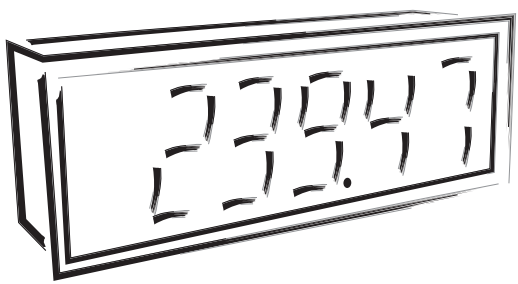
GUARANTEE 5 YEARS

OMD 202UQC

6 DIGIT PROGRAMMABLE LARGE DISPLAY

COUNTER
FREQUENCY METER
DUTY CYCLE MEASUREMENT
STOPWATCH/TIMER/CLOCK



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 202 series conform to the European regulation No. 73/23/EHS and No. 2004/108/EC.

They are up to the following European:
EN 61010-1 Electrical safety
EN 61326-1 Electrical measurement, EMC standards „Industrial use"

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.

ORBIT MERRET, spol. s r.o.
Vodňanská 675/30
198 00 Praha 9
Czech Republic

Tel: +420 - 281 040 200
Fax: +420 - 281 040 299
e-mail: orbit@merret.cz
www.orbit.merret.cz

2. INSTRUMENT DESCRIPTION

2.1 DESCRIPTION

The OMD 202UQC model series are 4/6 digit large panel programable counter/frequency meter/IRC singnal monitor/stopwatch/clock instrument. It comes either with a 3-colour LED display (red/green/orange) or with High Brightness LEDs (red or green with brightness of 1 300 mcd).
It is based on a single microprocessor and a powerful gatte array which ensure high accuracy, stability and easy controling.

MEASURING MODES

SINGLE	Counter/Frequency meter	C / F
A*B	Counter/Frequency meter with function AND between inputs A and B	C / F
XNOR	Counter/Frequency meter with function NOR between inputs A and B	C / F
DUTY	Duty cycle measurement	C / F
QVADR	Counter/Frequency meter for IRC encoders	C / F
UP/DW	UP/DW Counter/Frequency meter - measures on inputs A, B (B defines direction) and can display count/frequency	C / F
UP + DW	UP + DW Counter/Frequency meter C / F - measures on inputs A (UP), B (DW) and can display count/frequency	C / F
TIME	Stopwatch	H
RTC	Clock	H

PROGRAMABLE DISPLAY PROJECTION

Calibration	it is possible to set the calibration coefficients in the programming menu
Projection	-99999...999999 with fixed or floating decimal point, for measuring modes STOPWATCH/CLOCK with the option to set in the format 10/24/60
Masuring channelsy	it is possible to process two independednt functions (counter/frequency)
Time base	0,05 s/0,5 s/1 s/2 s/5 s/10 s/20 s/1 min/2 min/5 min/10 min/15 min

LINEARIZATION

Linearization	by linear interpolation in 45 points/channel (solely via OM Link)

DIGITAL FILTERS

Input filter:	Input filter processes the input signal and reduces/eliminates interference (such as false signals originating from closing/opening relay contacts). The value entered represents the top measured frequency (for duty cycle 50% - identical period of Hi/Lo level), which the instrument will be able to process. - off/1 MHz/500 kHz/250 kHz/100 kHz/1 kHz/100 Hz/65 Hz/45 Hz/10 Hz/.../10 min - filter for shaft revolution measurement (setting a whole no. of pulses per revolution) - blocking (extending) the input pulse to a defined length 0...120 s
Floating average:	from 2...30 measurements
Exponen.average:	from 2...100 measurements
Arithmetic average:	from 2...100 measurements
Rounding:	setting the projection step for display

FUNCTIONS

Setting the value	Entering the current count when installing the counter during a countitng cycle
Preset	initial non-zero value, unloaded always after instrument resetting
Summation	registration of the number upon shift operation
Tare	designed to reset display upon non-zero input signal
OM Link	company communication interface for setting, operation and update of instrument SW

EXTERNAL CONTROL

Lock:	control keys blocking
Hold:	display/instrument blocking
Tare:	tare activation/resetting tare to zero
Resetting MM	resetting min/max value
Resettting	resetting/pre-setting the counter
Start/Stop	stopwatch/timer control
Pause	stopwatch/timer control

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 OPTION

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 following modes for limits are custom selectable: „Hysteresis" / „Reset and generate one pulse" for the first relay and for the stopwatch it is also „to close" action when the stopwatch/clock for the second relay. 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, MESSBUS, MODBUS - RTU or PROFIBUS 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.

Time backup by means of RTC circuit is designed for the „TIMER" measuring mode and secures time measuring even if the instrument is switched-off (without display projection).

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.

Functions of inputs according to selected mode

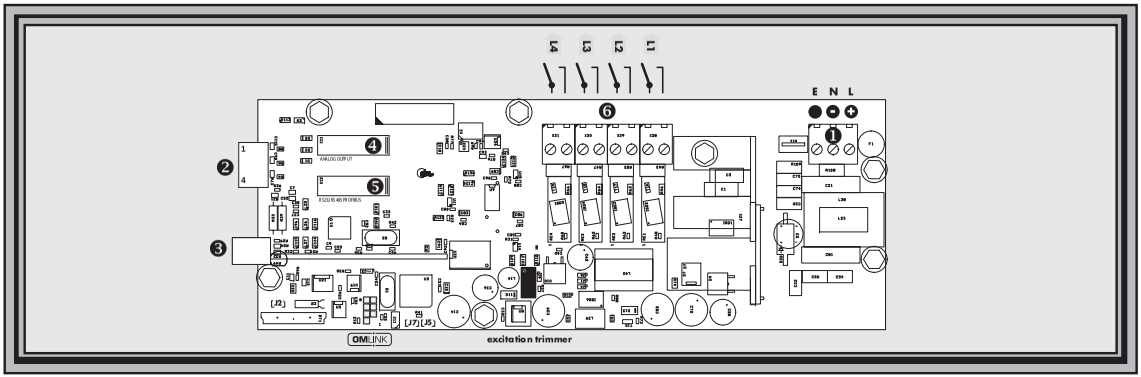
MODE	DESCRIPTION	FUNCTIONS OF INPUTS
SINGLE	Pulse counter/Frequency counter	Input A, Reseting (Input C)
A * B	Pulse counter/Frequency counter with function AND	Input A x B, Reseting (Input C)
XNOR	Pulse counter/Frequency counter with function xNOR	Input $\overline{A + B}$, Reseting (Input C)
DUTY	Duty	Input A
QUADR.	Pulse counter/ Frequency counter for IRC sensors	Input A + Input B, Reseting (Input C)
UP/DW	UP or DW Pulse counter/Frequency counter	Input A, Input B - determines direction (Hi = UP, Lo = DW) Reseting (Input C)
UP+DW	UP/DW Pulse counter/Frequency counter	Input A (UP), Input B (DW), Reseting (Input C)
TIME	Stopwatch Clock (time base 29 MHz)	Input A, Input B (Reseting - M.STOP), Reseting (Input C), M. NUL.
RTC	Stopwatch Clock with time back up (time base 1 s)	Input A, Input B (Reseting - M.STOP), Reseting (Input C), M. NUL.

CONNECTION

	DESCRIPTION	CONNECTION
INPUT A	input signal < 60 V	GND + Input A
INPUT B	input signal < 60 V	GND + Input B
INPUT C	input signal < 60 V	GND + Input C/Reseting

EXTERNAL INPUTS

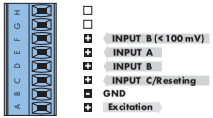
	DESCRIPTION	CONTROL
EXT. 1/2/3	According to setting in Menu (see Menu > EXT. IN., page 48)	upon contact, bracket (No. 14 + 15/16/17)



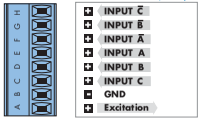
1 Power supply

2 External inputs

3 Input

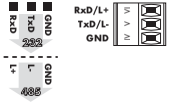


Line/SSI input



4 Analog output

5 Data output

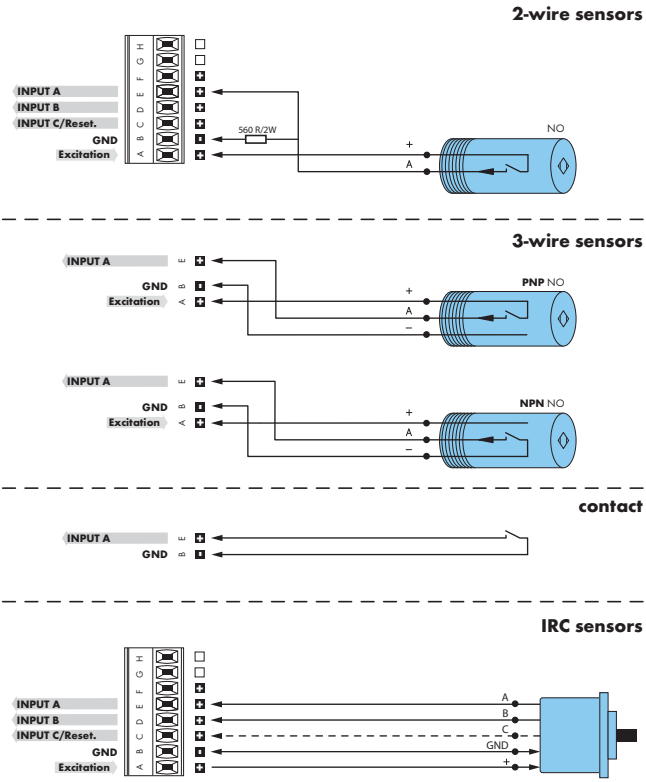


6 Comparators

Jumpers

J2 back-up battery
J5 hardware test
J7 "cold" load of instrument's FW

Sensor connection



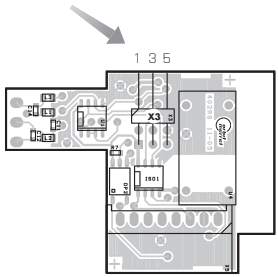
Sensors with PNP or NPN output have always only one „fixed" level and therefore it is extremely important the leads are properly shielded and separated from possible sources of interference. If interference occurs, it can be included in the measurement. One of the ways of eliminating this possible problem is applying an input signal filter in the Menu.

Termination of RS 485 communication line

X3 - Termination of commuication line RS 485

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

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



Comparator levels

Setting comparator levels for individual inputs is realised in the „LIGHT" or in the „PROFI" menu.
When setting the level manually by front panel buttons please set the required value first, then confirm by pressing the „ENTER" button. The value you have selected is automatically adjusted to the corresponding comparator level (see the table below).

COMPARATOR LEVEL TABLE (V)

TYPE	LEVEL (V)
standard	0,42 • 1,38 • 1,80 • 2,37 • 3,18 • 4,57 • 5,98 • 7,34 • 8,72 10,27 • 10,58 • 11,95 • 13,33 • 15,18 • 18,17 • 19,77 • 24,37
amplified (100x)	0,004 • 0,014 • 0,018 • 0,024 • 0,032 • 0,046 • 0,060 • 0,073 • 0,087 • 0,103 • 0,106 • 0,120 • 0,133 • 0,152 0,182 • 0,198 • 0,244 • 0,261 • 0,290 • 0,340 • 0,397

For an easier setting of inputs and the input levels the front panel LEDs signal their momentary state (it is necessary to wait for a approx 2 s).

LED „C" input A
LED „F" amplified input A
LED „1" input B
LED „2" input C

Amplified inputs

- only A
- in case you enter voltage lower input A than 0.8304 the iput is processed by pre-amplifier (which limits the frequency range), input B automatically (if necessary) switches ower to amplified input B (< 100 mV) and therefore it is essential, if A2 is used as input B to the counter, to select identical parameters AB

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:

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- contains complete instrument menu and is protected by optional number code

USER **User programming menu**
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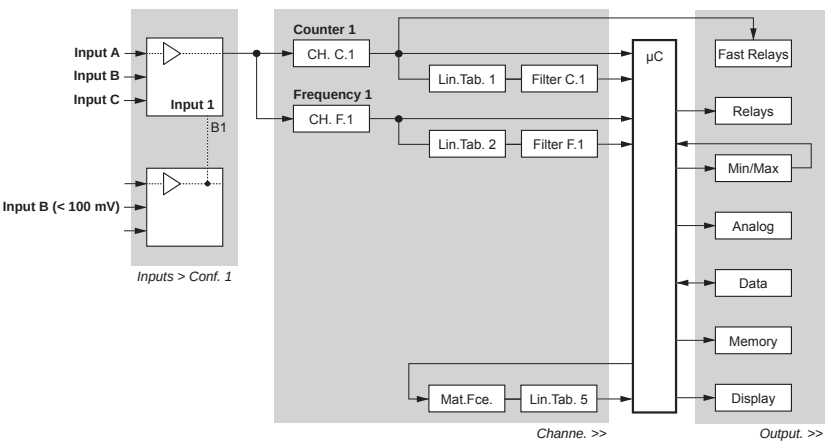
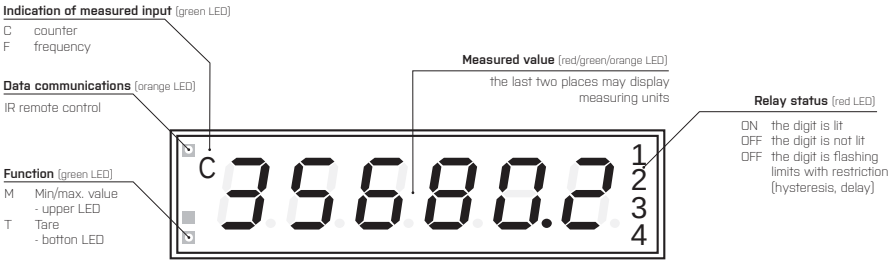
The operation program is freely accessible (www.orbit.merret.cz) and the only requirement is the purchase of OML cable to connect the instrument to PC. It is manufactured in version RS 232 and USB and is compatible with all ORBIT MERRET instruments.
Another option for connection is with the aid of data output RS 232 or RS 485 (without the need of the OML cable).

Scheme of processing the measured signal



6. 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

C F H Q Indicates the setting for given type of instrument

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

CONECT 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 w/o saving	transition to next item w/o saving
◀	programmable key function	return 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	setting/selection confirmation
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 address instrument/remote controler		

* 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

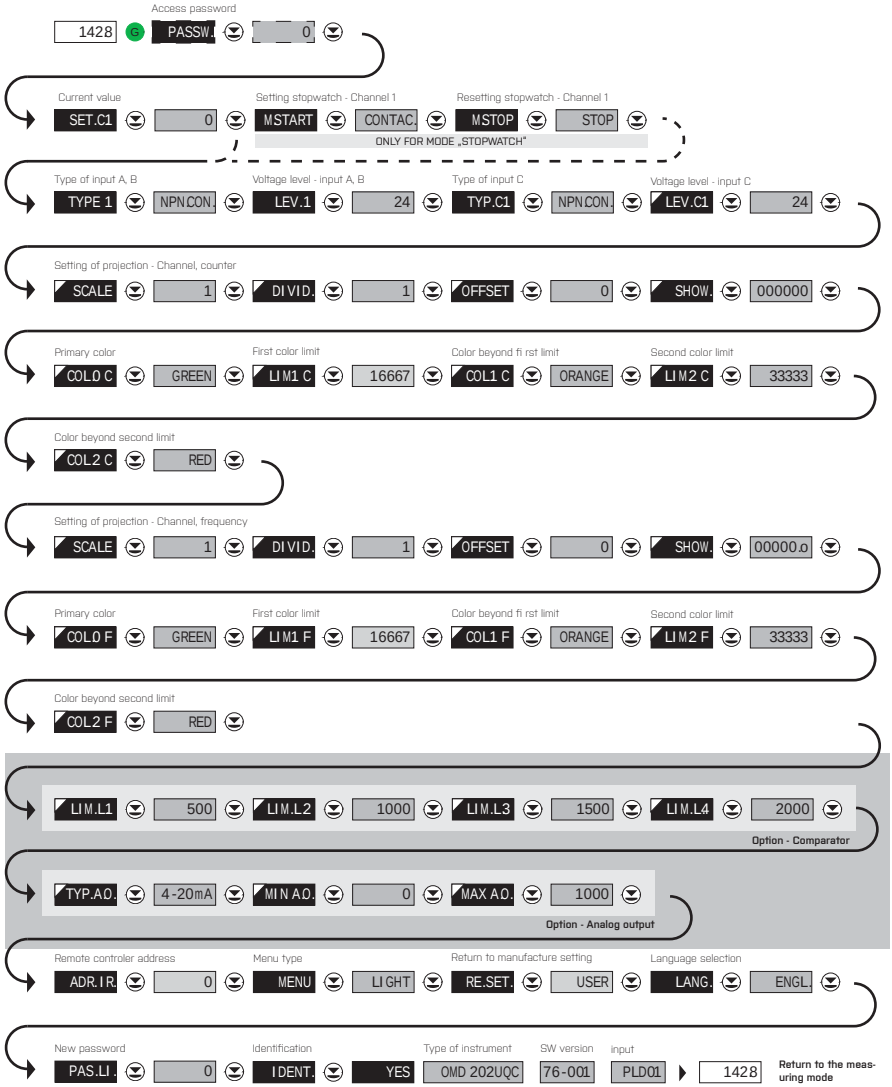
SETTING **LIGHT**

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	vypnuté
Setting the items	DEF

!

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


Access password
1428
G
PASSW.
0
Current value
SET.C1
0
Setting stopwatch - Channel 1
MSTART
CONTAC.
Resetting stopwatch - Channel 1
MSTOP
STOP
ONLY FOR MODE „STOPWATCH"
Type of input A, B
TYPE 1
NPN.CON.
Voltage level - input A, B
LEV.1
24
Type of input C
TYP.C1
NPN.CON.
Voltage level - input C
LEV.C1
24
Setting of projection - Channel, counter
SCALE
1
DIVID.
1
OFFSET
0
SHOW.
000000
Primary color
COLO C
GREEN
First color limit
LIM1 C
16667
Color beyond fi rst limit
COL1 C
ORANGE
Second color limit
LIM2 C
33333
Color beyond second limit
COL2 C
RED
Setting of projection - Channel, frequency
SCALE
1
DIVID.
1
OFFSET
0
SHOW.
00000.0
Primary color
COLO F
GREEN
First color limit
LIM1 F
16667
Color beyond fi rst limit
COL1 F
ORANGE
Second color limit
LIM2 F
33333
Color beyond second limit
COL2 F
RED
LIM.L1
500
LIM.L2
1000
LIM.L3
1500
LIM.L4
2000
Option - Comparator
TYP.AO.
4-20mA
MIN AO.
0
MAX AO.
1000
Option - Analog output
Remote controler address
ADR.IR.
0
Menu type
MENU
LIGHT
Return to manufacture setting
RE.SET.
USER
Language selection
LANG.
ENGL.
New password
PAS.LI.
0
Identification
IDENT.
YES
Type of instrument
OMD 202UQC
SW version
76-001
input
PLD01
1428
Return to the measuring mode

1428

G

PASSW. → 0 — Entering access password for access into the menu →

PASSW. **Access into instrument menu**

PASSW. = 0

- access into menu is unrestricted, after releasing keys you automaticaly move to first item of the menu

PASSW. > 0

- access into menu is protected ny numeric code

Set "PASSW." = 42 — Example

0 → 1 → 2 ← 02 → 12 → 22 → 32 → 42 → SET.C1

R

SET.C1 → 0 — Setting current value →

SET.C1 **Setting the current value**

- this function enables the user to set an current value on the display
- if you need to set the current value for a diferent mode it is necessary to change the mode first and then to set the initial value.

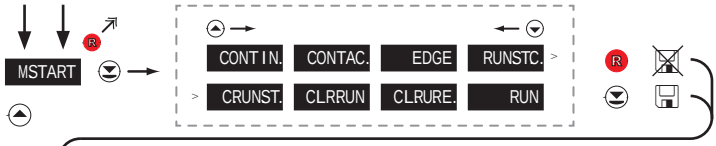
- setting "SET. C.1" is a one time action, unlike "OFFSET", which means that when the couter is re-rest the dispaly will show "0", unless a "OFFSET" is set (then the value would be the offset value and not "0").
- DEF = 0

Set "SET. C.1" = 233 — Example

0 → 1 → 2 → 3 ← 03 → 13 → 23 → 33 ← 033 → 133 → 233 → TYPE 1

!

The item „**SET C.1**" is not projected for measuring mode „**FREQV.**"



MSTART **Selection of stopwatch/timer control**

- menu for time setting is accessible only in the stopwatch/timer mode

CONTI N. Stopwatch/timer is running constantly if the instrument is turned on

CONTAC. Stopwatch/timer is running upon contact making

EDGE Stopwatch/timer is controlled by the priming signal edge

- time is set off by the edge (by the signal passing across the comparing level) and stopped by the next edge

RUN.ST.C. Stopwatch/timer is controlled and reset by the edge of the priming signal

- time is set off by the edge (by the signal passing across the comparing level) and stopped by the next edge

CRUN.ST. Stopwatch/timer is controlled and reset by the edge of the priming signal

- time is set off by the edge (by the signal passing across the comparing level) and stopped by the next edge

CLRRUN. Stopwatch/timer is reset and set off by the edge of the priming signal

CLRURE. Stopwatch/timer is reset and set off by the edge of the priming signal, the cycle is repeated with every other edge

RUN Stopwatch/timer is only set off by the edge

DEF = CONTAC.

Selection of stopwatch contro > EdGE — Example

CONTAC. ▲ EDGE ▼ M.STOP

M.STOP **Selection of stopwatch resetting**

- menu of the resetting option is accessible only in the stopwatch/timer regime

DEF = OFF

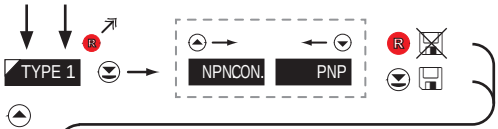
OFF Stopwatch/timer is reset through input „Clear"

ST.CLR. Stopwatch/timer is stopped and reset through input „Clear"

STOP Stopwatch/timer is stopped through input „Clear"

Selection of type of stopwatch resetting > St. CLr. — Example

OFF ▲ ST.CLR. ▼ TYPE 1



TYPE 1 — Selecting input type

- setting applies for Inputs A and B

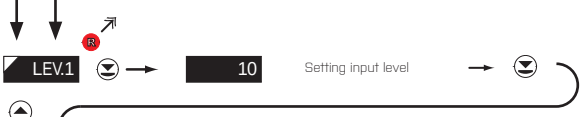
DEF = NPN.CON.

TYPE 1	Menu	Input type
	NPN.CON.	NPN or contact
	PNP	PNP

In this Example aplication a Wenglor sensor is used, model IB040BM37VB, type PNP Type 1 > PNP — Example

!

After selecting "**PNP**" it is necessary to set the input level (**LEV. 1**)

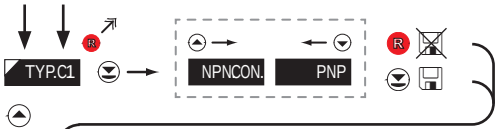


LEV.1 — Setting input level - Input A, B

- setting applies for Inputs A and B
- setting level (only for type PNP) of the input voltage, the instrument subsequently automatically selects divider and thus comparing levels
- range of setting 0,009...60 V
- table of comparing levels is on page 9

DEF = 24

The Example sensor IB040BM37VB is powered by the instrument's own excitation of 24 V — Example
and this is the level we will, set as input level, with the following comparing level (L>H: 2,0 V, H>L: 17,8 V). LEV. 1 > 24



TYP.C1 Selecting input type

- setting applies for Input C

DEF = NPN.CON.

TYP. C.1	Menu	Input type
	NPN.CON.	NPN or contact
	PNP	PNP

Resetting of the instrument will be done by a psh button (conatct) connected to terminals no. 12/14, TYP. C.1 > nPn.COn. Example

NPNCON. → LEV.C1

!

After selecting "**PNP**" it is necessary to set the input level (**LEV. 1**)

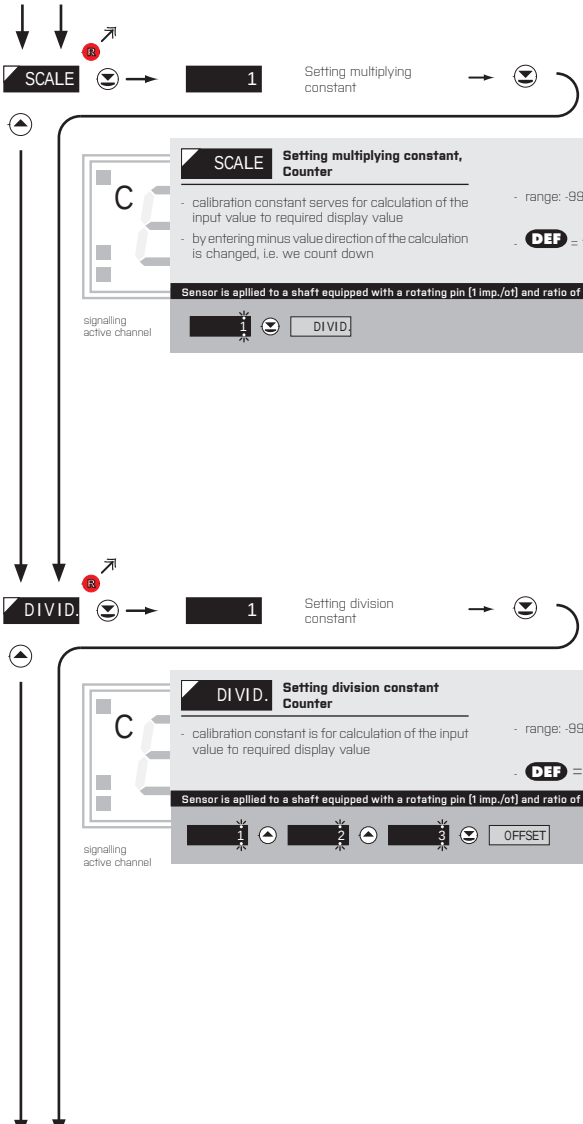
signalling active channel

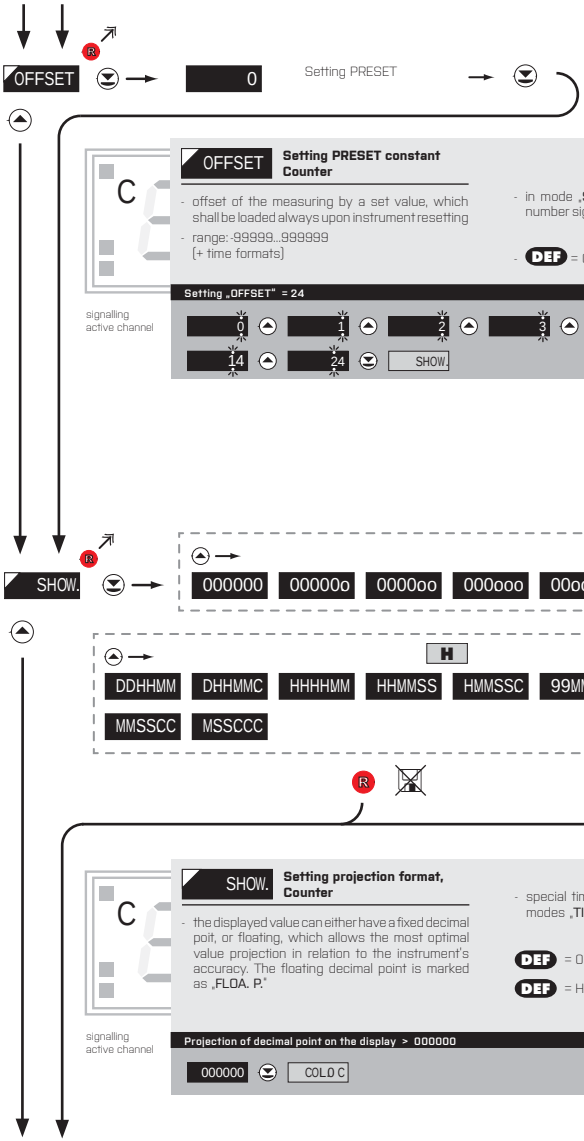
LEV.C1 Setting input level - Input C (Reseting)

- setting applies for Input C
- setting level (only for type PNP) of the input voltage, the instrument subsequently automatically selects divider and thus comparing levels
- range of setting 0,009...60 V
- table of comparing levels is on page 9

DEF = 24

In the previous type selection we chose „nPn.COn", so this option is not available now. If our choice had been „PNP" it is necessary to set the comparing level at this stage (see setting Level.A) Example


SCALE
1
Setting multiplying constant
SCALE
Setting multiplying constant, Counter
- calibration constant serves for calculation of the input value to required display value
- by entering minus value direction of the calculation is changed, i.e. we count down
- range: -99999...999999
- DEF = 1
Sensor is apllied to a shaft equipped with a rotating pin (1 imp./ot) and ratio of 1:3
Example
signalling active channel
1
DIVID.
DIVID.
1
Setting division constant
DIVID.
Setting division constant Counter
- calibration constant is for calculation of the input value to required display value
- range: -99999...999999
- DEF = 1
Sensor is apllied to a shaft equipped with a rotating pin (1 imp./ot) and ratio of 1:3
Example
signalling active channel
1
2
3
OFFSET

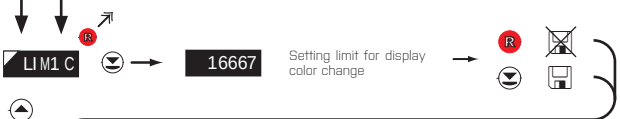

OFFSET
0
Setting PRESET
OFFSET
Setting PRESET constant Counter
- offset of the measuring by a set value, which shall be loaded always upon instrument resetting
- range: -99999...999999 (+ time formats)
- in mode „STOP WATCH" and constant > 0 the number sign will change automatically (page. 54)
- DEF = 0
Setting „OFFSET" = 24
Example
0
1
2
3
4
04
14
24
SHOW.
signalling active channel
SHOW.
000000
00000o
0000oo
000ooo
00oooo
0ooooo
FLOAT.P.
H
DDHHMM
DHHMMC
HHHHMM
HHMMSS
HMMSSC
99MMSS
MMMMSS
99SSCC
MMSSCC
MSSCCC
SHOW.
Setting projection format, Counter
- the displayed value can either have a fixed decimal poit, or floating, which allows the most optimal value projection in relation to the instrument's accuracy. The floating decimal point is marked as „FLOA. P."
- special time formats are pre-set for measuring modes „TIME" and „RTC".
DEF = 000000
DEF = HH.MM.SS
H
signalling active channel
Projection of decimal point on the display > 000000
Example
000000
COL0 C

COL0 C **Selection of display color > primary setting**

DEF = Green

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

GREEN → RED → LIM1 C



LIM1 C **Setting first value for color display change**

- range of setting is -99999...999999

DEF = 16667

Display value for 1st color change > LIM.1 C = 100 Example

16667 → + 0 → 00 → 000 → 100 → COL1 C

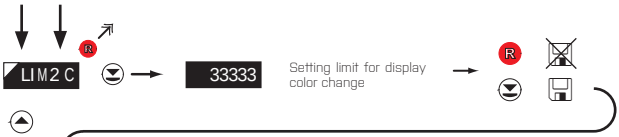
COL1 C **Selection of display color > after exceeding LIM.1 C**

- selection of display color is governed by setting under item „LIM.1 C"
- the color changes if the displayed value is higher than the value set in „LIM.1 C"

DEF = Orange

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

ORANGE → GREEN → LIM2 C

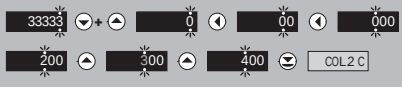


LIM2 C **Setting second value for display color change**

DEF = 33333

- range of setting is -99999...999999

Display value for 2st color change > LIM.2 C = 400 Example



COL2 C **Selection of display color > after exceeding LIM.2 C**

DEF = Red

- selection of display color is governed by setting under item „LIM.2 C"
- the color changes if the displayed value is higher than the value set in „LIM.2 C"

Selection of display color if the data is > LIM.2 C > orange Example

signalling active channel

SCALE **Setting multiplying constant, Frequency**

- calibration constant serves for calculation of the input value to required display value
- range: -99999...999999
- DEF = 1

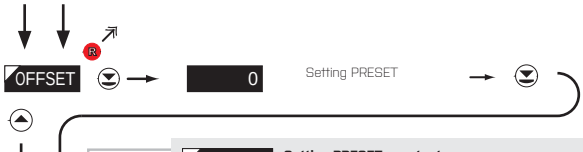
Sensor is apllied to a shaft equipped with a rotating pin (1 imp./ot) and ratio of 1:3 which is rotating at 3753 revs./min., (3753:60:3=20,85), SCALE > 20,85 Example

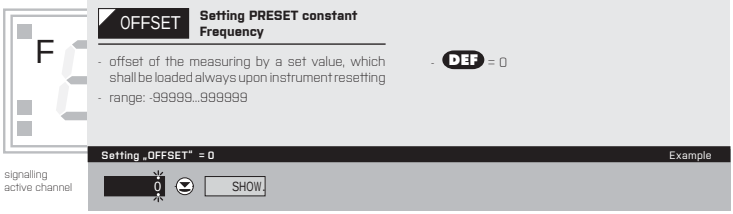
signalling active channel

DIVID. **Setting division constant Frequency**

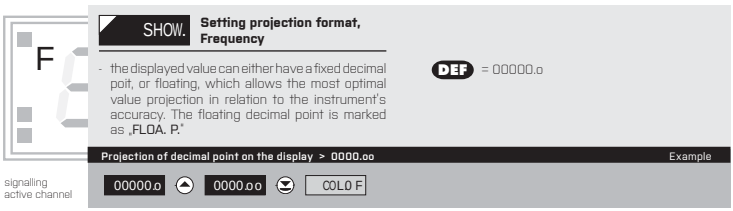
- calibration constant is for calculation of the input value to the required display value
- division constant - an integer number in the range of 2 to 100 which will enable accurate measurements relative to the set value, or its multiplication. In reality this means that revolutions are measured precisely after a comlpete number of revolutions, which results in improved measurement stability. This mode is not suitable for higher frequencies, where it can increase the measurement period. If you do not wish to use this mode, use a decimal number instead and adjust the multiplication constant apropriately.
- range: -99999...999999
- DEF = 1

On the display we want to see speed as revolutions/s. It is necessary to devide the figure by 60 (1 minute=60 s), It is possible to ener the resulting value in to the multiplication constant, diviD. > 60 Example


OFFSET
0
Setting PRESET


F
OFFSET
Setting PRESET constant
Frequency
- offset of the measuring by a set value, which shall be loaded always upon instrument resetting
- range: -99999...999999
- DEF = 0
Setting „OFFSET" = 0
Example
0
SHOW.
signalling active channel


SHOW.
000000
00000o
0000oo
000ooo
00oooo
0ooooo
FLOAT.P.

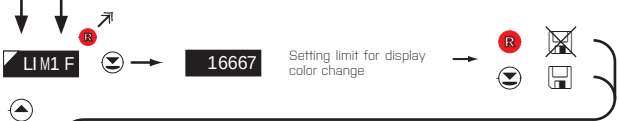

F
SHOW.
Setting projection format,
Frequency
- the displayed value can either have a fixed decimal poit, or floating, which allows the most optimal value projection in relation to the instrument's accuracy. The floating decimal point is marked as „FLOA. P."
DEF = 00000.o
Projection of decimal point on the display > 0000.oo
Example
00000.o
0000.oo
COLO F
signalling active channel

COL0 F **Selection of display color > primary setting**

DEF = Green

Selection of display color - primary > red Example

GREEN → RED → LIM1 F



LIM1 F **Setting first value for color display change**

DEF = 16667

- range of setting is -99999...999999

Display value for 1st color change > LIM.1 F = 100 Example

16667 → + 0 → 00 → 000 → 100 → COL1 F

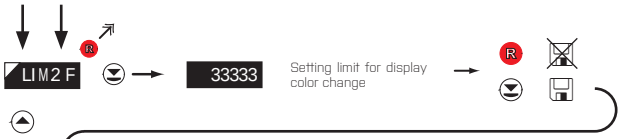
COL1 F **Selection of display color > after exceeding LIM.1 F**

DEF = Orange

- selection of display color is governed by setting under item „LIM.1 F"
- the color changes if the displayed value is higher than the value set in „LIM.1 F"

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

ORANGE → GREEN → LIM2 F



LIM2 F **Setting second value for display color change**

DEF = 33333

- range of setting is -99999...999999

Display value for 1st color change > LIM.2 F = 400 — Example

COL2 F **Selection of display color > after exceeding LIM.2 F**

DEF = Red

- selection of display color is governed by setting under item „LIM.2 F"
- the color changes if the displayed value is higher than the value set in „LIM.2 F"

Selection of display color if the data is > LIM.2 F > orange — Example

* subsequent item on the menu depends on instrument equipment

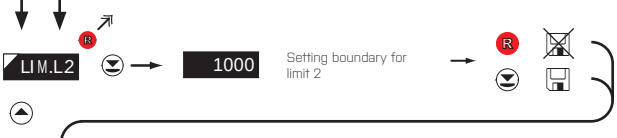
LIM.L1 **Setting boundary for limit 1**

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

DEF = 500

DEF „Hystresis"=0, „Delay"=0

Setting limit 1 > LIM. L.1 = 512 — Example



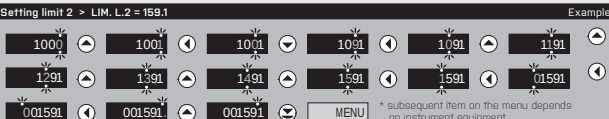
LIM.L2 **Setting boundary for limit 2**

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

DEF = 1000

DEF „Hystresis"=0, „Delay"=0

Setting limit 2 > LIM. L.2 = 159.1 — Example

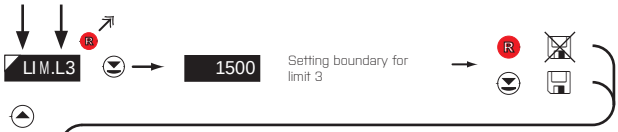


!

As a default setting, limits are active for the couter input "**COUNT.**" To change the input type to which the limits will be responding change the setting in item "**RE. SET.**" or by switching into "**PROFI Menu**" in item "**INP. L.1**"

!

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



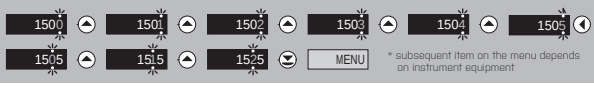
LIM.L3 **Setting boundary for limit 3**

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

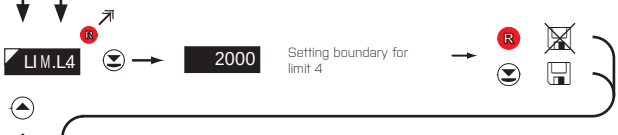
DEF = 1500

DEF „Hystresis"=0, „Delay"=0

Setting limit 3 > LIM. L.3 = 1525 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

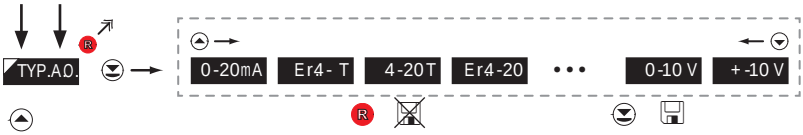
DEF = 2000

DEF „Hystresis"=0, „Delay"=0

Setting limit 4 > LIM. L.4 = 2123 Example

* subsequent item on the menu depends on instrument equipment

DISPLAYED ONLY WITH OPTIONS > **ANALOG OUTPUT**

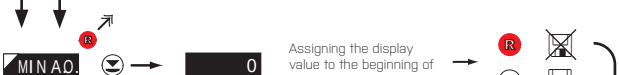


TYP.AO. Setting the type of analog output

TYP. A.O.	Menu	Range	Description
	0-20mA	0...20 mA	
	Er.4- T	4...20 mA	with error message indication and broken loop indication (<3,6 mA)
	4-20T	4...20 mA	with broken loop indication (<3,6 mA)
	Er.4-20	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	
	+-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

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

DEF = 0

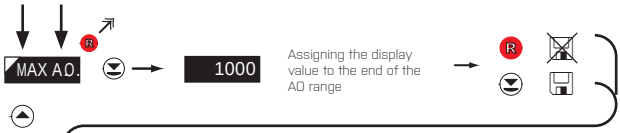
Display value for the beginning of the AO range > MIN A.O. = 0 — Example

!

As a default setting, analog output are active for the couter input "**COUNT.**"
To change the input type to which the limits will be responding change the setting in item "**RE. SET.**" or by switching into "**PROFI Menu**" in item "**INP. A.O**"

!

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

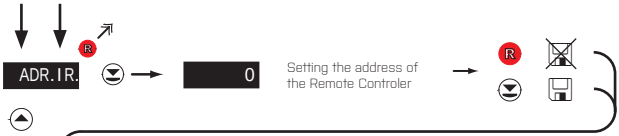


MAX AO. Assigning the display value to the end of the AO range

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

DEF = 1000

Display value for the end of the AO range > MAX A.O. = 1020 Example

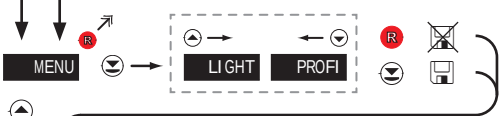


ADR. IR. **Setting the address of the Remote Controler**

- 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 setting: 0...99
- possible cancelation of address is done by pressing the RC's blue button

DEF = 0

Setting 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

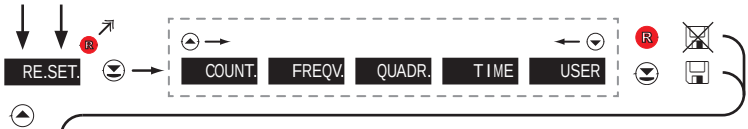
> linear tree structure

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

> tree menu structure

DEF = LIGHT

Menu LIGHT > MENU = LIGHT Example



RE.SET. **Return to manufacturer's setting**

- restores factory calibration and deafult menu items (DEF)
- by this restoration related menu items change as well, (input for limit evaluatin, analogue output, mathematical functions, ...)

COUNT. Factory setting for counter

FREQV. Factory setting for frequency measurement

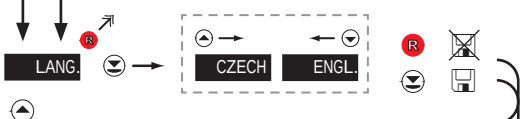
QUADR. Factory setting for IRC encoders

TIME Factory setting for clock/stop watch

USER Return to the customised user menu

- reading the user setting of instrument which is the setting saved in item **SERVIC./RESTOR./SAVE**

Return to manufacturer's setting, pre-setting mode > FREQV. Example

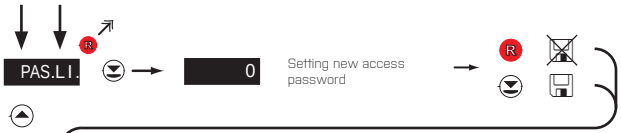


LANG. **Selection of language in instrument menu**

- selection of language version of the instrument menu

DEF = ENGL.

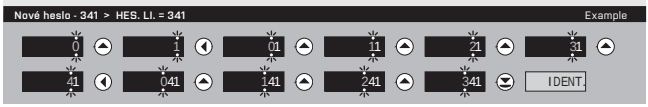
Language selection - ENGLISH > LANG. = ENGL. Example



PAS.LI. Setting new access password

- access password for menu **LIGHT**
- range of the number code 0...9999
- upon setting the password to "**0000**" the access to menu **LIGHT** is free without prompt to enter it
- in case the password is lost, please contact the adminstrator of this device

DEF = 0



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

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**

Switchng over to "PROFI" menu

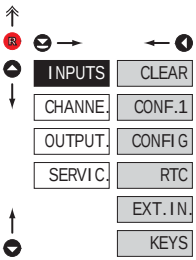
>3 s
G

- 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 > **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

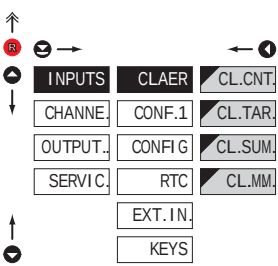
6.1 SETTING "PROFI" - INPUTS



The primary instrument parameters are set in this menu

CLEAR	Resetting internal values
CONF.1	Selection of measuring range and parameters Channel 1
CONFIG	Setting switching of channels
RTC	Setting date and time for option with RTC
EXT.IN.	Setting external inputs functions
KEYS	Assigning further functions to keys on the instrument

6.1.1 RESETTING INTERNAL VALUES



CLEAR **Resetting internal values to zero**

CL.CNT.	Counter resetting

- when zeroed, the figure on the display will be added to the total sum („grand total"), a value which is stored in the instrument's internal memory

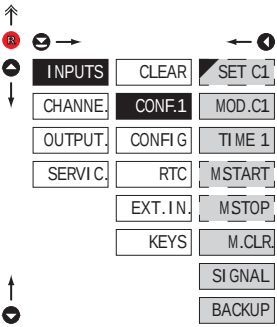
CL.TAR.	Tare resetting
CL.SUM.	Zeroing of the sum

- summation is used for cummulated values (i.e. factory shifts) when values from individual shifts are added to the total sum

CL.MM.	Zeroing of min/max value

- zeroes the memory used to store minimal and maximal values

6.1.2 INSTRUMENT CONFIGURTION - CHANNEL 1

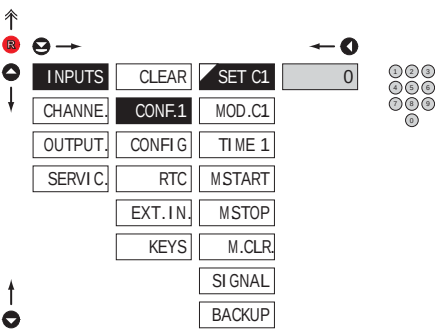


CONF.1 **Primary instrument setting**

- **SET C1** Setting the initial value
- **MOD.C1** Setting the instrument measuring mode
- **TI ME 1** Setting the time base
- **MSTART** Setting the stopwatch control
- **M.STOP** Setting stopwatchresetting
- **M.CLR.** Setting the zeroing of the instrument
- **SI GNAL** Setting input parameters
- **BACKUP** Setting data backup/time

6.1.2a SETTING THE INNITIAL DISPLAYED VALUE

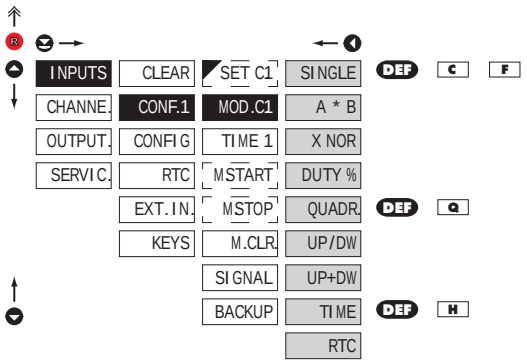
C H



SET C1 **Setting innitial displayed value**

- used to set the displayed value to desired innitial value (useful when exchanging instruments yet still keeping the original value)

6.1.2b SELECTION OF MEASURING MODE



MOD.C1 **Selection of instrument measuring mode**

SINGLE Impulse counter/Frequency measurement

A * B Impulse counter/Frequency meter with function „AND"

- instrument works with the following condition:

A	0	0	1	1
B	0	1	0	1
OUT	0	0	0	1

XNOR Impulse counter/Frequency meter with function „xNOR"

- instrument works with the following condition:

A	0	0	1	1
B	0	1	0	1
OUT	1	0	0	1

DUTY % Duty cycle

- the maximum frequency duty cycle measurement is 100 kHz

QUADR. Impulse counter/Frequency measurement for IRC encoders

- measurement on two inputs (A & B). Can display count and frequency
- in this mode every single rising edge of singnal A and B is included in the count

UP/DW UP/DW Impulse counter/ Frequency meter

- measurement on input A, (inp. B/direction). Can display count and frequency

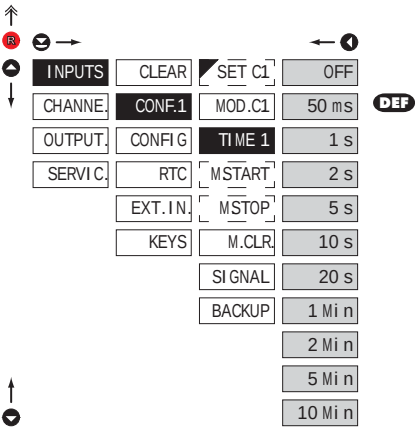
UP+DW UP+DW Impulse counter/ Frequency meter

- measures on inputs A (UP), B (DW). Can display count and frequency

TIME Mode „Stopwatch/timer"

RTC Mode „Stopwatch/timer" with RTC backup

6.1.2c SELECTION OF MEASURING PERIOD/TIME BASE



TI ME 1 **Selection of measuring period/time base**

- if you set measuring period e.g. for 1 s, the measuring runs approximtely from 1 s to 2 s (1 s + maximum one cycle of measured signal). If no signal arrives within 2 s it is taken that the signal has zero frequency
- range of setting of the time base is 0,5 s to 10 min.
- in the „**RTC**" regime with data projection the set time defines the cycle of switching between time (min. is 5 s), date (cca 2,5 s)

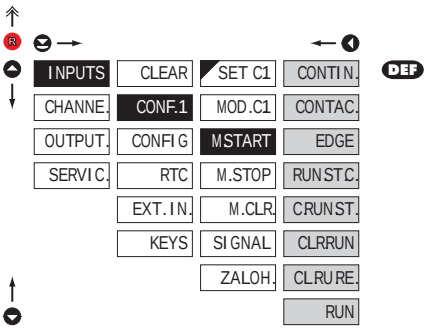
!

Attention! When setting the division constant in the range of 2...255, and when we measure using an exact no. of incoming pulses we need to ensure that an integer no. of pulses arrive, othervise the frequency is declared as **ZERO**!

*****

For mode "**TIME**" the time base is 29 MHz, for mode "**RTC**" it is 1 s

6.1.2d SELECTION OF STOPWATCH/TIMER CONTROL **H**



MSTART **Selection of stopwatch/ timer control**

- time setting menu is accessible only in the stopwatch/timer regime
- **setting applies only to input „A"**

CONTIN. Stopwatch/timer is running constantly if the instrument is turned on

CONTAC. Stopwatch/timer is running upon contact making

EDGE Stopwatch/timer is controlled by the priming signal edge

- time is set off by the edge (by the signal passing across the comparing level) and stopped by the next edge

RUNSTC. Stopwatch/timer is controlled and reset by the edge of the priming signal

- time is set off by the edge (by the signal passing across the comparing level) and stopped by the next edge

CRUNST. Stopwatch/timer is controlled and reset by the edge of the priming signal

- time is set off by the edge (by the signal passing across the comparing level) and stopped by the next edge

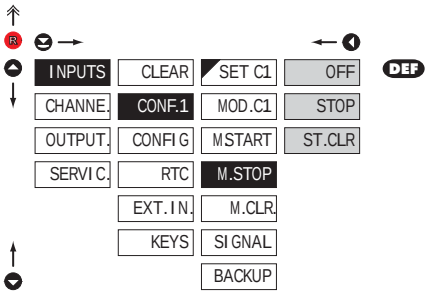
CLRRUN Stopwatch/timer is reset and set off by the edge of the priming signal (when the time is not running)

CLRURE. Stopwatch/timer is reset and set off by the edge of the priming signal, the cycle is repeated with every other edge (when the time is running)

RUN Stopwatch/timer is only set off by the edge

6.1.2e SELECTION OF STOPWATCH/TIMER RESETTING

H

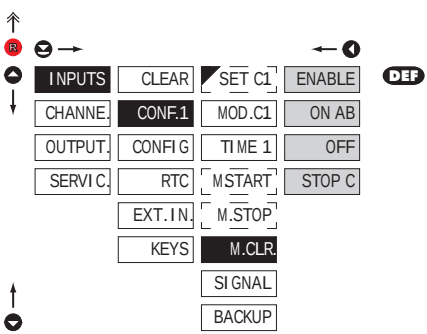


M.STOP **Selection of stopwatch resetting**

- menu of the resetting option is accessible only in the stopwatch/timer regime
- **setting applies only to Input „B"**

OFF	Zeroing by external input is switched off
STOP	Stopwatch/timer is stopped through input „Clear"
ST.CLR.	Stopwatch/timer is stopped and reset through input „Clear

6.1.2f SELECTION OF ZEROING



M.CLR. **Selection of zeroing**

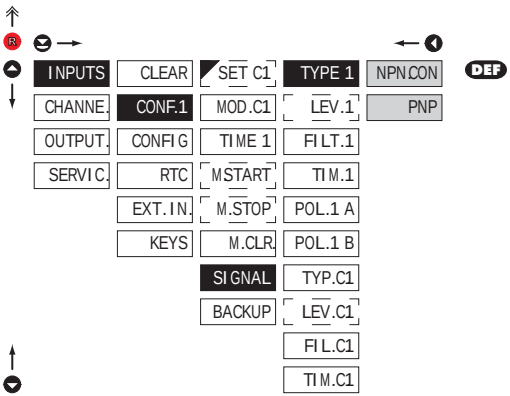
- **setting of external zeroing input „C"**

ENABLE	„Zeroing" is permited
ON AB	„Zeroing" is permited

- mode for IRC encoders
- Counter is zeroed only when sinals A and B are in log. 1

OFF	„Zeroing" is switched off
STOP C	Stop watch/clock is stopped by input „Zeroing"

6.1.2g SELECTION OF STOPWATCH/TIMER RESETTING FOR INPUT A & B



TYPE 1 **Selection of type of input**

- **setting applies to Inputs A and B**

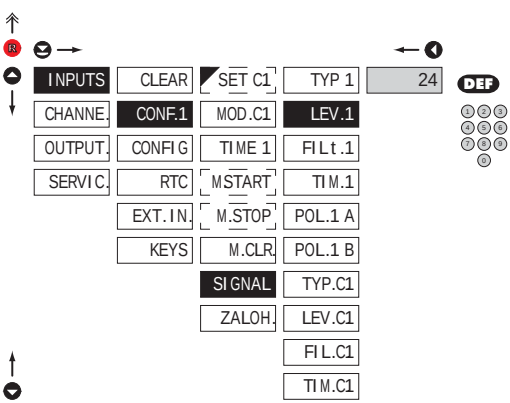
NPN.CON Type of input NPN and upon contact

PNP Type of input PNP

!

With selection of "**PNP**" it is necessary to set the input level (**LEV. 1**)

6.1.2h SELECTION OF ZEROING FOR INPUT A & B



LEV.C1 **Setting input level Input A & B**

- **setting applies for Inputs A and B**
- setting level (only for type PNP) of the input voltage, the instrument subsequently automatically selects divider and thus comparing levels
- range of setting 0,009...60 V
- table of comparing levels is on page 9

*****

Signalization by LEDs when selecting input level:

LED "C" signals, that input A is active

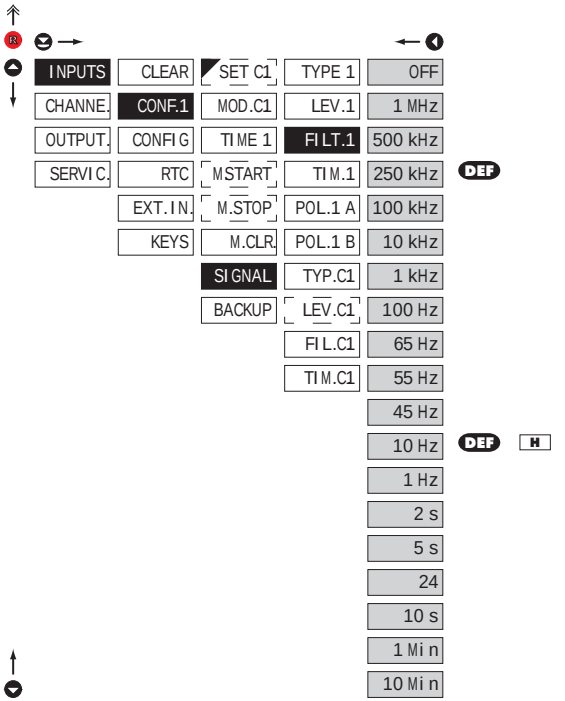
LED "F" signals, that amplified input A is active

LED "1" signals, that input B is active

LED "2" signals, that input C is active

When changing these menu items it is necessary to wait approx. 2 s before the input circuits switch to the new level.

6.1.2i SELECTION OF INPUT FILTER PARAMETERS FOR INPUT A & B



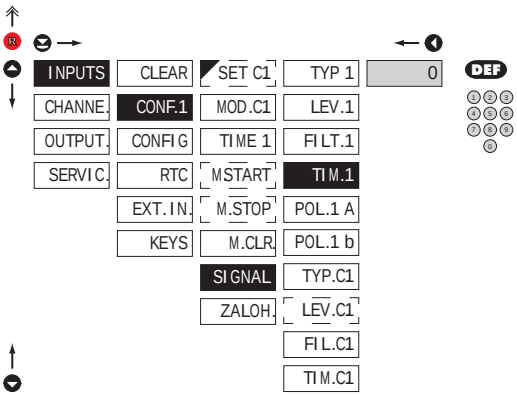
FI LT.1 **Selection of digital input filter**

- digital filter may suppress unwanted interfering impulses (e.g. relay backswings) on the input signal. The set parameter gives maximum possible frequency (Hz) of the instrument, which the instrument w/o limitatio
- for pulse duty cycle of 50 % - equal duration of Hi and Lo level"
- **in case if intereference the use of input filter is recommended**

!

When accessing upon contact and available maximum input frequency we recommend using filter

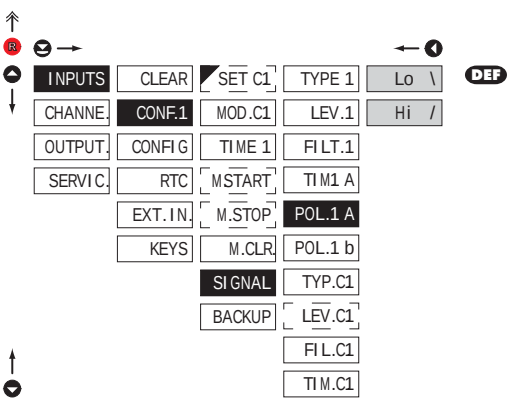
6.1.2j SETTING THE BLOCKING FOR INPUT A & B



TIM.1 **Setting the blocking of an input**

- **this setting is valid both to Input A & B**
- setting the time period when no incoming input signals are counted
- range of setting 0...120 s

6.1.2k SELECTION OF ACTIVE LEVEL OR EDGE FOR INPUT A



POL.1 A **Selection of active level or edge**

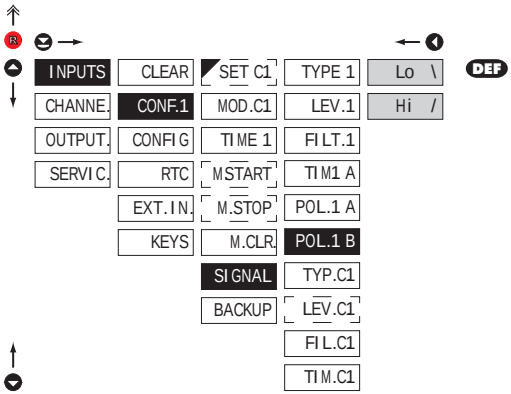
**Lo ** Active upon change of entering edge Hi > Lo

- upon entering the contact > active on switch-on

Hi / Active upon change of declining edge Lo >Hi

- upon entering the contact > active on switch-off

6.1.2l SELECTION OF ACTIVE LEVEL OR EDGE FOR INPUT B



POL.1 b **Selection of active level or edge**

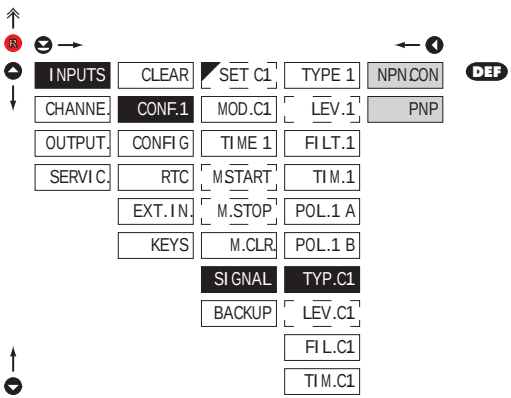
**Lo ** Active upon change of entering edge Hi > Lo

- upon entering the contact > active on switch-on

Hi / Active upon change of declining edge Lo >Hi

- upon entering the contact > active on switch-off

6.1.2m SELECTION OF THE TYPE OF INPUT FOR INPUT C



TYP.C1 **Selection of type of input**

- setting applies for Input C

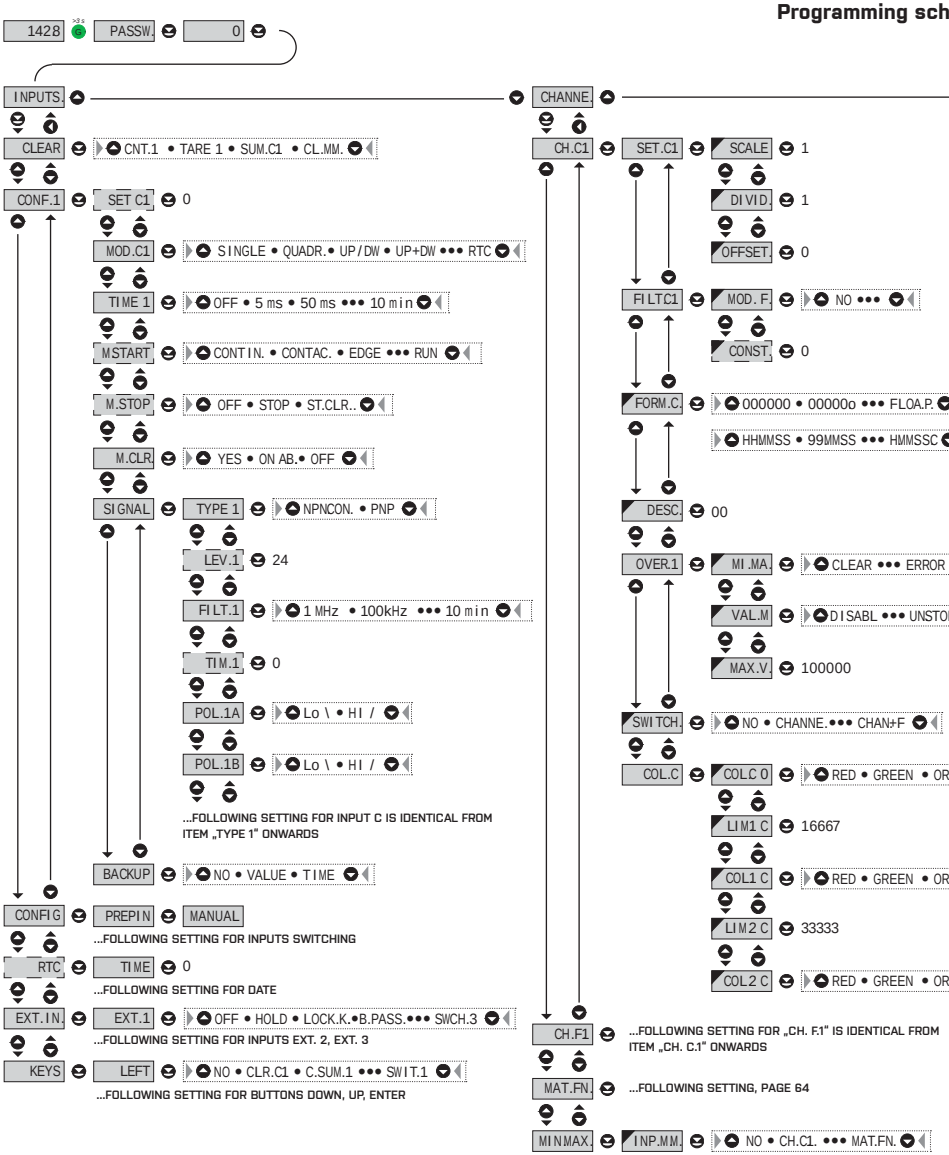
NPN.CON Type of input NPN and upon contact

PNP Type of input PNP

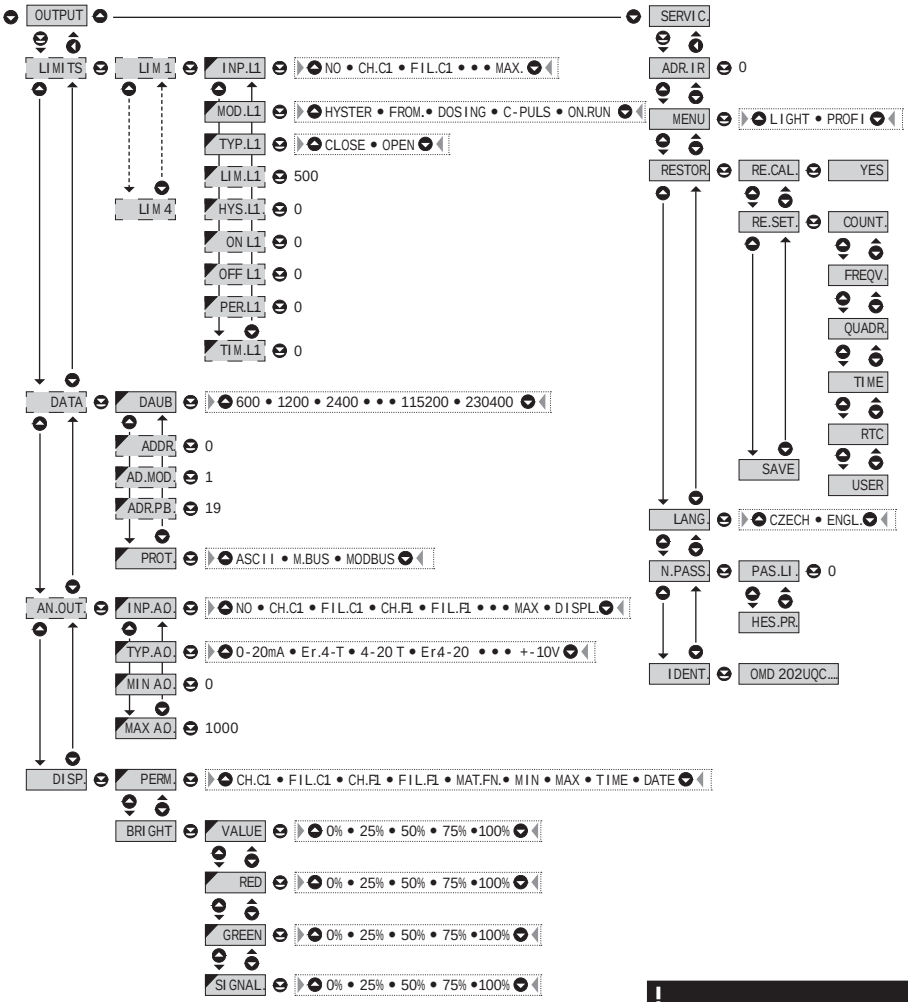
!

With selection of "**PNP**" it is necessary to set the input level (**LEV. C.1**)

Programming sch



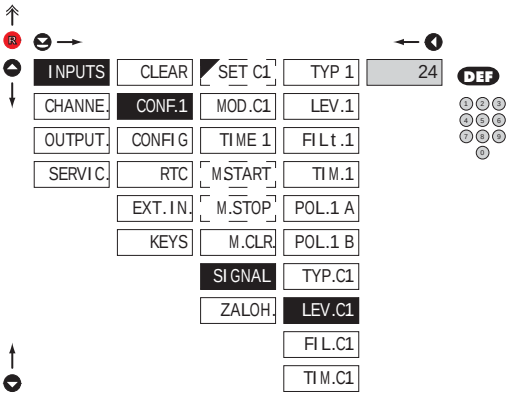
heme PROFI MENU



!

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

6.1.2n SETTING INPUT LEVEL FOR INPUT C



LEV.C1 **Setting input level**

- **setting applies for Input C**
- setting level (only for type PNP) of the input voltage, the instrument subsequently automatically selects divider and thus comparing levels
- range of setting 0,009...60 V
- table of comparing levels is on page 9

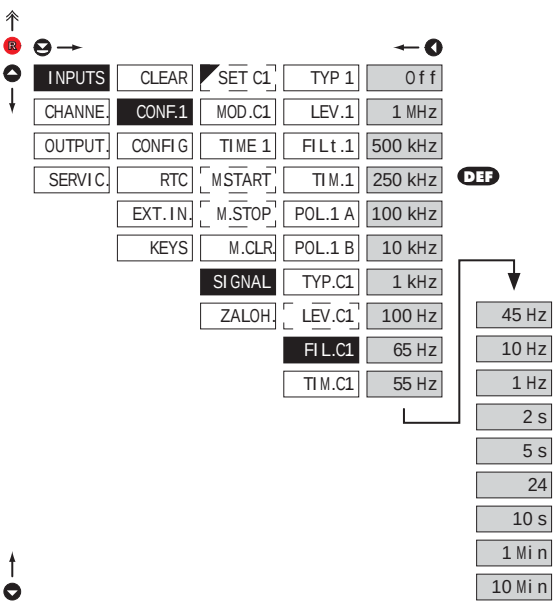
*****

Signalization by LEDs when selecting input level:

LED "2" signals, that input C is active

When changing these menu items it is necessary to wait approx. 2 s before the input circuits switch to the new level.

6.1.2o SELECTION OF INPUT FILTER PARAMETERS FOR INPUT C



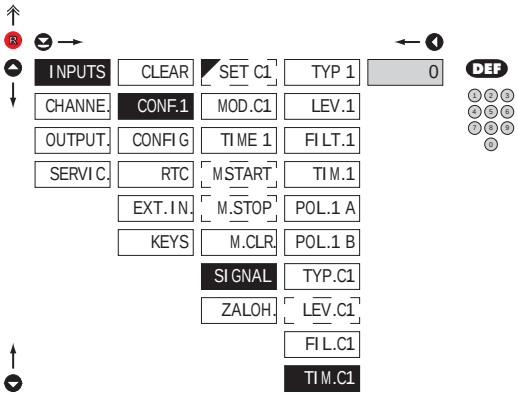
FIL.C1 **Volba digitálního vstupního filtru**

- **setting applies for Input C**
- digital filter may suppress unwanted interfering impulses (e.g. relay backswings) on the input signal. The set parameter gives maximum possible frequency (Hz) of the instrument, which the instrument w/o limitatio
- for pulse duty cycle of50% - equal duration of Hi and Lo level"
- **in case if intereference the use of input filter is recommended**

!

When accessing upon contact and available maximum input frequency we recommend using filter

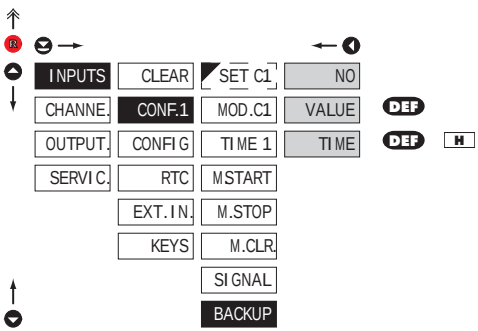
6.1.2p SETTING THE BLOCKING FOR INPUT C



TI M.1 **Setting the input blocking**

- **setting applies to input C**
- setting the time period when no incoming input signals are counted
- range of setting 0...120 s

6.1.2q SETTING THE DISPLAY STATUS BACKUP



BACKUP **Selection of display status backup**

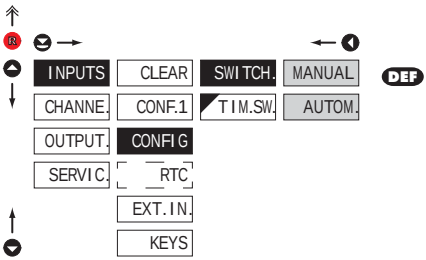
- time setting menu is accessible only in the stopwatch/timer regime
- setting display value restoration after power failure or instrument switch-off

NO Instrument resets itself after every switch-on

VALUE After switch-on the instrument loads the display status from the memory

TI ME Instrument downloads „running" time from RTC

6.1.3a SELECTION OF INPUTS SWITCHING



SWITCH. **Selection of inputs switching**

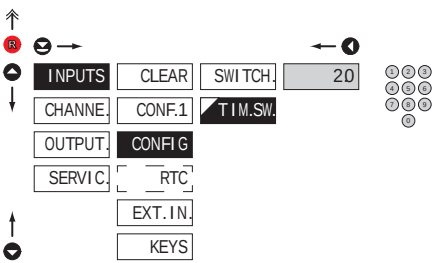
MANUAL Manual inputs switching

- inputs switching is controlled by selected key on the front panel or selected external input

AUTOM. Measuring on selected channel

- inputs switching is automatic in a time period set in "TIM. SW."

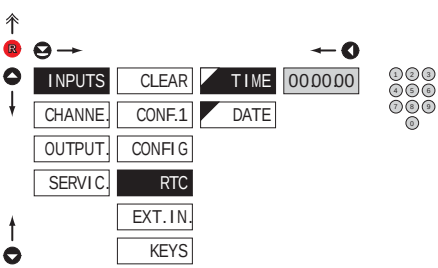
6.1.3b SETTING THE PERIOD FOR INPUTS SWITCHING



TIM.SW. **Setting the period for inputs switching**

- setting the time period for projection of channels in automatic mode ode of inputs switching ("AUTOM.")
- range of setting: 0,5...99,9 s (step 0,5 s)
- **DEF** TIM. SW. = 2 s

6.1.4 SETTING THE REAL TIME CLOCK



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

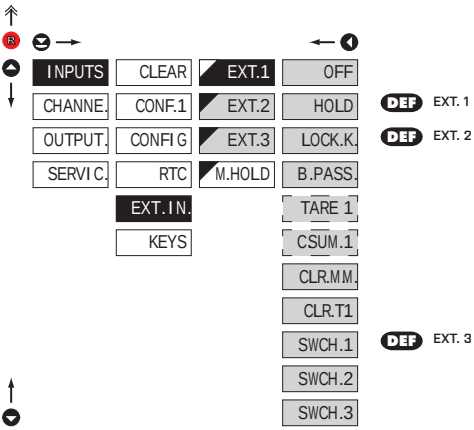
TIME Time setting

- format 23.59.59

DATE Date setting

- format DD.MM.YY

6.1.5a EXTERNAL INPUT FUNCTION SELECTION



!

Response to change of input is approx. 100 ms

External inputs table

Function	Ext 1	Ext 2	Ext 3
Channel - counter	0	0	
Channel - frequency	0	1	
MF	0	0	1
Min	0	1	1
Max	1	0	1
Max	1	1	1

EXT. I N. **External input function selection**

OFF Input is off

HOLD Activation of HOLD

- input activates function HOLD, which blocks all functions of the instrument

LOCK.K. Locking keys on the instrument

- active input disables all buttons to IR remote control

TARE 1 Tare activation

- input activates function TARE, only in mode "Frequency"

SUMA 1 External input controls function „Sum"

- active input dispalys the cummulated value of counter

N.SUM1 External input controls function „Zeroing of sum"

- active input zeroes (clears) the cummulated value of counter

CLR.MM. Resetting min/max value

CLR.T1 Tare resetting

SWCH.1 Successive switching of channel projection

SWCH.2 BCD switching of channel projection - EXT. 1,2

- for operation see the table
- following this choice the setting for "EXT. 2" is automatically restricted

SWCH.3 BCD switching of channel projection - EXT. 1,2, 3

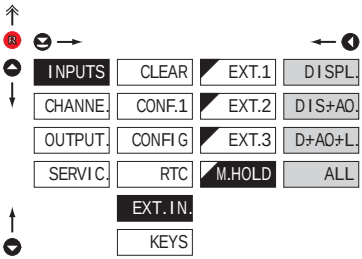
- for operation see the table
- following this choice the setting for "EXT.2" and "EXT. 3" is automatically restricted

- DEF EXT. 1 > **HOLD**
- DEF EXT. 2 > **LOCK. K.**
- DEF EXT. 3 > **SWCH. 1**

*****

Procedure identical for **EXT. 2** and **EXT. 3**.

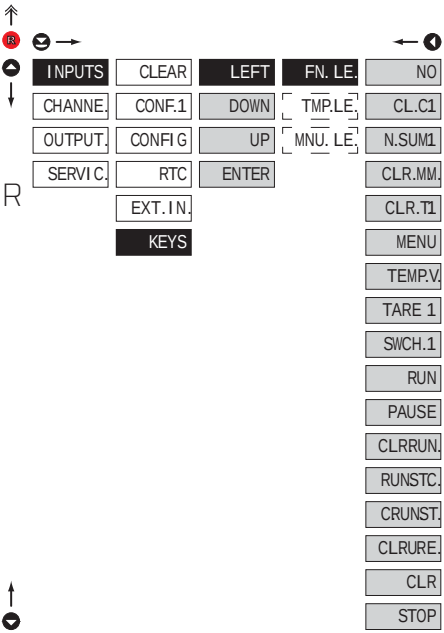
6.1.5b SELECTION OF FUNCTION "HOLD"



M.HOLD **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

6.1.6a OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS



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

- „FN. LE." > executive functions

NO	Key has no further function
CL.C1	Aux. input controls the „CLEAR" function

- input zeroes (presets) the counter

N.SUM1	Clearing of Sum

- input zeroes the cumulated value of the couter

CLR.MM	Resetting min/max value
CLR.T1	Tare resetting
MENU	Direct access to the selected item in the menu

- when this chioce is made the item "**MENU**" is displayed, and desired further selection can be made

TEMP.V.	Temporary projection of selected values

- when this chioce is made the item "**TMP. LE.**" is displayed, and desired further selection can be made

TARE 1	Activation of Tare function
SWI T.1	Continuous switching of projected channels
RUN	Activation function „RUN"
PAUSE	Activation function „PAUSE"
CLRRUN	Stopky/hodiny se hranou spouštěcího signálu vynulují a spustí

- other items arelate only to stopwatch conntrol (deatil description on p. 38/39)

!

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

!

Functions of button PAUSE

- dispalys the latest projected value until the next push of the button - dots/dot signals stop watch running by flashing

!

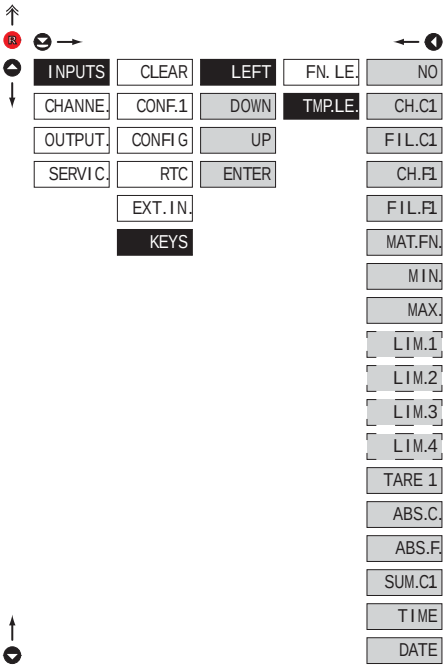
Preset button functions DEF.

	COUNTER	FREQUEN.	QVADRAT.	WATCH
LEFT	Sum C.1	C.1	F.1	Start
UP	MAX C.1	MAX F.1	MAX F.1	Clear
DOWN	CLR. MAX	MIN F.1	CLR. M.M.	Pause
ENTER	Clear	CLR. M.M.	Clear	Stop

!

Only the channel which is permanently projected is active

6.1.5b OPTIONAL ACCESSORY FUNCTIONS OF THE KEYS - TEMPORARY PROJECTION



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

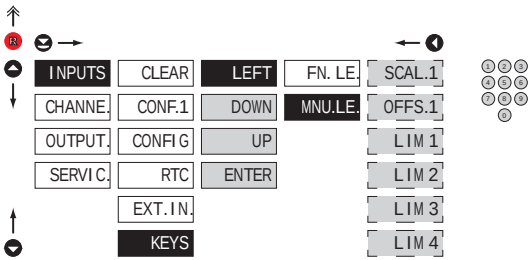
- „TMP. LE." > temporary projection of selected values
- "Temporary" projection of selected value is displayed for the time of keystroke
- "Temporary" projection may be switched to permanent by pressing + "Selected key", this holds until the stroke of any key

NO	Temporary projection is off
CH.C1	Temporary projection of counter value
FIL.C1	Temporary projection of counter value after being processed by digital filtres
CH.F1	Temporary projection of frequency
FIL.F1	Temporary projection of frequency after being processed by digital filtres
MAT.FN.	Temporary projection of "Mathematic functions"
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
TARE 1	Temporary projection of "TARE"
SUM.C1	Temporary projection of "SUMA"
TIME	Temporary projection of "TIME" value
DATE	Temporary projection of "DATE" value

!

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

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



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

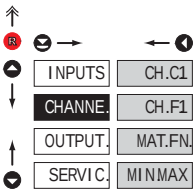
- „MNU. LE." > direct access into menu on selected item

SCAL.1	Direct access to item "SCALE"
OFFS.1	Direct access to item "OFFSET"
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"

!

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

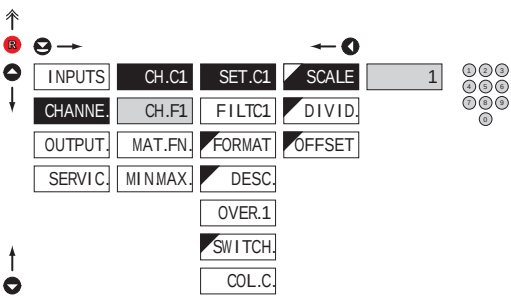
6.2 SETTING "PROFI" - CHANNEL



In this menu the instrument input parameters are set

CH.C1	Setting parameters of measuring "Channel 1" - Counter
CH.F1	Setting parameters of measuring "Channel 1" - Frequency/Watch
MAT.FN.	Setting parameters of mathematic functions
MINMAX	Selection of access and evaluation of Min/max value

6.2.1a SETTING MULTIPLYING CONSTANT - CHANNEL COUNTER



SCALE **Setting multiplying constant**

- multiplying constant serves for calculation of input value to required display value
- by entering minus value the direction of calculation is changed, i.e. we count down
- range: -99999...999999

- DEF = 1

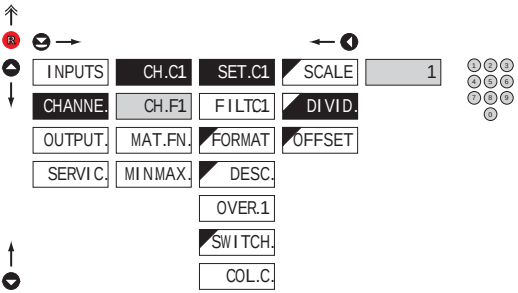
!

Setting is identical for "**CH. F.1**"

! H

If non-zero value is set in the "**TIME**" or "**RTC**" mode in the "**OFFSET**" item, it applies that the multiplying constant "**SCALE**" is negative

6.2.1b SETTING DIVISION CONSTANT - CHANNEL COUNTER



DIVID. Setting division constant Channel - Counter

- division constant serves for calculation of input value to required display value
- range: -99999...999999
- DEF = 1

!

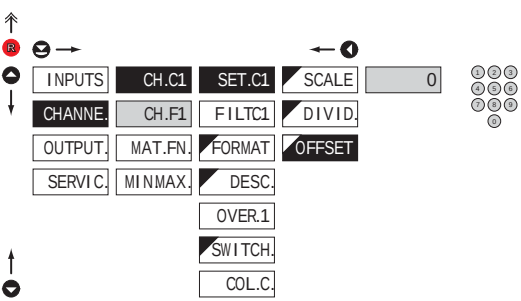
Setting is identical for "CH. F.1"

*****

Revolution measurement function

If you set the division constant (invariable) for channel F1 (F2) as an integer number (range 2...255), the measurement will be realised according to the preset multiplications of revolutions/pulses. In reality this means that revolutions are measured precisely after a number of revolutions have been fully completed, which results in an improved stability of the measured value. This mode is not suitable for higher frequencies, where it can increase the measurement period. If you do not wish to use this mode, mutliply both the multiplication and division constant by 10, 100 or 0,5 so that the resulting number is not integer or within the 2...255 range. Please pay attention to the time platform (TIME 1), which must must alow for adding up the 2...255 pulses within the set time period. ATTN! When this option is used in the QUADR mode, it may result in an error when the direction of revolution is reversed.

6.2.1c SETTING ADDITIVE CONSTANT - PRESET, CHANNEL COUNTER



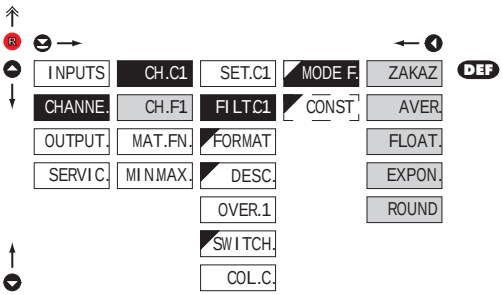
OFFSET Setting PRESET constant Channel - Counter

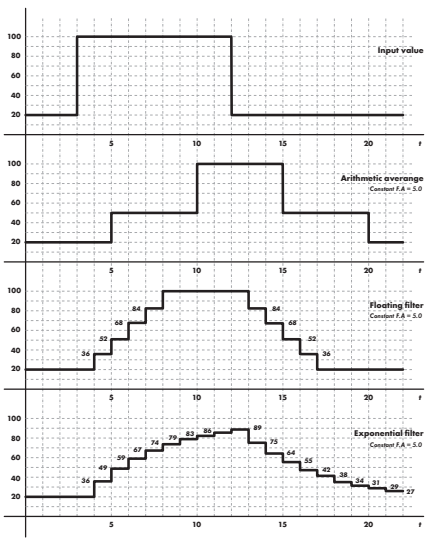
- offset of the measuring by a set value, which shall be loaded always upon instrument resetting
- range: -99999...999999
- DEF = 0

!

Setting is identical for "CH. F.1"

6.2.1d SETTING DIGITAL FILTERS - CHANNEL COUNTER





MODE F. **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 („CONST.") of measured values
- range 2...100

FLOAT. Selection of floating filter*

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

EXPON. Selection of exponential filter*

- integration filter of first prvniho grade with time constant („CONST.") measurement
- range 2...100

ROUND Measured value rounding

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

CONST . Setting constants

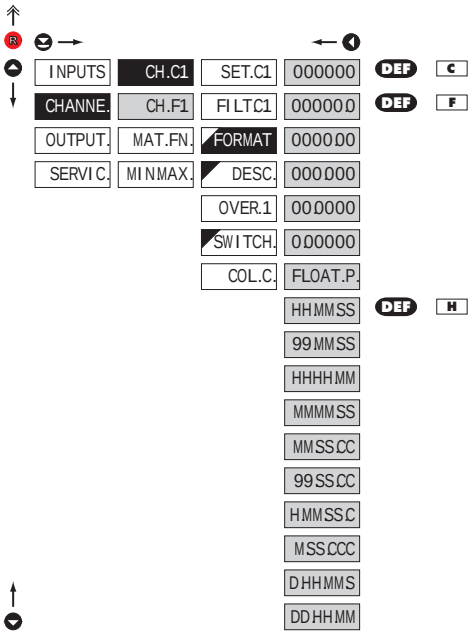
- this menu item is always displayed after selection of particular type of filte
- DEF = 2

!

Setting is identical for "CH. F.1"

*only for mode Frequency/Duty Cycle

6.2.1e PROJECTION FORMAT - POSITIONING OF DECIMAL POINT



FORMAT **Selection of decimal point**

- the instrument can project numbers in a standard way incl. the decimal point, time formats and also floating decimal point which ensures the most accurate value projection when „FLOA. P." is selected

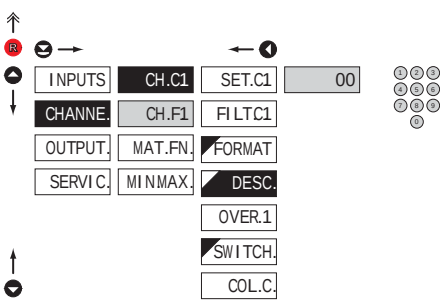
Abbreviations

- "FLOA. P." > floating decimal point
- "D." > day
- "H." > hour
- "M." > minute
- "S." > second
- "C." > hundredth of a second

!

Setting is identical for "CH. F.1"

6.2.1f PROJECTION OF DESCRIPTION - THE MEASURING UNITS



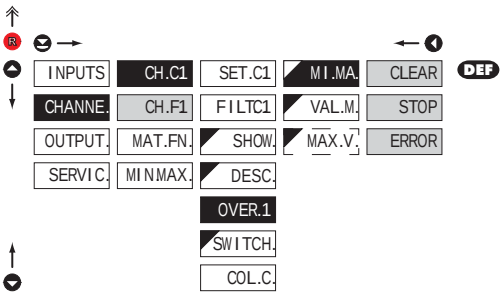
DESC. **Setting projection of descript. for "Channel A"**

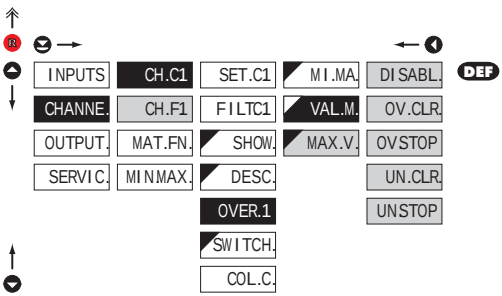
- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by code 00
- DEF = 00 (no description)

!

Table of signs on page 89

6.2.1g SETTING FUNCTIONS WHEN THERE IS DISPLAY/VALUE OVERFLOW





MI.MA. Setting the state of the instrument in the event of display overflow

- setting the state when there is an overflow/underflow of display
- can be used only for **Chan. C.1**

CLEAR The instrument zeroes itself and continues to count

STOP Measurement stops

- the display will continue to show the maximum or the minimum displayable value

ERROR Measurement stops

- display will show an error message „E. I.Un." or „E. I.Ov."

VAL.M. Setting the state of the instrument in the event of value overflow

- setting the state when the instrument reaches a preset display value

DISABL. Function is disabled

OV.CLR. Counter clears itself over a certain value

OVSTOP Counter stops itself over a certain value

UN.CLR. Counter clears itself just under a certain value

UNSTOP Counter stops itself just under a certain value

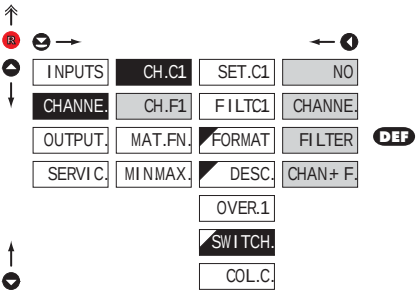
MAX.V. Setting the limit value

- Setting the value when the counter performes function selected in menu "**MAX. V.**"

!

Setting is identical for "**CH. F.1**"

6.2.1h SETTING THE CHANNEL PROJECTION IN SWITCH MODE



SWITCH. Channel projection in switch mode

- this menu item allows the user to select individual measuring channels which will be displayed when switching amongst channels is active - function „SWITCH."

NO Switching is disabled

CHANNE. „Channel 1" will be displayed

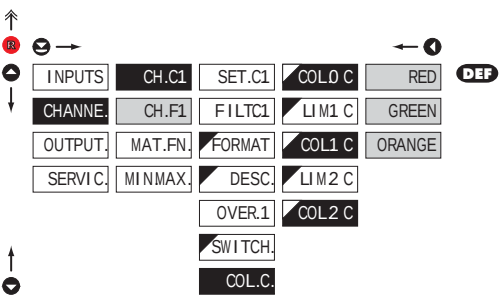
FILTER "Channel 1" after being processed by digital filter will be displayed

CHAN÷ F. "Channel 1" will be displayed followed by "Channel 1" after being processed by digital filter

!

Setting is identical for "CH. F.1"

6.2.1i SELECTION OF DISPLAY COLOR FOR CHANNEL COUNTER



COL.C Selection of display color

- the color selection is governed by setting under items "LIM.1 C." and "LIM.2 C."

RED Red color

GREEN Green color

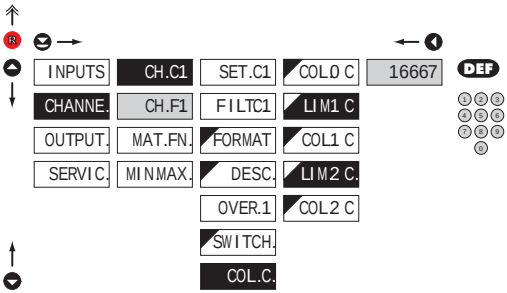
ORANGE Orange color

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

!

If the instrument is in the Hi Brightness LEDs execution, this menu item is not accessible

6.2.1j SELECTION OF DISPLAY COLOR CHANGE FOR CHANNEL COUNTER



LIM1 C **Selection of display color change**

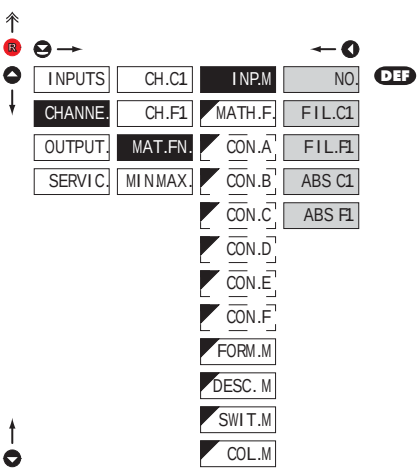
- under items "**LIM.1 C**" and "**LIM.2 C**" the limit is set for the time when the display color shall change

- "LIM.1 C" DEF = 16667
- "LIM.2 C" DEF = 33333

!

If the instrument is in the Hi Brightness LEDs execution, this menu item is not accessible

6.2.2a MATHEMATICAL FUNCTIONS - INPUT SELECTION

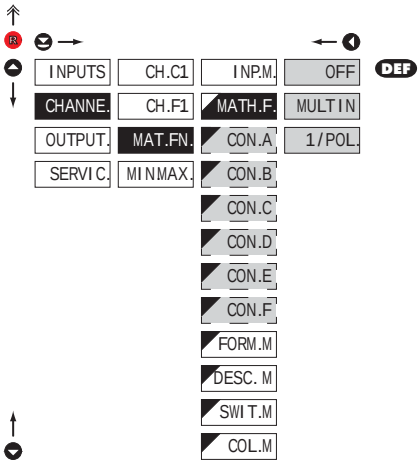


INP.M **Selecting the channel to be processed by mathematical function**

- selecting the value from which the mathematical function will be calculated

NO	Mathematical functions are off
FIL.C1	From channel 1 - counter after digital filter
FIL.F1	From channel 1- frequen. after digital filter
ABS C1	The absolute value of the channel counter
ABS F1	The absolute value of the channel frequency

6.2.2b MATHEMATIC FUNCTIONS



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

OFF Mathematic functions are off

MULTIN Polynom

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

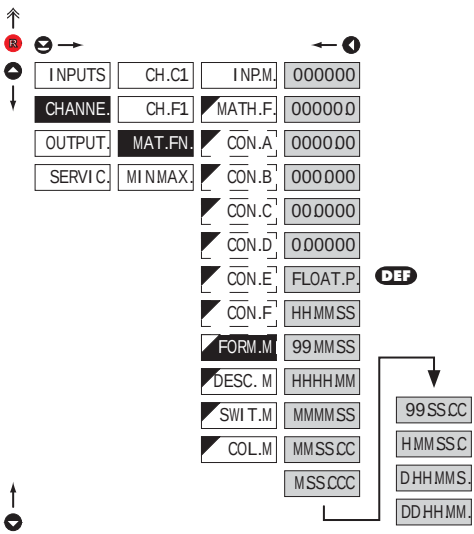
1/MUL 1/x

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

CON. - Setting constants for calculation of mat.functions

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

6.2.2c MATHEMATIC FUNCTIONS - DECIMAL POINT



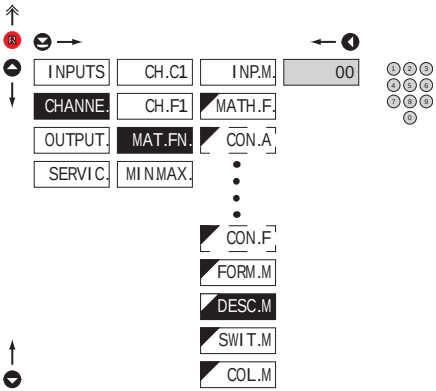
FORM.M **Selection of decimal point**

- the instrument can project numbers in a standard way incl. the decimal point, time formats and also floating decimal point which ensures the most accurate value projection when „**FLOA. P.**" is selected

Abbreviations

- "FLOA. P." > floating decimal point
- "D." > day
- "H." > hour
- "M." > minute
- "S." > second
- "C." > hundredth of a second

6.2.2d MATHEMATIC FUNCTIONS - MEASURING UNITS



DESC. M **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 = 00 (no description)

!

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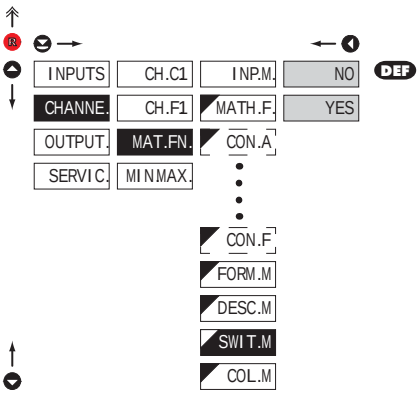
6.2.2e MATHEMATIC FUNCTIONS - SELECTION OF CHANNEL PROJECTION UPON SWITCHING



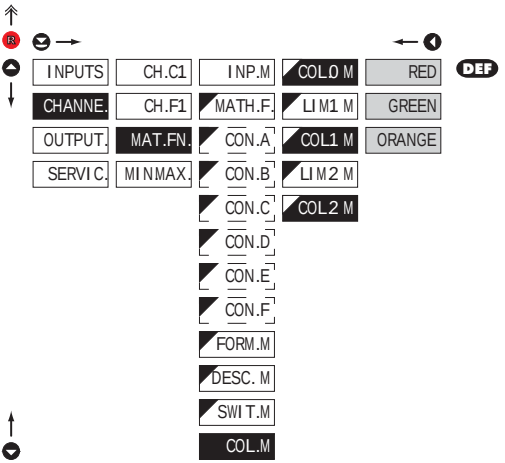
SWIT.M **Selection of channel rojection upon switching**

- setting in this item enables the user to select individual measuring channels which will be displayed upon switching the channel functions „SWIT. M"

NO — Projection permitted

YES — Projection restricted

6.2.2f MATHEMATIC FUNCTIONS - SELECTION OF DISPLAY COLOR



COL.M **Selection of display color**

- the color selection is governed by setting under items "**LIM.1 M**" and "**LIM.2 M**"

RED — Red color

GREEN — Green color

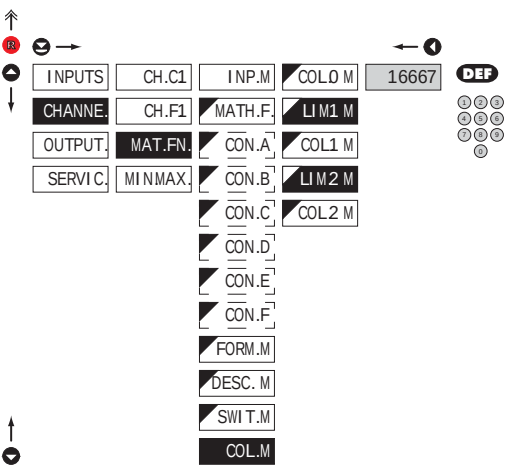
ORANGE — Orange color

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

!

If the instrument is in the Hi Brightness LEDs execution, this menu item is not accessible

6.2.2g MATHEMATIC FUNCTIONS - SELECTION OF DISPLAY COLOR CHANGE



LI M1 M **Selection of display color change**

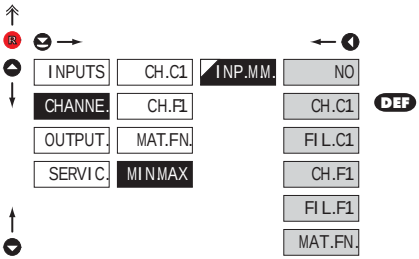
- under items "**LIM.1 M**" and "**LIM.2 M**" the limit is set for the time when the display color shall change

- "LIM.1 M" DEF = 16667
- "LIM.2 M" DEF = 33333

!

If the instrument is in the Hi Brightness LEDs execution, this menu item is not accessible

6.2.3 SELECTION OF EVALUATION OF MIN/MAX VALUE

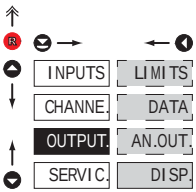


INP.MM. Selection of evaluation of min/max value

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

NO	Evaluation of min/max value is off
CH.C1	From "Channel 1" counter
FIL.C1	From "Channel 1" counter, after digital filters processing
CH.F1	From "Channel 1" frequency
FIL.F1	From "Channel 1" frequency, after digital filters processing
MAT.FN.	From "Mathematic functions"

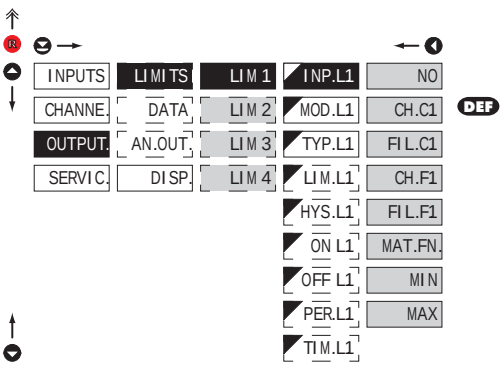
6.3 SETTING „PROFI" - OUTPUTS



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

- **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 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
- **CH.C1** From "Channel 1" counter
- **FIL.C1** From "Channel 1" counter, after digital filters processing
- **CH.F1** From "Channel 1" frequency
- **FIL.F1** From "Channel 1" frequency, after digital filters processing
- **MAT.FN.** From "Mathematic functions"
- **MIN.** From "Min. value"
- **MAX** From "Max. value"

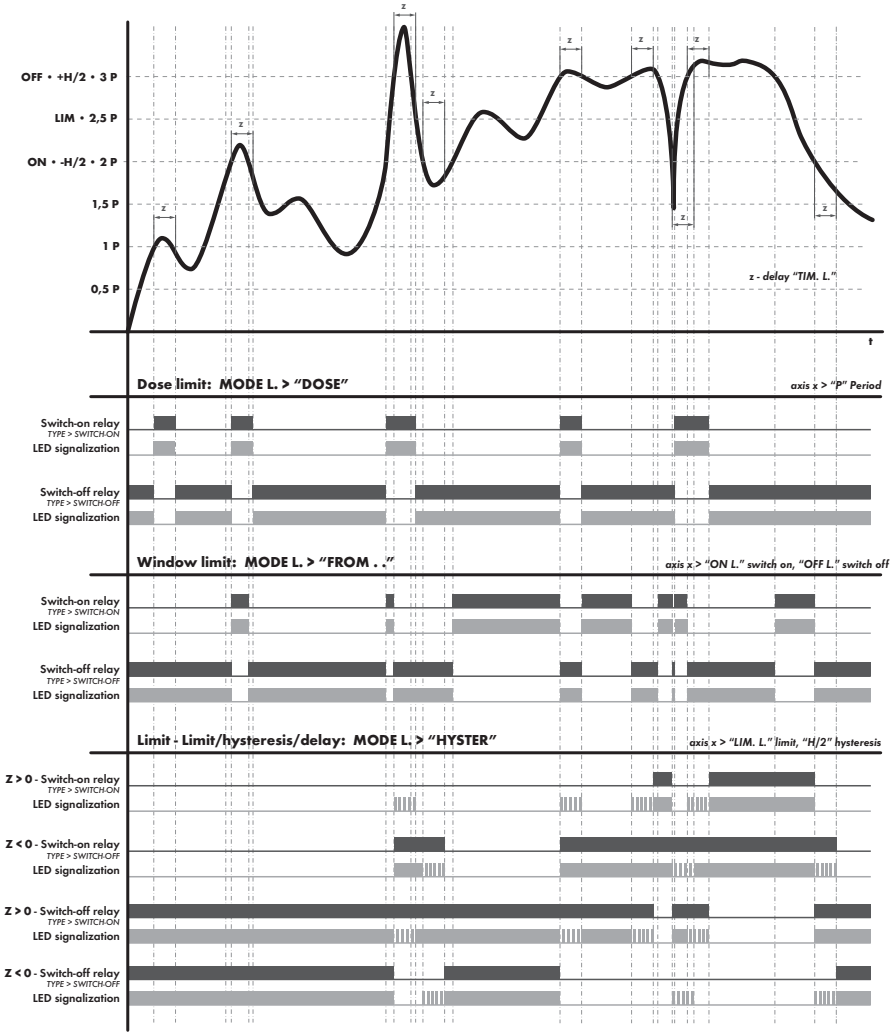
!

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

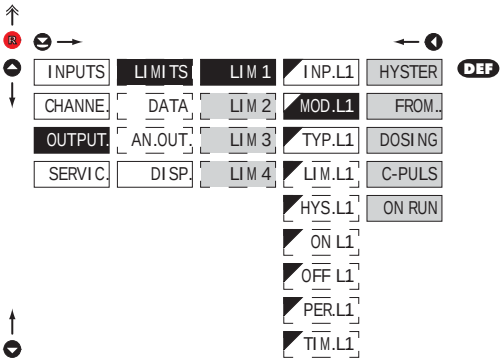
!

If you require the relay to react to the change of the measured value immediately, select no filtration. This way the value is evaluated dicetly in the gate array.

DESCRIPTION OF RELAY FUNCTION



6.3.1b SELECTION OF TYPE OF LIMIT



!

Dose limit puts a heavy burden on the µP and therefore we do not recommned using it at frequencies exceeding 25 kHz

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

C.-PULS. Automatic zeroing of the counter at a preset value and a generating an impulse of duration set in "**TIM. L.1**"*

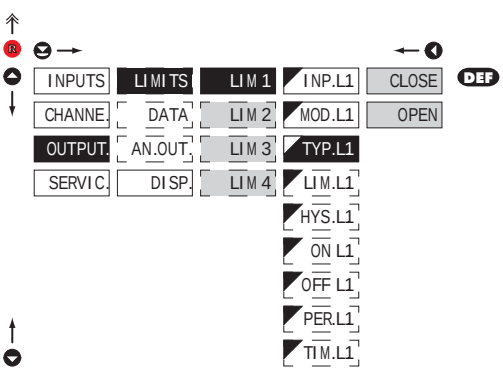
ON RUN Relay si closed/opened while the stopwatch is running*

!

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

* only for "fast limits"

6.3.1c SELECTION OF TYPE OF OUTPUT



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

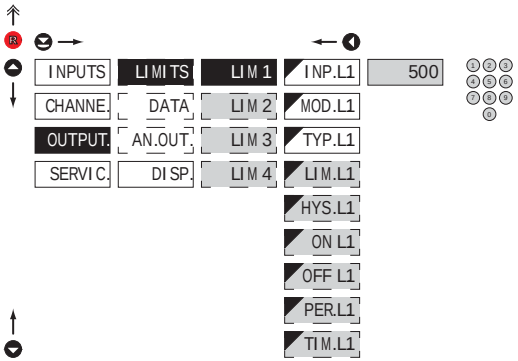
CLOSE Output switches on when condition is met

OPEN Output switches off when condition is met

!

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

6.3.1d SETTING VALUES FOR LIMITS EVALUATION



LI M.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**"

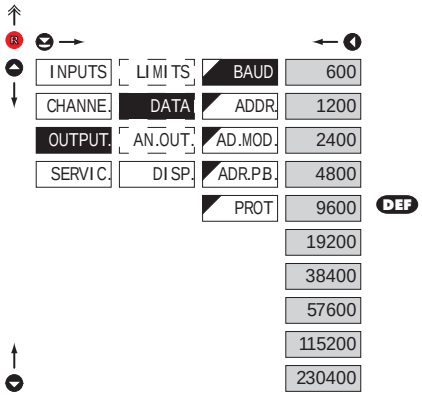
TI M.L1 Setting the time switch-on of the limit

- for type "**HYSTER**", "**DOSE**" and „**C-PULS**"
- setting within the range: ±0...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**)
- in mode „**DOSING**" relay switches on at preset value (**PER. L.1**) and the duration of the switch-on (**TIM. L.1**) determines its next function. If the time is zero, then the state will change permanently (until next period), if the time is set for a non zero value, the switch-on will only last for the selected duration

!

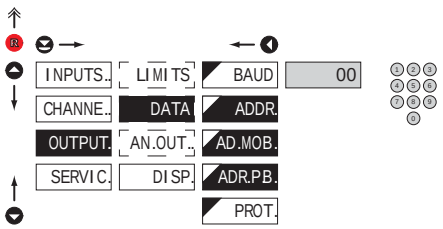
Setting is identical for **LIM 1**, **LIM 2**, **LIM 3**, and **LIM 4**

6.3.2a SELECTION OF DATA OUTPUT BAUD RATE



BAUD	**Selection of data output baud rate**
600	600 Baud
1200	1 200 Baud
2400	2 400 Baud
4800	4 800 Baud
9600	9 600 Baud
19200	19 200 Baud
38400	38 400 Baud
57600	57 600 Baud
115200	115 200 Baud
230400	230 400 Baud

6.3.2b SETTING INSTRUMENT ADDRESS



ADDR. **Setting instrument address**

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

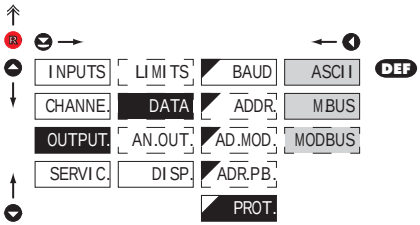
AD.MOB. **Setting instrument address - MODBUS**

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

ADR.PB. **Setting instrument address - PROFIBUS**

- setting in range: 1...127
- DEF = 19

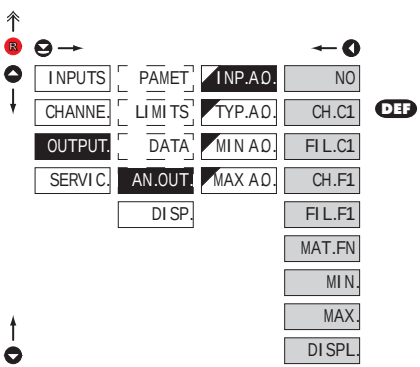
6.3.2c SELECTION OF DATA OUTPUT PROTOCOL



PROT.	**Selection of the type of analog output**
ASCI	Data protocol ASCII
M.BUS	Data protocol DIN MessBus
MODBUS	Data protocol MODBUS-RTU

- option is available only for RS 485

6.3.3a SELECTION OF INPUT FOR ANALOG OUTPUT

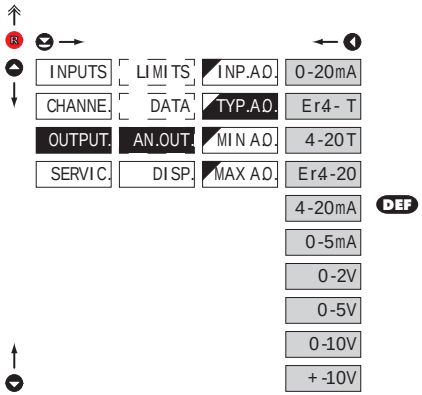


INP.AO.	**Selection of source for analogue output**

- selecting the value, on which the analogue output is based

NO	Analogue output is off
CH.C1	From ch. 1 - counter
FIL.C1	From ch. 1 - counter after digital filter
CH.F1	From ch. 1 - frequency
FIL.F1	From ch. 1 - frequency after digital filter
MAT.FN.	From "Matematical function"
MIN.	From "Min. value"
MAX.	From "Max. value"
DISPL.	From "Permanently projected display value"

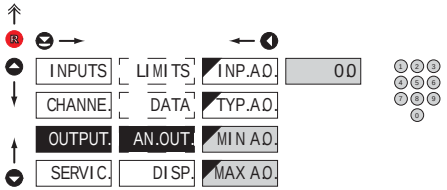
6.3.3b SELECTION OF THE TYPE OF ANALOG OUTPUT



TYP.AO. Selection of the type of analog output

- **0-20mA** Type: 0...20 mA
- **Er4- T** Type: 4...20 mA with indication
  - with broken loop detection and indication of error statement (< 3,6 mA)
- **4-20 T** Type: 4...20 mA with indication
  - with broken loop detection (< 3,6 mA)
- **Er4-20** Type: 4...20 mA with indication
  - with indic. of error statement (< 3,6 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

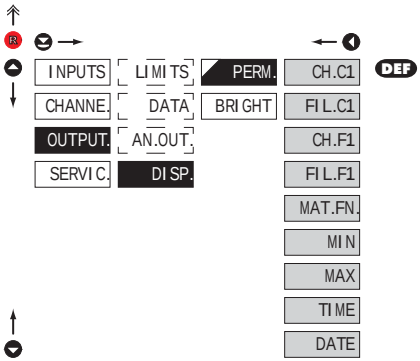
MIN AO. Assigning the display value to the beginning of the AO range

- setting in range: -99999...999999
- DEF = 0

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

- setting in range: -99999...999999
- DEF = 1000

6.3.4a SELECTION OF INPUT FOR DISPLAY PROJECTION



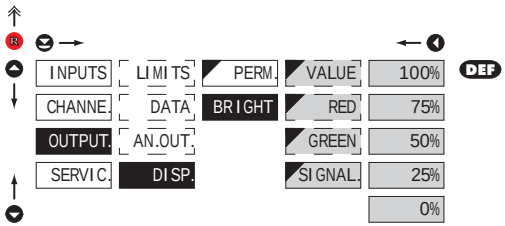
PERM. Selection display projection

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

CH.C1	Channel 1 - Counter
FI L.C1	Channel 1 - Counter, after digital filters processing
CH.F1	Channel 1 - Frequency
FI L.F1	Channel 1 - Frequency, after digital filters processing
MAT.FN.	"Math. functions"
MI N.	"Min. value"
MAX.	"Max. value"
TI ME	"Time"
DATE	"Date"

- display switches between date/time in ratio of 2/13 s

6.3.4b 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

VALUE Brightness for display

- only for Hi brighness LEDs

RED Brightness for red colour

- only for 3-color 7 segmen display

GREEN Brightness for green colour

- only for 3-color 7 segmen display

SIGNAL Brightness LEDs for signaling

0% Display is off

- after keystroke display turns on for 10 s

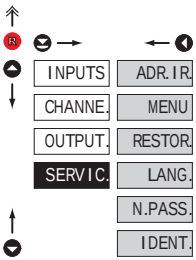
25% Display brightness - 25%

50% Display brightness - 50%

75% Display brightness - 75%

100% Display brightness - 100%

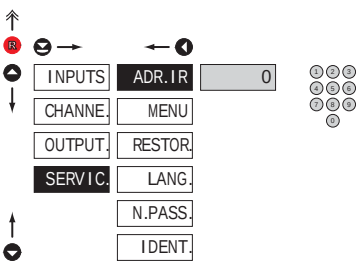
6.4 SETTING "PROFI" - SERVICE



The instrument service functions are set in this menu

ADR.IR.	Setting the address of IR remote 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
IDENT.	Instrument identification

6.4.1 SETTING THE ADDRESS OF IR REMOTE CONTROL

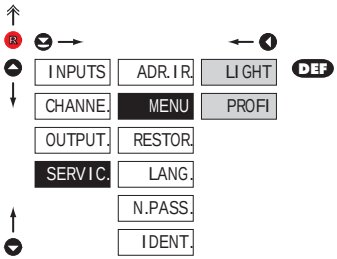


ADR.IR **Setting the address of IR remote control**

- setting the remote control address is inevitable only in case there are other large displays OMD 202 within the reach of IR remote control
- range of the address setting is 0...99
- it is possible to cancel the address by pressing the blue button on the remote control

- **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

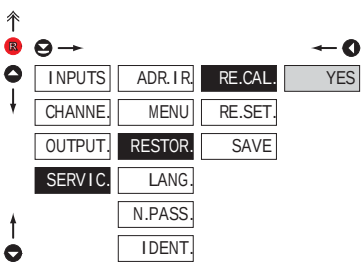
PROFI Active PROFI menu

- 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

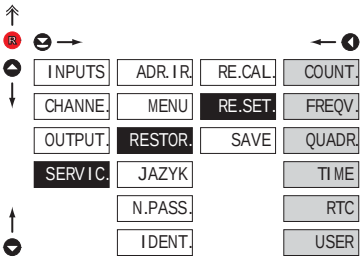


RESTOR. **Restoration of manufacture setting**

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

RE.CAL. Restoration of manufacture calibration of the instrument

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



RE.SET. Restoration of instrument manufacture setting

- reading of factory calibrations and default menu item setting (DEF)
- by selecting desired settings interconnected items change as well, (source for relay evaluation, analogue output, Mathematical functions, ...)

COUNT	Manufacturer setting for counter
FREQU.	Manufacturer setting for frequency
QUADR.	Manufacturer setting for IRC encoders
TIME	Manufacturer setting for clock/timer
RTC	Manufacturer setting for RTC
USER	Restoration of instrument user setting

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

SAVE	Save instrument user setting

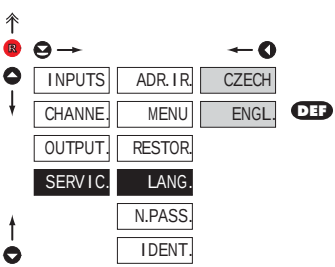
- storing the user setting allows the operator to restore it in future if needed

!

After restoration the instrument switches off for couple seconds

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

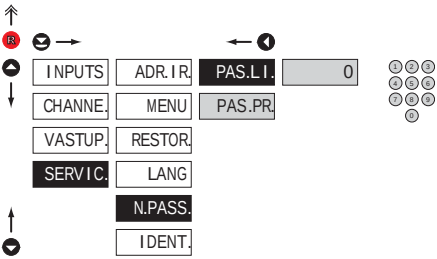
6.4.4 SELECTION OF INSTRUMENT MENU LANGUAGE VERSION



LANG. Selection of instrument menu language version

CZECH	Instrument menu is in Czech
ENGL.	Instrument menu is in English

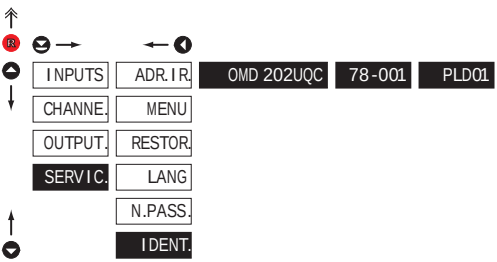
6.4.5 SETTING NEW ACCESS PASSWORD



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



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

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

SETTING
USER

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

7.0 SETTING ITEMS INTO "USER" MENU

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

SHOW item will be solely displayed in USER menu

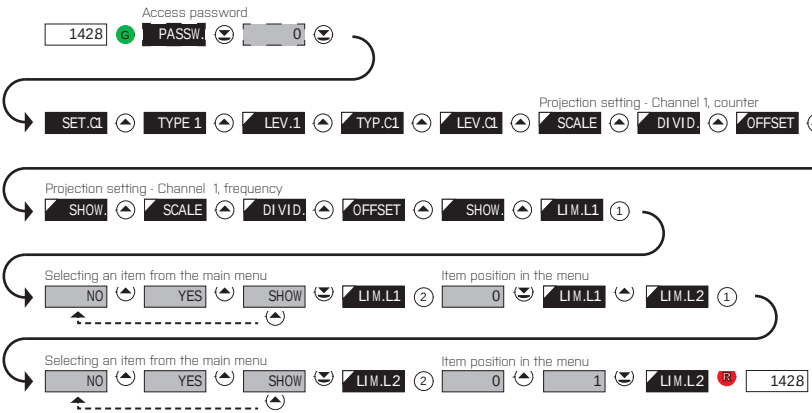
Setting sequence of items in "USER" menu

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

setting projection sequence

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

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



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

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

8. DATA PROTOCOL

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

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

The transfer rate is adjustable in the instrument menu. The instrument address is set in the instrument menu in the range of 0 ÷ 31. The manufacture setting always presets the ASCII protocol, rate of 9600 Baud, address 00. The type of line used - RS232 / RS485 - is determined by an output board automatically identified by the instrument.
The commands are described in specifications you can find at www.orbit.merret.cz

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) (D) <CR>
		MessBus	<STX> D (D) (D) (D) (D) (D) (D) (D) (D) (D) (D) <ETX> <BCC>
	485	ASCII	> D (D) (D) (D) (D) (D) (D) (D) (D) (D) (D) <CR>
		MessBus	<STX> D (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) (D) <CR>
		MessBus	<STX> $ N P (D) (D) (D) (D) (D) (D) (D) (D) <ETX> <BCC>
	485	ASCII	# A A N P (D) (D) (D) (D) (D) (D) (D) (D) <CR>
		MessBus	<STX> $ N P (D) (D) (D) (D) (D) (D) (D) (D) <ETX> <BCC>
Command confirmation (instrument)	232	ASCII OK	! A A <CR>
		ASCII Bad	? A A <CR>
		Messbus	No - data is transmitted permanently
	485	ASCII OK	! A A <CR>
		ASCII Bad	? A A <CR>
		Mess-Bus OK	<DLE> 1
		Mess-Bus Bad	<NAK>
Instrument identification			# A A 1 Y <CR>
HW identification			# A A 1 Z <CR>
One-time transmission			# A A 7 X <CR>
Repeated transmission			# A A 8 X <CR>

LEGEND

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

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"

9. ERROR STATEMENTS

ERROR	CAUSE	ELIMINATION
CH.DPo.	Number is too small (large negative) to be displayed	change DP setting, channel constant setting
CH.DPr.	Number is too large to be displayed	change DP setting, channel constant setting
CH.TPo.	Number is outside the table range	increase table values, change input setting (channel constant setting)
CH.TPr.	Number is outside the table range	increase table values, change input setting (channel constant setting)
CH.VPo.	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
CH.VPr.	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
CH. HW.	A part of the instrument does not work properly	send the instrument for repair
CH. EE	Data in EEPROM corrupted	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
CH.NAS.	Data in EEPROM outside the range	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
CH.SMA.	Memory was empty (presetting carried out)	upon repeated error statement send instrument for repair, possible failure in calibration
CH.VYS.	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	{	|	}	~	

11. TECHNICAL DATA

INPUT

Number:	1 input
Type:	upon contact, TTL, NPN/PNP, „Line", SSI
Measurement:	counter/frequency UP or DOWN duty cycle counter/frequency UP/DOWN counter/frequency for IRC encoders timer/clock
Input frequency:	0,001...1 MHz (< 100 kHz for duty cycle measurement)
Voltage levels:	10 mV - 0,8 V(amplified - only input A1, (B1)) 0,8 V - 60 V
Reaction time:	inputs react approx 3 s after instrument's switch-on

ZOBRAZENÍ

Display:	999999, digit height 57, 100 or 125 mm - 3-colour 7 segment LED display red/green/orange - high brightness LEDs, red or green (1300 mcd)
Projection:	-999...9999 or -99999...999999
Decimal point:	adjustable - in menu
Brightness:	adjustbale - in menu

INSTRUMENT ACCURACY

TC:	50 ppm/°C
Accuracy:	±0,01% of range + 1 digit (Frequency)
Time base:	0,05 s...15 min.
Multiplication const.:	-99999....999999
Division constant:	-99999....999999 -function RPM measurement in mode „Frequency"
Filtration constant:	helps to set max. valid frequency, which is processed (OFF/10 minutes...1 MHz)
Blocking measur.:	blocking/extending input pulse up to 120 s
Filter type:	digital
Offset:	-99999...999999
Data back up:	storing measured data after the instrument is switched off (EEPROM)
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
RTC:	time back up by the means of a battery used when the power supply is off (possible to turn off - jumper inside instrument) minimal lifespan 1 year
Baterie:	Lithium battery CR 2032RV, 3V/220 mAh
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.

COMPARATORS

Type:	digital, adjustable in menu
Contact switch:	< 10 ms < 50 µs (without filtration)
Mode:	Hysteresis, From, Dose, C-Puls, Run
Limita:	-99999...999999
Hysteresis:	0...999999
Delay:	0...99,9 s
Výstupy:	4x relé se spínacím kontaktem (Form A) (250 VAC/30 VDC, 3 A)*
Relé:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

DATA OUTPUTS

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

ANALOGUE OUTPUTS

Type:	isolated, programmable with 12 bits D/A convertor, analog output corresponds with displayed data, type and range are adjustable
Non-linearity:	0,1% of range
TC:	100 ppm/°C
Rate:	response to change of value < 1 ms
Voltage:	0...2 V/5 V/10 V/± 10V
Curernt:	0...5/20 mA/4...20 mA - compensation of conduct to 500 Ohm/12 V or 1 000 Ohm/24 V - broken loop detection

EXCITATION

Adjustable:	5...24 VDC/max. 1,2 W, isolated

* values apply for resistance load

POWER SUPPLY

Options:	10...30 V AC/DC, 27 VA, isolated PF ≥ 0,4, I_{STP}> 75 A/2 ms fuse inside (T 4000 mA) 80...250 V AC/DC, 27 VA, isolated PF ≥ 0,4, I_{STP}> 45 A/2 ms fuse inside (T 630 mA)

MECHANICAL PROPERTIES

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

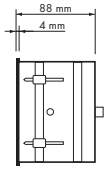
OPERATING CONDITIONS

Connection:	connector terminal board, conductor cross--section <1,5 mm^2 /<2,5 mm^2
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 data/ analog output 4 kVAC after 1 min between supply and relay output 2,5 kVAC after 1 min between supply and data/ analog output
Insulation resistan.:	for pollution degree II, measurement category III instrum.power supply > 670 V (PI), 300 V (DI) Input/output > 300 V (PI), 150 (DI)
EMC:	EN 61326-1

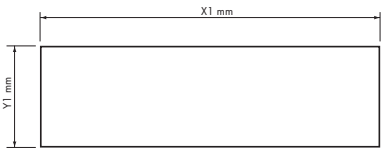
PI - Primary insulation, DI - Double insulation

Front view

Side view



Panel cutout

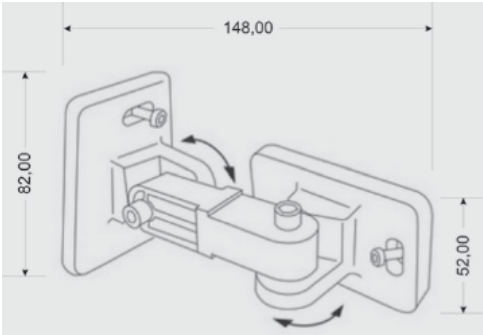


Panel thickness: 0,5 ... 50 mm

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

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 202UQC**
Type	. . . . .
Manufacturing No.	. . . . .
Date of sale	. . . . .

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

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

The guarantee shall not apply to defects caused by:

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

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

Stamp, signature

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

Product: Programmable panel instrument

Type: **OMD 202**

Version: UNI, PWR, UQC

Thas been designed and manufactured in line with requirements of:

Statutory order no. 17/2003 Coll., on low-voltage electrical equipment (directive no. 73/23/EHS)
Statutory order no. 616/2006 Coll., on electromagnetic compatibility (directive no. 2004/108/EHS)

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, chap. 14 and chap. 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, chap. 5 and chap. 6

The product is furnished with CE label issued in 2001.

As documentation serve the protocoles of authorized and accredited organizations:

EMC
MO CR, Prague, Testing institute of technical devices, protocol no.: 08-041/2001 of 24/11/2001
MO CR, Vyskov, Testing institute of technical devices, protocol no.: 730-325/2001 of 02/05/2001
MO CR, Vyskov, Testing institute of technical devices, protocol no.: 730-350/2001 of 07/05/2001
MO CR, Vyskov, Testing institute of technical devices, protocol no.: 730-372/2001 of 02/05/2001
MO CR, Vyskov, Testing institute of technical devices, protocol no.: 730-934/2001 of 20/11/2001

Place and date of issue: Prague, 19. Juli 2010

Miroslav Hackl
Company representative

Assessment of conformity pursuant to §22 of Act no. 22/1997 Coll. and changes as amended by Act no.71/2000 Coll. and 205/2002 Coll