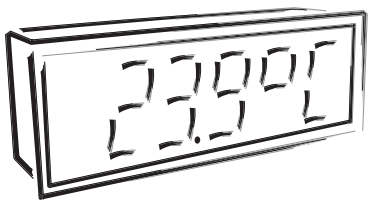
GUARANTEE
5
YEARS

# OMD 201 RS

## 4/6 DIGIT PROGRAMMABLE LAGRE DISPLAY

DATA DISPLAY
ASCII/MESSBUS/PROFIBUS



## SAFETY INSTRUCTIONS

Please, read the enclosed safety instructions carefully and observe them!
These instruments should be safeguarded by isolated or common fuses (breakers)!
For safety information the EN 61 010-1 + A2 standard must be observed.
This instrument is not explosion-safe!

## TECHNICAL DATA

Measuring instruments of the OMD 201 series conform to the European regulation 89/336/EWG and the Ordinance 168/1997 Coll.

The instruments are up to the following European standards:
EN 55 022, class B
EN 61000-4-2, -4, -5, -6, -8, -9, -10, -11

The instruments are applicable for unlimited use in agricultural and industrial areas.

## CONNECTION

Supply of energy from the main line has to be isolated from the measuring leads.

CE

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## 2.1 Description

The OMD 201 model series are 4/6 digit large panel programmable displays for the projection of data from data lines RS 232, RS 485 in protocoles ASCII/MESSBUS/MODBUS/PROFIBUS.

The instrument is based on an 8-bit microcontroller, which secures high accuracy, stability and easy operation of the instrument.

**PROGRAMMABLE PROJECTION**

| | |
|---|---|
| Setting: | Selection of integer/float input range |
| Protocol: | ASCII/MESSBUS |
| | MODBUS - RTU |
| | PROFIBUS DP* |
| Projection: | -9999...9999 (-99999...999999) |

**DIGITAL FILTERS**

| | |
|---|---|
| Exponen.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 |

**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 IR Remote control. 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).

OMLINK

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.cz) 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).

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.

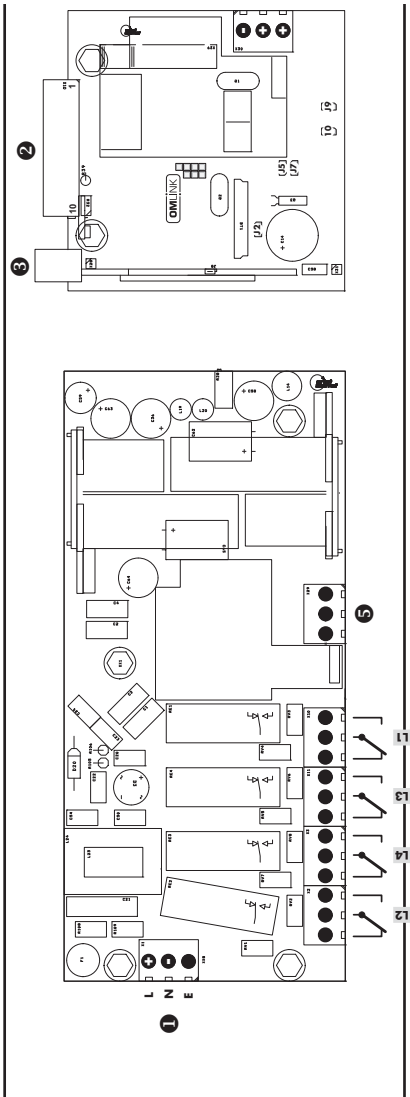
**Measured data record** is an internal time control of data collection. It is suitable where it is necessary to register measured values. Two modes may be used. FAST is designed for fast storage (40 records/s) of all measured values up to 8 000 records. Second mode is RTC, where data record is governed 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.

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.


1 Power supply
L
N
E
2 Input - horizontal
GND
Exchron
EXT.1
EXT.2
EXT.3
1
10
3 Input - vertical
RxD
TxD
GND
L+
L-
RS 232
RS 485
A B C D E F G H
4 Analog output
GND
AO - I
AO - U
5 Data output
GND
TxD
RxD
232
GND
L-
L+
485
6 Relays
L1
L3
L4
L2
OMLINK

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 IR Remote control. 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.cz) 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).

Setting and controlling the instrument is performed by means of the Remote control. With the aid of the Remote control it is possible to browse through the operation menu and to select and set the required values.


## Symbols used in the instructions

DEF values preset from manufacture

symbol indicates a flashing light (symbol)

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

broken 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

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)

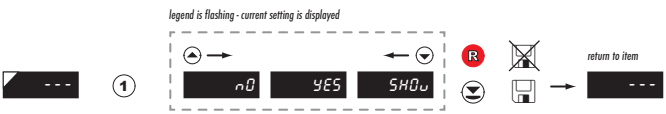
## Control keys functions

| Key | Measurement | Menu | Setting numbers/selection |
|---|---|---|---|
| R | 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 |
| G | access into LIGHT/PROFI menu | | |
| >3 s G | direct access into PROFI menu | | |
| 1 | | configuration of an item for "USER" menu | |
| 2 | | determine the sequence of items in "USER - LIGHT" menu | |

** alternatively, the setting may be done from the numeric keys of the remote control by selecting directly the number required*

## Setting items into „USER" menu

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




| | |
|---|---|
| nO | item will not be displayed in USER menu |
| YES | item will be displayed in USER menu with the option of setting |
| SHOu | item will be solely displayed in USER menu |

## 5.0 Setting "LIGHT"

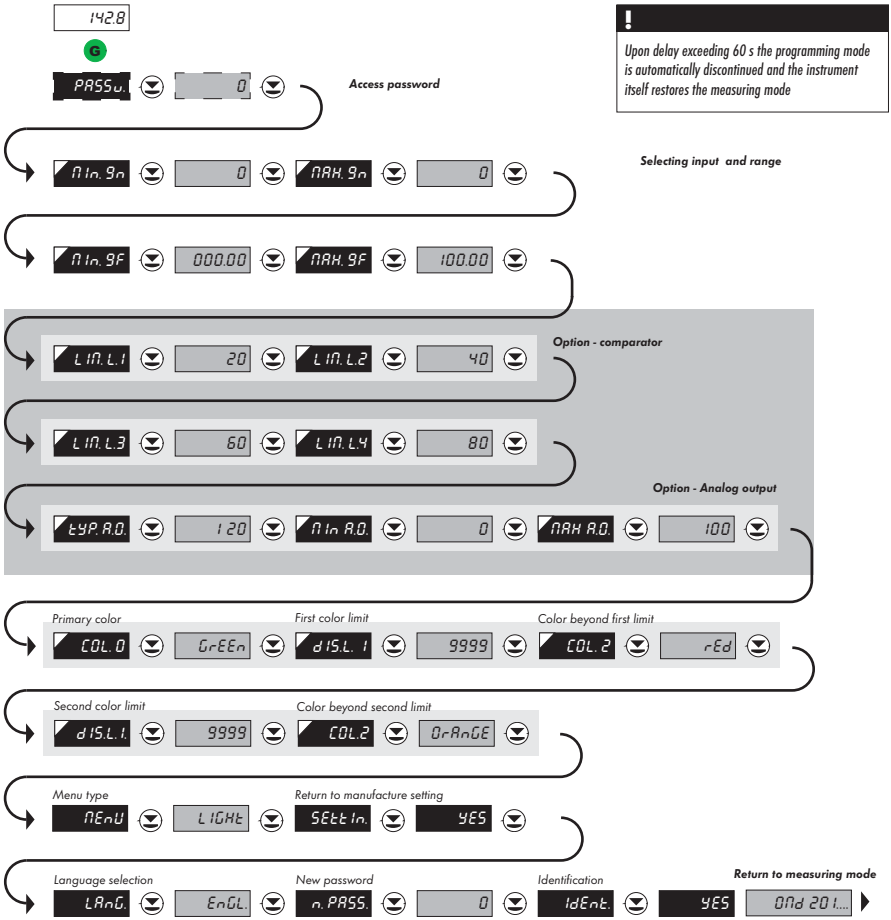
**LIGHT** **Simple programming menu**

- contains only items necessary for instrument setting and is protected by optional number code



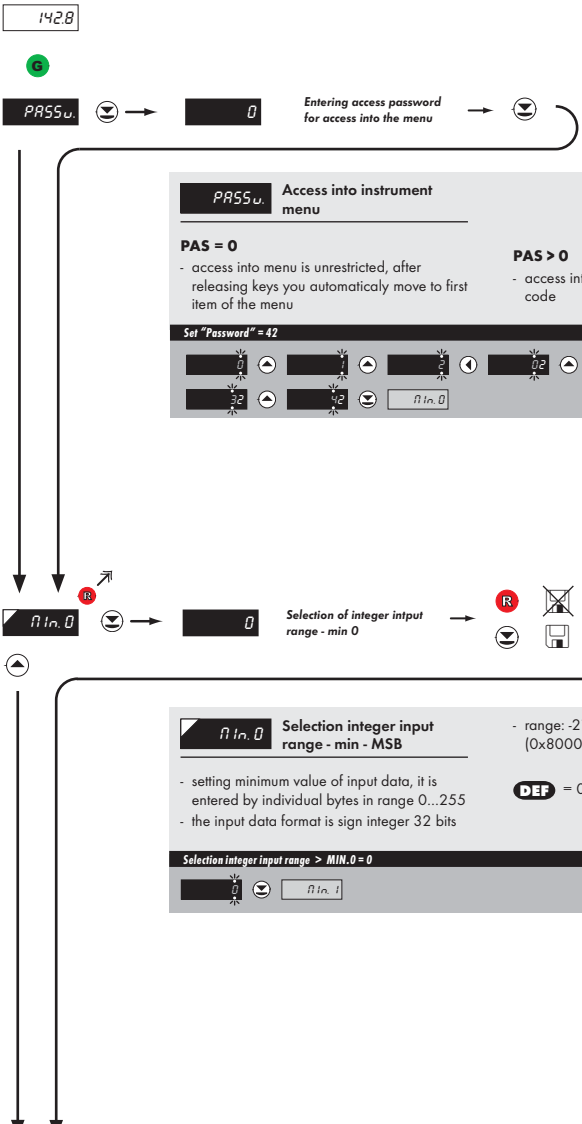

- **For capable users**
- **Only items necessary for instrument setting**
- **Access is password protected**
- **Possibility to arrange items of the „User" menu**
- **Linear menu structure**

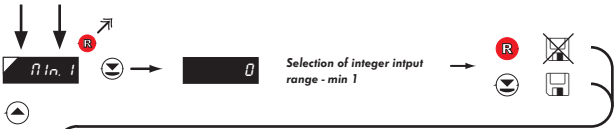
| Preset from manufacture | |
|---|---|
| *Password* | *"0"* |
| *Menu* | *LIGHT* |
| *USER menu* | *off* |
| *Setting the items* | DEF |




**!**

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


142.8
G
PASSu.
0
Entering access password for access into the menu
PASSu.
Access into instrument menu
PAS = 0
- access into menu is unrestricted, after releasing keys you automaticaly move to first item of the menu
PAS > 0
- access into menu is protected ny number code
Set "Password" = 42
Example
Min.0
Selection of integer intput range - min 0
Min.0
Selection integer input range - min - MSB
- setting minimum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits
- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)
DEF = 0
Selection integer input range > MIN.0 = 0
Example
Min.1



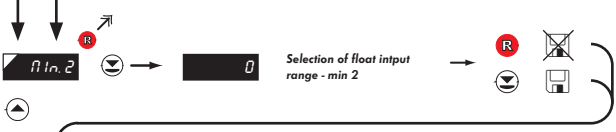

**Min. 1** **Selection of integer input range - min**

- setting minimum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

***Selection integer input range > MIN.1 = 0*** *Example*


**Min. 2** **Selection of float input range - min**

- setting minimum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

***Selection integer input range > MIN.2 = 0*** *Example*

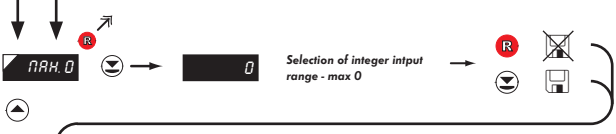

**MIN. 3** **Selection of integer input range - min - LSB**

- setting minimum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

*Selection integer input range > MIN.3 = 0* *Example*

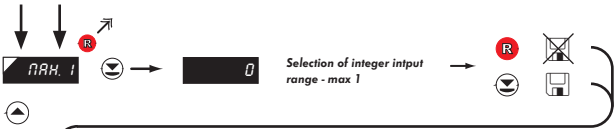

**MAX. 0** **Selection of integer input range - max - MSB**

- setting maximum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

*Selection integer input range > MAX.0 = 0* *Example*



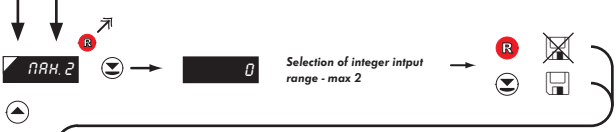

**MAX. 1** **Selection of integer input range - max**

- setting maximum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

*Selection integer input range > MAX.1 = 0* *Example*


**MAX. 2** **Selection of integer input range - max**

- setting maximum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

*Selection integer input range > MAX.2 = 0* *Example*

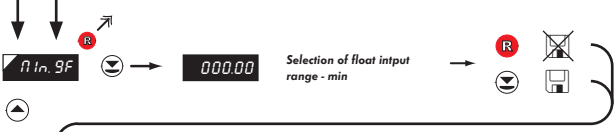

### MAX. 3 Selection of integer input range - max - LSB

- setting maximum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits

- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

DEF = 0

**Selection integer input range > MAX.3 = 0** *Example*


### MIn. 9F Selection of float input range - min

- setting minimum value of input data
- the input data format is float according to standard IEEE -754, 32 bits

- range: $0.3\times10^{38}$ <= |x| <= $1.7\times10^{38}$ d

DEF = 0

**Selection float input range > MIN. 9F = 0** *Example*


**MAX. 9F** **Selection of float input range - max**

- setting maximum value of input data
- the input data format is float according to standard IEEE -754, 32 bits

- range: $0.3\times10^{38}$ <= |x| <= $1.7\times10^{38}$

DEF = 0

*Selection float input range > MAX. 9F=100* *Example*

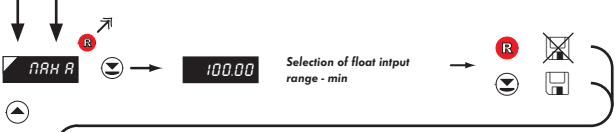

### MIN A Selection of integer input range - max

- range of the setting is -99999...999999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 0.00

**Projection for min > MIN A = 0.00** *Example*

000.00 MAX A




### MAX A Selection of float input range - min

- range of the setting is -99999...999999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100.00

**Projection for max > MAX A = 100.00** *Example*

100.00 FORM A


**FOrM.A** **Setting projection of the decimal point**

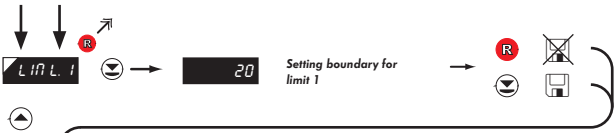
DEF = 0000.oo

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

***Projection of DP on display > 00000.o*** *Example*

0000.oo → 00000.o → nEnU

**subsequent item on the menu depends on instrument equipment*



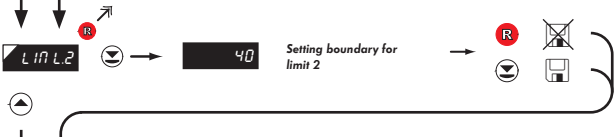

### LIN L.1 Setting boundary for limit 1

- range of the setting is -99999...999999
- default "Hystresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 20

*Setting limit 1 > L1 = 32* — *Example*

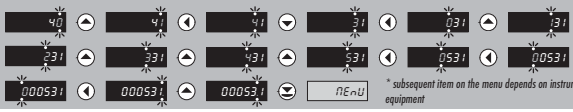

### LIN L.2 Setting boundary for limit 2

- range of the setting is -99999...999999
- default "Hysteresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 40

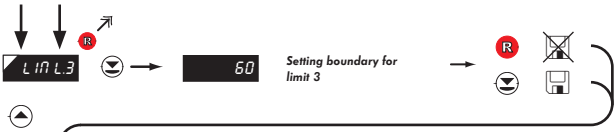
*Setting limit 2 > L2 = 53.1* — *Example*




* subsequent item on the menu depends on instrument equipment

**!**

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



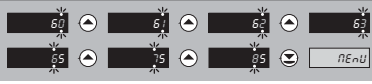

**LIN L3** **Setting boundary for limit 3**

- range of the setting is -99999...999999
- default "Hysteresis"=0 "Delay"=0

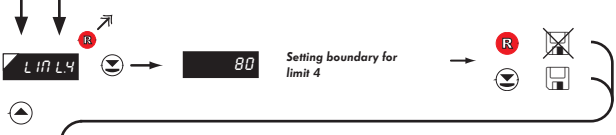
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 60

*Setting limit 3 > L 3 = 85* *Example*




* subsequent item on the menu depends on instrument equipment




**LIN L4** **Setting boundary for limit 4**

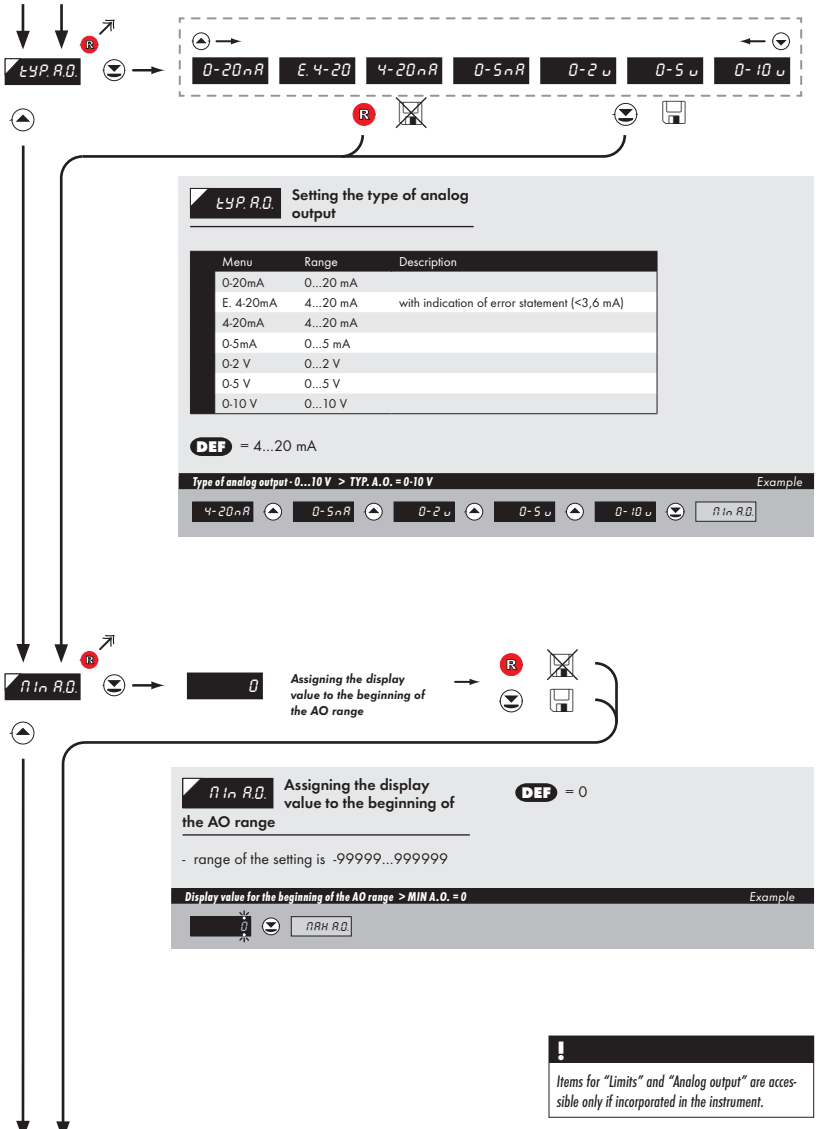
- range of the setting is -99999...999999
- default "Hysteresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 80

*Setting limit 4 > L 4 = 103* *Example*


* subsequent item on the menu depends on instrument equipment




**tYP. A.O.** **Setting the type of analog output**

| Menu | Range | Description |
|---|---|---|
| 0-20mA | 0...20 mA | |
| E. 4-20mA | 4...20 mA | with indication of error statement (<3,6 mA) |
| 4-20mA | 4...20 mA | |
| 0-5mA | 0...5 mA | |
| 0-2 V | 0...2 V | |
| 0-5 V | 0...5 V | |
| 0-10 V | 0...10 V | |

**DEF** = 4...20 mA

***Type of analog output - 0...10 V > TYP. A.O. = 0-10 V*** *Example*

4-20mA > 0-5mA > 0-2 V > 0-5 V > 0-10 V > Min A.O.

**Min A.O.** **Assigning the display value to the beginning of the AO range**

**DEF** = 0

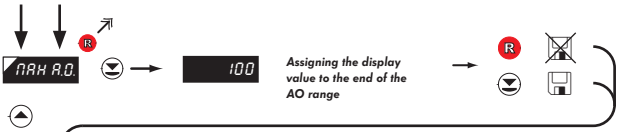
- range of the setting is -99999...999999

***Display value for the beginning of the AO range > MIN A.O. = 0*** *Example*

0 > MAX A.O.

**!**

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




**MAX A.O.** **Assigning the display value to the end of the AO range**

DEF = 100

- range of the setting is -99999...999999

*Display value for the end of the AO range > MAX A.O. = 120* *Example*


**COL.0** **Selection of display color > primary setting**

DEF = Green

*Selection of display color - primary > red* *Example*



*Setting limit for display color change*

**diSL.1.** Setting first value for color display change

DEF = 9999

- range of setting is -999...9999

*Display value for 1st color change > 100* *Example*

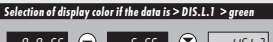


**COL. 1** **Selection of display color > after exceeding DIS.L. 1.**

DEF = Orange

- selection of display color is governed by setting under item dIS.L1
- the color changes if the displayed value is higher than the value set in DIS.L1

*Selection of display color if the data is > DIS.L.1 > green* *Example*




**dISL.2.** Setting second value for display color change

**DEF** = 9999

- range of setting is -999...9999

*Display value for 1st color change > 400* — *Example*

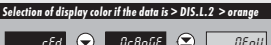


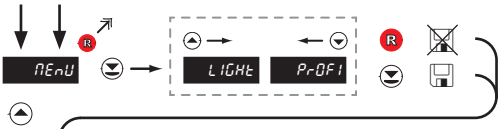
**COL.2** **Selection of display color > after exceeding DIS.L. 2**

**DEF** = Red

- selection of display color is governed by setting under item DIS.L.2
- the color changes if the displayed value is higher than the value set in DIS.L.2

*Selection of display color if the data is > DIS.L.2 > orange* — *Example*





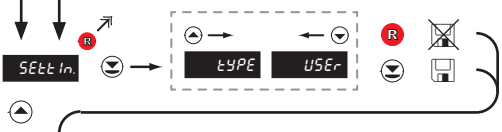

**MENU** **Setting the menu type LIGHT/PROFI**

**LIGHT** > menu LIGHT, a simple menu, which contains only the most essential items necessary for instrument setting
> linear tree structure

**PROFI** > menu PROFI, a complete menu for complete instrument setting
> tree menu structure

**DEF** = LIGHT

***Menu LIGHT > MENU = LIGHT*** *Example*

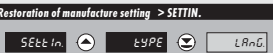



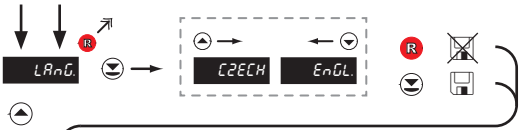

**SETT IN.** **Restoration of manufacture instrument setting**

- 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 "TYPE")

- provided you stored your user setting in the "PROFI" menu, it may also be restored (select "USER")
- loading manufacture calibration and primary setting of items on the menu (DEF)

***Restoration of manufacture setting > SETTIN.*** *Example*



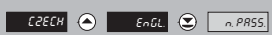



### LAnG. Selection of language in instrument menu

- selection of language version of the instrument menu

DEF = ENGL.

*Language selection - ENGLISH > LANG. = ENGL.* *Example*



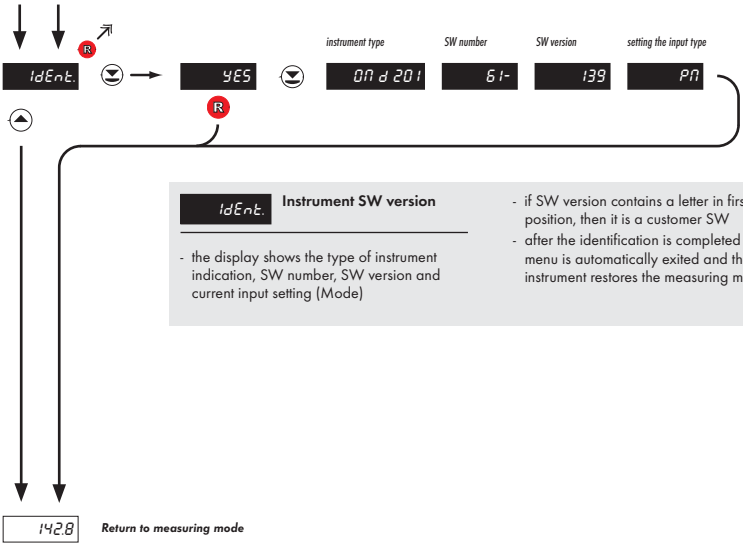


### n. PASS. Setting new access password

- access password for menu LIGHT/PROFI
- range of the number code 0...9999
- upon setting the password to "000" the access to menu LIGHT/PROFI is free without prompt to enter it
- in the event of loss universal password "8177" may be used

DEF = 0

*New password - 341 > N.PASSW. = 341* *Example*




**IdEnt. 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

## 6.0 Setting "PROFI"

**PROFI** **Complete programming menu**

- contains complete instrument menu and is protected by optional number code
- designed for expert users
- preset from manufacture is menu **LIGHT**




- **For expert users**
- **Complete instrument menu**
- **Access is password protected**
- **Possibility to arrange items of the „User" menu**
- **Tree menu structure**

### Switching over to "PROFI" menu

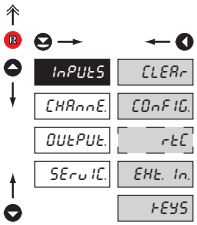
>3 s
G

- temporary switch-over to **PROFI** menu, which is suitable to edit a few items
- after quitting **PROFI** menu the instrument automatically switches to **LIGHT** menu
- access is password protected (if it was not set under item N. PASS. =0)

G

- access into **LIGHT** menu and transition to item „MENU" with subsequent selection of „PROFI" and confirmation
- after re-entering the menu the **PROFI** type is active
- access is password protected (if it was not set under item N. PASS. =0)

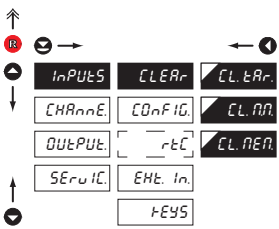
## 6.1 Setting "PROFI" - INPUT




The primary instrument parameters are set in this menu

- CLEAr — Resetting internal values
- COnFIG. — Selection of measuring range and parameters
- rtC — Setting date and time for option with RTC
- EXt. In. — Setting external inputs functions
- tEYS — Assigning further functions to keys on the instrument

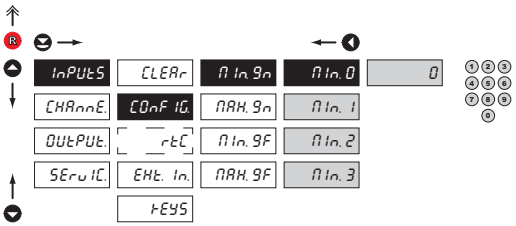
### 6.1.1 Resetting internal values




**CLEAr — Resetting internal values**

- CL. tAr. — Tare resetting
- CL. M.M. — Resetting min/max value
  - resetting memory for the storage of minimum and maximum value achieved during measurement
- CL. MEM. — Resetting the instrument memory
  - resetting memory with data measured in the "FAST" or "RTC" modes
  - not in standard equipment

## 6.1.2a Selection of integer input range - minimum




**Min.0** **Selection of integer input range - min**

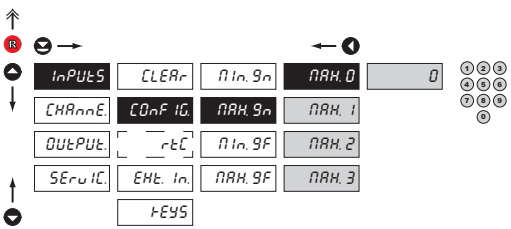
- setting minimum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits
- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

**Min.0** Most significant byte - "MSB"

---

**Min.3** Least significant byte - "LSB"

## 6.1.2b Selection of integer input range - maximum




**MAX.0** **Selection of integer input range - max**

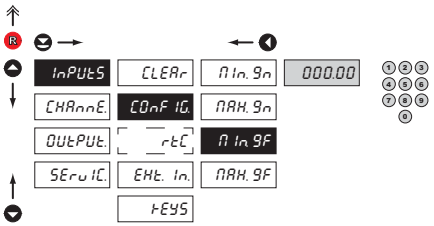
- setting minimum value of input data, it is entered by individual bytes in range 0...255
- the input data format is sign integer 32 bits
- range: -2147483648...2147483647 (0x80000000...0x7FFFFFFF)

**MAX.0** Most significant byte - "MSB"

---

**MAX.3** Least significant byte - "LSB"

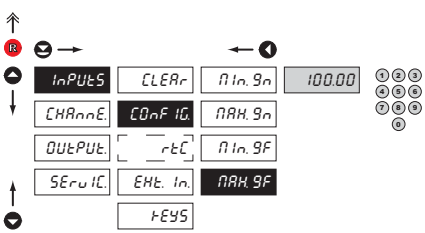
## 6.1.2c Selection of float input range - minimum




**Min. 9F** **Selection of float input range - min.**

- setting minimum value of input data
- input data format is float according to standard IEEE -754, 32 bits
- range: $0.3\times10^{-38}$ <= |x| <= $1.7\times10^{38}$

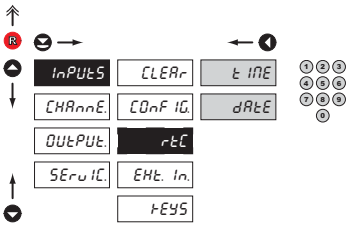
## 6.1.2d Selection of float input range - maximum




**MAX. 9F** **Selection of float input range - max**

- setting minimum value of input data
- input data format is float according to standard IEEE -754, 32 bits
- range: $0.3\times10^{-38}$ <= |x| <= $1.7\times10^{38}$

## 6.1.3 Setting the real time clock




**rtC** **Setting the real time clock (RTC)**

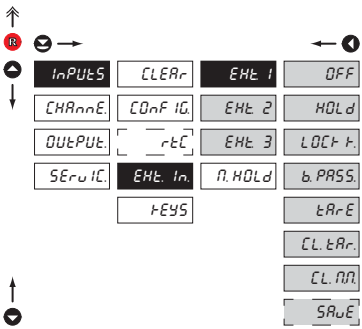
**tIME** Time setting

- format 23.59.59

**dAtE** Date setting

- format DD.MM.YY

## 6.1.4a External input function selection




**EHt. In.** **External input function selection**

**OFF** Input is off

**HOLd** Activation of HOLD

**LOCH K.** Locking keys on the instrument

**b. PASS.** Activation of locking access into programming menu LIGHT/PROFI

**tArE** Tare activation

**CL. tAr.** Tare resetting

**CL. nn.** Resetting min/max value

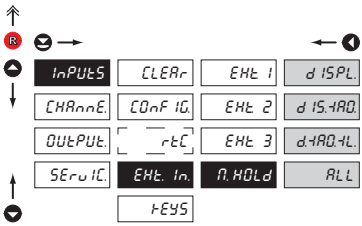
**SAvE** Activation of measured data record in instrument memory (not in standard equipment)

- DEF EXT. 1 > HOLD
- DEF EXT. 2 > LOCK K.
- DEF EXT. 3 > TARE

*****

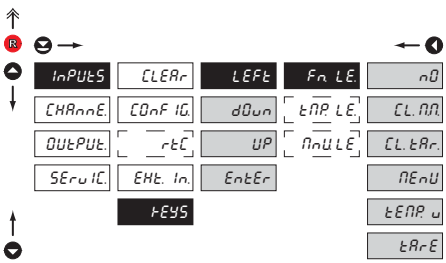
*Setting procedure is identical for EXT. 2 and EXT. 3*

## 6.1.4b Selection of function "HOLD"




| | |
|---|---|
| n.HOLd | **Selection of function "HOLD"** |
| dISPL. | "HOLD" locks only the value displayed |
| dIS.tAO. | "HOLD" locks the value displayed and on AO |
| d.tAO.tL. | "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. LE. | **Assigning further functions to instrument keys** |

- „FN. LE." > executive functions
- „TMP. LE." > temporary projection of selected values
- „MNU. LE." > direct access into menu on selected item

| | |
|---|---|
| nO | Key has no further function |
| CL.MM. | Resetting min/max value |
| CL.tAr. | Tare resetting |
| MEnU | Direct access into menu on selected item |

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

| | |
|---|---|
| tEMP. u. | Temporary projection of selected values |

- after confirmation of this selection the item "TMP. LE." is displayed on superior menu level, whererequired selection is performed

| | |
|---|---|
| tArE | Tare function activation |

**!**

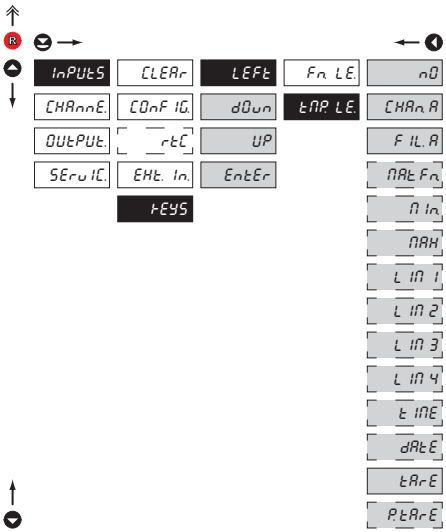
*Preset values of the control keys* **DEF**:

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

**!**

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

## 6.1.5b Optional accessory functions of the keys - Temporary projection



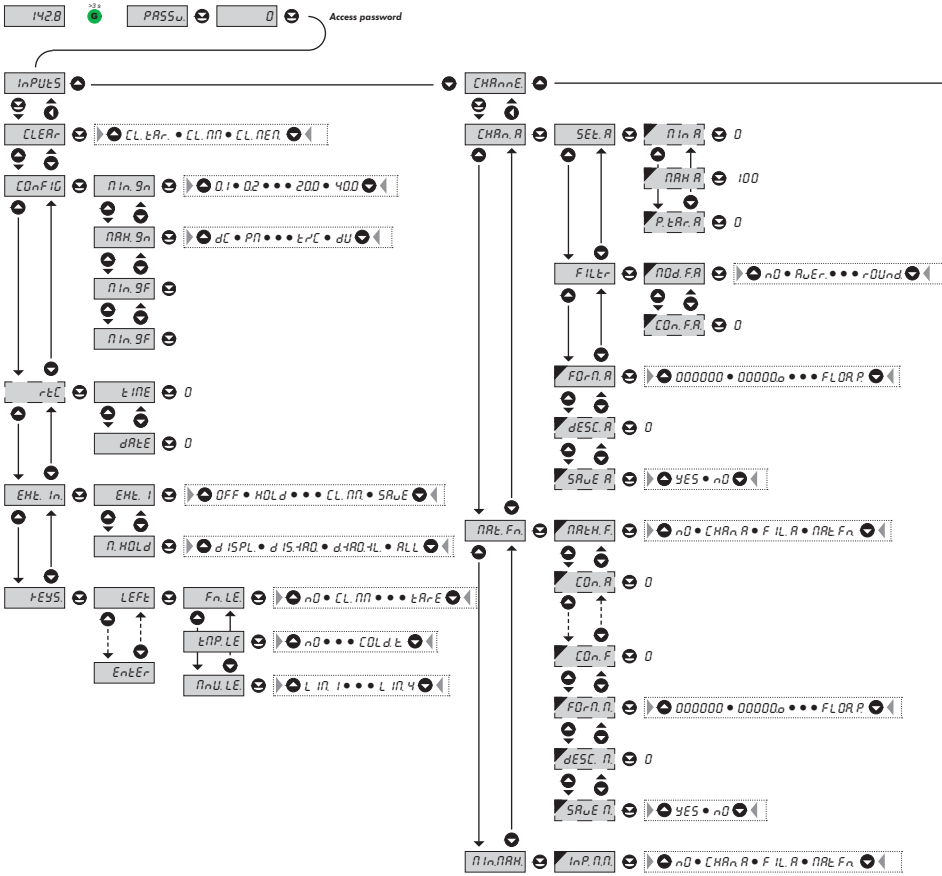

**tMP. LE. Temporary projection of selected item**

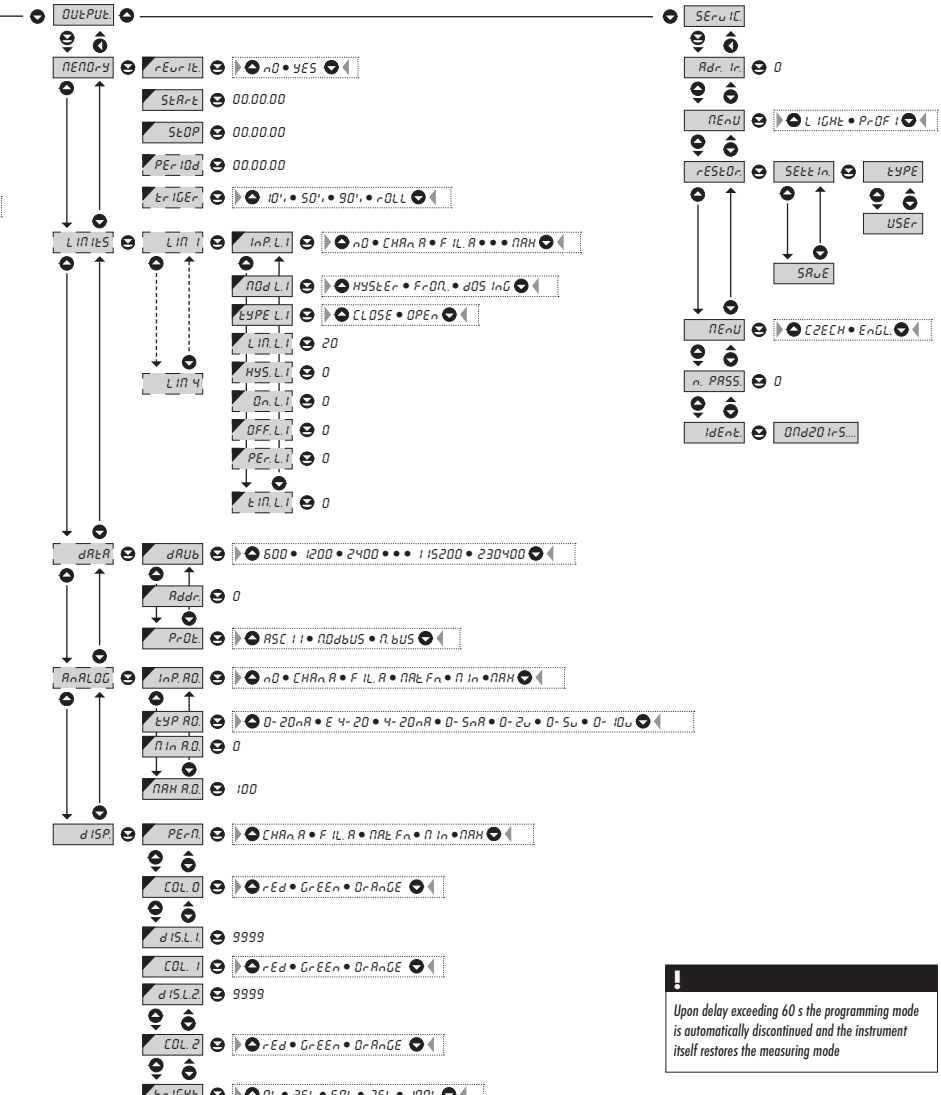
- "Temporary" projection of selected value is displayed for the time of keystroke
- "Temporary" projection may be switched to permanent by pressing R + "Selected key", this holds until the stroke of any key

| | |
|---|---|
| nO | Temporary projection is off |
| CHAn.A | Temporary projection of "Channel A" value |
| FIL.A | Temporary projection of "Channel A" value after processing digital filters |
| MAt.Fn. | Temporary projection of "Mathematic functions" value |
| Min | Temporary projection of "Min. value" |
| MAX | Temporary projection of "Max. value" |
| LIM 1 | Temporary projection of "Limit 1" value |
| LIM 2 | Temporary projection of "Limit 2" value |
| LIM. 3 | Temporary projection of "Limit 3" value |
| LIM. 4 | Temporary projection of "Limit 4" value |
| t IME | Temporary projection of "TIME" value |
| dAtE | Temporary projection of "DATE" value |
| tArE | Temporary projection of "TARE" value |
| P.tArE | Temporary projection of "P. TARE" value |

**!**

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

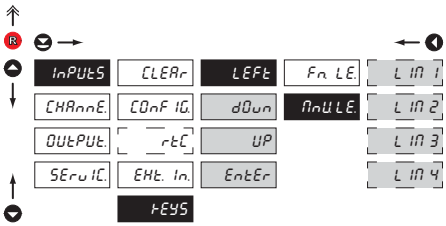

1428
PASSw
0
Access password
INPUTS
CLEAr
CL. tAr. • CL. nn • CL. nEn.
CONFIG
Min. 4n
0.1 • 0.2 • • • 20.0 • 40.0
MAX. 4n
dC • Pn • • • tr'C • dU
Min. 3F
Min. 3F
rtC
tIME
0
dAtE
0
EHt. In.
EHt. 1
OFF • HOLd • • • CL. nn • SAvE
n. HOLd
d ISPL • d IS.tAB. • d.tAB.tL • ALL
tEYS
LEFt
Fn. LE.
nO • CL. nn • • • tArE
tMP. LE
nO • • • COLd t
nU. LE
L in. 1 • • • L in. 4
EntEr
CHARnE
CHAn. A
SEt. A
Min A
0
MAX A
100
P. tAr. A
0
FILtEr
nOd. FA
nO • AvEr. • • • rOUnd
CO. FA.
0
FO-n. A
000000 • 00000. • • • FLOA.P
dESC. A
0
SAvE A
YES • nO
MAt. Fn
MAtH. F.
nO • CHAn. A • F IL. A • MAt Fn
CO. A
0
CO. F
0
FO-n. n.
000000 • 00000. • • • FLOA.P
dESC. n.
0
SAvE n.
YES • nO
MinMAX
InP. nn.
nO • CHAn. A • F IL. A • MAt Fn




**!**

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

## 6.1.5c Optional accessory functions of the keys - Direct access to item



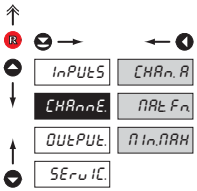

**AnU.LE. Assigning access to selected menu item**

- LIN 1 Direct access to item "LIM 1"
- LIN 2 Direct access to item "LIM 2"
- LIN 3 Direct access to item "LIM 3"
- LIN 4 Direct access to item "LIM 4"

**!**

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

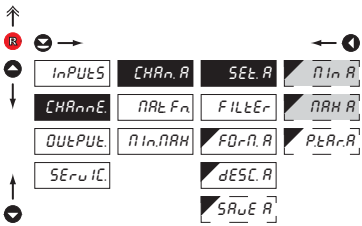
## 6.2 Setting "PROFI" - CHANNELS




The primary instrument parameters are set in this menu

- CHAn. A — Setting parameters of measuring "Channel"
- nAt. Fn. — Setting parameters of mathematic functions
- MIn.MAX — Selection of access and evaluation of Min/max value

### 6.2.1a Display projection

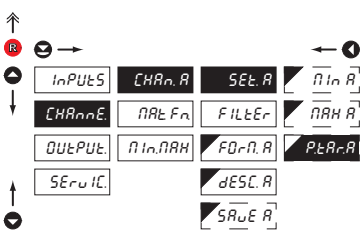



**SEt. A — Setting display projection**

MIn A — Setting display projection for minimum value of input signal
- range of the setting is -99999...999999
- DEF = 0

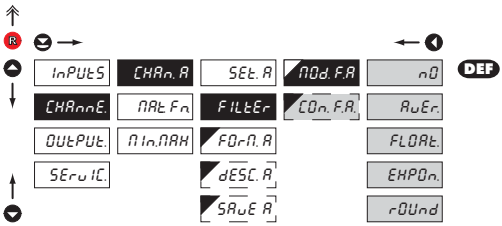
MAX A — Setting display projection for maximum value of input signal
- range of the setting is -99999...999999
- DEF = 100

### 6.2.1b Setting fixed tare




**P. tAr. A — Setting "Fixed tare" value**
- setting is designed for the event when it is necessary to firmly shift the beginning of the range by known size
- when setting (P. TAR. A > 0) display shows "T" symbol
- range of the setting is 0...999999
- DEF = 0

## 6.2.1c Digital filters




**nOd.F.A** **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

**AuEr.** Measured data average

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

**FLOAt.** Selection of floating filter

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

**EHPOn.** Selection of exponential filter

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

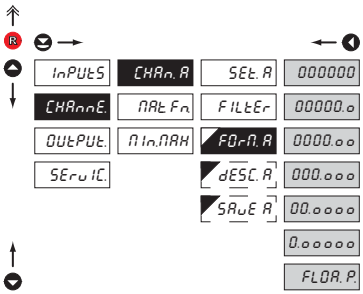
**rOUnd** Measured value rounding

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

**CON.F.A.** Setting constants

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

## 6.2.1d Projection format - positioning of decimal point

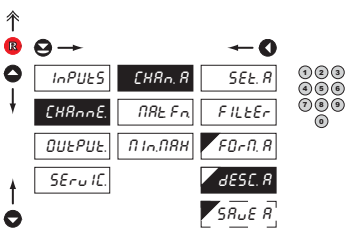



**FOrM.A** **Selection of decimal point**

- 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 *„FLOAT.P."*

| | |
|---|---|
| 000000. | Setting DP - XXXXXX. |
| 00000.0 | Setting DP - XXXXX.x |
| 0000.00 | Setting DP - XXXX.xx |
| 000.000 | Setting DP - XXX.xxx |
| - DEF | |
| 00.0000 | Setting DP - XX.xxxx |
| 0.00000 | Setting DP - X.xxxxx |
| FLOA.P. | Floating DP |

## 6.2.1e Projection of description - the measuring units




**dESC.A** **Setting projection of descript. for "Channel A"**

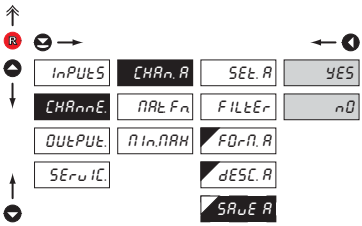
- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by code 00

DEF = none

!

*Table of signs on page 73*

## 6.2.1f Selection of storing data into instrument memory



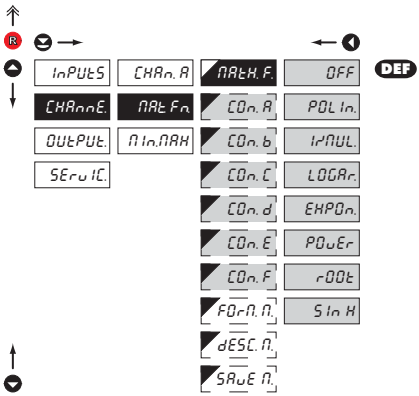

**SAuE A** **Selection of storing data into instrument memory**

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

**YES** Measured data are stored in the memory

**nO** Measured data are not stored

## 6.2.2a Mathematic functions




**nAtH. F.** **Selection of mathematic functions**

**OFF** Mathematic functions are off

**POL In** Polynome

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

**IrNUL.** 1/x

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

**LOGAr.** Logarithm

$$A \times \ln\left(\frac{Bx + C}{Dx + E}\right) + F$$

**EXPOn.** Exponential

$$A \times e^{\left(\frac{Bx+C}{Dx+E}\right)} + F$$

**POwEr** Power

$$A \times (Bx + C)^{(Dx+E)} + F$$

**rOOt** Root

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

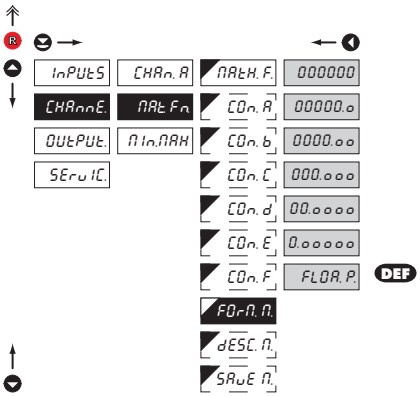
**S In H** Sin x

$$A\sin^5 x + B\sin^4 x + C\sin^3 x + D\sin^2 x + E\sin x + F$$

**CO n. -** 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



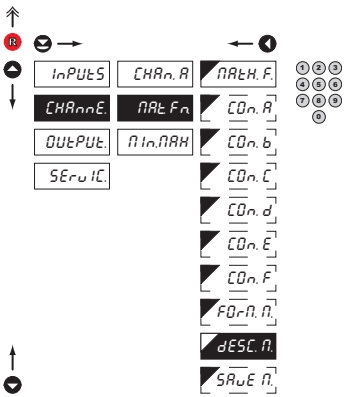

**FOrn. n. Selection of decimal point**

- 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 „FLOA.P."

| | |
|---|---|
| 000000. | Setting DP - XXXXXX. |
| 00000.0 | Setting DP - XXXXX.x |
| 0000.00 | Setting DP - XXXX.xx |
| 000.000 | Setting DP - XXX.xxx |
| 00.0000 | Setting DP - XX.xxxx |
| 0.00000 | Setting DP - X.xxxxx |
| FLOA. P. | Floating DP |

- DEF

## 6.2.2c Mathematic functions - measuring units




**dESC. n. Setting projection of description for "MAT.FN"**

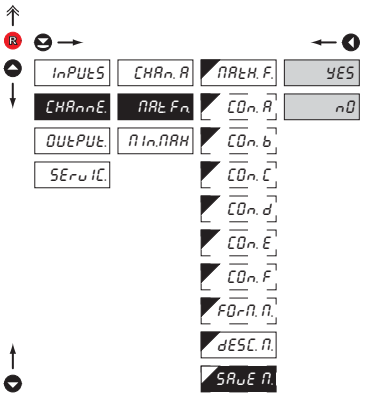
- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by code 00

- DEF = no description

!

*Table of signs on page 73*

## 6.2.2d Mathematic functions - selection of storing data into instrument memory

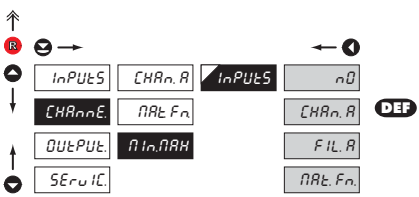



**SAuE n. Selection of storing data into instrument memory**

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

| | |
|---|---|
| YES | Measured data are stored in the memory |
| nO | Measured data are not stored |

## 6.2.3 Selection of evaluation of min/max value

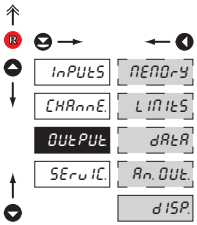



**InPUtS Selection of evaluation of min/max value**

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

| | |
|---|---|
| nO | Evaluation of min/max value is off |
| CHAn. A | From "Channel A" |
| FIL. A | From "Channel A" after digital filters processing |
| MAt. Fn. | From "Mathematic functions" |

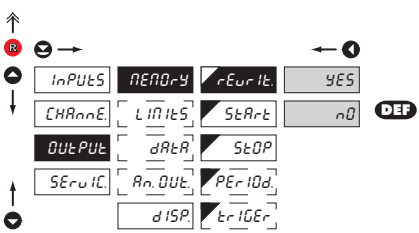
## 6.3 Setting „PROFI“ - OUTPUTS




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

- MEMOrY — Setting data logging into memory
- LIMItS — Setting type and parameters of limits
- dAtA — Setting type and parameters of data output
- An. OUt. — Setting type and parameters of analog output
- diSP. — Setting display projection and brightness

### 6.3.1a Selection of mode of data logging into instrument memory

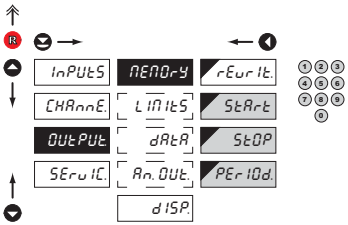



**rEurIt. Selection of the mode of data logging**

- 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




**StArt** Start of data logging into instrument memory

- time format HH.MM.SS

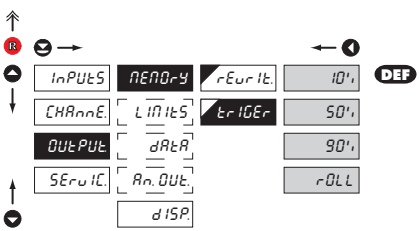
**StOP** Stop data logging into instrument memory

- time format HH.MM.SS

**PEr IOd.** 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 *START* and *STOP*
- time format HH.MM.SS
- records are made on a daily basis in selected interval and period
- item not displayed if "STORE" is selected in menu *(Input > EXT. IN.)*

## 6.3.1c Setting data logging into instrument memory - FAST




**trIGEr** **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 imputse
- initiation is on ext. input or control key

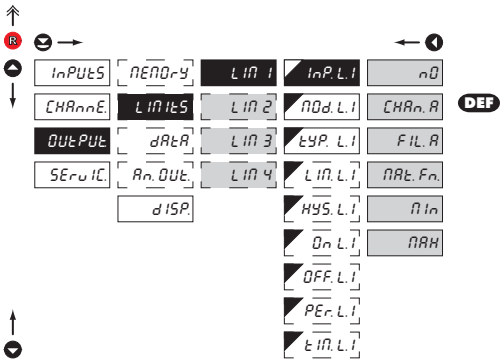
**10'** Reser. of 10 % memory prior init. of data logging

**50'** Reser. of 50 % memory prior init. of data logging

**90'** Reser. of 90 % memory prior init. of data logging

**rOLL** After initiation of data logging the memory is cyclically transcribed

## 6.3.2a Selection of input for limits evaluation




!

*Setting is identical for LIM 2, LIM 3 and LIM 4*

**inP. L.1 Selection evaluation of limits**

- selection of value from which the limit will be evaluated

nO — Limit evaluation is off

CHAn. A — Limit evaluation from "Channel A"

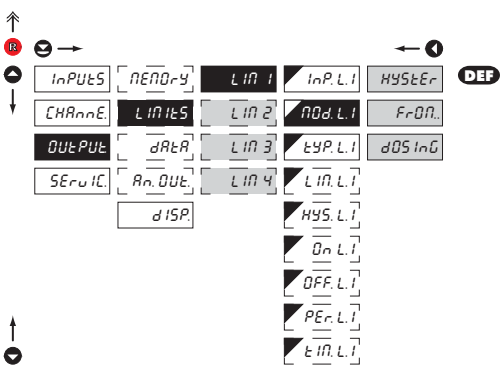
FIL. A — Limit evaluation from "Channel A" after digital filters processing

MAt. Fn. — Limit evaluation from "Mathematic functions"

MIn — Limit evaluation from "Min.value"

MAX — Limit evaluation from "Max.value"

## 6.3.2b Selection of type of limit




!

*Setting is identical for LIM 2, LIM 3 and LIM 4*

**nOd. L.1 Selection the type of limit**

HYStEr — Limit is in mode "Limit, hysteresis, delay"

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

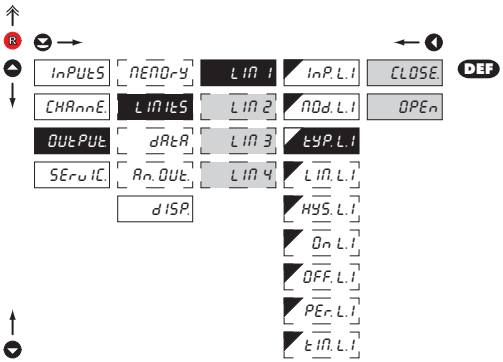
FrOn.. — Frame limit

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

dOSInG — Dose limit (periodic)

- for this mode the parameters are set for *"PER. L."* determining the limit value as well as its multiples at which the output is active and *"TIM. L."* indicating the time during which is the output active

## 6.3.2c Selection of type of output

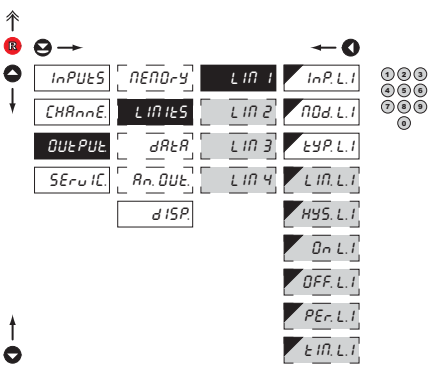



**tYP. L.1** — **Selection of type of output**

- **CLOSE.** — Output switches on when condition is met
- **OPEn** — Output switches off when condition is met

> **!** *Setting is identical for LIM 2, LIM 3 and LIM 4*

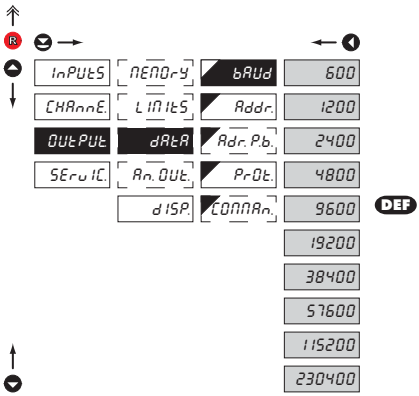
## 6.3.2d Setting values for limits evaluation




- **LIn. L.1** — Setting limit for switch-on
  - for type *"HYSTER"*
- **HYS. L.1** — Setting hysteresis
  - for type *"HYSTER"*
  - indicates the range around the limit (in both directions, LIM. ±1/2 HYS.)
- **On. L.1** — Setting the outset of the interval of limit switch-on
  - for type *"FROM"*
- **OFF. L.1** — Setting the end of the interval of limit switch-on
  - for type *"FROM"*
- **PEr. L.1** — Setting the period of limit switch-on
  - for type *"DOSE"*
- **tIn. L.1** — Setting the time switch-on of the limit
  - for type *"HYSTER"* and *"DOSE"*

> **!** *Setting is identical for LIM 2, LIM 3 and LIM 4*

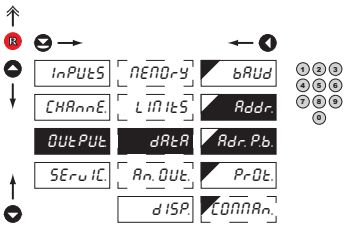
## 6.3.3a Selection of data output baud rate




**bAUd** Selection of data output baud rate

| | |
|---|---|
| 600 | Rate - 600 Baud |
| 1200 | Rate - 1 200 Baud |
| 2400 | Rate - 2 400 Baud |
| 4800 | Rate - 4 800 Baud |
| 9600 | Rate - 9 600 Baud |
| 19200 | Rate - 19 200 Baud |
| 38400 | Rate - 38 400 Baud |
| 57600 | Rate - 57 600 Baud |
| 115200 | Rate - 115 200 Baud |
| 230400 | Rate - 230 400 Baud |

## 6.3.3b Setting instrument address



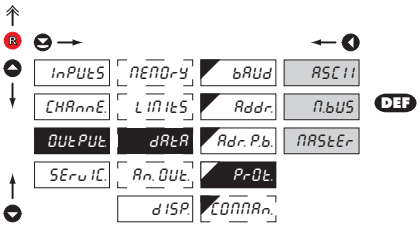

**Addr.** Setting instrument address

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

**Adr. Pb.** Setting instrument address - PROFIBUS

- setting in range 1...127
- DEF = 0

## 6.3.3c Selection of data output protocol




**!**

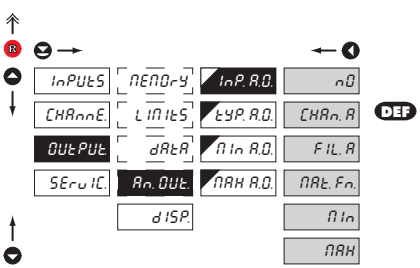
*If is „COMMAND" „uu" (two spaces) is broadcast query on data #AA<CR>.*
*Else #AA<<COMMAND>><CR> will wait on confirmation „!AA" and after it will send out request about data #AA<CR>*

**Pr0t. Selection of the type of analog output**

| | |
|---|---|
| ASCII | Data protocol ASCII |
| n.bUS | Data protocol DIN MessBus |
| MAStEr | Instrument solicits data from subordinate system |

- instrument controls data tansmission from subordinate system
- "COMMAN" may be used for selection of received data (for commands see data protocol)
- instrument asks 10 questions/s, if no response arrives within 2 s the display shows " - - - -

## 6.3.4a Selection of input for analog output

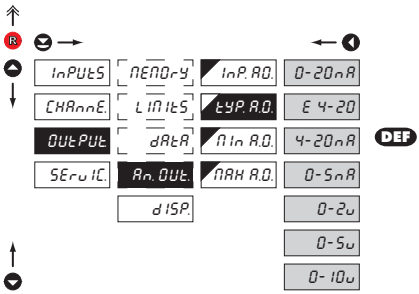



**InP. AO. Selection evaluation analog output**

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

| | |
|---|---|
| n0 | AO evaluation is off |
| CHAn. A | AO evaluation from "Channel A" |
| FIL. A | AO evaluation from "Channel A" after digital filters processing |
| MAt. Fn. | AO evaluation from "Math.functions" |
| Min | AO evaluation from "Min.value" |
| MAX | AO evaluation from "Max.value" |

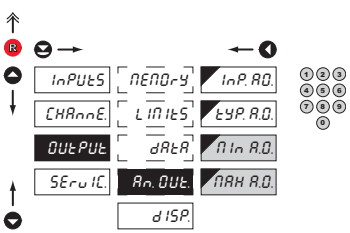
## 6.3.4b Selection of the type of analog output




**tYP. AO.** **Selection of the type of analog output**

- 0-20mA — Type - 0...20 mA
- E 4-20 — Type - 4...20 mA
  - with indication of error statement (< 3,0 mA)
- 4-20mA — Type - 4...20 mA
- 0-5mA — Type - 0...5 mA
- 0-2u — Type - 0...2 V
- 0-5u — Type - 0...5 V
- 0-10u — Type - 0...10 V

## 6.3.4c Setting the analog output range




**An. OUt.** **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

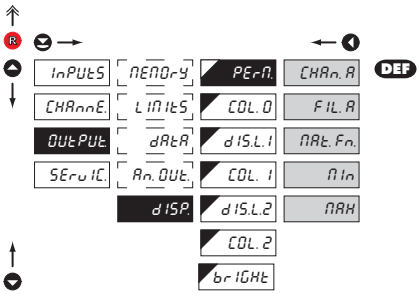
**Min AO.** Assigning the display value to the beginning of the AO range

- range of the setting is -99999...999999
- DEF = 0

**MAX AO.** Assigning the display value to the end of the AO range

- range of the setting is -99999...999999
- DEF = 100

## 6.3.5a Selection of input for display projection




**PErM. Selection display projection**

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

CHAn.A Projection of values from "Channel A"

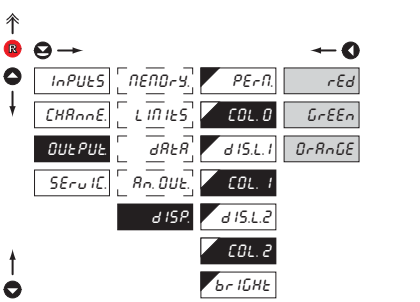
FIL.A Projection of values from "Channel A" after digital filters processing

MAt.Fn. Projection of values from "Math.functions"

Min. Projection of values from "Min.value"

MAX Projection of values from "Max.value"

## 6.3.5b Selection of display color




**COL.- Selection of display color**

- the color selection is governed by setting under items "DIS.L.1." and "DIS.L.2."

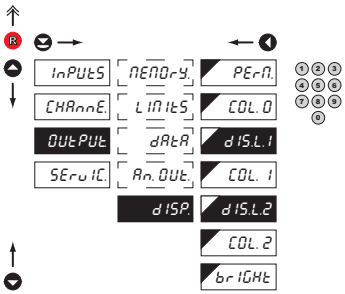
rEd Red color

GrEEn Green color

OrAnGE Orange color

- "COL. 0." DEF = Green
- "COL. 1." DEF = Orange
- "COL. 2." DEF = Red

## 6.3.5c Selection of display color change

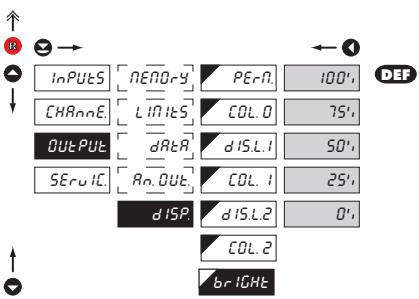



**diS.L.-** **Selection of display color change**

- under items "DIS.L. 1" and "DIS.L.2" the limit is set for the time when the display color shall change

- "DIS.L. 1." DEF = 9999
- "DIS.L. 2." DEF = 9999

## 6.3.5d Selection of display brightness




**brIGHt** **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

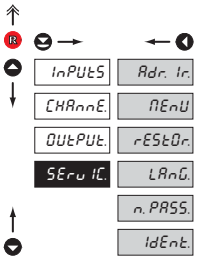
25' Display brightness - 25 %

50' Display brightness - 50 %

75' Display brightness - 75 %

100' Display brightness - 100 %

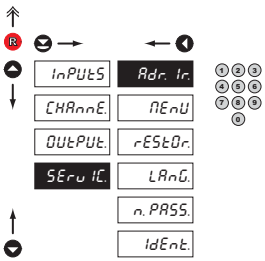
## 6.4 Setting "PROFI" - SERVICE




The instrument service functions are set in this menu

| | |
|---|---|
| Adr. Ir. | Setting the address of IR control |
| MEnU | Selection of menu type LIGHT/PROFI |
| rESEt. | Restore instrument manufacture setting and calibration |
| LAnG. | Language version of instrument menu |
| n. PASS. | Setting new access password |
| IdEnt. | Instrument identification |

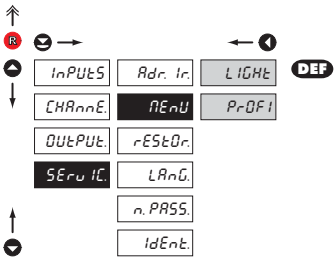
### 6.4.1 Setting the address of IR remote control




**Adr. Ir.** Setting the address of IR remote control

- setting the remote control address is inevitable only in case there are other large displays OMD 201 within the reach of IR remote control
- range of the setting is 0...99
- DEF = 0

## 6.4.2 Selection of type of programming menu




**MEnU Selection of menu type - LIGHT/PROFI**

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

LIGHt Active LIGHT menu

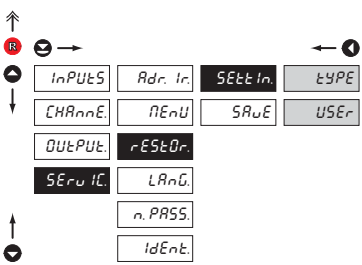
- simple programming menu, contains only items necessary for configuration and instrument setting
- linear menu > items one after another

PrOFI Active PROFI menu

- complete programming menu for expert users
- tree menu

> **!**
>
> *Change of setting is valid upon next access into menu*

## 6.4.3 Restoration of manufacture setting




**rESEt. Restoration of manufacture setting**

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

**SEtt In. Restoration of instrument manufacture setting**

tYPE Restoration of instrument manufacture setting

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

USEr Restoration of instrument user setting

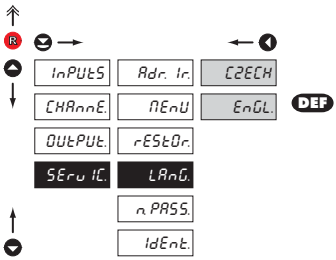
- generating the instrument user setting, i.e. setting stored under SERVIC./RESTOR./ SAVE

SAvE 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*

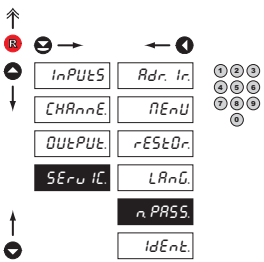
## 6.4.4 Selection of instrument menu language version




**LAnG. Selection of instrument menu language version**

- CZECH — Instrument menu is in Czech
- EnGL. — Instrument menu is in English

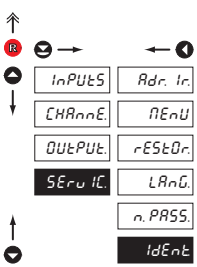
## 6.4.5 Setting new access password




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

- this selection enables changing number code that blocks the access into LIGHT and PROFI Menu.
- range of the number code is 0...9999
- universal password in the event of loss is „8177"

## 6.4.6 Instrument identification




**IdEnt. 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

## 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




- **For user operation**
- **Menu items are set by the user (Profi/Light) as per request**
- **Access is not password protected**

### 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:*

Into USER menu were selected these items

(keys 1 ) > *CL. TAR.*, *LIM 1*, *LIM 2*, *LIM 3*, for which we have preset this sequence (keys 2 ):

| | |
|---|---|
| CL. TAR. | *5* |
| LIM 1 | 0 (sequence not determined) |
| LIM 2 | 2 |
| LIM 3 | 1 |

Upon entering USER menu

(key R) items will be projected in the following sequence: LIM 3 > LIM 2 > CL.TAR. > LIM 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 na www.orbit.merret.cz/rs or in the OM Link program.

**DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE**

| Event | Type | Protocol | | Transmitted data | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data solicitation (PC) | 232 | ASCII | | # | A | A | <CR> | | | | | | | | | |
| | | MessBus | | No - data is transmitted permanently | | | | | | | | | | | | |
| | 485 | ASCII | | # | A | A | <CR> | | | | | | | | | |
| | | MessBus | | <SADR> | <ENQ> | | | | | | | | | | | |
| Data transmission (instrument) | 232 | ASCII | | > | D | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | <CR> | |
| | | MessBus | | <SADR> | D | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | <ETX> | <BCC> |
| | 485 | ASCII | | > | D | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | <CR> | |
| | | MessBus | | <SADR> | D | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | (D) | <ETX> | <BCC> |
| Confirmation of data acceptannce (PC) - OK | 485 | MessBus | | <DLE> | 1 | | | | | | | | | | | |
| Confirmation of data acceptance (PC) - Bad | | | | <NAK> | | | | | | | | | | | | |
| Sending address (PC) prior command | | | | <EADR> | <ENQ> | | | | | | | | | | | |
| Confirmation of address (instrument) | | | | <SADR> | <ENQ> | | | | | | | | | | | |
| Command transmission (PC) | 232 | ASCII | | # | A | A | N | P | (D) | (D) | (D) | (D) | (D) | (D) | (D) | <CR> |
| | | MessBus | | <STX> | $ | N | P | (D) | (D) | (D) | (D) | (D) | <ETX> | <BCC> | | |
| | 485 | ASCII | | # | A | A | N | P | (D) | (D) | (D) | (D) | (D) | (D) | (D) | <CR> |
| | | MessBus | | <SADR> | $ | N | P | (D) | (D) | (D) | (D) | (D) | <ETX> | <BCC> | | |
| Command confirmation (instrument) | 232 | ASCII | OK | ! | A | A | <CR> | | | | | | | | | |
| | | | Bad | ? | A | A | <CR> | | | | | | | | | |
| | | Messbus | | No - data is transmitted permanently | | | | | | | | | | | | |
| | 485 | ASCII | OK | ! | A | A | <CR> | | | | | | | | | |
| | | | Bad | ? | A | A | <CR> | | | | | | | | | |
| | | MessBus | OK | <DLE> | 1 | | | | | | | | | | | |
| | | | Bad | <NAK> | | | | | | | | | | | | |
| Command confirmation (inst.) - OK | 485 | MessBus | | ! | A | A | <CR> | | | | | | | | | |
| Command confirmati (instrument) - Bad | | | | ? | A | A | <CR> | | | | | | | | | |
| Instrument identification | | | | # | A | A | 1Y | <CR> | | | | | | | | |
| HW identification | | | | # | A | A | 1Z | <CR> | | | | | | | | |
| One-time transmission | | | | # | A | A | 7X | <CR> | | | | | | | | |
| Repeated transmission | | | | # | A | A | 8X | <CR> | | | | | | | | |

**LEGEND**

| | | | |
|---|---|---|---|
| # | 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 |
| N, 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> | addresa +$60_H$ | | Prompt to send from address |
| <EADR> | addresa +$40_H$ | | Prompt to accept command at address |
| <ENQ> | 5 | $05_H$ | Terminate address |
| <DLE>1 | 16<br>49 | $10_H$<br>$31_H$ | Confirm correct statement |
| <NAK> | 21 | $15_H$ | Confirm error statement |
| <BCC> | | | Check sum -XOR |

**RELAY, TARE**

| Sign | 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 $00_H$...$FF_H$. The lowest bit stands for „Relay 1", the highest for „Relay 8"

**Commands in RS monitors**

| | | |
|---|---|---|
| 9D | XXXXXX | Projection<br>- displays value and the point joins the previous symbol |
| 9C | BBBBBB | Color setting<br>- B 1 red<br>2 green<br>3 orange |
| 9B | HHH | Setting the display flashing<br>- 0...255, sum of the values of the following table<br>128 points flashing<br>64 1. symbol<br>32 2. symbol<br>16 3. symbol<br>8 4. symbol<br>4 5. symbol<br>2 6. symbol |
| 9L | HHH | Setting the LED flashing<br>32 lower right<br>16 upper right<br>2 lower left<br>1 upper left |
| 9N | HHHHHHHH | Selection of integer input range<br>- hexa number in sign long integer format (signed long integer)<br>- range: -2147483648...2147483647<br>(0x80000000...0x00000000...0x7FFFFFFF) |
| 9F | HHHHHHHH | Selection of float input range<br>- hexa number, corresponding binary presentation of number with floating DP according to standard IEEE-754 (single/short float)<br>- significance of individual bites<br>SEEEEEEE EMMMMMMM MMMMMMMM MMMMMMMM<br>where: S is a sign (1 bit)<br>E is exponent incl. the sign (8 bits)<br>M is mantissa (23 bits)<br>- range: 0.3×10-38 <= \|x\| <= 1.7×1038 |

For both commands applies the rule:
If less data is sent out, they are supplemented from the right with zeros to full length.
It enables contingent acceleration of ccommunication.
E.g.: #009F4<CR> is identical as #009F40000000<CR>. They both send away number 2,0.

| ERROR | CAUSE | ELIMINATION |
|---|---|---|
| E. d. Un. | Number is too small (large negative) to be displayed | change DP setting, channel constant setting |
| E. d. Ou | Number is too large to be displayed | change DP setting, channel constant setting |
| E. t Un. | Number is outside the table range | increase table values, change input setting (channel constant setting) |
| E. t Ou | Number is outside the table range | increase table values, change input setting (channel constant setting) |
| E. 1. Un. | Input quantity is smaller than permitted input quantity range | change input signal value or input (range) setting |
| E. 1. Ou | Input quantity is larger than permitted input quantity range | change input signal value or input (range) setting |
| E. Hu. | 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. dAtA | Data in EEPROM outside the range | perform restoration of manufacture setting, upon repeated error statement send instrument for repair |
| E. CLr. | Memory was empty (presetting carried out) | upon repeated error statement send instrument for repair, possible failure in calibration |

The instrument allows to add two descriptive characters to the classic numeric formats (at the expense of the number of displayed places). The setting is performed by means of a shifted ASCII code. Upon modification the first two places display the entered characters and the last two places the code of the relevant symbol from 0 to 95. Numeric value of given character equals the sum of the numbers on both axes of the table.
Description is cancelled by entering characters with code 00

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 0 | | !. | '' | #. | $. | '. | &. | ' |
| 8 | (. | ). | *. | +. | ,. | -. | . | /. |
| 16 | 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. |
| 24 | 8. | 9. | :. | ;. | <. | =. | >. | ?. |
| 32 | @. | A. | B. | C. | D. | E. | F. | G. |
| 40 | H. | I. | J. | K. | L. | M. | N. | O. |
| 48 | P. | Q. | R. | S. | T. | U. | V. | W. |
| 56 | X. | Y. | Z. | [. | \. | ]. | ^. | _. |
| 64 | `. | a. | b. | c. | d. | e. | f. | g. |
| 72 | h. | i. | j. | k. | l. | m. | n. | o. |
| 80 | p. | q. | r. | s. | t. | u. | v. | w. |
| 88 | x. | y. | z. | {. | |. | }. | ~. | |

## INPUT

| | |
|---|---|
| Protocol: | ASCII, MESSBUS, MODBUS - RTU, PROFIBUS DP |
| Data format: | 8 bit + no parity + 1 stop bit (ASCII)<br>7 bit + even parity + 1 stop bit (MESSBUS) |
| Rate: | 600...230 400 Baud (max. 12 MBaud for PROFIBUS) |
| RS 232: | isolated, two-way communication |
| RS 485: | isolated, two-way communication,<br>addressing (in range 1...247) |

## PROJECTION

| | |
|---|---|
| Display: | 999999, intensive red/green/orange<br>7 segment LED, digit height 57 or 100 or 125 mm |
| Projection: | ±9999 (-99999...999999) |
| Decimal point: | adjustable - in menu |
| Brightness: | adjustbale - in menu |

## INSTRUMENT ACCURACY

| | |
|---|---|
| Linearisation: | by linear interpolation in 50 points<br>- solely via OM Link |
| Digital filters: | Averaging, Floating average, Exponential filter, Rounding |
| Functions: | Tare - display resetting<br>Hold - stop measuring (at contact)<br>Lock - control key locking<br>MM - min/max value<br>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 |
| Limita: | -99999...999999 |
| Hysteresis: | 0...999999 |
| Delay: | 0...99,9 s |
| Outputs: | 4x relays with switch-off contact (Form C)<br>(230 VAC/50 VDC, 3 A)* |
| Relay: | 1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300 |

## DATA OUTPUTS

| | |
|---|---|
| Protocols: | ASCII, DIN MessBus, MODBUS-RTU, PROBUS |
| Data format: | 8 bit + no parity + 1 stop bit (ASCII)<br>7 bit + even parity + 1 stop bit (MessBus) |
| Rate: | 600...230 400 Baud |
| RS 232: | isolated, two-way communication |
| RS 485: | isolated, two-way communication,<br>addressing (max. 31 instruments) |
| PROFIBUS | Data protocol SIEMENS |

## ANALOGO OUTPUTS

| | |
|---|---|
| Type: | isolated, programmable with resolution of max.10 000 points, analog output corresponds with displayed data, type and range are adjustable |
| Non-linearity: | 0,2 % of range |
| TC: | 100 ppm/°C |
| Rate: | response to change of value < 150 ms |
| Voltage: | 0...2 V/5 V/10 V |
| Curernt: | 0...5/20 mA/4...20 mA<br>- compensation of conduct to 500 Ohm/12 V<br>or 1 000 Ohm/24 V |

## 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 |

## EXCITATION

| | |
|---|---|
| Adjustbale: | 5...24 VDC/max. 1,2 W, isolated |

## POWER SUPPLY

| | |
|---|---|
| Options: | 10...30 V AC/DC, max. 27 VA, isolated,<br>- fuse inside (T 4A)<br>80...250 V AC/DC, max. 27 VA, isolated<br>- fuse inside (T 4A) |

## MECHANIC PROPERTIES

| | |
|---|---|
| Material: | anodized aluminum, black |
| Dimensions: | see chapter 13 |
| Panel cut-out: | see chapter 13 |

## OPERATING CONDITIONS

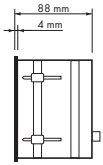
| | |
|---|---|
| Connection: | through cable bushings to terminal boards inside the instrument, conductore section up to <1,5 mm² /<2,5 mm² |
| Stabilisation period: | within 15 minutes after switch-on |
| Working temp.: | 0°...60°C |
| Storage temp.: | -10°...85°C |
| Cover: | IP64 |
| Construction: | safety class I |
| Overvoltage category: | EN 61010-1, A2 |
| Insulation resistance: | for pollution degree II, measurement category III<br>instrum.power supply > 670 V (PI), 300 V (DI)<br>Input/output > 300 V (PI), 150 (DI) |
| EMC: | EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11;<br>EN 550222, A1, A2 |

** values apply for resistance load*

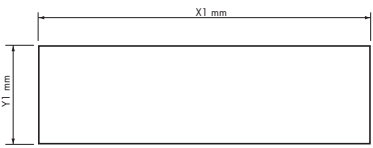
*PI - Primary insulation, DI - Double insulation*

**Front view**


**SIde view**




**Panel cut-out**



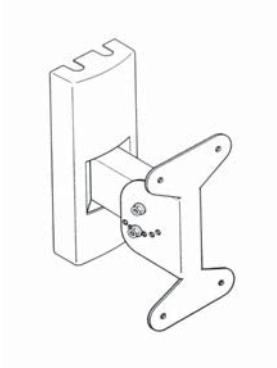

| Height | X | Y | X1 | Y1 |
|---|---|---|---|---|
| ***57*** | 372 | 116 | 364 | 108 |
| ***100-4*** | 465 | 181 | 457 | 173 |
| ***100-6*** | 651 | 181 | 643 | 173 |
| ***125-4*** | 539 | 237 | 531 | 228 |
| ***125-6*** | 754 | 237 | 746 | 228 |

Tolerance: ±1 mm

Panel thickness: 0,5 ... 50 mm

## Wall mounting

As a standard, large displays are designed for panel installation. Upon request we may also supply a holder for wall mounting, see picture.



| | |
|---|---|
| Product | **OMD 201RS** |
| Type | . . . . . |
| Manufacturing No. | . . . . . |
| Date of sale | . . . . . |

## GUARANTEE

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.

Y E A R S

Stamp, signature

# DECLARATION OF CONFORMITY

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

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

declares at its full 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 type listed hereunder, which are being brought out to the market, with technical documentation and requirements of the appurtenant statutory orders.

**Product:** 4/6-digit programmable large display

**Type:** **OMD 201**

**Version:** UNI, PWR, UQC, RS

Conformity is assessed pursuant to the following standards:

| | | |
|---|---|---|
| El. safety: | EN 61010-1 | |
| EMC: | EN 50131-1, chapter 14 and chapter 15 | |
| | EN 50130-4, chapter 7 | EN 61000-4-11 |
| | EN 50130-4, chapter 8 | EN 61000-4-11 |
| | EN 50130-4, chapter 9 | EN 61000-4-2 |
| | EN 50130-4, chapter 10 | EN 61000-4-3 |
| | EN 50130-4, chapter 11 | EN 61000-4-6 |
| | EN 50130-4, chapter 12 | EN 61000-4-4 |
| | EN 50130-4, chapter 13 | EN 61000-4-5 |
| | EN 50130-5, chapter 20 | |
| | prEN 50131-2-1, par. 9.3.1 | |
| | EN 61000-4-8 | |
| | EN 61000-4-9 | |
| | EN 61000-3-2 ed. 2:2001 | |
| | EN 61000-3-3: 1997, Cor. 1:1998, Z1:2002 | |
| | EN 55022, chapter 5 and chapter 6 | |

and Ordinance on:

| | |
|---|---|
| El. safety: | No. 168/1997 Coll. |
| EMC: | No. 169/1997 Coll. |

The evidence are the protocols of authorized and accredited organizations:
VTÚE Praha, experimental laboratory No. 1158, accredited by ČIA
VTÚPV Vyškov, experimental laboratory No. 1103, accredited by ČIA

Place and date of issue: Prague, 12. Juni 2001

Miroslav Hackl v.r.
Company representative

*Mode of asses. of conformity §12, par. 4 b, d Act No. 22/1997 Coll.*