USER MANUAL

OMD 202RS - MB

4/6 DIGIT PROGRAMMABLE LARGE DISPLAY

DATA DISPLAY
RS 232/485
MODBUS

WARRANTY 5 YEARS

orbit merret

SAFETY INSTRUCTIONS

Please read carefully the enclosed safety instructions and observe them!

Installation, all operational interventions, maintenance and service must be performed by a qualified personnel and in accordance with the attached information and safety regulations. The manufacturer is not liable for damage caused by improper installation, configuration, maintenance, and service.

The recorder must be installed according to the respective application. Incorrect installation can cause a malfunction, which can result in damage or accident.

The recorder uses dangerous voltages that can cause a fatal accident. Before you start solving problems (e.g. in case of failure or disassembly), the device must be disconnected from the power supply. For safety information the EN 61 010-1 + A2 standard must be observed.

When removing or inserting a card, observe the safety instructions and follow the recommended procedure. During any intervention the recorder must be disconnected from the power supply.

Do not attempt to repair or modify the device. A defective recorder must be sent for repair to the manufacturer.

These devices should be safeguarded by isolated or common fuses (breakers)!

The recorder is not designed for installation in potentially explosive surroundings (Ex). Use it only outside potentially explosive surroundings

TECHNICAL DATA

Measuring instruments of the OMD 202 series conform to the European regulation 2014/30/EU and 2014/35/EU

The instruments are up to the following European standards:

EN 61010-1 Electrical safety

EN 61326-1 Electronic measuring, control and laboratory devices – Requirements for EMC “Industrial use”

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

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2. INSTRUMENT DESCRIPTION

2.1 DESCRIPTION

The OMD 202RS 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 can be supplied with either a 3-colour LED display (red/green/orange) or with hight intensity SMD LEDs (red or green with brightness of 1 300 mcd).

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

Floating average:	from 2...30 measurements
Exponential 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

EXTERNAL CONTROL

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

* description is presented in a separate manual

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).

Complete instrument operation and setting may be performed via OM Link communication interface, which is a standard equipment of all instruments.

OMLINK 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).

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.

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.

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.

3. INSTRUMENT CONNECTION

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.

❶ **Power supply**

E
N
L

❷ **External inputs**

1 EXT.1
2 EXT.2
3 EXT.3
4

❸ **Excitation***

5 L-
6 L+
7 NC

❹ **Analogue output***

1 AO -U
2 AO -I
3 GND

❺ **Input - PROFIBUS***

1 B - Positive
2 A - Negative
3 GND

❻ **Input**

8 L-
9 L+
10 GND
11 TxD (RS 232)
12 RxD (RS 232)
(RS 485)

❻ **Relays***

*Option

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

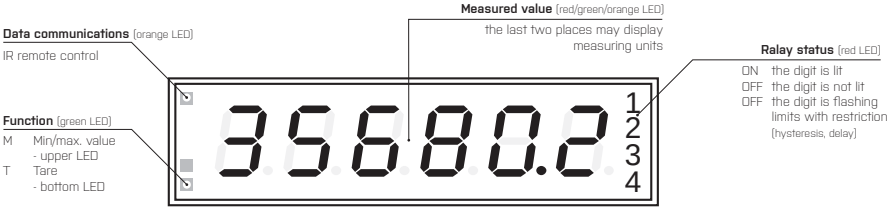
Complete instrument operation and setting may be performed via OM Link communication interface, which is a standard equipment of all instruments.

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).

4. INSTRUMENT SETTING

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

42 — symbol indicates a flashing light (symbol)

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

LIM.L1 — 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

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

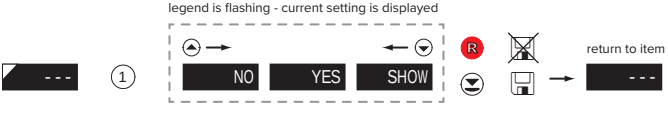
KEY	MEASUREMENT	MENU	SETTING NUMBERS/SELECTION
R	access into USER menu	exit menu	quit editing
◀	programmable key function	back to previous level	move to higher decade*
▼	programmable key function	move to previous item	move down*
▲	programmable key function	move to next item	move up*
▼▲	programmable key 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	
●	cancelation of instrument's/controler's address		

* 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

USER



NO item will not be displayed in USER menu

YES item will be displayed in USER menu with the option of setting

SHOW item will be solely displayed in USER menu

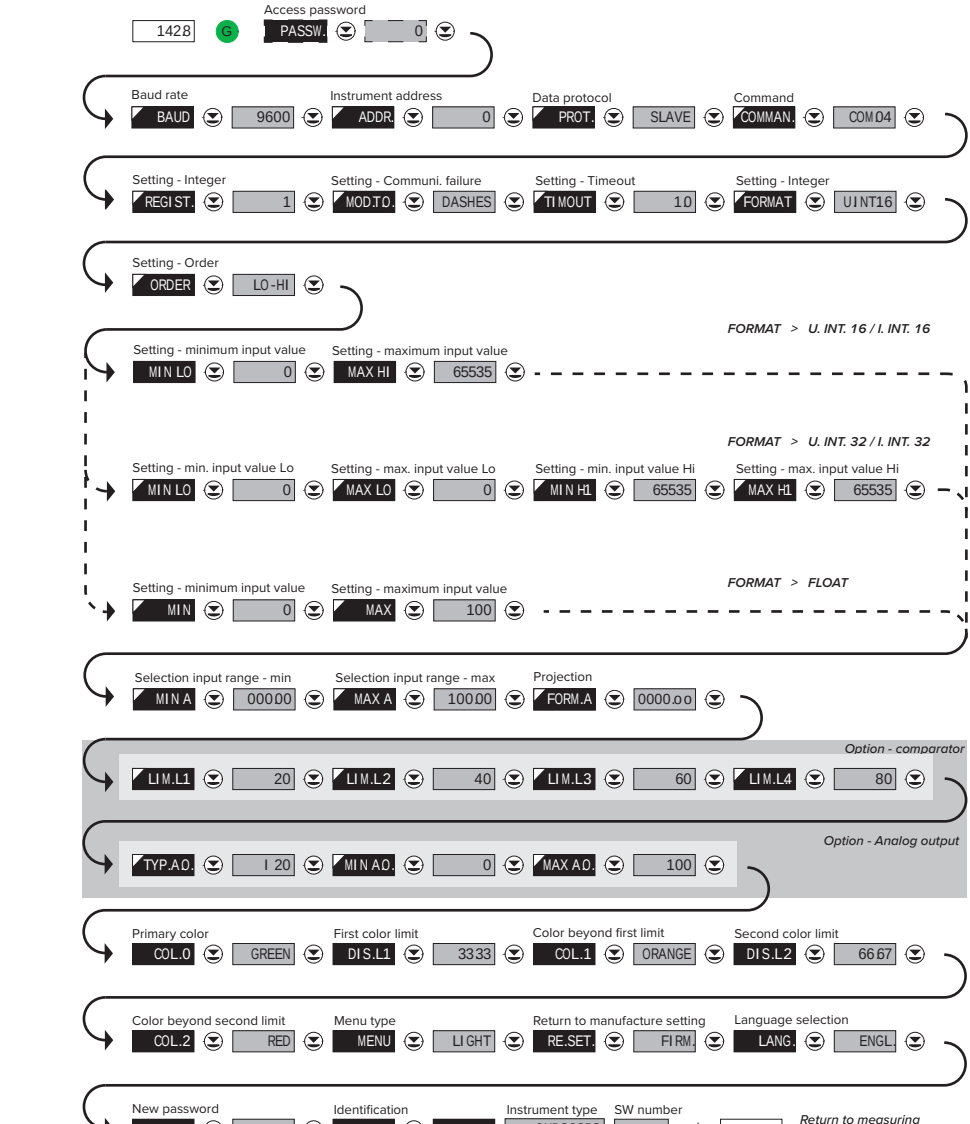
SETTING **LIGHT**

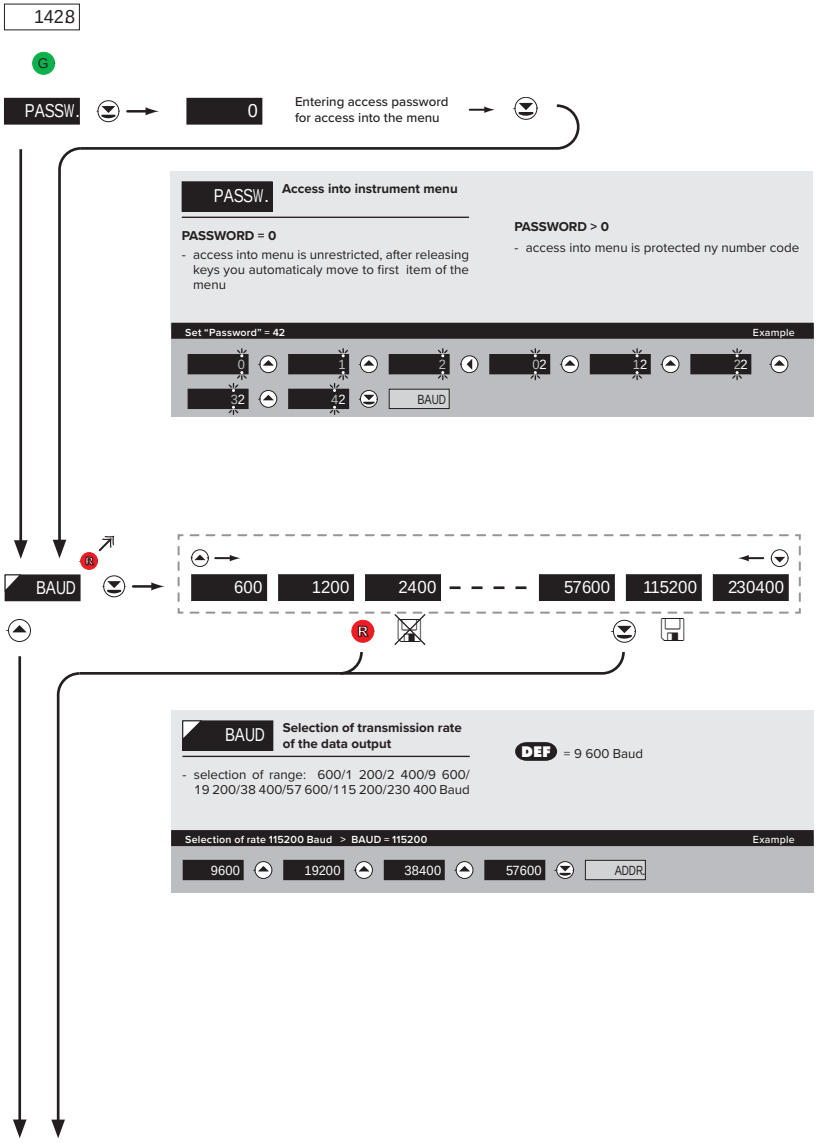
For trained users
Only items necessary for instrument setting
Access is password protected
Possibility to arrange items of the **USER MENU**
Linear menu structure

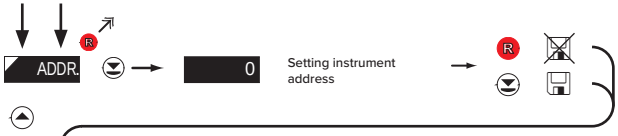
Preset from manufacture	
Password	"0"
Menu	LIGHT
USER menu	off
Setting the items	DEF

!

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


1428
G
Access password
PASSW.
0
Baud rate
BAUD
9600
Instrument address
ADDR
0
Data protocol
PROT.
SLAVE
Command
COMMAN.
COM.04
Setting - Integer
REGIST.
1
Setting - Communi. failure
MOD.TO.
DASHES
Setting - Timeout
TIMOUT
1.0
Setting - Integer
FORMAT
U.INT16
Setting - Order
ORDER
LO-HI
FORMAT > U. INT. 16 / I. INT. 16
Setting - minimum input value
MIN LO
0
Setting - maximum input value
MAX HI
65535
FORMAT > U. INT. 32 / I. INT. 32
Setting - min. input value Lo
MIN LO
0
Setting - max. input value Lo
MAX LO
0
Setting - min. input value Hi
MIN HI
65535
Setting - max. input value Hi
MAX HI
65535
FORMAT > FLOAT
Setting - minimum input value
MIN
0
Setting - maximum input value
MAX
100
Selection input range - min
MIN A
0000
Selection input range - max
MAX A
1000
Projection
FORM.A
0000.00
Option - comparator
LIM.L1
20
LIM.L2
40
LIM.L3
60
LIM.L4
80
Option - Analog output
TYP.AO.
I 20
MIN AO.
0
MAX AO.
100
Primary color
COL.0
GREEN
First color limit
DIS.L1
3333
Color beyond first limit
COL.1
ORANGE
Second color limit
DIS.L2
6667
Color beyond second limit
COL.2
RED
Menu type
MENU
LIGHT
Return to manufacture setting
RE.SET.
FIRM.
Language selection
LANG.
ENGL.
New password
PAS.LI.
0
Identification
IDENT.
YES
Instrument type
OMD202RS
SW number
78
1428
Return to measuring mode


1428
G
PASSW.
0
Entering access password for access into the menu
PASSW.
Access into instrument menu
PASSWORD = 0
- access into menu is unrestricted, after releasing keys you automaticaly move to first item of the menu
PASSWORD > 0
- access into menu is protected ny number code
Set "Password" = 42
Example
0
1
2
02
12
22
32
42
BAUD
BAUD
600
1200
2400
57600
115200
230400
BAUD
Selection of transmission rate of the data output
- selection of range: 600/1 200/2 400/9 600/ 19 200/38 400/57 600/115 200/230 400 Baud
DEF = 9 600 Baud
Selection of rate 115200 Baud > BAUD = 115200
Example
9600
19200
38400
57600
ADDR

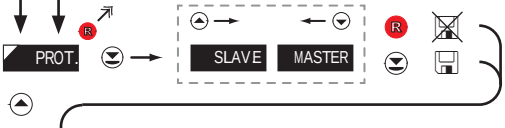


ADDR. **Setting instrument address**

DEF = 0

Address 10 > ADDR. = 10 — Example

0 | 00 | 10 | PROT.



PROT. **Selection of data protocol**

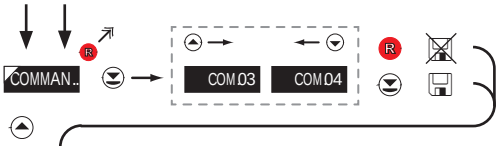
DEF = SLAVE

PROT.	Menu	Description
	MASTER	Instrument solicits data by selected command from given register
	SLAVE	Display shows data entered through commands 0x06 nebo 0x10

Data protocol = SLAVE > SLAVE — Example

ASCII | COMMAN.

* subsequent item on the menu depends on instrument setting



COMMAN.. **Setting - Command**

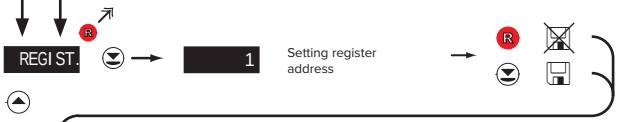
DEF = COM.04

COM.03 > reading setup (holding) registers at address 4xxxx

COM.04 > reading input (input) registers at address 3xxxx

- applies only for option "MASTER"

Register at address 4xxxx > COMM. =COM.04 Example

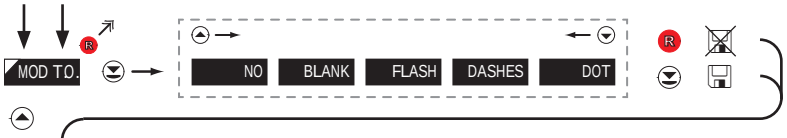


REGI ST. **Setting register address**

DEF = 1

- range of setting 0...65 535
- the address usually entered is 0...9999 (without highest digit)
- defines address of the register to be read

Register address 3 > REG. = 1 Example



MOD TO. Selecting display mode in case of communication failure

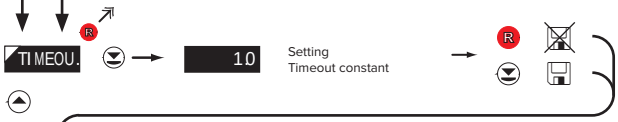
DEF = DASHES

MO.T.O.	Menu	Popis
	NO	Display goes off
	BLANK	Display goes off
	FLASH	Dash symbols displayed
	DASHES	Dash symbols displayed
	DOT	Decimal point is displayed

Selecting mode > **DASHES** — Example

!

Item will not appear in **MASTER** protocol



TIMEOU. Setting the time constant for Timeout

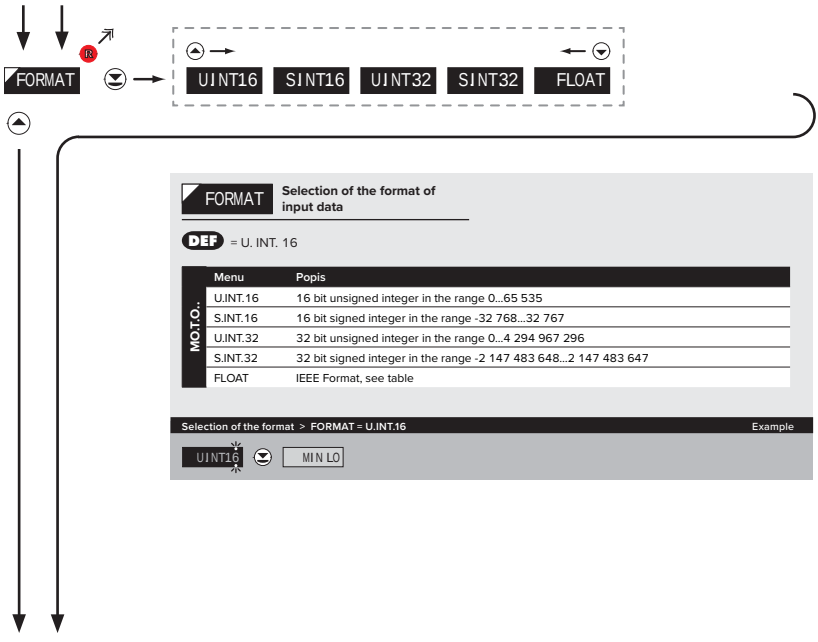
- DEF = 1.0 s

- setting the time delay after which the indication of interrupted communication will appear on the display in the mode of **Mod t.0**.
- range: 0...99,9 s

Setting - Constant > **tIMEOU. = 1** — Example

!

Item will not appear in **MASTER** protocol and when **MOD t.0.** is disabled



FORMAT	ORDER	COMMAND	DATA
U. INT. 16	n/a	0x06	<AA> 06 00 00 <Word Hi> <Word Lo> <CRC Lo> <CRC Hi>
S. INT. 16	n/a	0x06	<AA> 06 00 00 <Word Hi> <Word Lo> <CRC Lo> <CRC Hi>
U. INT. 32	LO - HI	0x10	<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>
S. INT. 32	LO - HI	0x10	<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>
FLOAT	LO - HI	0x10	<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>
U. INT. 32	HI - LO	0x10	<AA> 10 00 00 00 02 04 <Hi Word Hi> <Hi Word Lo> <Lo Word Hi> <Lo Word Lo> <CRC Lo> <CRC Hi>
S. INT. 32	HI - LO	0x10	<AA> 10 00 00 00 02 04 <Hi Word Hi> <Hi Word Lo> <Lo Word Hi> <Lo Word Lo> <CRC Lo> <CRC Hi>
FLOAT	HI - LO	0x10	<AA> 10 00 00 00 02 04 <Hi Word Hi> <Hi Word Lo> <Lo Word Hi> <Lo Word Lo> <CRC Lo> <CRC Hi>

LEGEND

SIGN	DESCRIPTION
#	Beginning of command
<AA>	Instrument address (1...247)
<Word xx>	16-bit data
<Lo Word xx>	32-bit data (lower part)
<Hi Word xx>	32-bit data (higher part)

MIN.LO **Setting mimum value of input data**

- setting minimum input value
- range of setting 0...65 535

DEF = 0 (U.INT.16)

DEF = 32 (S.INT.16)

Setting for minimum "Lo" > Min. LO. = 0 — Example

MAX.LO **Setting maximum value of input data**

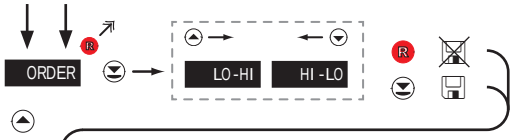
- setting maximum input value
- range of setting 0...65 535

DEF = 65 535 (U.INT.16)

DEF = 32 767 (S.INT.16)

Setting for maximum "Lo" > MAX. LO. = 62135 — Example

FORMAT > **U. INT. 32 / S. INT. 32**



ORDER **Selection of order of the 32 bit data parts**

LO - HI > lower 16 bit is transmitted first
HI - LO > higher 16 bit is transmitted second

DEF = LO - HI

First transmission of lower > ORDER = LO-HI — Example

MIN.HI **Setting mimum value of input data**

- setting the range of input values “Long integer” number in two values (words) “MIN Lo” and “MIN Hi”
- to set minimum divide the values by 65536, split the outcome to two parts and enter to “MIN Lo” and “MIN Hi”
- range of setting -99999...99999

MIN Lo

DEF = 0 (U.INT.32)

DEF = 0 (S.INT.32)

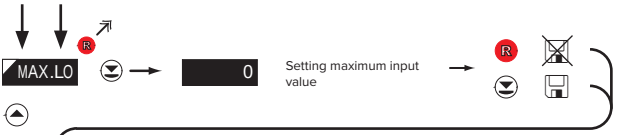
MIN. Hi

DEF = 0 (U.INT.32)

DEF = 32768 (S.INT.32)

- preset value in HEX format equals 0x800 0000

Setting for minimum “Lo” > Min. LO. = 0 — Example



MAX.LO **Setting maximum value of input data**

- setting the range of input values "Long integer" number in two values (words) "MAX Lo" and "MAX Hi"
- to set maximum divide the values by 65536, split the outcome to two parts and enter to "MAX Lo" and "MAX Hi"
- range of setting -99999...9999995

MIN Lo

DEF = 65535 (U.INT.32)

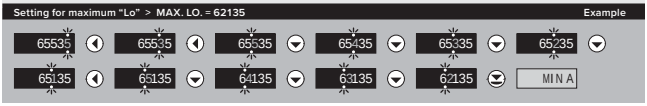
DEF = 65535 (S.INT.32)

MIN. Hi

DEF = 65535 (U.INT.32)

DEF = 32767 (S.INT.32)

- preset value in HEX format equals 0x7FFF FFFF



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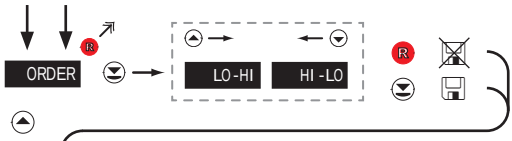
FORMAT > **FLOAT**



ORDER **Selection of order of the 32 bit data parts**

LO - HI > lower 16 bit is transmitted first
HI - LO > higher 16 bit is transmitted second

DEF = LO - HI

First transmission of lower > ORDER = LO-HI — Example

MIN **Setting mimum value of input data**

- range of setting -99999...99999

DEF = 0

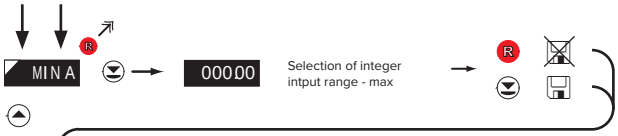
Setting for minimum > Min = 0 — Example

MAX **Setting maximum value of input data**

- range of setting -99999...99999

DEF = 100

Setting for maximum > MAX = 300 — Example



MIN A **Setting display projection for minimum value of input value**

DEF = 0.00

- 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

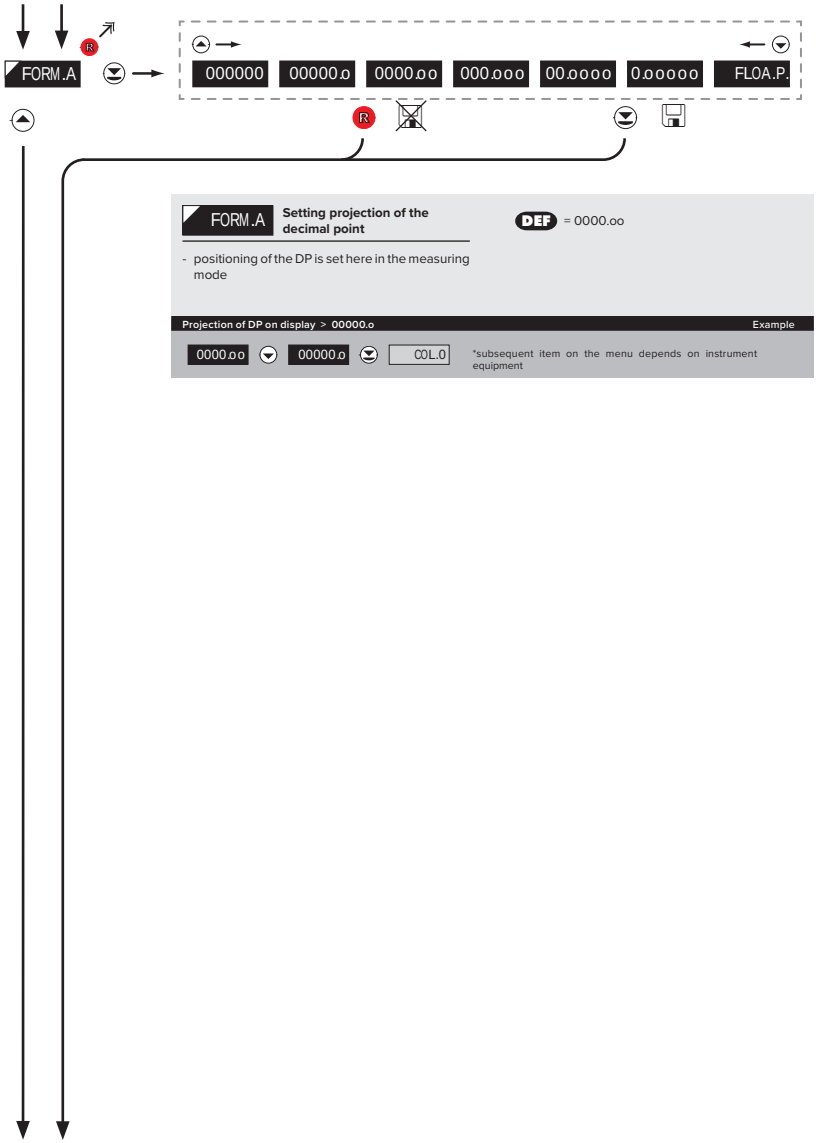
Projection for min > **MIN A = 0.00** Example

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

DEF = 100.00

- 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

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



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 → COL.0

*subsequent item on the menu depends on instrument equipment

DISPLAYED ONLY WITH OPTIONS > **COMPARATORS**

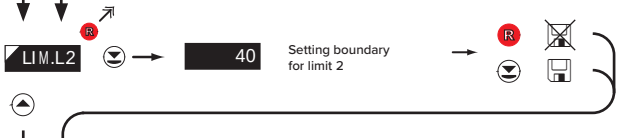
LIM.L1 **Setting boundary for limit 1**

- range of the setting: -99999...999999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 20

DEF „Hysteresis"=0, „Delay"=0

Setting limit 1 > LIM. L.1 = 32 — Example



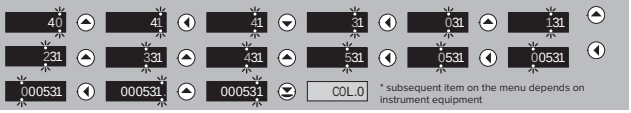
LIM.L2 **Setting boundary for limit 2**

- range of the setting: -99999...999999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 40

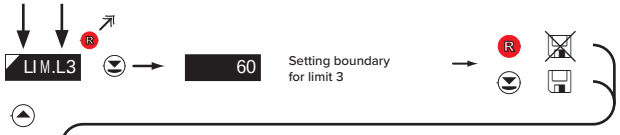
DEF „Hysteresis"=0, „Delay"=0

Setting limit 2 > LIM. L.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.



LIM.L3 Setting boundary for limit 3

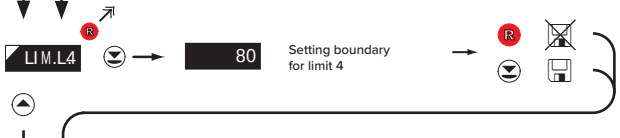
- range of the setting: -99999...999999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 60

DEF „Hysteresis"=0, „Delay"=0

Setting limit 3 > LIM. L.3 = 85 — Example

* subsequent item on the menu depends on instrument equipment



LIM.L4 Setting boundary for limit 4

- range of the setting: -99999...999999
- contingent modification of hysteresis or delay may be performed in "PROFI" menu

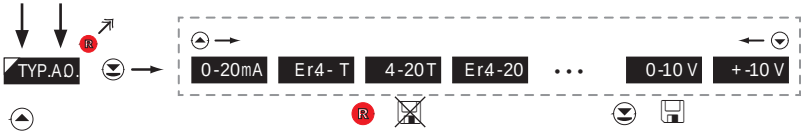
DEF = 80

DEF „Hysteresis"=0, „Delay"=0

Setting limit 4 > LIM. L.4 = 103 — Example

* subsequent item on the menu depends on instrument equipment

DISPLAYED ONLY WITH OPTIONS > **ANALOG OUTPUT**

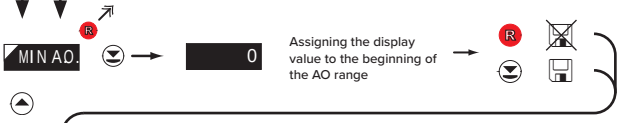


Typ.AO **Setting the type of analog output**

Menu	Range	Description
0-20mA	0...20 mA	
Er.4- T	4...20 mA	signaling interrupted current loop and displaying an error message (< 3,0 mA)
4-20T	4...20 mA	signaling broken current loop (< 3,0 mA)
Er.4-20mA	4...20 mA	with indication of error statement (< 3,0 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	
+-10 V	±10 V	

DEF = 4...20 mA

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



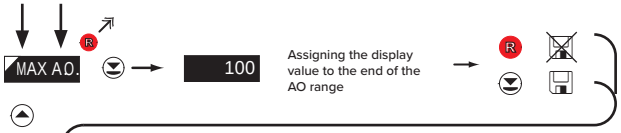
MIN AO. **Assigning the display value to the beginning of the AO range**

DEF = 0

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

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

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



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

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

DEF = 100

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

APLICABLE ONLY TO 3-COLOUR DISPLAY

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

DEF = Green

Selection of display color - primary > red > COL. 0 = red — Example

dIS.L1 **Setting first value for color display change**

DEF = 33.33

- range of setting: -99999...999999

Display value for 1st color change > DIS. L.1 = 100 — Example

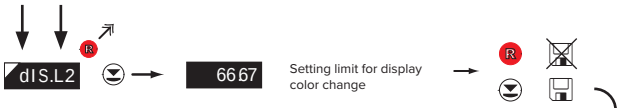
COL.1 **Selection of display color > after exceeding dIS. L.1**

DEF = Orange

- selection of display color is governed by setting under item dIS. L.1
- the color changes if the displayed value is higher than the value set in dIS. L.1

Selection of display color if the data is > COL. 1 = green — Example

APLICABLE ONLY TO 3-COLOUR DISPLAY



dIS.L2 **Setting second value for color display change**

- range of setting: -99999...999999

DEF = 66.67

Display value for 1st color change > DIS. L.2 = 400 — Example

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

- 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**

DEF = red

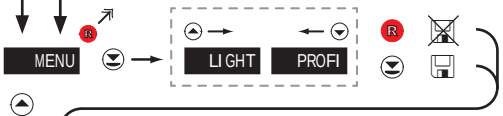
Selection of display color if the data is > **COL. 2** = orange — Example

ADR. I R. **Setting the address of the Remote Controler**

- setting the address of the IR Remote Controler is needed only when more than one OMD 202 are within the controler's reach
- range of settung: 0...99
- possible cancelation of address is done by pressing the RC's blue button

DEF = 0

Setting the address - 21 > Adr. Ir. = 21 Example



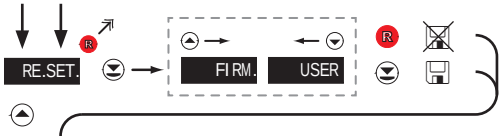
MENU **Setting the menu type LIGHT/PROFI**

- **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

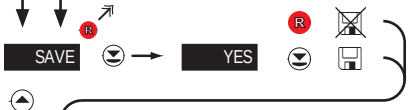
Menu LIGHT > MENU = LIGHT Example



- in the event of error setting the manufacture setting may be restored
- 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 > FIRM. Example

RE.SET. ▲ FI RM. ▼ SAVE

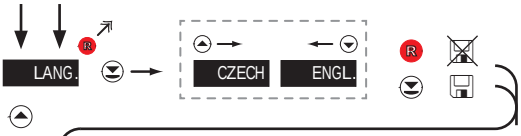


SAVE **Saving the user setting**

- by saving the user user setting it is possible to recall it later without the need of going through the customisation process again

Saving the user setting > SAVE Example

SAVE ▲ YES ▼ PAS.LI

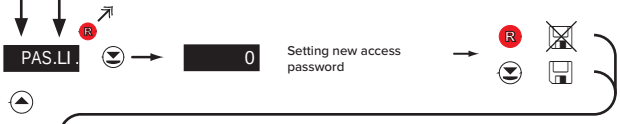


LANG. **Selection of language in instrument menu**

- selection of language version of the instrument menu

DEF = ENGL.

Language selection - ENGLISH > LANG. = ENGL. Example

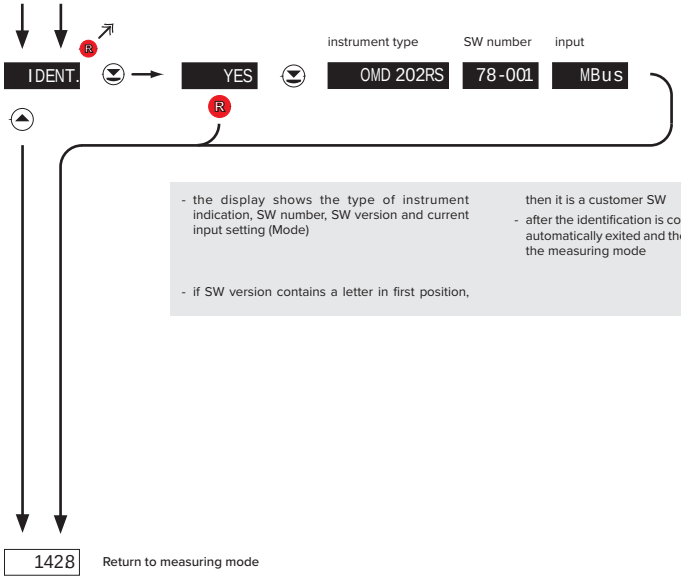


PAS.LI. **Setting new access password**

- access password for menu LIGHT
- range of the number code 0...9999
- upon setting the password to "000" the access to menu LIGHT is free without prompt to enter it
- if you forget your password, please contact your instrument's administrator

DEF = 0

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



- 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
- preset from manufacture is menu **LIGHT**

Switching over to "PROFI" menu

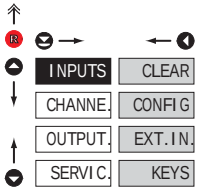
>3 s G

- access to **PROFI** menu
- authorization for access to **PROFI** menu does not depend on setting under item SERVIC. > MENU
- password protected access (unless set as follows under the item SERVIC. > N. PASS. > **PROFI** =0)

G

- access to menu selected under item SERVIC. > MENU > LIGHT/PROFI
- password protected access (unless set as follows under the item SERVIC. > N. PASS. > **LIGHT** =0)
- for access to **LIGHT** menu passwords for **LIGHT** and **PROFI** menu may be used

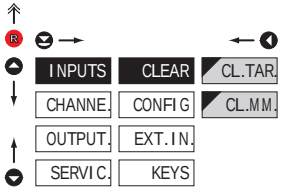
6.1 SETTING “PROFI” - INPUT



The primary instrument parameters are set in this menu

CLEAR	Resetting internal values
CONFIG.	Selection of measuring range and parameters
EXT.IN.	Setting external inputs functions
KEYS	Assigning further functions to keys on the instrumenti

6.1.1 RESETTING INTERNAL VALUES

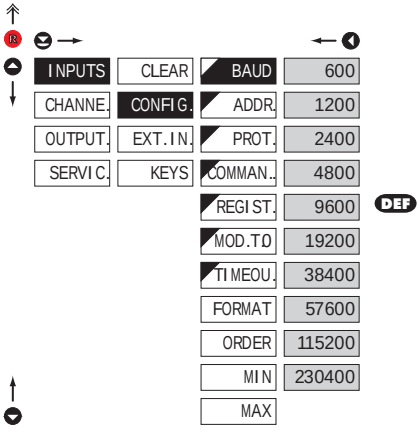


CLEAR **Resetting internal values**

CL.TAR.	Tare resetting
CL.MM.	Resetting min/max value

- resetting memory for the storage of minimum and maximum value achieved during measurement

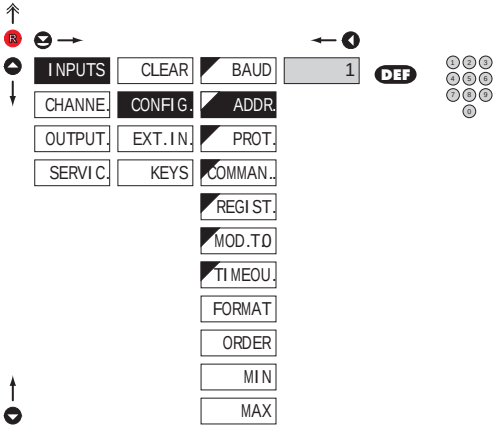
6.1.2a SELECTION OF DATA BAUD RATE



BAUD — **Selection of data 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

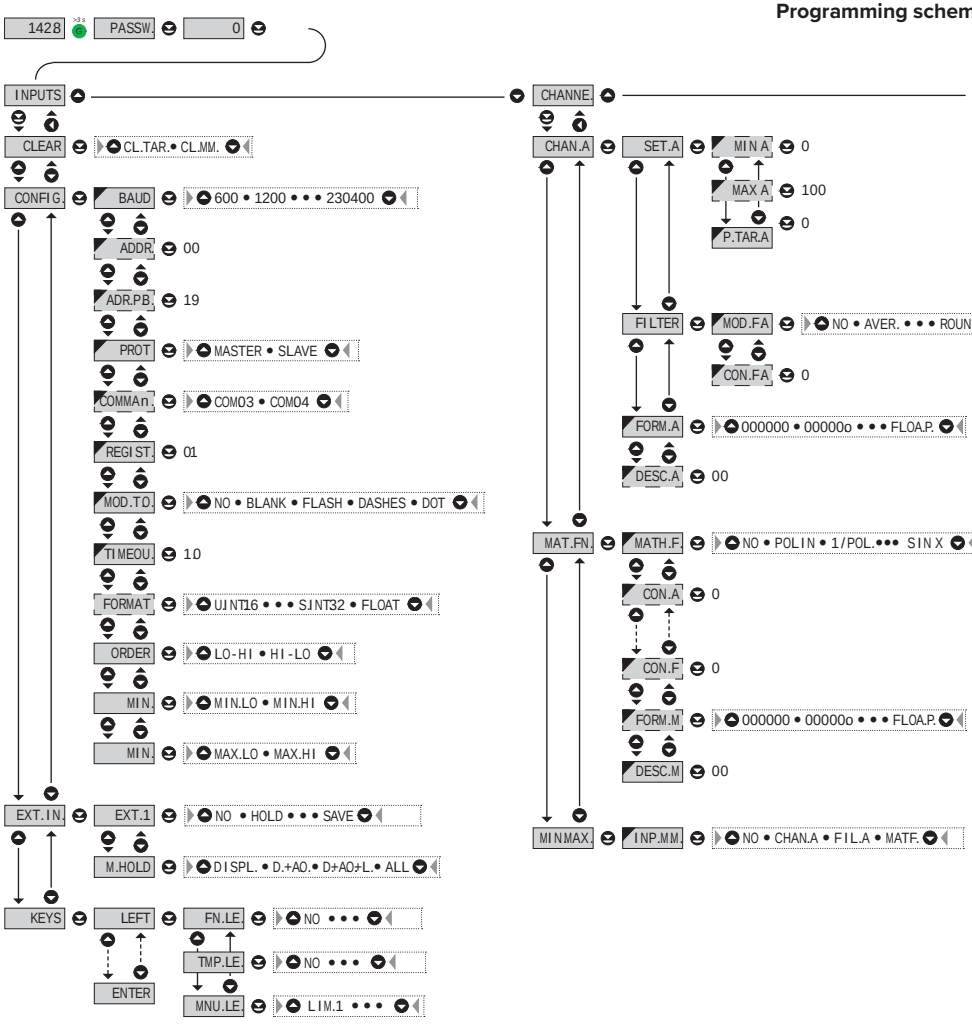
6.1.2b SETTING INSTRUMENT ADDRESS



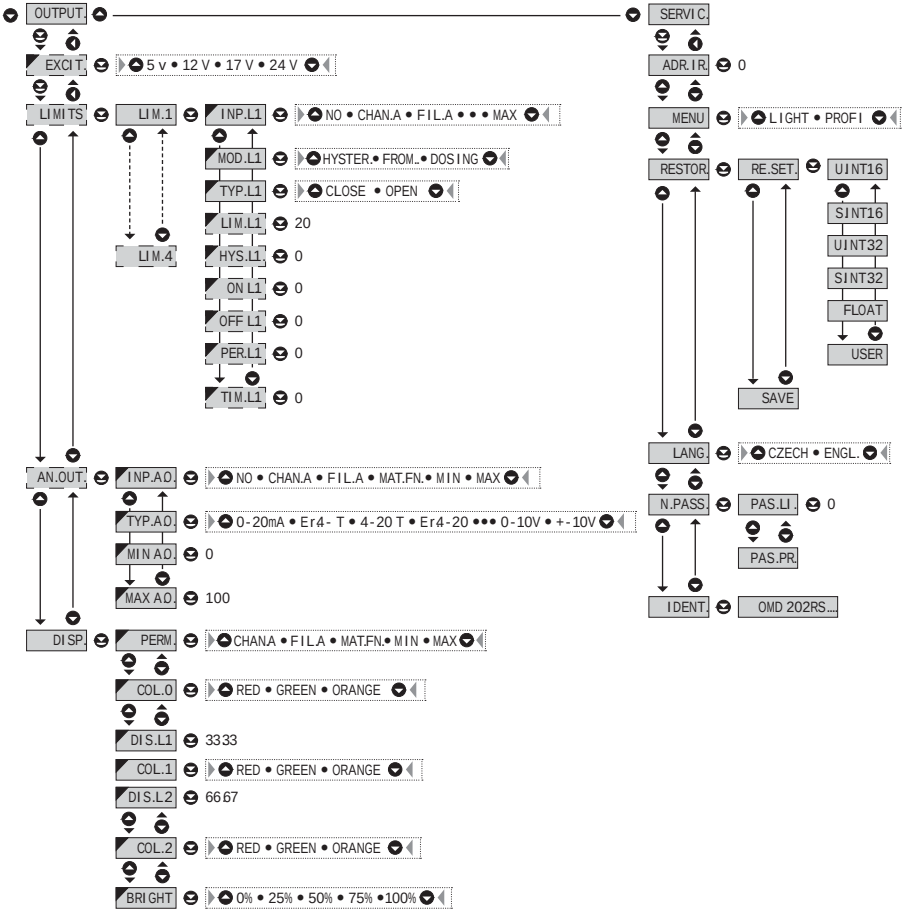
ADDR. — **Setting instrument address**

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

Programming schem



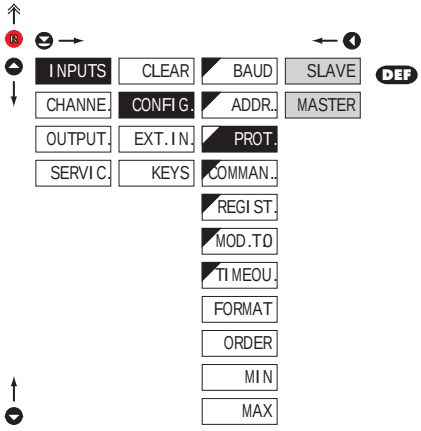
cheme PROFI MENU



!

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

6.1.2c SELECTION OF DATA PROTOCOL



PROT. **Selection of data protocol**

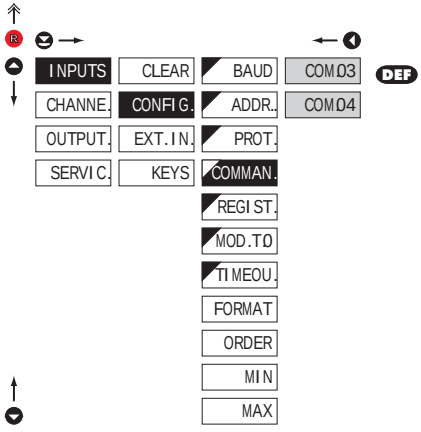
MASTER Instrument solicits data from subordinate system

- 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 " - - - -

SLAVE Passive Display - Slave

- passive display - slave is used where there is communication of other isntruments or a computer in the "**MASTER**" mode. If "**COMMAND**" is correctly received, the instrumetns will display the data.

6.1.2d SELECTION OF REGISTERS



COMMAN. **Selection of registers**

- the item is accessible only after setting MASTER" > „CONFIG/PROT."

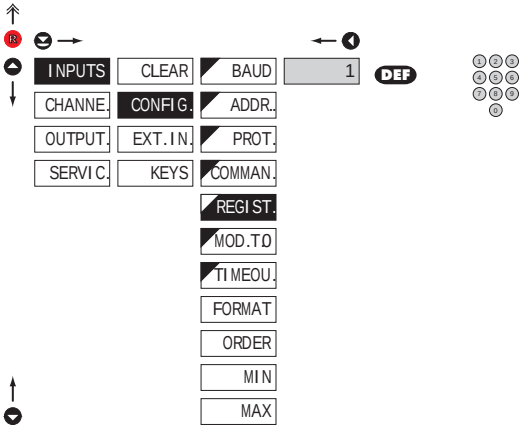
COM03 Reading setup (holding) registers at address 4xxxx

COM04 Reading input (input) registers at address 3xxxx

!

Item will appear only in "**MASTER**" protocol

6.1.2e SETTING REGISTER ADDRESS



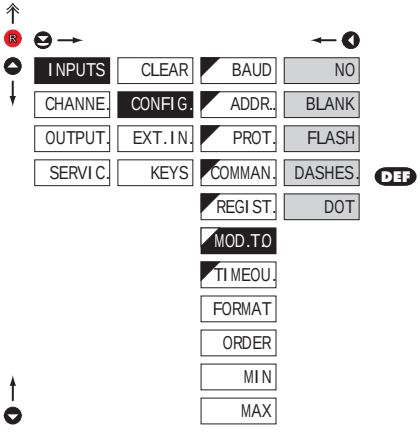
REGIST. **Setting register address**

- the item s accessible only after setting „MASTER“ > „CONFIG/PROT.“
- defines the address of the register to be read
- allows to enter the range 0...65535, the address usually set is in range 0...9999 (without highest digits)
- DEF = 1

!

Item will appear only in “**MASTER**” protocol

6.1.2f SELECTING DISPLAY MODE IN CASE OF COMMUNICATION FAILURE



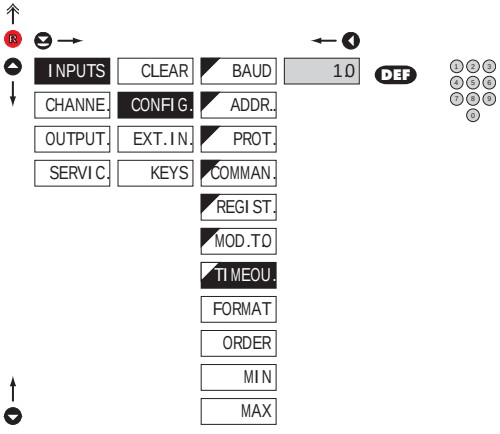
MOD.TO **Selecting display mode in case of communication failure**

NO	No reaction
BLANK	Displey goes off
FLASH	Last displayed value starts flashing
DASHES	Dash symbols displayed
DOT	Decimal point is displayed

!

Item will not appear in “**MASTER**” protocol

6.1.2g SETTING THE TIME CONSTANT FOR TIMEOUT



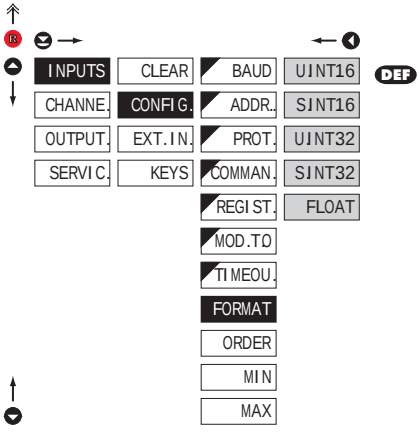
TIMEOU. Setting the time constant for Timeout

- setting the time delay after which the indication of interrupted communication will appear on the display in the mode of **„MOD. t.0“**
- range: 0...99,9 s
- DEF = 1,0 s

!

Item will appear only in **“SLAVE”** and when **„MOD. T.0“** is enable

6.1.2h SELECTION OF THE FORMAT OF INPUT DATA



FORMAT Selection of the format of input data

UINT16 16-bit unsign integer
- range: 0...65 535

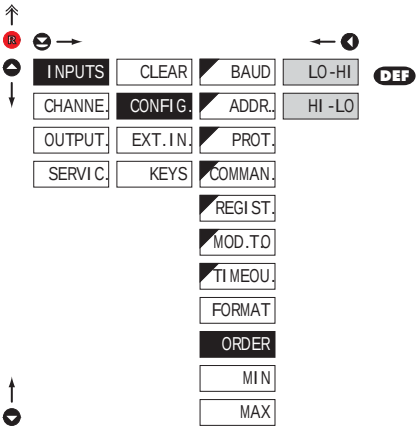
SINT16 16-bit sign integer
- range: -32 768...32 767

UINT32 32-bit unsign integer
- range: 0...4 294 967 296

SINT32 32-bit sign integer
- range: -2 147 483 648...2 147 483 644

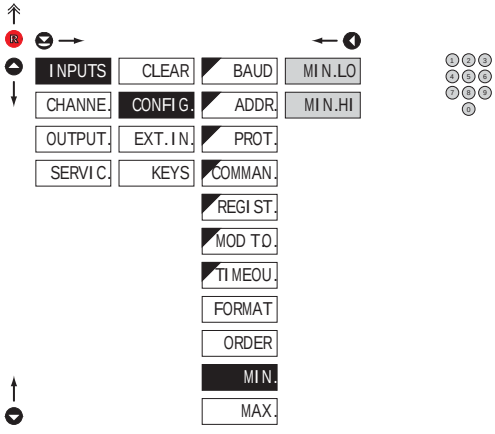
FLOAT IEEE format
- range: ±6,80564693277058E+38
- for description see table on page 72

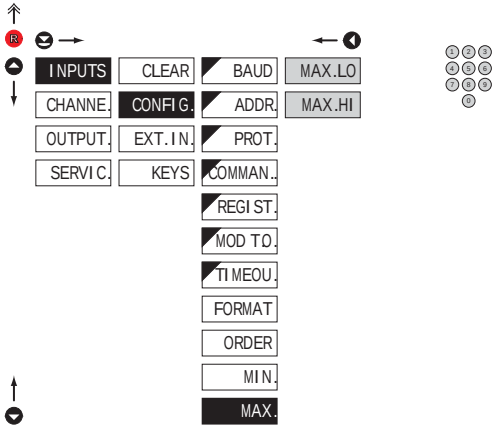
6.1.2i SELETION OF ORDER OF THE 32 BIT DATA PARTS



ORDER	**Seletion of order of the 32 bit data parts**
LO-HI	Lower 16 bit is transmitted first
HI -LO	Higher 16 bit is transmitted second

6.1.2j SETTING INPUT VALUE





CONFIG. **Setting input value**

„FORMAT“ > U.INT.16/S.INT.16

- range of the setting: 0...65 535

MIN Lo — Setting mimum value of input data

MIN Lo DEF = 0 (U.INT.16)

MIN Lo DEF = 32 768 (S.INT.16)

MAX Lo — Setting maximum value of input data

MAX Lo DEF = 65 535 (U.INT.16)

MAX Lo DEF = 32 767 (S.INT.16)

„FORMAT“ > U.INT.32/S.INT.32

- range of the setting: -99 999...999 999
- setting the range of input values “Long integer” number in two values (words) “**MIN Lo**”, “**MIN Hi**” and “**MAX Lo**”, “**MAX Hi**”
- to set minimum/maximum divide the values by 65536, split the outcome to two parts and enter to “**MIN Lo**” and “**MIN Hi**” /“**MAX Lo**” and “**MAX Hi**”

MIN - - — Setting mimum value of input data

MIN Lo DEF = 0 (U.INT.32)

MIN Hi DEF = 0 (U.INT.32)

MIN Lo DEF = 0 (S.INT.32)

MIN Hi DEF = 32 768 (S.INT.32)

MAX - - — Setting maximum value of input data

MAX Lo DEF = 65 535 (U.INT.32)

MAX Hi DEF = 65 535 (U.INT.32)

MAX Lo DEF = 65 535 (S.INT.32)

MAX Hi DEF = 32 767 (S.INT.32)

„FORMAT“ > FLOAT

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

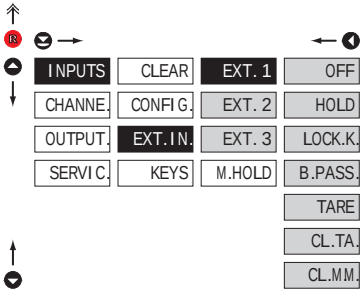
MIN — Setting mimum value of input data

DEF = 0

MAX — Setting maximum value of input data

DEF = 100

6.1.3a EXTERNAL INPUT FUNCTION SELECTION



EXT.IN. — **External input function selection**

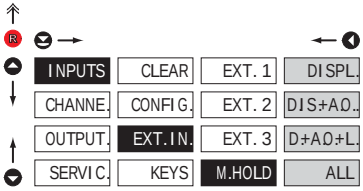
OFF	Input is off
HOLD	Activation of HOLD
LOCK.K.	Locking keys on the instrument
B.PASS.	Activation of locking access into programming menu LIGHT/PROFI
TARE	Tare activation
CL.TAR.	Tare resetting
CL.MM.	Resetting min/max value

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

*****

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

6.1.3b SELECTION OF FUNCTION "HOLD"



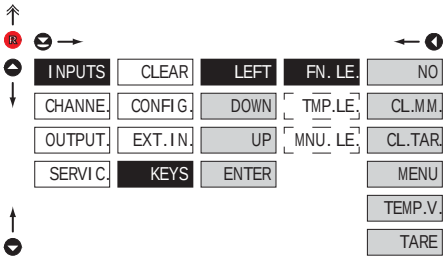
M.MOLD — **Selection of function "HOLD"**

DISPL.	"HOLD" locks only the value displayed
DIS+AO.	"HOLD" locks the value displayed and on AO
D+AO+L.	"HOLD" locks the value displayed, on AO and limit evaluation
ALL	"HOLD" locks the entire instrument

*****

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

6.1.4a OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS



!

Preset values of the control keys DEF:

LEFT	Show Tare
UP	Show max. value
DOWN	Show min. value
ENTER	w/o function

FN. LE. **Assigning further functions to instrument keys**

- „**FN. LE.**" > executive functions

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.V. Temporary projection of selected values

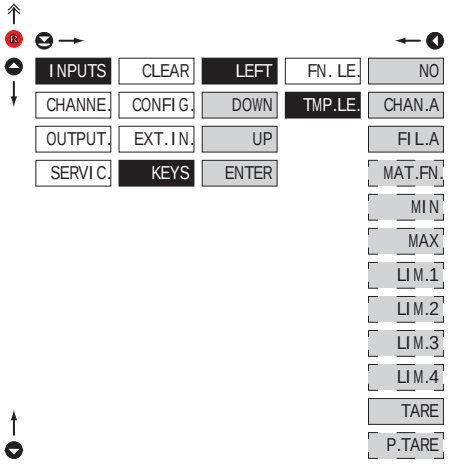
- after confirmation of this selection the item "**TMP. LE.**", is displayed on superior menu level, whererequired selection is performed

TARE Tare function activation

!

Setting is identical for LEFT, DOWN, UP and ENTER

6.1.4b OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS - TEMPORARY PROJECTION



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

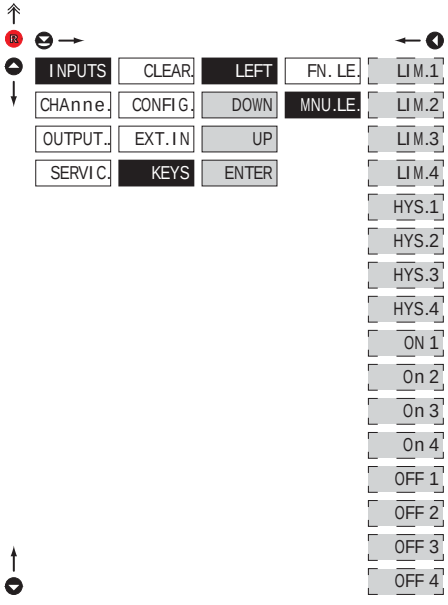
- „TMP. LE.“ > temporary projection of selected values
- “Temporary” projection of selected value is displayed for the time of keystroke
- “Temporary” projection may be switched to permanent by pressing + “Selected key”, this holds until the stroke of any key

NO	Temporary projection is off
CHAN.A	Temporary projection of “Channel A” value
FI L.A	Temporary projection of “Channel A” value after processing digital filters
MAT.FN.	Temporary projection of “Mathematic functions” value
MI N	Temporary projection of “Min. value”
MAX	Temporary projection of “Max. value”
LI M.1	Temporary projection of “Limit 1” value
LI M.2	Temporary projection of “Limit 2” value
LI M.3	Temporary projection of “Limit 3” value
LI M.4	Temporary projection of “Limit 4” value
TARE	Temporary projection of “TARE” value
P.TARE	Temporary projection of “P. TARE” value

!

Setting is identical for LEFT, DOWN, UP and ENTER

6.1.4c OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS - DIRECT ACCESS TO ITEM



MNU.LE. Assigning access to selected menu item

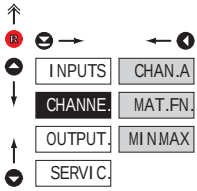
- „MNU. LE.“ > direct access into menu on selected item

LIM.1	Direct access to item “LIM 1”
LIM.2	Direct access to item “LIM 2”
LIM.3	Direct access to item “LIM 3”
LIM.4	Direct access to item “LIM 4”
HYS.1	Direct access to item “HYS. L.1”
HYS.2	Direct access to item “HYS. L.2”
HYS.3	Direct access to item “HYS. L.3”
HYS.4	Direct access to item “HYS. L.4”
ON 1	Direct access to item “ON L.1”
ON 2	Direct access to item “ON L.2”
ON 3	Direct access to item “ON L.3”
ON 4	Direct access to item “ON L.4”
OFF 1	Direct access to item “OFF L.1”
OFF 2	Direct access to item “OFF L.2”
OFF 3	Direct access to item “OFF L.3”
OFF 4	Direct access to item “OFF L.4”

!

Setting is identical for LEFT, DOWN, UP and ENTER

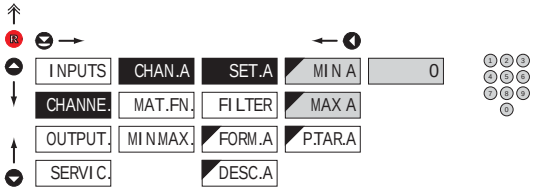
6.2 SETTING "PROFI" - CHANNEL



The primary instrument parameters are set in this menu

CHAN.A	Setting parameters of measuring "Channel"
MAT.FN.	Setting parameters of mathematic functions
MI NMAX	Selection of access and evaluation of Min/max value

6.2.1a DISPLAY PROJECTION



SET.A **Setting display projection**

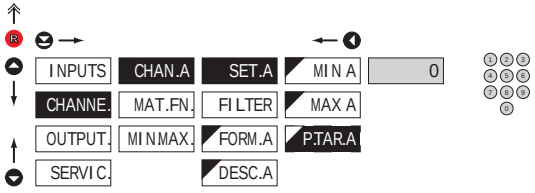
MI N A Setting display projection for minimum value of input signal

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

MAX A Setting display projection for maximum value of input signal

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

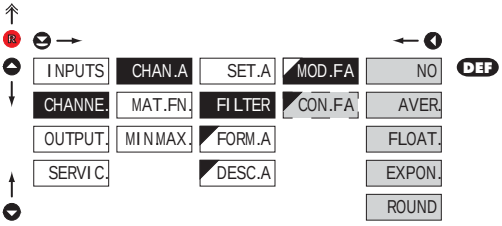
6.2.1b SETTING FIXED TARE

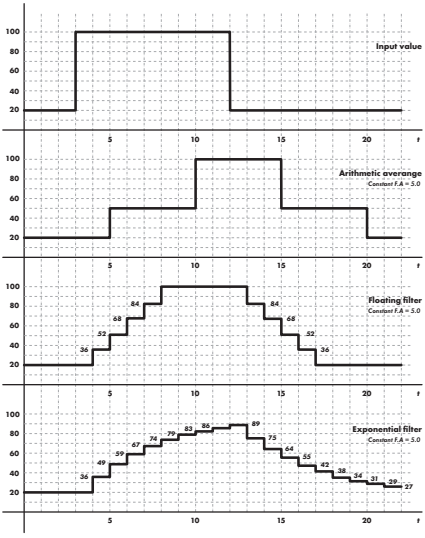


P.TAR.A **Setting "Fixed tare" value**

- 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: -99999...999999
- DEF = 0

6.2.1c DIGITAL FILTERS





MOD FA **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

AVER. 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

EXPON. Selection of exponential filter

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

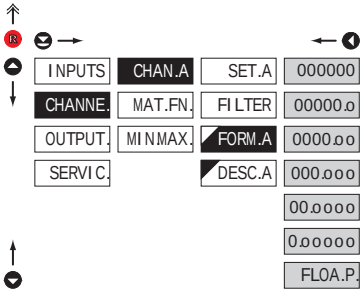
ROUND Measured value rounding

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

CON.FA 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

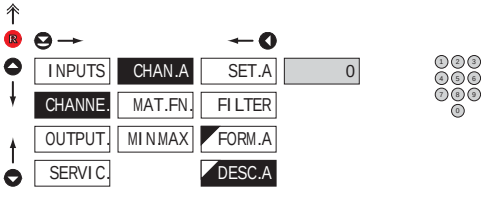


FORM.A **Selection of decimal point**

- 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 „**FLOA. P.**“

000000	Setting DP - XXXXXX
- DEF	
00000.0	Setting DP - XXXXX.x
0000.00	Setting DP - XXXX.xx
000.000	Setting DP - XXX.xxx
00.0000	Setting DP - XX.xxxx
0.0000	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”**

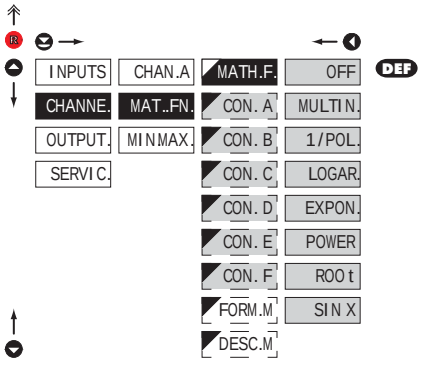
- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by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

- DEF = no description

!

Table of signs on page 75

6.2.2a MATHEMATIC FUNCTIONS



MATH.F. **Selection of mathematic functions**

OFF Mathematic functions are off

MULTI N. Polynome

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

1/POL. 1/x

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

LOGAR. Logarithm

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

EXPON. Exponenciál

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

POWER Power

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

ROO t Root

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

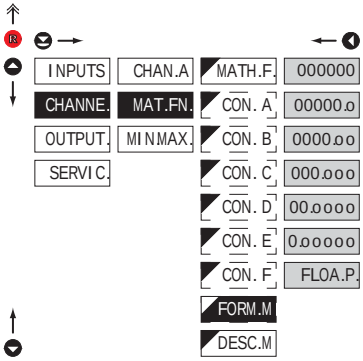
SI N X Sin x

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

CON. - 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



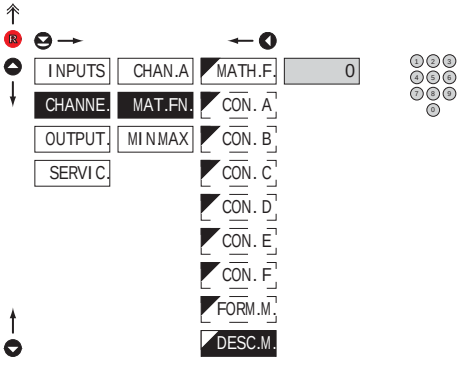
FORM.M **Selection of decimal point**

- 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



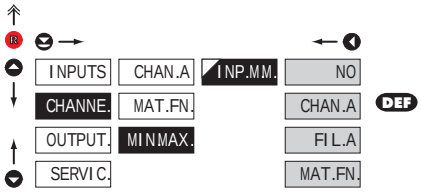
DESC.M **Setting projection of description for “MATH. F.”**

- 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 75

6.2.3 SELECTION OF EVALUATION OF MIN/MAX VALUE

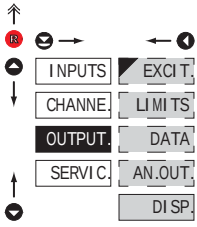


INP.MM. Selection of evaluation of min/max value

- 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”
FI L.A	From “Channel A” after digital filters processing
MAT.FN.	From “Mathematic functions”

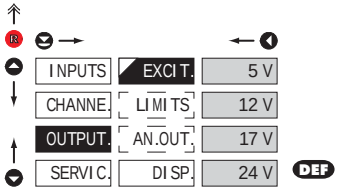
6.3 SETTING „PROFI“ - OUTPUTS



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

EXCIT.	Volba výstupního napětí pomocného zdroje
LIMITS	Setting type and parameters of limits
AN.OUT.	Setting type and parameters of analog output
DISP.	Setting display projection and brightness

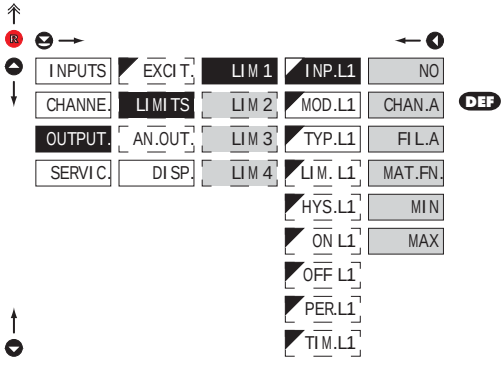
6.3.1 SELECTION OF SENSOR EXCITATION VOLTAGE



EXCIT. **Selection of sensor excitation voltage (aux. power supply)**

5 V	5 VDC, max. 2,5 W
12 V	12 VDC, max. 2,5 W
17 V	17 VDC, max. 2,5 W
24 V	24 VDC, max. 2,5 W

6.3.2a SELECTION OF INPUT FOR LIMITS EVALUATION



INP.L1 **Selection evaluation of limits**

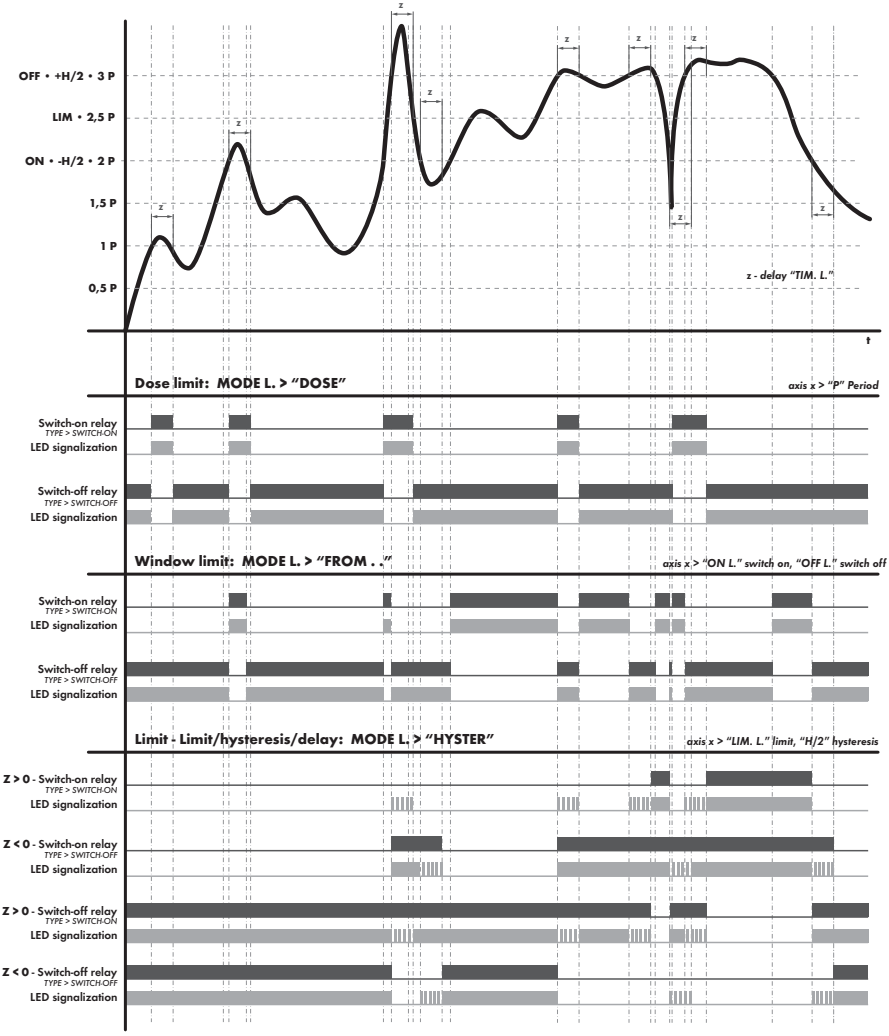
- selection of value from which the limit will be evaluated

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”

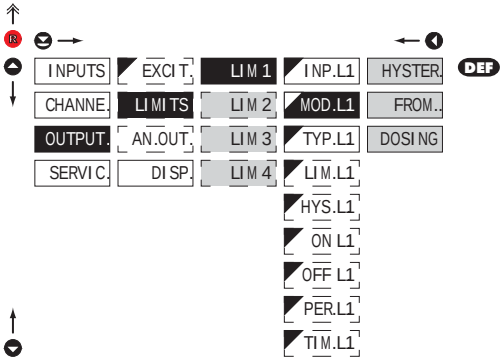
!

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

DESCRIPTION OF RELAY FUNCTION



6.3.2b SELECTION THE TYPE OF LIMIT



MOD.L1 — **Selection the type of limit**

HYSTER. — Limit is in mode "Limit, hysteresis, delay"

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

FROM.. — Frame limit

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

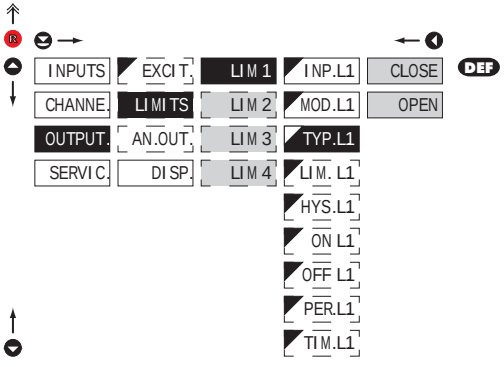
DOSING — Dose limit (periodic)

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

!

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

6.3.2c SELECTION OF TYPE OF OUTPUT



TYP.L1 — **Selection of type of output**

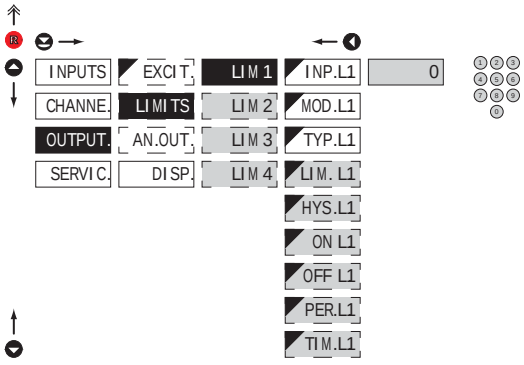
CLOSE — Output switches on when condition is met

OPEN — Output switches off when condition is met

!

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

6.3.2d SETTING VALUES FOR LIMITS EVALUATION



LIM. L1 Setting limit for switch-on

- for type "**HYSTER.**"

HYS.L1 Setting hysteresis

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

ON L1 Setting the outset of the interval of limit switch-on

- for type "**FROM..**"

OFF L1 Setting the end of the interval of limit switch-on

- for type "**FROM..**"

PER. L1. Setting the period of limit switch-on

- for type "**DOSING**"

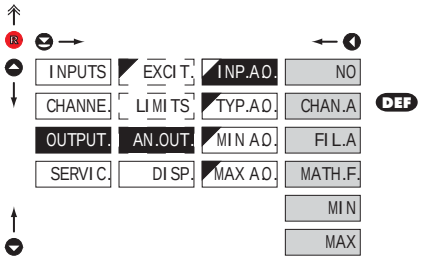
TIM.L1 Setting the time switch-on of the limit

- for type "**HYSTER.**" and "**DOSING**"
- setting within the range: ±99,9 s
- positive time > relay switches on after crossing the limit (**LIM. L.1**) and the set time (**TIM. L.1**)
- negative time > relay switches off after crossing the limit (**LIM. L.1**) and the set negative time (**TIM. L.1**)

!

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

6.3.3a SELECTION OF INPUT FOR ANALOG OUTPUT

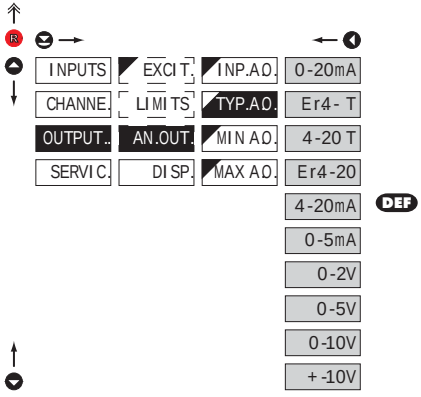


INP.AO. Selection evaluation analog output

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

NO	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”

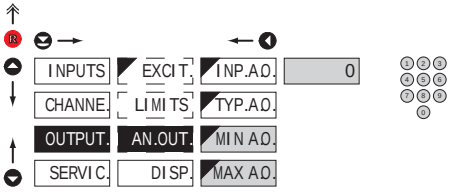
6.3.3b SELECTION OF THE TYPE OF ANALOG OUTPUT



TYP.AO. Selection of the type of analog output

0-20mA	Type: 0...20 mA
Er4-T	Type: 4...20 mA, with broken loop detection and indication of error statement (< 3,0 mA)
4-20T	Type: 4...20 mA, with broken loop detection (< 3,0 mA)
Er4-20	Type: 4...20 mA, with indic. of error statement (< 3,0 mA)
4-20mA	Type: 4...20 mA
0-5mA	Type: 0...5 mA
0-2V	Type: 0...2 V
0-5V	Type: 0...5 V
0-10V	Type: 0...10 V
+-10V	Type: ±10 V

6.3.3c 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

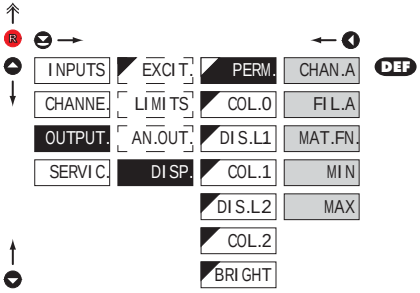
MIN AO. Assigning the display value to the beginning of the AO range

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

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

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

6.3.4a 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"

- „raw" data will be projected on the display in the format they have been received by the instrument

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

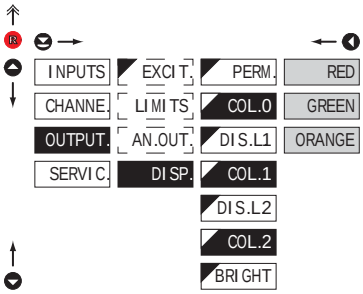
- data which have been succesfully converted to numbers will be projected

MAT.FN. Projection of values from "Math. functions"

MIN Projection of values from "Min. value"

MAX Projection of values from "Max. value"

6.3.4b 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

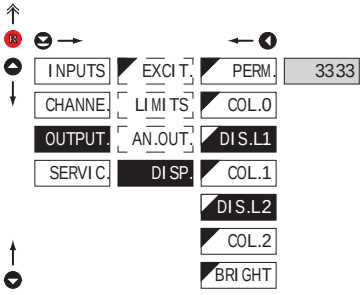
ORANGE — Orange color

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

!

Not aplicable to the version with monocolur high brightness LED display

6.3.4c SELECTION OF DISPLAY COLOR CHANGE



DI S.L.- **Selection of display color change**

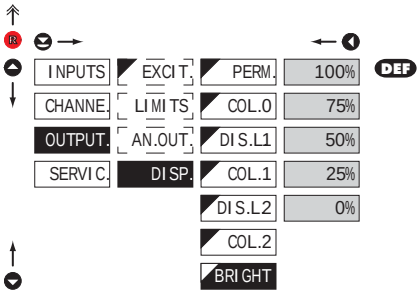
- under items "**DIS. L.1**" and "**DIS. L.2**" the limit is set for the time when the display color shall change

- "DIS. L.1" DEF = 33.33
- "DIS. L.2" DEF = 66.67

!

Not aplicable to the version with monocolur high brightness LED display

6.3.4d SELECTION OF DISPLAY BRIGHTNESS



BRIGHT **Selection of display brightness**

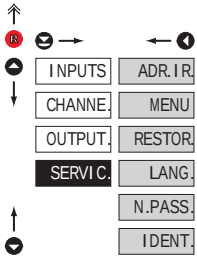
- by selecting display brightness we may appropriately react to light conditions in place of instrument location

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 %

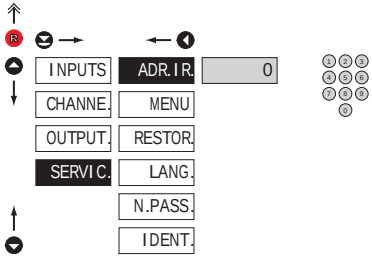
6.4 SETTING “PROFI” - SERVICE



The instrument service functions are set in this menu

ADR. I R.	Setting the address of IR control
MENU	Selection of menu type LIGHT/PROFI
RESTOR.	Restore instrument manufacture setting and calibration
LANG.	Language version of instrument menu
N.PASS.	Setting new access password
I DENT.	Instrument identification

6.4.1 SETTING THE ADDRESS OF IR REMOTE CONTROL



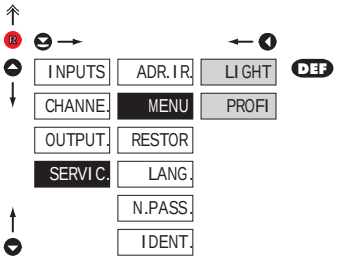
ADR. I R. Setting the address of IR remote control

- setting the remote control address is inevitable only in case there are other large displays OMD 202 within the reach of IR remote control
- range of the setting: 0...99
- DEF = 0

Controlling addressed instrument

- if the OMD has an address different than „0“
- press the green button and key in the address of the controlled device
- after establishing communication a yellow signalling LED lights up on the display
- then you can control the dispaly in the standard way in LIGHT/PROFI/USER menu
- if needed, the address can cancelled by pressing the blue button of the remote

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

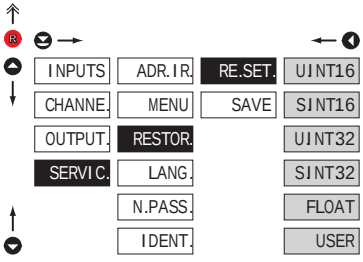
PROFI Active PROFI menu

- 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



RE.SET. **Restoration of manufacture setting**

- - - Return to manufacture setting of the instrument

- in the event of error setting it is possible to return to manufacture setting
- restoration is performed for currently selected type of data format
- provided you stored your user setting in the "PROFI" menu it is possible to restore it (option "USER")
- reading the primary setting of items in menu (DEF)

USER Restoration of instrument user setting

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

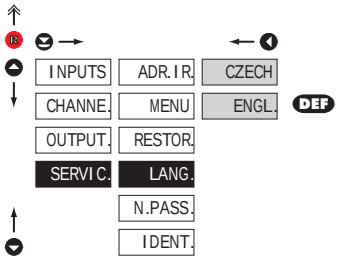
SAVE Save instrument user setting

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

!

After restoration the instrument switches off for couple seconds

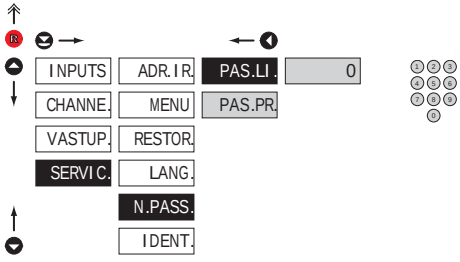
6.4.4 SELECTION OF INSTRUMENT MENU LANGUAGE VERSION



LANG. — **Selection of instrument menu language version**

- **CZECH** — Instrument menu is in Czech
- **ENGL.** — Instrument menu is in English

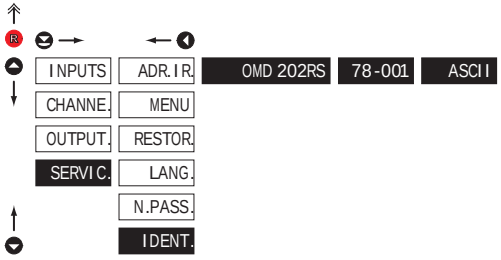
6.4.5 SETTING NEW ACCESS PASSWORD



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

- this option allows to change the numeric code, which blocks the access into LIGHT and PROFI Menu.
- numerci code range: 0...9999
- universal passwords in the event of loss:
  LIGHT Menu > „**8177**“
  PROFI Menu > „**7915**“

6.4.6 INSTRUMENT IDENTIFICATION



- 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

IDENT.

Blok	Description
1.	Instrument
2.	no. of SW version
3.	type/input mode

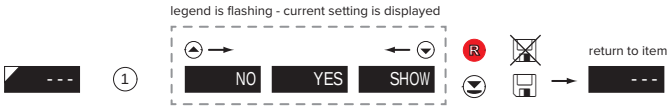
SETTING **USER**

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 L 1
- setting may be performed in **LIGHT** or **PROFI** menu, with the **USER** menu then overtaking the given menu structure

Setting



NO item will not be displayed in USER menu

YES item will be displayed in USER menu with the option of setting

SHOW item will be solely displayed in USER menu

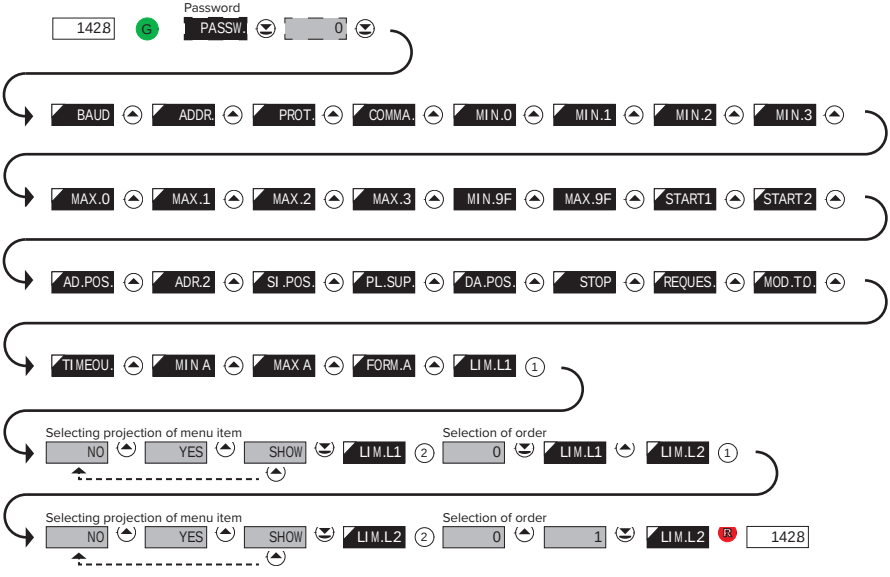
Setting items into „USER“ menu

When setting up the USER menu out of active LIGHT menu it is possible to rank the menu items (max. 10) in the order we want them to appear in the menu.

Setting up the ranking order

Example of setting up menu items into “USER” menu

As an example we are going to use a direct access into manu items Limit1 and Limit2 (the given example is for Light menu but can be applied also in Profi menu).



The resulting setting is as follows: After pressing button R „**LIM L.1**“is projected. By pressing ⏬ you confirm this and you set the desired limit value, alternatively by pressing button ⏫ you can go over to setting of „**LIM. L.2**“ where you repeat the procedure. You can finish the setting up by pressing the ⏬ button, by which you save the latest setting and by pressing the R you return to the operating mode.

8. DATA PROTOCOL

Command 6h > Input value

<AA> 06 00 00 <Word Hi> <Word Lo> <CRC Lo> <CRC Hi>

where:
Word is the value in the format signed integer -32 768 (8000h) - 0 - 32 767 (7FFFh)
When displayed this value is recalculated with the aid of values entered in menu **VSTUPY/KONFIG/MIN/MIN. Lo** and **MAX. Lo.** Values "**MIN. Hi**" and "**MAX. Hi**" are of no significance in this case.

Response:
<AA> 06 00 00 <Word Hi><Word Lo><CRC Lo><CRC Hi>.

Command 10h > Input value

<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>

where:
<Hi Word><Lo Word> together they create the value LONG INT.

Input values are calculated through the following values:

$$\textbf{CHAN. A} = \text{MIN. A} + \frac{(\text{MAX. A - MIN. A})}{(\text{MAX. - MIN.})} \times (\text{input data - MIN.})$$

Chan. A	value to be displayed and futher processed in the instrument
MIN. A, MAX. A	values entered in menu CHANAL./CHAN. A/SETTIN.
MIN., MAX.	values entered in menu INPUTS/CONFIG
	MIN. = MIN. Hi x 65536 + MIN. Lo
	MAX. = MAX. Hi x 65536 + MAX. Lo

Response:
Command copied without data part <AA> 10 00 00 00 02 <CRC Lo><CRC Hi>

Command 20h > NON-STANDARD COMMAND for MODBUS

making instrument control accessible through standard commands of the OM ASCII protocol

<AA> 20 <počet znaků standardní zprávy> standardní zpráva **<CRC Lo> <CRC Hi>**

Response:
provided no error occurs in MODBUS frame:
<AA> 20 <number of characters in standard message> standard message <CRC Lo> <CRC Hi>
In this format is also the response ?00, reporting error in processing standard OM command.
Address field of standard message will always be 00 - here without any significance.

ERROR STATUS

In case of wrong address or CRC nothing comes back.
In case of error command (CRC is not controlled) <AA> A0 01 <CRC Lo> <CRC Hi> comes back. If an error is in 10h command error statement "2" or "3" is reported.
If other command is used than the one corresponding with selected data format, it is evaluated as error command.

In common:

<AA> instrument address - binary 1 - 247 (set in instrument menu)
<CRC Lo> <CRC Hi> is a control word according to definitions in Appendix C of MODBUS protocol description

TERMINATING COMMUNICATION

Communication is terminated provided no data arrives during 3 1/2 characters. This period is determined with uncertainty of ±250vs. MODBUS has standard rates up to 19 200. For higher rate it is necessary to count with this uncertainty - e.g. 115 200 Baud -> 500±250 vs, 230 400 Baud -> 250 ±250

FORMAT	ORDER	COMMAND	DATA
U. INT. 16	n/a	0x06	<AA> 06 00 00 <Word Hi> <Word Lo> <CRC Lo> <CRC Hi>
S. INT. 16	n/a	0x06	<AA> 06 00 00 <Word Hi> <Word Lo> <CRC Lo> <CRC Hi>
U. INT. 32	LO - HI	0x10	<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>
S. INT. 32	LO - HI	0x10	<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>
FLOAT	LO - HI	0x10	<AA> 10 00 00 00 02 04 <Lo Word Hi> <Lo Word Lo> <Hi Word Hi> <Hi Word Lo> <CRC Lo> <CRC Hi>
U. INT. 32	HI - LO	0x10	<AA> 10 00 00 00 02 04 <Hi Word Hi> <Hi Word Lo> <Lo Word Hi> <Lo Word Lo> <CRC Lo> <CRC Hi>
S. INT. 32	HI - LO	0x10	<AA> 10 00 00 00 02 04 <Hi Word Hi> <Hi Word Lo> <Lo Word Hi> <Lo Word Lo> <CRC Lo> <CRC Hi>
FLOAT	HI - LO	0x10	<AA> 10 00 00 00 02 04 <Hi Word Hi> <Hi Word Lo> <Lo Word Hi> <Lo Word Lo> <CRC Lo> <CRC Hi>

LEGEND

#	Command beginning	
<AA>	Instrument address (1...247)	
<Word xx>	16-bit data	
<Lo Word xx>	32-bit data (lower part)	
<Hi Word xx>	32-bit data (higher part)	
U.INT.16	unsingned integer	0 (0x0000)...65 535 (0xFFFF)
S.INT.16	singned integer	-32 768 (0x8000)...65 535 (0x7FFF)
U.INT.32	unsingned integer	0 (0x0000 0000)...4 294 967 295 (0xFFFF FFFF)
S.INT.32	singned integer	-2 147 483 648 (0x8000 0000)...65 535 (0x7FFF FFFF)
FLOAT	IEEE floating point	±6,80564693277058E+38 <Hi Word Hi> = ZEEE EEE; <Hi Word Lo> = EMMM MMMM <Lo Word Hi> = MMMM MMMM; <Lo Worg Lo> = MMMM MMMM Z...sign (1(0)/-1(1)); E...Exponent (-127(0x00)...0(0x7F)...128(0xFF)) M...Mantisa (1.0...2.0), highest mantisa bit is always 1 and it is covered by the lowest exponent bit e.g.: 0x3F80 0000 = Z*2^E*M = 1*2^(0)*1 = 1

9. ERROR STATEMENTS

ERROR	CAUSE	ELIMINATION
E.D.UN.	Number is too small (large negative) to be displayed	change DP setting, channel constant setting
E D.OV.	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.OV.	Number is outside the table range	increase table values, change input setting (channel constant setting)
E. I .UN.	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
E. I .OV.	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.SET.	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
E.OUT.	Analogue output current loop disconnected	check wire connection

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	{	|	}	~	

Table ASCII

0	1	2	3	4	5	6	7		9	10	11	12	13	14	15	16	17	18	19
NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI	DLE	DC1	DC2	DC3

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
DC4	NAC	SYN	ETB	CAN	EM	SUB	ESC	FS	CS	RS	US	SP	!	„	#	$	%	&	,

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
<	=	>	?	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O

80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_	`	a	b	c

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w

120	121	122	123	124	125	126	127
x	y	z	{	|	}	~	DEL

11. TECHNICAL DATA

INPUT

Protocol:	ASCII, MessBus, Modbus RTU, PROFIBUS DP
Data format:	8 bit + no parity + 1 stop bit (ASCII) 7 bit + even parity + 1 stop bit (MessBus) Universal protocol
Rate:	600...230 400 Baud 9 600...12 000 KBaud (PROFIBUS)
RS 232:	isolated, two-way communication
RS 485:	isolated, two-way communication, addressing (in range 1...247)

PROJECTION

Display:	999999, 4 (100/125 mm) or 6 digit (57/100/125 mm) Three-color 7 segment LED - red/green/orange High bright singles LED - red or green (1300 mcd)
Projection:	-999...9999 or -99999...999999
Decimal point:	adjustable - in menu
Brightness:	adjustbale - in menu

INSTRUMENT ACCURACY

Linearisation:	by linear interpolation in 50 points - solely via OM Link
Digital filters:	Averaging, Floating average, Exponential filter, Rounding
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
Limita:	-99999...999999
Hysteresis:	0...999999
Delay:	0...99,9 s
Outputs:	4x relays with switch-on contact (Form A) (230 VAC/30 VDC, 3 A)* 4x open collectors (30 VDC/100 mA)
Relay:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

ANALOG OUTPUT

Type:	isolated, programmable with 12 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/±10 V
Current:	0...5/20 mA/4...20 mA - compensation of conduct to 500 Ω /12 V or 1 000 Ω/24 V

EXCITATION

Adjustbale:	5/12/17/24 VDC/max. 2,5 W, isolated

POWER SUPPLY

Options:	10...30 V AC/DC, max. 27 VA, isolated PF ≥ 0,4, I_{STP}> 75 A/2 ms fuse inside (T 4A) 80...250 V AC/DC, max. 27 VA, isolated PF ≥ 0,4, I_{STP}> 475 A/2 ms fuse inside (T 4A)

MECHANIC PROPERTIES

Material:	anodized aluminum, black
Dimensions:	see chapter 12
Panel cut-out:	see chapter 12

OPERATING CONDITIONS

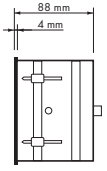
Connection:	through cable bushings to terminal boards inside the instrument, conductore section up to < 1,5 mm² /< 2,5 mm²
Stabilisation period:	within 15 minutes after switch-on
Working temp.:	-20°...60°C
Storage temp.:	-20°...85°C
Cover:	IP64
Construction:	safety class I
Overvoltage cat.:	EN 61010-1, A2
Dielectric strength:	4 kVAC after 1 min between supply and input 4 kVAC after 1 min between supply and analog output 4 kVAC after 1 min between supply and relay output 2,5 kVAC after 1 min between supply and analog output
Insulation resist.:	for pollution degree II, measurement cat. III instrum.power supply > 670 V (PI), 300 V (DI) Input/output > 300 V (PI), 150 (DI)
EMC:	EN 61326-1

* values apply for resistance load

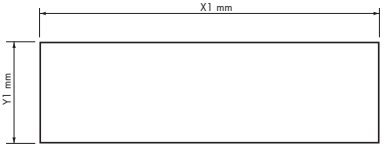
PI - Primary insulation, DI - Double insulation

Front view

Side view



Panel cutout

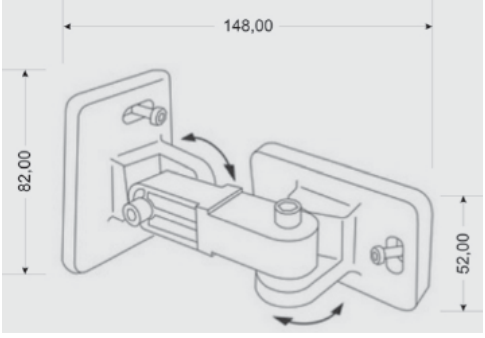


Panel thickness: 0,5 ... 50 mm

Height	X	Y	X1	Y1
57-6	375	119	367	111
100-4	465	181	457	173
100-6	651	181	643	173
125-4	539	237	531	228
125-6	754	237	746	228

Wall mounting

Our large displays are supplied along with a wall mount holder as shown in the the drawing.



13. CERTIFICATE OF GUARANTEE

Product	**OMD 202RS**
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

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 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 4/6-digit programmable large display

Type OMD 202

Version UNI, PWR, UQC, RS

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 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-3-2, EN 61000-3-3, EN 55022, cap. 5 and cap. 6

The product is furnished with CE label issued in 2001.

As documentation serve the protocoles of authorized and accredited organizations

EMC VTÚE Praha, experimental laboratory No. 1158, protocol No. 08-041/2001 of 24/11/2001
VTÚPV Vyškov, experimental laboratory No. 1103, protocol No. 730-325/2001 of 02/05/2001
VTÚPV Vyškov, experimental laboratory No. 1103, protocol No. 730-350/2001 of 07/05/2001
VTÚPV Vyškov, experimental laboratory No. 1103, protocol No. 730-372/2001 of 02/05/2001
VTÚPV Vyškov, experimental laboratory No. 1103, protocol No. 730-934/2001 of 20/11/2001

Place and date of issue: Prague, 19. Juli 2009

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