacture setting for currently selected type of instrument (items marked **DEF**)

USr. Restoration of instrument user setting

- generating the instrument user setting, i.e. setting stored under **SER./RES./SAV**.

SAv. Save instrument user setting

- storing the user setting allows the operator to restore it in future if needed

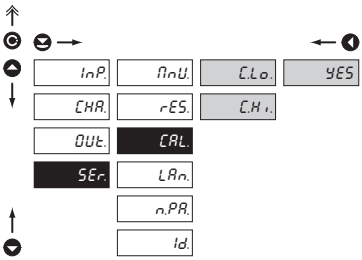
!

After restoration the instrument switches off for couple seconds

JOBS PERFORMED	RESTORE	
	CALIBRATION	SETTING
cancels USER menu rights	✓	✓
deletes table of items order in USER - LIGHT menu	✓	✓
adds items from manufcture to LIGHT menu	✓	✓
deletes data stored in FLASH	✓	✓
cancels or linearization tables	✓	✓
clears tare	✓	✓
restore manufacture calibration	✓	✗
restore manufacture setting	✗	✓

6.4.3 CALIBRATION - INPUT RANGE

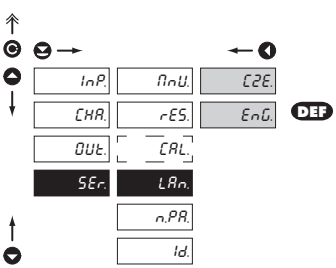
DU



CAL. Input range calibration

- when "**C.Lo.**" is displayed, move the potentiometer traveller to the required minimum position and confirm by „Enter", calibration is confirmed by "**YES**"
- when "**C.Hi.**" is displayed, move the potentiometer traveller to required maximum position and confirm by „Enter", calibration is confirmed by "**YES**"

6.4.4 SELECTION OF INSTRUMENT MENU LANGUAGE VERSION

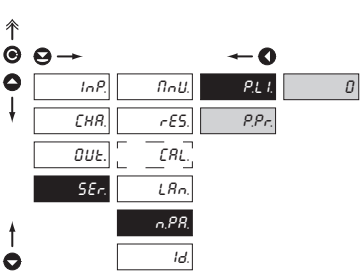


LAn. Selection of instrument menu language version

CZE. Instrument menu is in Czech

ENG. Instrument menu is in English

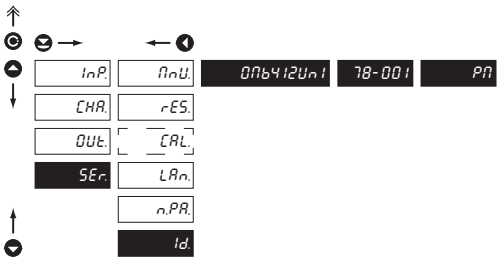
6.4.5 SETTING NEW ACCESS PASSWORD



n.PA. Setting new password for access to LIGHT and PROFI menu

- this option allows to change the numeric code, which blocks the access into **LIGHT** and **PROFI** menu.
- numerci code range: 0...999
- universal passwords in the event of loss: LIGHT Menu > „**177**"
  PROFI Menu > „**915**"

6.4.6 INSTRUMENT IDENTIFICATION



Id. **Projection of instrument SW version**

- display shows type identification of the instrument, SW number, SW version and current input setting (Mode)
- if the SW version reads a letter on first position, it is a customer SW

ID.

Pos.	Description
1.	type of instrument
2.	SW: number - version
3.	the input type

SETTING **USER**

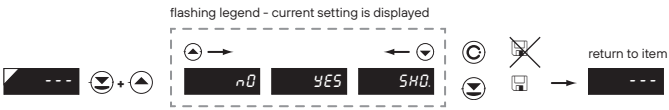
For user operation
Menu items are set by the user (Profi/Light) as per request
Access is not password protected
Optional menu structure either tree (PROFI) or linear (LIGHT)

7.0 SETTING ITEMS INTO "USER" MENU

- **USER** menu is designed for users who need to change only several items of the setting without the option to change the primary instrument setting (e.g. repeated change of limit setting)
- there are no items from manufacture permitted in **USER** menu
- on items indicated by inverse triangle 

- setting may be performed in **LIGHT** or **PROFI** menu, with the **USER** menu then overtaking the given menu structure

Setting



item will not be displayed in USER menu

item will be displayed in USER menu with editing option

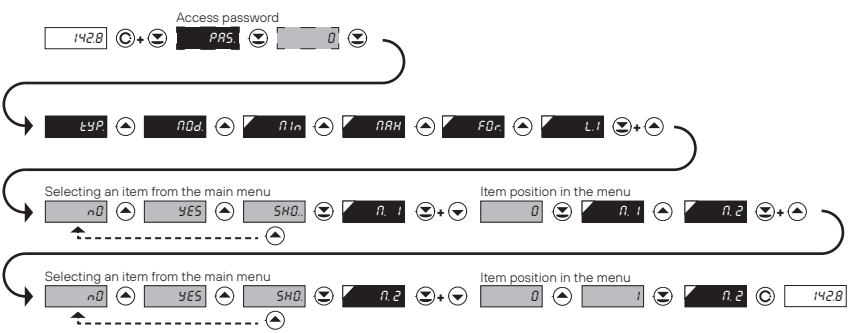
item will be solely displayed in USER menu

Setting sequence of items in "USER" menu

In compiling USER menu from active LIGHT menu the items (max. 10) may be assigned a sequence, in which they will be projected in the menu

Example of ranking the order of menu items in the "USER" menu

In this example we want to have a direct access to menu items Limit 1 and Limit 2 (example show is for the Light menu, but can equaly be used in the Profi menu).

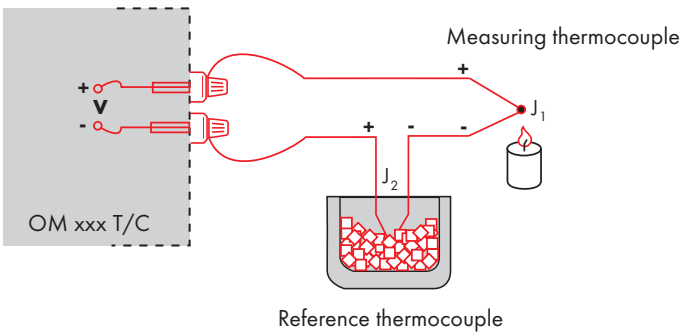


The result of this setting is that when the © button is pressed, the display will readí **„M. 1"**. By pressing ⏬ button you confirm your selection and then you can set the desired limit value, or by pressing the ⏫ button you can go to setting of **„M. 2"** where you can proceed identically as with Limit one.

You can exit the setting by pressing the ⏬ button by which you store the latest setting and pressing the ©. button will take you back to the measuring mode.

8. METHOD OF MEASURING THE CJC

Instrument with input for temperature measurement with thermocouple allows to set two types of measurement of cold junction.



WITH REFERENCE THERMOCOUPLE

- a reference thermocouple may be located in the same place as the measuring instrument or in place with stable temperature/compensation box
- when measuring with reference thermocouple set **CON.** in the instrument menu to **IN.2** or **EX.2**
- when using a thermostat (a compensation box or environment with constant temperature) set in the instrument menu **T.C.J.** its temperature (applies for setting **CON**. to **EX.2**)
- if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu **CON.** to **IN.2.** Based on this selection the measurement of the ambient temperature is performed by a sensor located in the instrument terminal board

WITHOUT REFERENCE THERMOCOUPLE

- inaccuracyoriginatingfromthecreationofdissimilarthermocouplesonthetransitionpointterminal/conductoroftheThermocouple is not compensated for in the instrument
- when measuring without reference thermocouple set **CON**. in the instrument menu to **IN.1** or **EX.1**
- when measuring temperature without reference thermocouple the error in measured data may be as much as 10°C (applies for setting **CON.** to **EX.1)**

The instruments communicate via serial line RS232 or RS485. For communication they use the ASCII protocol. Communication runs in the following format:

ASCII	8 bit, no parity, one stop bit
DIN MessBus	7 bit, even parity, one stop bit

The transfer rate is adjustable in the instrument menu. The instrument address is set in the instrument menu in the range of 0 ÷ 31. The manufacture setting always presets the ASCII protocol, rate of 9600 Baud, address 00. The type of line used - RS232 / RS485 - is determined by an output board automatically identified by the instrument.

The commands are described in specifications you can find at www.orbit.merret.eu or software OM Link.

DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE

Event	Transmitted data										
Data solicitation(PC)	#	A	A	<CR>							
Data transmission (Instrument)	>	R	<SP>	D	D	D	D	D	(D)	(D)	<CR>
Command confirmation (Instrum.) - OK	!	A	A	<CR>							
Command confirmation (Instrum.) - Bad	?	A	A	<CR>							
Instrument identification	#	A	A	1Y	<CR>						
HW identification	#	A	A	1Z	<CR>						

LEGEND

SING	RANGE		DESCRIPTION
#	35	23_H	Command beginning
A A	0...31		Two characters of instrument address (sent in ASCII - tens and units, e.g. "01", "99" universal
<CR>	13	$0D_H$	Carriage return
<SP>	32	20_H	Space
Č, P			Number and command - command code
D			Data - usually characters "0"..."9", "-", "."; (D) - dp. and (-) may prolong data
R	30_H...$3F_H$		Relay and tare status
!	33	21_H	Positive confirmation of command (ok)
?	63	$3F_H$	Negative confirmation of command (point)
>	62	$3E_H$	Beginning of transmitted data
<STX>	2	02_H	Beginning of text
<ETX>	3	03_H	End of text
<SADR>	adresa +60_H		Prompt to send from address
<EADR>	adresa +40_H		Prompt to accept command at address
<ENQ>	5	05_H	Terminate address
<DLE>1	16 49	10_H 31_H	Confirm correct statement
<NAK>	21	15_H	Confirm error statement
<BCC>			Check sum -XOR

RELAYS, TARE

SING	RELAY 1	RELAY 2	TARE	CHANGE RELAY 3/4
P	0	0	0	0
Q	1	0	0	0
R	0	1	0	0
S	1	1	0	0
T	0	0	1	0
U	1	0	1	0
V	0	1	1	0
W	1	1	1	0
p	0	0	0	1
q	1	0	0	1
r	0	1	0	1
s	1	1	0	1
t	0	0	1	1
u	1	0	1	1
v	0	1	1	1
w	1	1	1	1

Relay status is generated by command #AA6X <CR>.

The instrument immediately returns the value in the format >HH <CR>, where HH is value in HEX format and range 00H...FFH. The lowest bit stands for „Relay 1", the highest for „Relay 8"

10. ERROR STATEMENTS

ERROR	CAUSE	ELIMINATION
E.d._	Number is too small (large negative) to be displayed	change DP setting, channel constant setting
E.d.-	Number is too large to be displayed	change DP setting, channel constant setting
E.t._	Number is outside the table range	increase table values, change input setting (channel constant setting)
E.t.-	Number is outside the table range	increase table values, change input setting (channel constant setting)
E.i._	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
E.i.-	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
E.Hw	A part of the instrument does not work properly	send the instrument for repair
E.EE	Data in EEPROM corrupted	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E.SE.	Data in EEPROM outside the range	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E.CL.	Memory was empty (presetting carried out)	upon repeated error statement send instrument for repair, possible failure in calibration
E.ou	Analogue output current loop disconnected	check wire connection

11. TECHNICAL DATA

INPUT

			DC
Range	±60 mV	>100 MΩ	Input U
	±150 mV	>100 MΩ	Input U
	±300 mV	>100 MΩ	Input U
	±1200 mV	>100 MΩ	Input U
			DC - rozšíření "A"
Range	±0,1 A	< 300 mV	Input I
	±0,25 A	< 300 mV	Input I
	±0,5 A	< 300 mV	Input I
	±1 A	< 30 mV	Input I
	±5 A	< 150 mV	Input I
	±100 V	20 MΩ	Input U
	±250 V	20 MΩ	Input U
	±500 V	20 MΩ	Input U
			PM
Range	0/4...20 mA	< 400 mV	Input I
	±2 V	1 MΩ	Input U
	±5 V	1 MΩ	Input U
	±10 V	1 MΩ	Input U
	±40 V	1 MΩ	Input U

		OHM
Range	0...100 Ω	
	0...1 kΩ	
	0...10 kΩ	
	0...100 kΩ	
Connection	2, 3 or 4 wire	
Pt xxxx	-200°...850°C	**RTD**
Pt xxx/3910 ppm	-200°...1100°C	
Ni xxxx	-50°..250°C	
Cu/4260 ppm	-50°...200°C	
Cu/4280 ppm	-200°...200°C	
Type Pt	EU > 100/500/1 000 Ω, with 3 850 ppm/°C	
	US > 100 Ω, with 3 920 ppm/°C	
	RU > 50/100 Ω with 3 910 ppm/°C	
Type Ni	Ni 1 000/ Ni 10 000 with 5 000/6 180 ppm/°C	
Type Cu	Cu 50/Cu 100 with 4 260/4 280 ppm/°C	
Connection	2, 3 or 4 wire	

		T/C
Type	J (Fe-CuNi)	-200°...900°C
	K (NiCr-Ni)	-200°...1 300°C
	T (Cu-CuNi)	-200°...400°C
	E (NiCr-CuNi)	-200°...690°C
	B (PtRh30-PtRh6)	300°...1 820°C
	S (PtRh10-Pt)	-50°...1 760°C
	R (Pt13Rh-Pt)	-50°...1 740°C
	N (Omegalloy)	-200°...1 300°C
	L (Fe-CuNi)	-200°...900°C

		DU
Voltage of lin. pot.	2,5 VDC/6 mA	
	min. potentiometer resistance is 500 Ωd	

PROJECTION

Display	24-segment 3-color bargraph red/green/orange	
Auxiliary display	999, intensive red or green 7segment LEDs, digit height 9,1 mm	
Projection	24 LED/-99...999	
Decimal point	adjustbale - in menu	
Brightness	adjustbale - in menu	

INSTRUMENT ACCURACY

TC	50 ppm/°C	
Accuracy	±0,1 % of range + 1 digit	
	±0,15 % of range + 1 digit	**RTD, T/C**
	Above accuracies apply for projection 9999	
Resolution	0,01°/0,1°/1°	**RTD**
Rate	0,1...40 measurements/s**	
Overload capacity	10x (t < 100 ms) not for 400 V and 5 A, 2x (long-term)	
Linearisation	by linear interpolation in 38 points - solely via OM Link	
Digital filters	Averaging, Floating average, Exponential filter, Rounding	
Comp. of conduct	max. 40 Ω/100 Ω	**RTD**
Comp. of cold junc.	adjustable 0°...99°C or automatic	**T/C**
Functions	Tare - display resetting Hold - stop measuring (at contact) Lock - control key locking MM - min/max value Mathematic functions	
OM Link	company communication interface for setting, operation and update of instrument SW	
Watch-dog	reset after 400 ms	
Calibration	at 25°C and 40 % of r.h.	

COMPARATOR

Type	digital, adjustable in menu
Mode	Hysteresis, From, Dosing
Limits	-99...9999
Hysteresis	0...999
Delay	0...99,9 s
Outputs	2x relays with switch-on contact (Form A) (230 VAC/30 VDC, 3 A)* 2x relays with switch-off contact (Form C) (230 VAC/50 VDC, 3 A)* 2x SSR (250 VAC/ 1 A)* 2x/4x open collector (30 VDC/100 mA) 2x bistabil relays (250 VAC/250 VDC, 3 A/0,3 A*
Relay	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

DATA OUTPUTS

Protokols	ASCII, DIN MessBus, MODBUS RTU, PROFIBUS
Data format	8 bitů + no parity + 1 stop bit (ASCII) 7 bitů + even parity + 1 stop bit (MessBus)
Rate	600...230 400 Baud 9 600 Baud...12 Mbaud (PROFIBUS)
RS 232	isolated, two-way communication
RS 485	isolated, two-way communication, addressing (max. 31 instruments)
PROFIBUS	Data protocol SIEMENS

** values apply for resistance load*

ANALOG OUTPUTS

Type	isolated, programmable with 16 bits D/A convertor, analogoutput corresponds with displayed data, type and range are adjustable
Non-linearity	0,1 % of range
TC	15 ppm/°C
Rate	response to change of value < 1 ms
Voltage	0...2 V/5 V/10 V/± 10V
Current	0...5/20 mA/4...20 mA compensation of conduct to 500 Ω/12V or 1 000 Ω/24V

MEASURED DATA RECORD

Type RTC	time-controlled logging of measured data into instrument memory, allows to log up to 250 000 values
Type FAST	fast data logging into instrument memory, allows to log up to 8 000 values at a rate of 40 records/s
Transmission	via data output RS 232/485 or via OM Link

EXITATION

Adjustabale	5...24 VDC/max. 1,2 W, isolated

POWER SUPPLY

Options	10...30 V AC/DC, max. 13,5 VA, PF ≥ 0,4, I_{STP}< 40 A/1 ms, isolated - fuse inside (T 4000 mA) 80...250 V AC/DC, max. 13,5 VA, PF ≥ 0,4, I_{STP}< 40 A/1 ms, isolated - fuse inside (T 630 mA)

MECHANIC PROPERTIES

Material	Noryl GFN2 SE1, incombustible UL 94 V-I
Dimensions	48 x 96 x 120 mm
Panel cut-out	45 x 90,5 mm

OPERATING CONDITIONS

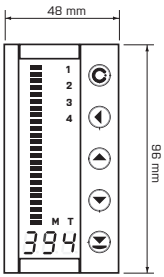
Connection	connector terminal board, conductor cross-section <1,5 mm² /<2,5 mm²
Stabilisation period	within 15 minutes after switch-on
Working temp.	-20°...60°C
Storage temp.	-20°...85°C
Cover	IP64 (front panel only)
Construction	safety class I
Overvoltage cat.	EN 61010-1, A2
Dielectric strength	4 kVAC after 1 min between supply and input 4 kVAC after 1 min between supply and data/analog output 4 kVAC after 1 min between supply and relay output 2,5 kVAC after 1 min between supply and data/analog output
Insulation resist.	for pollution degree II, measurement cat. III power supply > 670 V (ZI), 300 V (DI) Input/output > 300 V (ZI), 150 (DI)
EMC	EN 61326-1
Seismic qualification	IEC/IEEE 60980-344 Edition 1.0, 2020, par. 6, 9
Mechanic. resistibility	EN 60068-2-6 ed. 2:2008

**Table of rate of measurement in relation to number of inputs

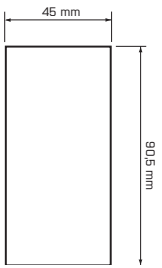
Channels/Rate	40	20	10	5	2	1	0,5	0,2	0,1
No.of channels: 1 (Type: DC, PM, DU)	40,00	20,00	10,00	5,00	2,00	1,00	0,50	0,20	0,10
No.of channels: 2	5,00	2,50	1,25	1,00	0,62	0,38	0,22	0,09	0,05
No.of channels: 3	3,33	1,66	0,83	0,66	0,42	0,26	0,14	0,06	0,03
No.of channels: 4	2,50	1,25	0,62	0,50	0,31	0,19	0,11	0,05	0,02
No.of channels: 1 (Type: OHM, RTD, T/C)	5,00	2,50	1,25	1,00	0,62	0,38	0,22	0,09	0,05
No.of channels: 2	3,33	1,066	0,83	0,66	0,42	0,26	0,14	0,06	0,03
No.of channels: 3	2,50	1,25	0,62	0,50	0,31	0,19	0,11	0,05	0,02
No.of channels: 4	2,00	1,00	0,50	0,40	0,25	0,15	0,08	0,04	0,02

PI - Primary insulation, DI - Double insulation

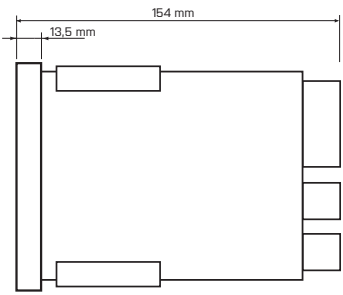
Front view



Panel cut



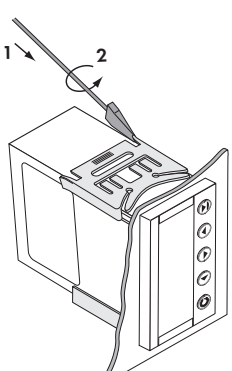
Side view

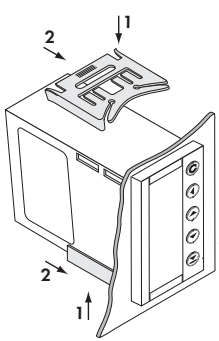


Panel thickness: 0,5...20 mm

INSTRUMENT INSTALLATION

1. insert the instrument into the panel cut-out
2. fit both travellers on the box
3. press the travellers close to the panel





INSTRUMENT DISASSEMBLY

1. slide a screw driver under the traveller wing
2. turn the screw driver and remove the traveller
3. take the instrument out of the panel

Product **OMB 412UNI A**

Type .....

Manufacturing No. .....

Date of sale .....

A guarantee period of 60 months from the date of sale to the user applies to this instrument.
Defects occuring during this period due to manufacture error or due to material faults shall be eliminated free of charge.

For quality, function and construction of the instrument the guarantee shall apply provided that the instrument was connected and used in compliance with the instructions for use.

The guarantee shall not apply to defects caused by:

- mechanic damage
- transportation
- intervention of unqualified person incl. the user
- unavoidable event
- other unprofessional interventions

The manufacturer performs guarantee and post.guarantee repairs unless provided for otherwise.

Stamp, signature

ES PROHLÁŠENÍ O SHODĚ

Company **ORBIT MERRET, spol. s r.o.**
Klánova 81/141, 142 00 Prague 4, Czech Republic, IČ: 00551309

Manufactured **ORBIT MERRET, spol. s r.o.**
Vodnanská 675/30, 198 00 Prague 9, Czech Republic

declares at its explicit responsibility that the product presented hereunder meets all technical requirements, is safe for use when utilised under the terms and conditions determined by ORBIT MERRET, spol.s r.o. and that our company has taken all measures to ensure conformity of all products of the types referred-to hereunder, which are being brought out to the market, with technical documentation and requirements of the appurtenant Czech statutory orders.

Product Programmable panel instrument

Type **OMB 412**

Version UNI, PWR

Thas been designed and manufactured in line with requirements of

Low-voltage electrical equipment (directive no. 2014/35/EU)
Electromagnetic compatibility (directive no. 2014/30/EU)

The product qualities are in conformity with harmonized standard

El. safety	EN 61010-1
EMC	EN 61326-1 Electronic measuring, control and laboratory devices – Requirements for EMC "Industrial use" EN 50131-1, cap. 14 and cap. 15, EN 50130-4, cap. 7, EN 50130-4, cap. 8, EN 50130-4, cap. 9, EN 50130-4, cap. 10, EN 50130-4, cap. 11, EN 50130-4, cap. 12, EN 50130-4, cap. 13, EN 61000-4-8, EN 61000-4-9, EN 61000-6-1, EN 61000-6-2, EN 55022, ccap. 5 and cap. 6
Seis. qualification	IEC/IEEE 60980-344 Edition 1.0, 2020, par. 6, 9
Mech. resistibility	EN 60068-2-6 ed. 2:2008

The product is furnished with CE label issued in 2006

As documentation serve the protocoles of authorized and accredited organizations

EMC	MO ČR, Testing institute of technical devices, protocol no. 80/6-328/2006 of 15/01/2007
	MO ČR, Testing institute of technical devices, protocol no. 80/6-333/2006 of 15/01/2007
Seismic	VTÚPV Vyškov, Labotory no. 1103, protocol no. 194200-128/2021 of 25/10/2021

Place and date of issue: Prague, November 1, 2021

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