OM 653UQC

6 DIGIT PROGRAMMABLE

IMPULSE COUNTER/FREQUENCY METER
STOPWATCH/TIMER

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 OM 653 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 Prague 9
Czech Republic

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

2.1 Description

The OM 653UQC model is a universal 6 digit panel programmable impulse counter/frequencymeter and stopwatch/timer. The instrument is based on an 8-bit microprocessor, which secures high accuracy, stability and easy operation of the instrument.

Measuring modes

SINGLE	Counter/Frequencymeter	C / F
QVADR	Counter/Frequencymeter for IRC sensors	C / F
UP/DW	UP/DW Counter/Frequencymeter	C / F
	- used in inputs A, C (direction) and can display count/frequency	
UP - DW	UP - DW Counter/Frequencymeter	C / F
	- used in inputs A (UP), C (DW) and can display count/frequency	
TIME	Stopwatch	H
RTC	Timer	H
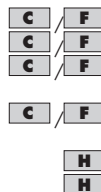
PROGRAMMABLE PROJECTION

Calibration	calibration coefficient may be set in „CM" independently for every channel
Projection	-99999...999999 with fixed or floating DP, for measuring modes STOPWATCH/TIMER with the option of setting in format 10/24/60
Measuring channels	two independent functions may be evaluated from each input (Counter/Frequency)
Time base	0,5/1/5/10 s

DIGITAL FILTERS

Input filter	the instrument enables filtering the input signal and thus suppress unwatnted interfering signals (e.g. relay backswings). The parameter set gives maximum feasible measured frequency processed by the instrument, 5/40/100/1 000 Hz
Exponen.average	from 2...100 measurements
Rounding	setting projection step for display

LINEARIZATION

Linearization	by linear interpolation in 25 points (solely via OM Link)
	- a single table for frequency, alternativly for for counting pulses when frequency not used

FUCTIONS

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 interface for control, setting and instrument update

EXTERNAL CONTROL

Hold	display/instrument blocking
Lock	locking the control keys for access into Configuration menu
Resettting	resetting/pre-setting the counter
Tare	tare activation
Start/Stop	stopwatch/timer control

2.2   Operation

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

LIGHT   **Simple programming menu**
- contains only items necessary for instrument setting and is protected by an optional numeral code

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

USER   **User programmable menu**
- may contain arbitrary items selected from programmable menu (LIGHT/PROFI), which determines the authorization (see or change)
- access is without password

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

OMLI**NK**   Complete operation and setting of the instrument may be performed via communication interface OM Link, which is a standard equipment of every instrument.
The operation program is freely available (www.orbit.merret.cz) and the only requirement is the purchase of OML cable for connecting 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 for OML cable).
The OM LINK program version „Standard" allows you to connect an unlimited number of instruments with the option of visualizatiion and storage in PC.

2.3   Extension

Excitation is suitable for feeding sensors and converters. It has a galvanic isolation.
Comparators are assigned to control two limit values with relay output. The modes: „Hysteresis" / „Zero and pulse" can be asigned by user to the first relay and for the second relay it is starting the stopwatch/clock. The limits have adjustable hysteresis as well as selectable delay of the switch-on. 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 measured data for further projection or directly into the control systems. We offer an isolated RS232 and RS485 with the ASCII protocol.
Analog outputs will find their place in applications where further evaluating or processing of measured data in external devices is required. We offer a universal analog output with the option of selection of output type - voltage/current. The value of analog output corresponds with the displayed data and its type and range are selectable in the programming mode.
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).

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.
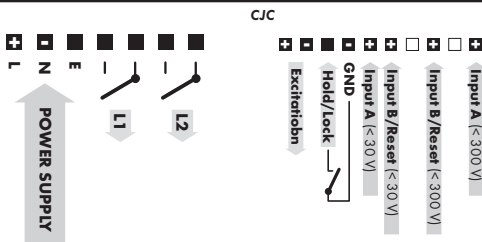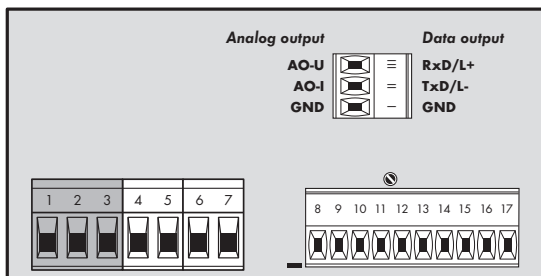
> **!**
>
> Grounding on bracket „E" has to connected at all times

> **!**
>
> 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.

CONNECTION

	Description	Connection
Input A (< 30 V)	input signal < 43 V (absolute 60 V)	GND + Input A (< 30 V)
Input A (< 300 V)	input signal < 300 V	GND + Input A (< 300 V)
Input B/Reset (< 30 V)	input signal < 43 V	GND + Resetting (< 30 V)
Input B/Reset (< 300 V)	input signal < 300 V	GND + Resetting (< 300 V)

Function	Description	Control
Optional	According to setting in Menu (see Menu > EXT. IN., p. 46)	upon contact, bracket (no. 11/12)

FUNCTIONS OF INPUTS ACCORDING TO SELECTED MODE

Mode	Description	Functions of inputs
SINGLE	Pulse counter/Frequency counter	Input A, Reseting (Input B)
QUADR.	Pulse counter/ Frequency counter for IRC sensors	Input A + Input B, Reseting is possible on terminal 10
UP/DW	UP or DW Pulse counter/Frequency counter	Input A, Input B - determines direction (Hi = UP, Lo = DW) Reseting is possible on terminal 10
UP-DW	UP/DW Pulse counter/Frequency counter	Input A (UP), Input B (DW), Reseting is possible on terminal 10
TIME	Stopwatch Clock	Input A, Reseting (Input B)
RTC	Stopwatch Clock with time back up	Input A, Reseting (Input B)

Sensor connection

2-wire sensors

3-wire sensors
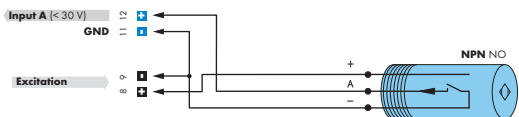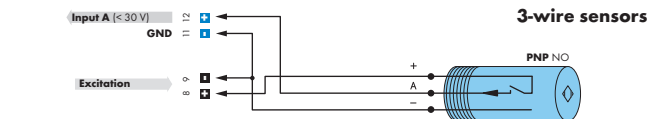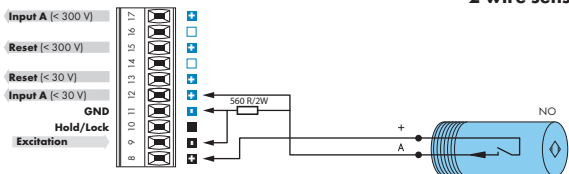
contact

Table of comparation levels

Input	Type of input	Maximum input voltage (Level A, C)	Maximum comparation levels	
			L > H	H > L
Input A Resetting (< 30 V)	NPN, Contact	xxx	0,5 V	4,5 V
	PNP	9,7 V	0,5 V	4,5 V
	PNP	14,4 V	1,0 V	9,0 V
	PNP	19,2 V	1,5 V	13,3 V
	PNP	23,9 V	2,0 V	17,8 V
	PNP	28,7 V	2,5 V	22,1 V
	PNP	33,5 V	3,0 V	26,6 V
	PNP	38,3 V	3,4 V	31,0 V
	PNP	43,0 V	3,9 V	35,5 V
Input A Resetting (< 300 V)	NPN, Contact	!!! prohibited !!!		
	PNP	84 V	4,9 V	39,8 V
	PNP	128 V	9,2 V	78,0 V
	PNP	170 V	13,6 V	117,8 V
	PNP	211 V	17,8 V	156,0 V
	PNP	253 V	22,3 V	195,8 V
	PNP	295 V	26,5 V	234,1 V
	PNP	301 V	30,9 V	273,9 V

SETTING | PROFI

profi

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

SETTING | LIGHT

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

profi *light*

user

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

4.1 Setting

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

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

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

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

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

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

The operation program is freely accessible (www.orbit.merret.cz) and the only requirement is the purchase of OML cable to connect the instrument to PC. It is manufactured in version RS 232 and USB and is compatible with all ORBIT MERRET instruments.

Another option for connection is with the aid of data output RS 232 or RS 485 (without the need of the OML cable).

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

Symbols used in the instructions

Indication of currantly displayed value (orange LED)

C   Counter
F   Frequency

Measured value (red/green LED)

Function (green LED)

M   Min/max. value
T   Tare

Relay status (red LED)
ON   the digit is lit
OFF the digit is not lit
OFF the digit is flashing
        limits with restriction
        (hysteresis, delay)
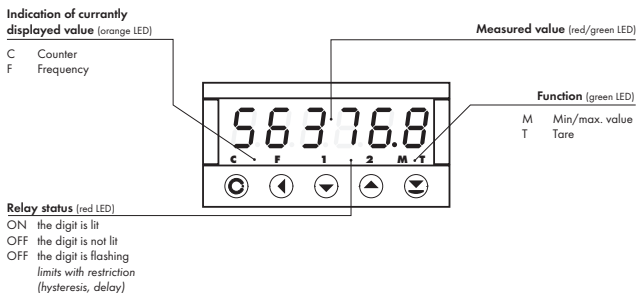
H   Indicates the setting for given type of instrument

DEF   values preset from manufacture

42   symbol indicates a flashing light (symbol)

Π ln   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
⟳	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
▲ + ▼			numeric value is set to zero
⟳ + ✉	access into LIGHT/PROFI menu		
⟳ + ▼	direct access into PROFI menu - temporary (remains LIGHT)		
✉ + ▲		confi guration of an item for "USER" menu	
✉ + ▼		determine the sequence of items in "USER - LIGHT" menu	

Setting items into „USER" menu

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

legend is flashing - current setting is displayed

| ⎯ --- | ✉ + ▲ | ▲ → ← ▼ nO YES SHO | ⟳ ✉ 🚫 💾 → | return to item --- |

nO   item will not be displayed in USER menu

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

SHO   item will be solely displayed in USER menu

5.0 Setting "LIGHT"

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

SETTING | LIGHT

- • **For capable users**
- • **Only items necessary for instrument setting**
- • **Password protected access**
- • **Possibility to arrange items of the „User" menu**
- • **Linear menu structure**

Preset from manufacture

Password	"0"
Menu	LIGHT
USR menu	off
Setting the items	**DEF**

Access password

`142.8` C + ⌄ `PASSw.` ⌄ `0` ⌄

Initial value

`SEt. U.` ⌄ `0` Measuring range `nOdE` ⌄ `SInGLE` ⌄ Input filter `FILtEr` ⌄ `OFF` ⌄

Mode - input

`n.StArt` ⌄ `COntACt` ⌄ Mode - reset `n.StOP` ⌄ `CLEAr` ⌄ **Only for Mode > TIME and RTC**

Type of inputs   Input A   Input B

`SEtt In.` ⌄ `A: nPn` ⌄ `b: nPn` ⌄

Multiplying constant   Dividing constant   Preset   Decimal point

`SCAL. C.` ⌄ `1` ⌄ `dLU. C.` ⌄ `1` ⌄ `OFFS. C.` ⌄ `0` ⌄ `FOrn. C.` ⌄ `00000.o` ⌄

Multiplying constant   Dividing constant   Preset   Decimal point

`SCAL. F.` ⌄ `1` ⌄ `dLU. F.` ⌄ `1` ⌄ `OFFS. F.` ⌄ `0` ⌄ `FOrn. F.` ⌄ `00000.o` ⌄

Option - Comparator

`InP. L.1` ⌄ `COUnt` ⌄ `LIn. L.1` ⌄ `25` ⌄ `InP. L.2` ⌄ `COUnt` ⌄ `LIn. L.2` ⌄ `75` ⌄

Option - Analog output

`InP. A.O.` ⌄ `COUnt` ⌄ `tYP A.u.` ⌄ `120` ⌄ `nIn A.u.` ⌄ `0` ⌄ `nAH A.u.` ⌄ `100` ⌄

Typ Menu   Menu type   Return to manufacture setting   Return to user setting

`InP. d.` ⌄ `COUnt` ⌄ `nEnU` ⌄ `LIGHt` ⌄ `FIrn.` ⌄ `YES` ⌄ `USEr` ⌄ `YES` ⌄

New password   Identification   Type of instrument   version SW   input   **Return to previous measuring mode**

`PAS. L.1` ⌄ `0` ⌄ `IdEnt.` ⌄ `YES` ⌄ `On 653UQC` `62-001` `SInGLE` ▶ `142.8`

!

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

`142.8`

©+⊻

`PRSS.` ⊻ → `0`   *Entering access password for access into the menu* → ⊻

`PRSS.` **Access into instrument menu**

PAS = 0
- access into menu is unrestricted, after releasing keys you automatically move to first item of the menu

PAS > 0
- access into menu is protected ny numeric code

Set "PASS." = 42   Example

`0` ⌃ `1` ⌃ `2` ◁ `02` ⌃ `12` ⌃ `22` ⌃

`32` ⌃ `42` ⊻ `SEt v.`

© ↗

`SEt v.` ⊻ → `0`   *Setting initial value* → ⊻

⌃

`SEt v.` **Setting initial value**

- the function allows the user a single-time setting of initial value of display projection
- the instrument is preset from manufacture into "FREQU." measuring mode and unless another mode is set the item remains hidden
- if you need to set initial value for another mode it is necessary to do so upon next access to programming menu > after

change of measuring mode
- setting "SET V." is a one-time operation unlike the "OFFSET" option, i.e. after resetting the display value is "0", provided there is no other value set in the "OFFSET" item

DEF = 0

Set "SET V." = 233   Example

`0` ⌃ `1` ⌃ `2` ⌃ `3` ◁ `03` ⌃ `13` ⌃

`23` ⌃ `33` ◁ `033` ⌄ `133` ⌄ `233` ⊻ `nOdE`

!

The item „SET V." is not projected for measuring mode „FREQU."
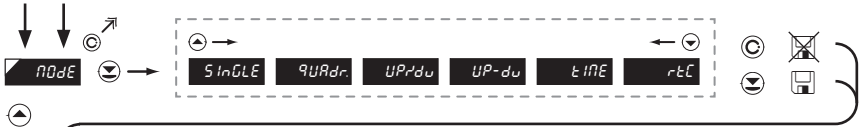
NOdE
Selection of instrument measuring mode

- elementary selection of instrument type

DEF = SINGLE

	Menu	Instrument mode
MODE	SINGLE	Counter/Frequencymeter
	QUADR.	Counter/Frequencymeter for IRC
	UP/DW	UP/DW - Counter/Frequencymet.
	UP-DW	UP/DW - Counter/Frequencymet.
	TIME	Stopwatch/timer
	RTC	Stopwatch/backup timer

- detail description of measuring modes is on p. 7 and 40

Selection of "RTC" mode *Example*

SInGLE ▸ rtC ▸ FILtEr

FILtEr
Selection of digital filter

- digital filter may suppress unwanted interfering impulses (e.g. relay backswings) on the input signal. The set parameter gives maximum possible frequency, which the instrument processes w/o limitation

- for pulse duty cycle of 50% - equal duration of Hi and Lo level"

DEF = OFF

In this setting the instrument will only register signal of max 100 Hz, highrer freuency will be discarted. *Example*
Filter > 100

OFF ▸ 1000 ▸ 100 ▸ tYPE A

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

Only for measuring mode
COUNT. · TIME · RTC

Only for measuring mode
TIME · RTC

COnt In.	COntAC.	EdGE	rUn.St.C. >
> C.rUn.St.	CL.rrUn	CL.rU.rE.	rUn

n.StArt

---

n.StArt **Selection of stopwatch/ timer control**

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

COnt In. 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

C.rUn.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

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

CL.rU.rE. 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 control > EdGE   Example

COntAC	▲	EdGE	▼	n.StOP

---

n.StOP

CLEAr	St.CLr.	StOP

n.StOP **Selection of stopwatch resetting**

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

DEF = CLEAR

CLEAr 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

CLEAr	▲	St.CLr	▼	LEuEL.A
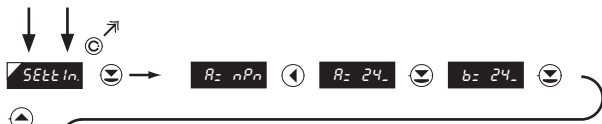
SEtt in. — Automatic setting of the inputs

`SEtt in.` ▼ → `A= nPn` ◀ `A= 24_` ▼ `b= 24_` ▼

SEtt in.   **Automatic setting of the inputs**

- it is posible to choose in the menu between automatic or manual setting for input A and B
- for automatic detection the minimum frequency required is 10 Hz

DEF = NPN.CON.

◀ start of automatic input setting
▼ manual input setting - down
▲ manual input setting - up
▼ confirm the setting and proceed to second input (short key stroke)
to copy the setting of Input A to Input B (long key stroke)

In this example application we are using encoder Wenglor, model IB040BM37VB, type PNP powered by the instrument's own excitation of 24 V, reset on contact. Settin. > Automatic setting (button „LEFT")

`A= nPn` ◀ `A= 24_` ▼ `b= nPn` ▼ `SCAL.C`

SCAL.C.

`SCAL.C.` ▼ → `1`   *Setting multiplying-constant* → ▼

SCAL.C.   **Setting multiplying constant - Channel 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: -0,00001...999999

- **DEF** = 1

Sensor is apllied to a shaft equipped with a rotating pin (1 imp./ot) and ratio of 1:3   *Example*

`1` ▼ `dLU.C`

dLU.C. ⊗ → 1   *Setting division constant* → ⊗

▲

d lu. C. | **Setting division constant - Channel Counter**

- calibration constant is for calculation of the input value to required display value
- range: -0,00001...999999

- **DEF** = 1

Sensor is apllied to a shaft equipped with a rotating pin (1 imp./ot) and ratio of 1:3 | *Example*

1 ▲ 2 ▲ 3 ⊗ | OFF.C

OFF.C. ⊗ → 0   *Setting PRESET* → ⊗

▲

OFF.C. | **Setting additive constant - PRESET, Channel Counter**

- offset of the measuring by a set value, which shall be loaded always upon instrument resetting
- range: -99999...999999
  (+ time formats)

- **DEF** = 0

Setting „PRESET" = 24 | *Example*

0 ▲ 1 ▲ 2 ▲ 3 ▲ 4 ◀ 04 ▲

14 ▲ 24 ⊗ | FO-n.C.

FOr-N. C.

F	C					
000000	00000.o	0000.oo	000.ooo	00.oooo	0.ooooo	FLOR. P.

H						
HH.NN.SS	99.NN.SS	HH.NN	HHHH.NN	NNNN.SS	NN.SS.CC	99.SS.CC	H.NN.SS.C
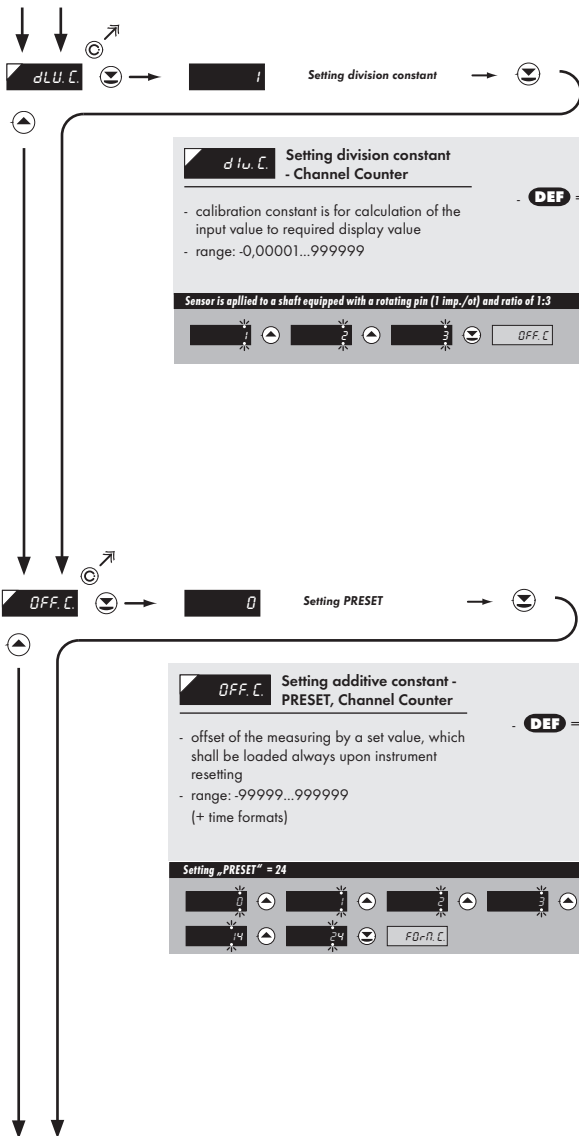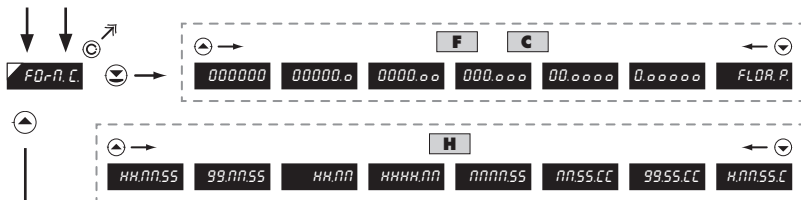
FOr-N. C. Selection of projection format - Channel Counter

- instrument enables classical projection of number with fixed position of decimal point as well as projection with floating allowing fo projection of number in its most precise form „FLOA. P."

- for measuring modes „TIME" and „RTC" special time formats are preset

DEF = 000000
DEF = HH.MM.SS [H]

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

000000	00000.o	SCAL. F.

SCAL. F.

1 → Setting multiplying-constant

SCAL. F. Setting multiplying constant - Channel Freque.

- 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: -0,00001...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*

1	2	3	4	5	05
95	85	085	0085	1085	2085
02085	002085	002085.	002085	0020.85	d iu. F.

`dLU.F.` → `1`   *Setting division constant*

Setting division constant - Channel Frequency

`d lu. F.`

- calibration constant is for calculation of the input value to required display value
- range: -0,00001...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, **dIuID. > 60**   *Example*

`1` `0` `00` `90` `80` `70`
`60` `OFF. F.`

`OFF.F.` → `0`   *Setting PRESET*

Setting additive constant - PRESET, Channel Freque.

`OFF. F.`

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

- **DEF** = 0

Setting „PRESET" = 24   *Example*

`0` `FO-N. F.`

◤
C ↗
F0-N.F. ⊻ →   (▲)→   F   C   ←(▼)

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

(▲)

C ⊠ (▼) 💾
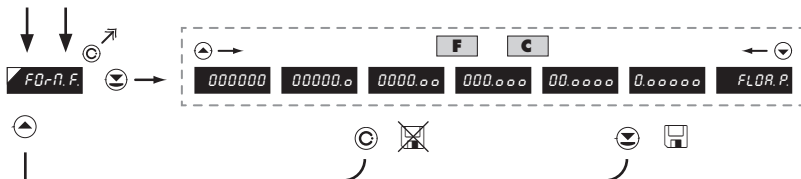
▰ F0-N.F.   **Selection of projection format - Channel Freque.**

- instrument enables classical projection of number with fixed position of decimal point as well as projection with floating allowing fo projection of number in its most precise form „FLOA. P."

DEF = 000000

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

000000 (▲) 00000.o (▼) InP.d   * subsequent menu item depends on instrument equipment

Only with option > **Dual Comparator**

InP. L.1 — Selection of how Limit 1 is evaluated

- selection of value to which the limit is related

DEF = COUNT.

COUnt. From "Channel Counter"

FrEq. From "Channel Frequency"

Evaluation of the limit related to channel "Counter" > INP. L.1= COUNT.   *Example*

L In. L.1 — Setting the boundary for limit 1

- range of the setting is -99999...999999 (+ time formats)
- presetting "Hysteresis"=0 "Delay"=0

- contingent change of hysteresis or offset of the switch-on may be performed in the PROFI menu

DEF = 25

Setting limit 1 > L 1 = 30   *Example*

!

Items for "Limits" and "Analog output" are accessible only if the instrument contains them.

InP.L.2

COUnt.   FrE9.

InP.L.2 — Selection of how Limit 2 is evaluated

- selection of value to which the limit is related

DEF = COUNT.

| COUnt. | From "Channel Counter" |
| FrE9. | From "Channel Frequency" |

Evaluation of the limit related to channel "Counter"   > INP. L.2= COUNT.   *Example*

COUnt.   →   L in. L.2

L in. L.2

75   *Setting the boundary for limit 2*
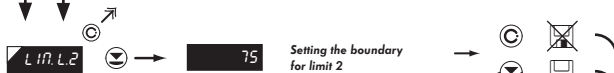
L in. L.2 — Setting the boundary for limit 2

- range of the setting is -99999...999999 (+ time formats)
- presetting "Hysteresis"=0 "Delay"=0

- contingent change of hysteresis or offset of the switch-on may be performed in the PROFI menu

DEF = 75

Setting limit 2 > L 2 = 230   *Example*

i00   i00   i i0   i20   i30   i30   230   nEnU

* following item of the menu depends on instrument equipment, provided it has an analog output the following item is „Type"

Only with option > **Dual Comparator**

Only with option > **Analog output**

InP. A.O.   →   COUnt.   FrEq.   C   ☒   💾

InP. A.O.   Selection of how analogue output is evaluated

- selection of value to which the analogue output is related

COUnt.   From "Channel Counter"

FrEq.   From "Channel Frequency"

DEF = COUNT.

Evaluation of analogue output from channel "Counter" > INP. A.O.= COUNT.   *Example*

COUnt   ⊻   tY. A.O

tY.A.O.   →   0-20nA   Er4-20   4-20nA   • • • •   0-5 u   0-10 u   +-10 u   C   ☒   ⊻   💾

tYP. A.O.   Setting the type of analog output   **DEF** = E 4

Menu	Range	Description
0-20nA	0...20 mA	
Er 4-20	4...20 mA	with indication of error statement (<3,6 mA)
4-20nA	4...20 mA	
0-5nA	0...5 mA	
0-2 u	0...2 V	
0-5 u	0...5 V	
0-10 V	0...10 V	
+10 u	±10 V	

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

4-20nA   ⊼   0-5nA   ⊼   0-2 u   ⊼   0-5 u   ⊼   0-10 u   ⊻   A.In. A.O.

Only with option > **Analog output**

Min. A.O.	→	0	Assigning the display value to the beginning of the AO range	→	C	⌧
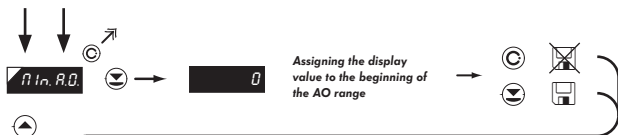
Min. A.O.	Assigning the display value to the beginning of the AO range	DEF = 0

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

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

0	MAX. A.O.

MAX. A.O.	→	100	Assigning the display value to the end of the AO range	→	C	⌧
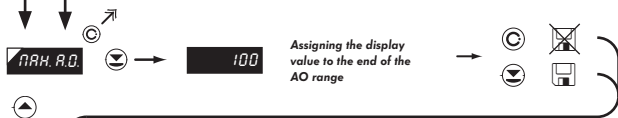
MAX. A.O.	Assigning the display value to the end of the AO range	DEF = 100

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

Display value for the end of the AO range > MAX. A.O. = 120 *Příklad*
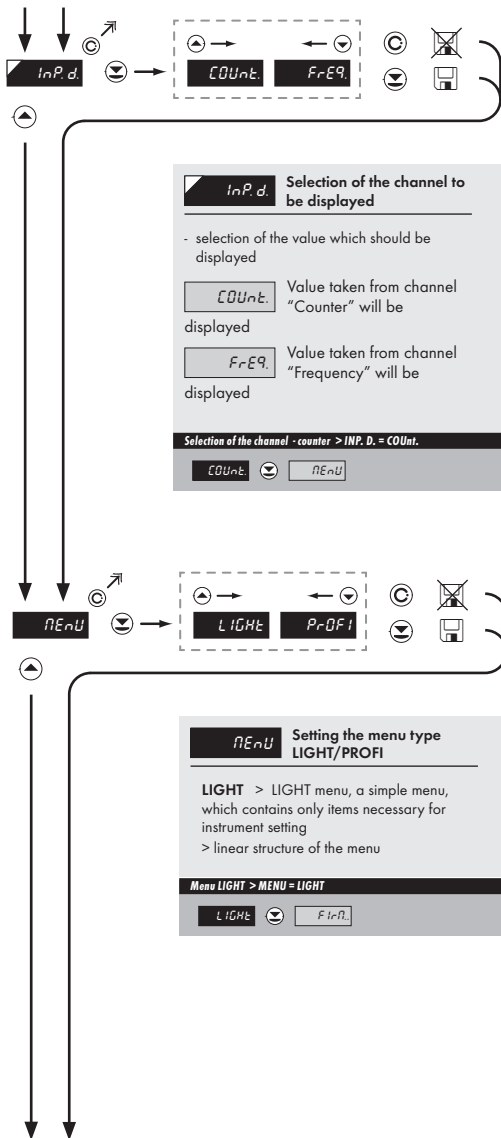
100	→	100	→	110	→	120	InP. d.

InP. d. Selection of the channel to be displayed

- selection of the value which should be displayed

COUnt. Value taken from channel "Counter" will be displayed

DEF = COUNT.

FrE9. Value taken from channel "Frequency" will be displayed

Selection of the channel - counter > INP. D. = COUnt.   *Example*

COUnt. ⊙ NEnU

NEnU Setting the menu type LIGHT/PROFI

LIGHT > LIGHT menu, a simple menu, which contains only items necessary for instrument setting
> linear structure of the menu

PROFI > PROFI menu, a complete menu for entire instrument setting
> tree structure of the menu

DEF = LIGHT

Menu LIGHT > MENU = LIGHT   *Example*

LIGHT ⊙ F ir.N.

FirΠ. ⊙→ → YES

Restoration of the instrument manufacture setting

- in case of incorrect setting or calibration it

is possible to return to manufacture setting. Prior execution of the changes you will be asked to confirm your selection (YES)
- reading the manufacture calibration and original setting of items in the menu

Restoration of manufacture setting   > FIRM.   *Example*

FirΠ.   YES   USEr

USEr ⊙→ → YES

Restoration of the instrument user setting

- downloading user setting of the instrument, i.e. setting which was stored under item SERVIC./RESTOR./SAVE

Restoration of user setting   > USER   *Example*

FirΠ.   YES   PAS.Li.

!

Do not perform restoration of user setting (USER) prior to its saving in Profi menu

`PAS. L I.` → `0` — *Setting new access password*

PAS. L I. Setting new access password

- access password for LIGHT menu
- range of the numeral code 0...9999
- when setting password to "0000" the

access into LIGHT menu is accessible without call for entering it
- in case of loss of password universal password "8177" may be used

DEF = 0

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

`0` ◀ `1` ▲ `01` ◀ `11` ▲ `21` ▲ `31` ▲
`41` ◀ `041` ▲ `41` ▲ `241` ▲ `341` ⬇ `IdEnt.`

`IdEnt.` → `YES` → *Instrument type* `OM 652`   *SW number* `62-`   *SW version* `001`   *setting the input type* `FrEqu.`
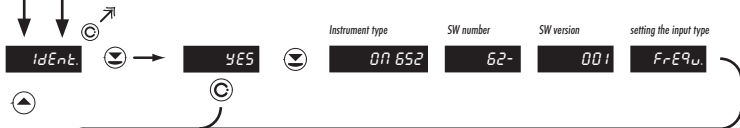
IdEnt. SW version of the instrument

- the display shows the type identification of the instrument, SW number, SW version and current input setting (Mode)

- if the SW version reads a letter on the first position, then it is a customer SW
- after the identification is completed the menu automatically quits the display and measuring mode is restored

`142.8` *Return to measuring mode*

6.0 Setting "PROFI"

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

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

Switching over to "PROFI" menu

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

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

6.1 Setting "PROFI" - INPUT
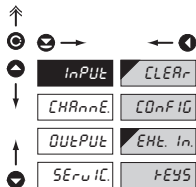
The basic instrument parameters are set in this menu

InPut	CLEAr	Resetting internal values
CHAnnE.	COnFIG	Primary instrument setting
OUtPUt	EHt. In.	Setting the external input function
SErvIC.	rEYS	Setting the ENTER key function

6.1.1 Resetting internal values
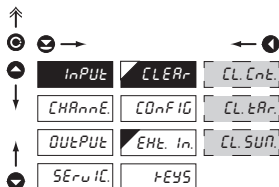
CLEAr Resetting internal values

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.SUn. Zeroing of the sum

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

6.1.2 Instrument configurtion
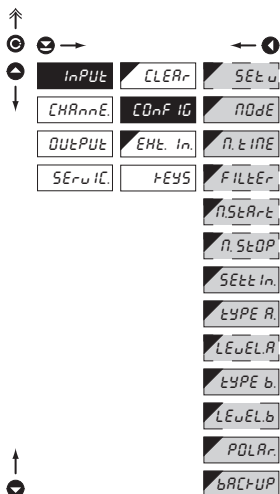
InPUt	CLEAr	SEt u.		**ConFiG** — Primary instrument setting
CHAnnE.	COnFiG	nOdE		SEt. u. — Setting the initial value
OUtPUt	EHt. In.	n. tinE		nOdE — Setting the instrument measuring mode
SEru iC.	HEYS	FiLtEr		n. tinE — Setting the time base
		n.StArt		FiLtEr — Setting the input filtration constant
		n. StOP		n.StArt — Setting the stopwatch control
		SEtt In.		n. StOP — Setting stopwatch resetting
		tYPE A.		SEtt In. — Automatic setting of the inputs
		LEuEL.A		tYPE - — Setting the type of input
		tYPE b.		LEuEL.- — Setting the input level
		LEuEL.b		POLAr. — Selection of active level/edge
		POLAr.		bACtUP — Setting data backup/time
		bACtUP		

6.1.2a Setting the initial value
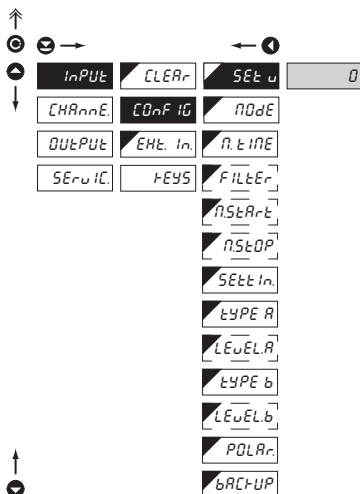
InPUt	CLEAr	SEt u	0	**SEt u.** — Setting initial value
CHAnnE.	COnFiG	nOdE		
OUtPUt	EHt. In.	n. tinE		- function allows the user a one-time setting of the display initial value
SEru iC.	HEYS	FiLtEr		
		n.StArt		
		n.StOP		
		SEtt In.		
		tYPE A		
		LEuEL.A		
		tYPE b		
		LEuEL.b		
		POLAr.		
		bACtUP		

Programming scher

| `142.8` ⊙+ ⊖ | `PASS.` ⊖ | `0` ⊖ |

`InPUt`

`CLEAr` ⊖ ▶ ⊖ `CL. Cnt` • `CL. tAr` • `CL. SUM.` ⊖ ◀

`COnFIG` ⊖ `SEt u.` ⊖ `0`

`nOdE` ⊖ ▶ ⊖ `S InGLE` • `9UAdr.` • `UP/du` • `UP- du` • `t InE` • `rtC` ⊖ ◀

`n. t InE` ⊖ ▶ ⊖ `0.5` • `10` • `50` • `100` ⊖ ◀

`FILtEr` ⊖ ▶ ⊖ `OFF` • `1000` • `100` • `40` • `5` ⊖ ◀

`nStArt` ⊖ ▶ ⊖ `COnt In` • `COntAC.` • `EdGE` ••• `rUn` ⊖ ◀

`n. StOP` ⊖ ▶ ⊖ `CLEAr` • `St CLr.` • `StOP` ⊖ ◀

`SEtt In.` ⊖

`tYPE A.` ⊖ ▶ ⊖ `nPnCOn` • `PnP` ⊖ ◀

`LEuEL.A` ⊖ `10`

`tYPE b` ⊖ ▶ ⊖ `nPnCOn` • `PnP` ⊖ ◀

`LEuEL.b` ⊖ `10`

`POLAr.` ⊖ ▶ ⊖ `Lo 4` • `H I4` ⊖ ◀

`bACkUP` ⊖ ▶ ⊖ `YES` • `nO` ⊖ ◀

`bACkUP` ⊖ ▶ ⊖ `nO` • `uALUE` • `t InE` ⊖ ◀

`EHt. In.` `EHt. I` ⊖ ▶ ⊖ `OFF` • `LOCk.t.` • `HOLd` • `tArE` • `CLEAr` • `CLr. St` • `CL. SUM.` ⊖ ◀

`kEYS` ⊖ `LEFt` ⊖ ▶ ⊖ `OFF` • `COUnt` • `FrE9.` • `CLEAr` • `SEt L.1` • `SEt L.2` • `SHOU t` • `CLr. t` • `tArE` • `SUnA` ⊖ ◀

`dOun` ⊖ ▶ ⊖ `OFF` • `COUnt` • `FrE9.` • `CLEAr` • `SEt L.1` • `SEt L.2` • `SHOU t` • `CLr. t` • `tArE` • `SUnA` ⊖ ◀

`LEFt` ⊖ ▶ ⊖ `OFF` • `COUnt` • `FrE9.` • `CLEAr` • `SEt L.1` • `SEt L.2` • `SHOU t` • `CLr. t` • `tArE` • `SUnA` ⊖ ◀

`EntEr` ⊖ ▶ ⊖ `OFF` • `COUnt` • `FrE9.` • `CLEAr` • `SEt L.1` • `SEt L.2` • `SHOU t` • `CLr. t` • `tArE` • `SUnA` ⊖ ◀

`CHAnnE.`

`SEt. C.` ⊖ `SCAL. C.` ⊖ `1`

`d Iu. C.` ⊖ `1`

`OFF. C.` ⊖ `0`

`F ILtEr` ⊖ `nOd. F.C.` ⊖ ▶ ⊖ `nO` • `EHPOn` • `rOUnd` ⊖ ◀

`COn. F.C.` ⊖ `0`

`FOrn. C.` ⊖ ▶ ⊖ `000000` • `00000o` ••• `0ooooo` • `FLOA P.` ⊖ ◀

▶ ⊖ `HHnnSS` • `99nnSS` • `nnSS` • `HHHHnn` ••• `Hnn5`

`SEt. Fr.` ⊖ `SCAL. F.` ⊖ `1`

`d Iu. F.` ⊖ `1`

`OFF. F.` ⊖ `0`

`F ILtEr` ⊖ `nOd. F.F.` ⊖ ▶ ⊖ `nO` • `EHPOn` • `rOUnd` ⊖ ◀

`COn. F.F.` ⊖ `0`

`FOrn. F.` ⊖ ▶ ⊖ `000000` • `00000o` ••• `0ooooo` • `FLOA P.` ⊖ ◀

me of **PROFI MENU**

Menu flow diagram (PROFI MENU):

OUTPUT

- **LIMITS**
  - **LIM. 1**
    - **InP.L.1** — COUnt • FrEq.
    - **MOd.L.1** — HYStEr. • C-PULS.
    - **tYP.L.1** — CLOSE • OPEn
    - **LIM.L.1** — 25
    - **HYS.L.1** — 0
    - **tIM.L.1** — 0
  - **LIM. 2**
    - **InP.L.2** — COUnt • FrEq.
    - **MOd.L.2** — HYStEr. • On rUn
    - **tYP.L.2** — CLOSE • OPEn
    - **LIM.L.2** — 75
    - **HYS.L.2** — 0
    - **tIM.L.2** — 0
- **dAtA**
  - **bAUd** — 300 • 600 • 1200 • 2400 • 4800 • 9600 • 19200 • 38400 • 57600 • 115200 • 230400
  - **Addr.** — 0
- **An.OUt**
  - **InP.A.O.** — COUnt • FrEq.
  - **tYP.A.O.** — 0-20mA • Er 4-20 • 4-20mA • 0-5mA • 0-2 u • 0-5 u • 0-10 u
  - **M in.A.O.** — 0
  - **MAX.A.O.** — 100
- **dISP.**
  - **InP.d.** — COUnt • FrEq.
  - **br IGHt.** — 25'. • 50'. • 75'. • 100'. • AUtO H. • AUtO M. • AUtO L.

SErvIC

- **MEnU** — LIGHt • PrOF 1
- **rEStOr**
  - **FIrM.** — YES
  - **USEr**
  - **SAvE**
- **n.PASS.**
  - **PAS.L 1.** — 0
  - **PAS.Pr.**
- **IdEnt.** — OM 653UQC...

!

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

6.1.2b Selection of measuring mode

InPut	CLEAr	SEt. u.	SInGLE	DEF
CHAnnE.	COnFIG	NOdE	9UAdr.	
OUtPUt.	EHt. In.	N. tINE	UPrdu	
SEru IC.	rEYS	FILtEr	UP-du	
		N.StArt	tINE	
		N.StOP	rtC	
		SEtt In.		
		tYPE A		
		LEuEL.A		
		tYPE b		
		LEuEL.b		
		POLAr.		
		bACrUP		

NOdE — Selection of instrument measuring mode

SInGLE — Impulse counter/ Frequency measurement

9UAdr. — 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

UPrdu — UP/DW Impulse counter/Frequency meter
- measurement on input A, (inp. B/direction). Can display count and frequency

UP-du. — UP-DW Impulse counter/ Frequency meter
- measures on inputs A (UP), B (DW). Can display count and frequency

tINE — Mode „Stopwatch/ timer"

rtC — Mode „Stopwatch/ timer" with RTC backup
- not in standard equipment

6.1.2c Selection of measuring period/time base

InPut	CLEAr	SEt. u.	0.5	
CHAnnE.	COnFIG	NOdE	1.0	DEF
OUtPUt.	EHt. In.	N. t INE	5.0	
SEru IC.	rEYS	FILtEr	10.0	
		N.StArt		
		N.StOP		
		SEtt In.		
		tYPE A		
		LEuEL.A		
		tYPE b		
		LEuEL.b		
		POLAr.		
		bACrUP		

N. t INE — 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 s
- in the „RTC" regime with data projection the set time defines the cycle of switching between time/date, min. is 5 s, datue is displayed for approx. 2,5 s

6.1.2d　**Selection of input filter parameters**　　　C　H

InPUt	CLEAr	SEt. u.	OFF
CHAnnE.	COnFIG	nOdE	1000
OUtPUt.	EHt. In.	n. t InE	100
SEru IC.	FEYS	FILtEr	40
		n.StArt	5
		n. StOP	
		SEtt In.	
		tYPE A	
		LEuEL.A	
		tYPE b	
		LEuEL.b	
		POLAr.	
		bACFUP	

FILtEr　**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 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

6.1.2e Selection of stopwatch/timer control ☐H

InPUt	CLEAr	SEt. u.	COnt In.
CHAnnE.	COnFIG	nOdE	COntAC.
OUtPUt.	EHt. In.	n. tInE	EdGE
SErvIC.	rEYS	FILtEr	rUn.St. C.
		n.StArt	C.rUn.St.
		n.StOP	CLr.rUn.
		SEtt In.	CL.rU.rE.
		tYPE A	rUn
		LEvEL.A	
		tYPE b	
		LEvEL.b	
		POLAr.	
		bACrUP	

DEF

---
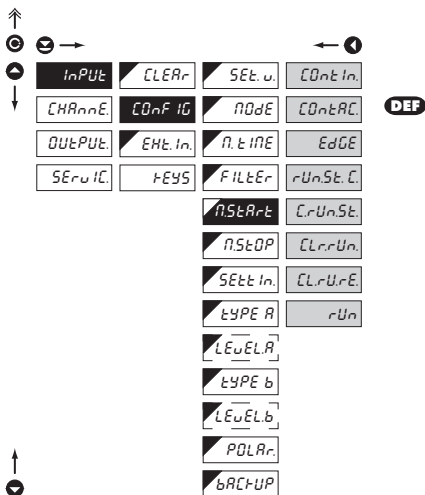
n.StArt **Selection of stopwatch/timer control**

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

COnt In. 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

C.rUn. 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

CLr.rUn. Stopwatch/timer is reset and set off by the edge of the priming signal (when the time is not running)
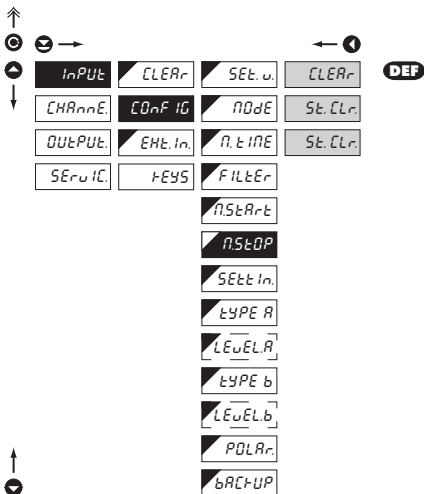
CL.rU.rE. Stopwatch/timer is reset and set off by the edge of the priming signal, the cycle is repeated with every other edge
- regardles of whether the time is running or not

rUn Stopwatch/timer is only set off by the edge

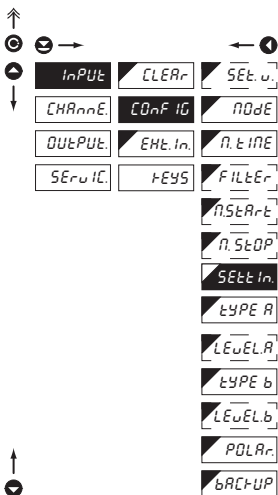
6.1.2f   Selection of stopwatch/timer resetting   **H**

InPUt	CLEAr	SEt. u.	CLEAr	**DEF**
CHAnnE.	COnF IG	NOdE	St. CLr.	
OUtPUt.	EHt. In.	N. t INE	St. CLr.	
SEru IC.	rEYS	F ILtEr		
		N.StArt		
		N.StOP		
		SEtt In.		
		tYPE A		
		LEuEL.A		
		tYPE b		
		LEuEL.b		
		POLAr.		
		bACrUP		

N. StOP   **Selection of stopwatch resetting**

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

CLEAr   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"

6.1.2g   Automatic setting of the inputs

InPUt	CLEAr	SEt. u.
CHAnnE.	COnF IG	NOdE
OUtPUt.	EHt. In.	N. t INE
SEru IC.	rEYS	F ILtEr
		N.StArt
		N. StOP
		SEtt In.
		tYPE A
		LEuEL.A
		tYPE b
		LEuEL.b
		POLAr.
		bACrUP

SEtt In.   **Automatic setting of the inputs**

- it is possible to choose in the menu between automatic or manual setting for input A and B
- for automatic detection the minimum frequency required is 10 Hz

◄ start of automatic input setting

▼ manual input setting - down

▲ manual input setting - up

⊕ confirm the setting and proceed to second input (short key stroke) to copy the setting of Input A to Input B (long key stroke)

DEF = NPN.CON.

6.1.2h   Selection of the type of input
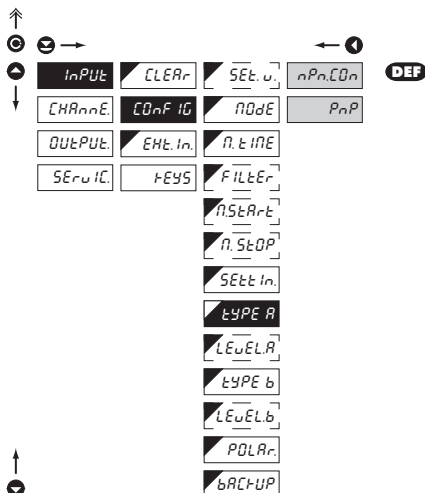
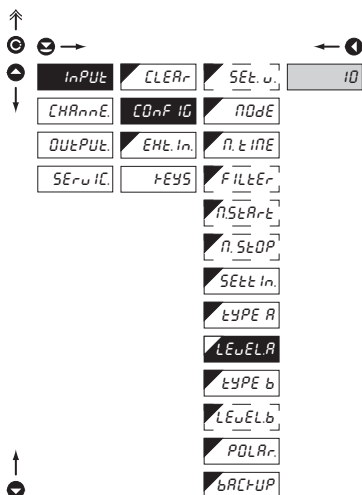**TYPE A**   Selection of type of input

- setting applies for Input A

nPn.COn   Type of input NPN and upon contact

PnP   Type of input PNP

!
Input levels (Level A) must be set after this selection

!
Setting for input Resetting (Level. B) is identical with setting for Input A

6.1.2i   Setting input level

LEvEL.A   Setting input level

- setting applies for Input A
- setting level (only for type PNP) of the input voltage, the instrument subsequently automatically selects divider and thus comparing levels
- range of setting 0...43 V
  (Input A < 30 V, bracket No. 12)
  (Input B < 30 V, bracket No. 13)
- range of setting 43...300 V
  (Input A <300 V, bracket No. 17)
  (Input B <300 V, bracket No. 15)
- table of comparing levels is on page 8

!
Setting for input Resetting (TYPE B) is identical with setting for Input A

6.1.2j Selection of active level or edge

InPUt	CLEAr	SEt. u.	Lo h	DEF
CHAnnE.	COnF iG	nOdE	Hi r	
OUtPUt.	EHt. In.	n. t ImE		
SEru iC.	hEYS	F iLtEr		
		n.StArt		
		n. StOP		
		SEtt In.		
		tYPE A		
		LEuEL.A		
		tYPE b		
		LEuEL.b		
		POLAr.		
		bAChUP		

POLAr. Selection of active level or edge

Lo h Active upon change of declining edge Lo >Hi
- upon entering the contact > active on switch-on

Hi r Active upon change of entering edge Hi > Lo
- upon entering the contact > active on switch-off

6.1.2k Selection of display status backup

InPUt	CLEAr	SEt. u.	nO	
CHAnnE.	COnF iG	nOdE	YES	DEF
OUtPUt.	EHt. In.	n. t ImE		
SEru iC.	hEYS	F iLtEr		
		SEtt In.		
		tYPE A		
		LEuEL.A		
		tYPE b		
		LEuEL.b		
		POLAr.		
		bAChUP		

bAChUP Selection of display status backup

- setting display value restoration after power failure or instrument switch-off

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

YES Instrument resets itself after switch-on

6.1.2h Setting the display status backup [H]

InPUt	CLEAr	SEt. u.	nO
CHAnnE.	COnFIG	nOdE	uALUE
OUtPUt.	EHt. In.	N. tINE	tINE DEF
SErvIC.	HEYS	FILtEr	
		N.StArt	
		N. StOP	
		SEtt In.	
		tYPE A	
		LEuEL.A	
		tYPE b	
		LEuEL.b	
		POLAr.	
		bACHUP	
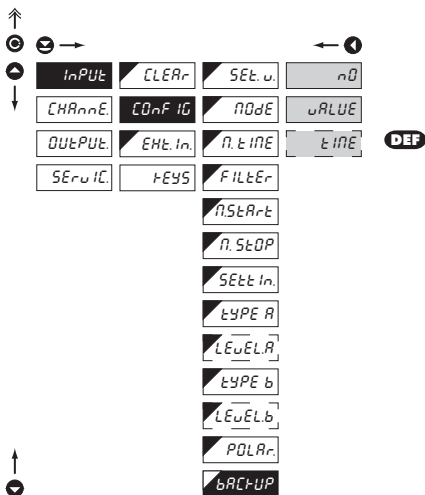
bACHUP Selection of display status backup

- 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

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

tINE Instrument downloads „running" time from RTC

- item accessible only with extension „Time backup"

6.1.3 External input function selection

EHt. In. External input function selection

OFF Input is off

LOCH. H. Auxiliary input governs the „LOCK" function
- the input governs the blocking of control keys on front panel

HOLd Auxiliary input governs the „HOLD" function
- the input governs the HOLD function, which blocks all instrument functions

tArE Auxiliary input governs the „TARE" function
- the TARE function is activated through the input, only in the "Frequency" mode

CLEAr Auxiliary input governs the „Clear" function
- stopwatch/counter is cleared (preset) through the input

CLr.St. Auxiliary input governs the „Clear" function
- stopwatch/counter is cleared (preset) through the input, Stopwatcg stops altogether

CL.SUN. Auxiliary input governs the „Clear Sum" function"
- the "grand total" of the counter is zeroed

SUNA Auxiliary input governs the „SUM" function
- the cummulated value is displayed

COUnt. Auxiliary input governs the counter display
- the value of "Counter" channel is displayed

FrE9. Auxiliary input governs the frequency display
- the value of "Frequency" channel is displayed

! Response time to the change of input is approx 100 ms

6.1.4   Optional accessory functions of the keys

InPUt	CLEAr	LEFt	OFF
CHAnnE.	COnFIG	dOun	COUnt
OUtPUt	EHt. In.	UP	FrE9.
SEruIC.	HEYS	EntEr	CLEAr
			SEt L.1
			SEt L.2
			SHOu.t
			CLr.t.
			tArE
			CL.SUN.
			SUNA
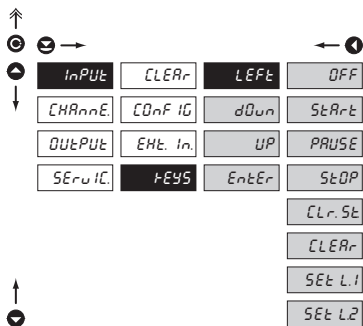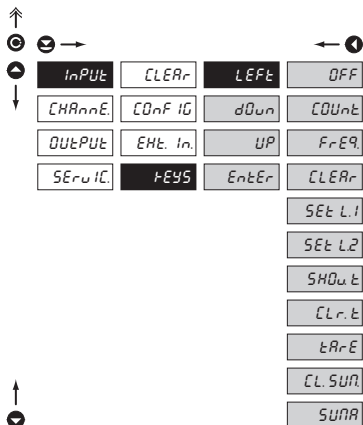
HEYS	Assigning accessory functions of control keys

- this setting is identical for all control keys

OFF	Accessory functions are off
COUnt.	Displays value from channel "Counter"
FrE9.	Displays value from channel "Frequency"
CLEAr	Clears Counter
SEt. L.-	Setting limit L1, resp. L2
SHOu. t.	Shows TARE
CLr. t.	Clears TARE
tArA	Activates function TARE
CL. SUN.	Clears the total sum
SUNA	Dispalys the total sum (grand total)

InPUt	CLEAr	LEFt	OFF
CHAnnE.	COnFIG	dOun	StArt
OUtPUt	EHt. In.	UP	PAUSE
SEruIC.	HEYS	EntEr	StOP
			CLr.St.
			CLEAr
			SEt L.1
			SEt L.2

HEYS	Assigning accessory functions of control keys

- can be used only in mode "TIME" and "RTC"
- this setting is identical for all control keys

OFF	Accessory functions are off
StArt	Start - stopwatch/clock
PAUSE	Pause - stopwatch/clock
StOP	Stop - stopwatch/clock
CLr.St.	Stop and clear - stopwatch/clock
CLEAr	Clear- stopwatch/clock
SEt. L.-	Setting limit L1, resp. L2

6.2 Setting "PROFI" - CHANNEL
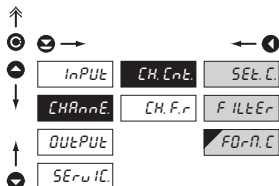
In this menu the instrument input parameters are set

InPUt	CH.Cnt.	SEt. C.
CHAnnE.	CH.F.r	F ILtEr
OUtPUt		FOrN. C
SEru IC.		

SEt. C. Setting calibration constant

F ILtEr Setting the digital filters

FOrN. C. Selection of projection format

6.2.1a Setting multiplying constant - Channel Counter

InPUt	CH.Cnt.	SEt. C	SCAL.C.	I
CHAnnE.	CH.Fr.	F ILtEr	d Iu.C.	
OUtPUt.		FOrN.C	OFF.C.	
SEru IC.				
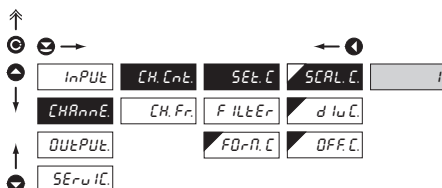
SCAL. C. Setting multiplying constant - channel C

- 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: -0,00001...999999

- **DEF** = 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

InPUt	CH.Cnt.	SEt. C	SCAL. C.	I
CHAnnE.	CH.Fr.	F ILtEr	d Iu.C.	
OUtPUt.		FOrN.C	OFF.C.	
SEru IC.				
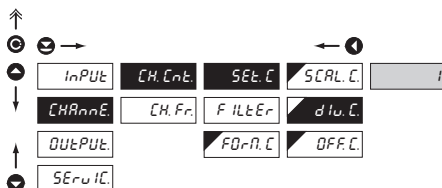
d Iu. C. Setting division constant - channel C

- division constant serves for calculation of input value to required display value
- range: 0,00001...999999

- **DEF** = 1

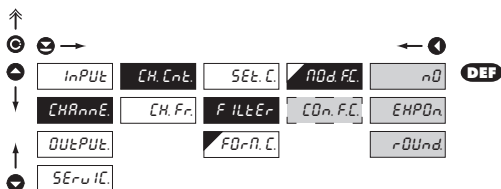## 6.2.1c Setting additive constant - PRESET, Channel Counter

InPUt	CH.Cnt.	SEt. C.	SCAL. C.	0
CHAnnE.	CH.Fr.	F ILtEr	d iuC.	
OUtPUt.		FOrN. C.	OFF.C.	
SEru iC.				
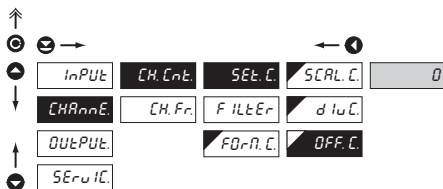
OFF. C. **Setting PRESET constant - channel C**

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

- **DEF** = 0

! **H**

If non-zero value is set in the "TIME" or "RTC" mode in the "OFF. C." item, it applies that the multiplying constant "SCAL. C." is negative

6.2.2 Setting the digital filters - Channel Counter

InPUt	CH.Cnt.	SEt. C.	NOd.FC.	nO	DEF
CHAnnE.	CH.Fr.	F ILtEr	COn. F.C.	EHPOn	
OUtPUt.		FOrN. C.		rOUnd	
SEru iC.					

F ILtEr **Setting the digital filters**

COn. C. Setting the constant

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

nO Filters are switched off

EHPOn. Selection of exponential filter

- calculation of value from the number of measurements selected in „CON. C."

rOUnd. Selection of value round-up

- it is set by ...arbitrary number, which determines the projection step (e.g.: "Con. F.C."=2,5 > display 0, 2.5, 5,...)

!

Identical setting is used for CH. Fr.

6.2.3 Selection of projection format - Channel Counter

FOrN. C. Selection of projection format

- the instrument enables projection of number with decade positioning of decimal point
- for projection of time there are also other projection forms available

! **H**

In mode "TIME" or "RTC" the time base is preset according to projection format

in seconds > 000000...0.00000, Floa.P., HH.MM.SS, 99.MM.SS, MMMM.SS
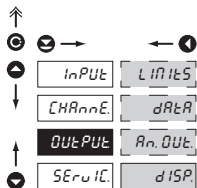
in minutes > HH.MM, HHHH.MM

in tenths of seconds > H.MM.SS.C

in hundredths of seconds > MM.SS.CC, 99.SS.CC

!

Identical setting is used for CH. Fr.

6.3 Setting „PROFI" - OUTPUTS

It is possible to set the parameters of the instrument output signals in this menu

LIMItS	Setting the type and the switching of limits
dAtA	Setting the type and the parameters ot data output
An. OUt.	Setting the type and parameters of analog output
dISP.	Setting the display brightness

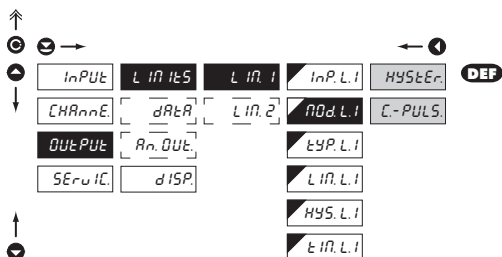### 6.3.1a Selection of how Limit 1 is evaluated
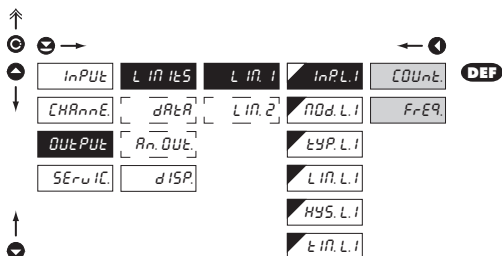
InP.L.1 Selection of how Limit 1 is evaluated

- selection of value to which the limit is related

| COUnt. | From "Channel Counter" |
| FrEq. | From "Channel Frequency" |

6.3.1b Selection of mode of output L 1



MOd.L.1 Mode of limit 1

| HYStEr. | Standard mode - limit, hysteresis and delay |
| C.- PULS. | Automatic clearing of counter to preset value and generate an impulse of the length set in "TIM.L.1" |

!

*Setting is available only for LIM 1*

Description of relay function > HYSTER

+H/2 · 3 P
LIM · 2,5 P
-H/2 · 2 P
1,5 P
1 P
0,5 P

z - delay "TIM. L."

Limit - Limit/hysteresis/delay: MODE L. > "HYSTER"

axis x > "LIM. L." limit, "H/2" hysteresis

Z > 0 - Switch-on relay
TYPE > SWITCH-ON
LED signalization

Z < 0 - Switch-on relay
TYPE > SWITCH-OFF
LED signalization

Z > 0 - Switch-off relay
TYPE > SWITCH-ON
LED signalization

Z < 0 - Switch-off relay
TYPE > SWITCH-OFF
LED signalization

6.3.1c | **Selection of mode of output L 2**

InPUt	L IM ItS	L IM. 1	InP. L.2	HYStEr.	DEF
CHAnnE.	dAtA	L IM.2	MOd. L.2	On rUn
OUtPUt	An. OUt.		tYP. L.2
SEru IC.	d ISP.		L IM. L.2
			HYS. L.2
			t IM. L.2

| MOd. L.2 | **Mode of limit 2** |

| HYStEr. | Standard mode - limit, hysteresis and delay |

| On rUn | Relay is switched on/ off if the stopwatch is running |

!

Setting is available only for LIM 2

6.3.1d | **Selectionof type of output**
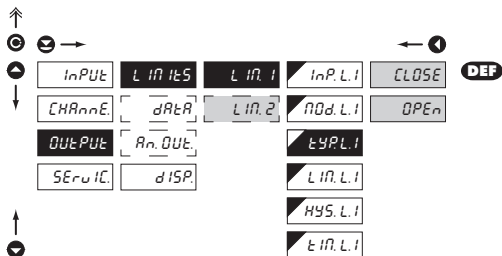
	Setting the type of relay function
ŁYP.L.1	
CLOSE	Relay switches on when the condition is met
OPEn	Relay switches off when the condition is met

> **!**
> *Setting is identical for LIM 1 and LIM 2*

6.3.1e | **Setting values for limits evaluation**
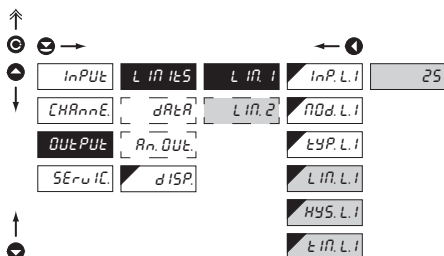
	Setting the boundary for relay switch-on
L iN. L.1	

- within the full display range

	Setting hysteresis
HYS. L.1	

- defines the band around the limit (on both sides, LIM. ±1/2 HYS.)
- within the full display range

	Setting the offset of the relay switch-on
Ł iN. L.1	

- setting within the range: ±0...99,9 s
- positive time > relay switches on after crossing the limit (LIM. L1) and the set time (TIM. L1)
- negative time > relay switches off after crossing the limit (LIM. L1) and the set negative time (TIM. L1)

> **!**
> *Setting is identical for LIM 1 and LIM 2*

6.3.2a **Selection of transmission rate of data output**

InPUt	L iN itS	bAUd
CHAnnE.	dAtA	Addr.
OUtPUt	An.OUt.	
SErv iC.	d iSP.	

600
600
1200
2400
4800
9600 **DEF**
19200
38400
57600
115200
230400

bAUd	**Setting the data output rate**
300	Rate - 300 Baud
600	Rate - 600 Baud
1200	Rate - 1 200 Baud
2400	Rate - 2 400 Baud
4800	Rate - 4 800 Baud
9600	Rate - 9 600 Baud
19200	Rate - 19 200 Baud
38400	Rate - 38 400 Baud
57600	Rate - 57 600 Baud
115200	Rate - 115 200 Baud
230400	Rate - 230 400 Baud

6.3.2b **Setting the instrument address**

InPUt	L iN itS	bAUd	00
CHAnnE.	dAtA	Addr.	
OUtPUt	An.OUt.	Adr.Pb.	
SErv iC.	d iSP.		

Addr.	**Setting the instrument address**

- setting within the range 0...31
- **DEF** = 00

6.3.3a Selection of how analogue output is evaluated

`InPUt`	`LIMItS`	`InP.A.O.`	`COUnt.`	**DEF**
`CHAnnE.`	`dAtA`	`tYP.A.O.`	`FrEq.`	
`OUtPUt`	`An.OUt.`	`MIn.A.O.`		
`SEruiC.`	`dISP.`	`MAX.A.O.`		

`InP.A.O.` Selection of how analogue output is evaluated

- selection of value to which the analogue output is related

`COUnt.` From "Channel Counter"

`FrEq.` From "Channel Frequency"

6.3.3b Selection of type of analog output

`InPUt`	`LIMItS`	`InP.A.O.`	`0-20nA`	
`CHAnnE.`	`dAtA`	`tYP.A.O.`	`Er4-20`	
`OUtPUt`	`An.OUt.`	`MIn.A.O.`	`4-20nA`	**DEF**
`SEruiC.`	`dISP.`	`MAX.A.O.`	`0-5nA`	
			`0-2 u`	
			`0-5 u`	
			`0-10 u`	
			`+-10 u`	

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

`0-20nA` Type - 0...20 mA

`Er4-20` Type - 4...20 mA
- with indication of error statement (<3,6 mA)

`4-20nA` Type - 4...20 mA

`0-5nA` Type - 0...5 mA

`0-2 u` Type - 0...2 V

`0-5 u` Type - 0...5 V

`0-10 u` Type - 0...10 V

`+-10 u` Type - ±10 V

6.3.3b Selection of analog output range
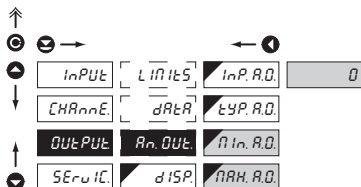
An. OUt. **Setting the analog output range**

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

M In. A.O. Assigning the displayed value to the beginning of the analog output range
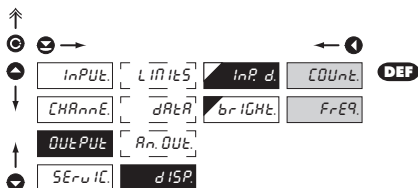- range of the setting is -99999...999999
- **DEF** = 0

MAH. A.O. Assigning the displayed value to the end of the analog output range
- range of the setting is -99999...999999
- **DEF** = 100

6.3.4a Selection of the channel to be displayed

InP. d. **Selection of the channel to be displayed**

- selection of the value which should be displayed

COUnt. Value taken from channel "Counter" will be displayed

**FrEq.** Value taken from channel "Frequency" will be displayed

6.3.4b Selection of display brightness
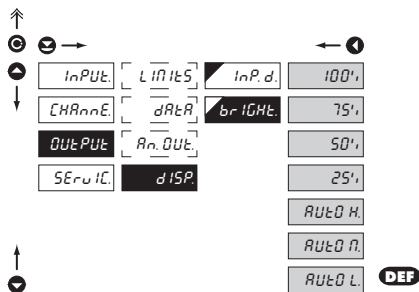
Setting the display brightness

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

25'.	Display brightness - 25 %
50'.	Display brightness - 50 %
75'.	Display brightness - 75 %
100'.	Display brightness - 100 %
AUtO H.	Automatic brightness adjustment - High
AUtO П.	Automatic brightness adjustment - Medium
AUtO L.	Automatic brightness adjustment - Low

6.4 Setting "PROFI" - SERVICE

InPUt	∩EnU
CHAnnE.	rEStOr.
OUtPUt	n.PASS.
SEru IC.	IdEnt.
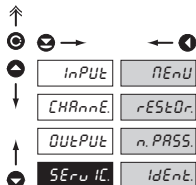
The instrument's service functions are set in this menu

∩EnU	Selection of menu type LIGHT/PROFI
rEStOr.	Restoration of the manufacture setting and instrument calibration
n.PASS.	Setting new access password
IdEnt.	Instrument identification

6.4.1 Selection of the type of programming menu

InPUt	∩EnU	LIGHt	DEF
CHAnnE.	rEStOr.	PrOFI
OUtPUt	n.PASS.	
SEru IC.	IdEnt.	

∩EnU **Selection of menu type LiGHT/PROFI**

- allows to set the menu complexity as per user needs and abilities

LIGHt Active LIGHT menu

- simple programming menu, contains only items necessary for instrument configuraction and setting
- linear menu structure > items in succession

PrOFI Active PROFI menu

- complete programming menu for expert users
- tree menu

!

Change of setting is valid with next access into menu

SETTING 6

6.4.2 Restoration of the manufacture setting

InPUt	∩EnU	F Ir∩.
CHAnnE.	rEStOr.	USEr
OUtPUt	n. PASS.	SAʋE
SErʋ IC.	IdEnt.	

**! **
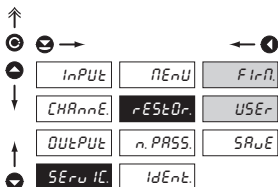
After restoration of setting the instrument switches off for several seconds

rEStOr. Restoration of the instrument manufacture setting

F IrN. Return to manufacture setting of the instrument

- downloading manufacture setting for currently selected type of instrument (items described DEF)

USEr Return to user setting of the instrument

- downloading user setting of the instrument, i.e. setting which was stored under item SERVIC./RESTOR./SAVE

SAʋE Storing user setting of the instrument

- storing the setting enables the operator its future contingent restoration


6.4.3 Setting new access password

InPUt	∩EnU	PAS.L I.	0
CHAnnE.	rEStOr.	PAS.Pr.	
OUtPUt	n.PASS.		
SErʋ IC.	IdEnt.		
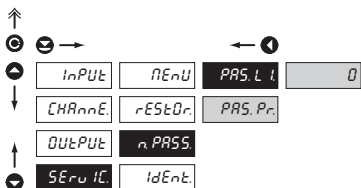
n.PASS. Setting new password for access into the LIGHT and PROFI menu

- 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"

6.4.4 Instrument identification

InPUt	∩EnU
CHAnnE.	rEStOr.
OUtPUt	n. PASS.
SErʋ IC.	IdEnt
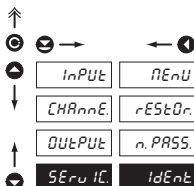
IdEnt. Projection of instrument SW version

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

7.0 "USER" menu configuration

- **USER** menu is designed for users who need to change only several items of the setting without the option to change the basic instrument setting (e.g. repeated change of limit setting)
- there are no default items from manufacture in **USER** menu
- menu configuration possible on items indicated by inverse triangle `nOd.L.1`
- setting may be performed in **LIGHT** or **PROFI** menu, with the **USER** menu then overtaking the given menu structure

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

SETTING

flashing sign - current setting is displayed

return to item

`nO`	item will not be displayed in USER menu
`YES`	item will be displayed in USER menu with the chance of editing
`SHO`	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

--- 😑 + 🔽   0

Example:

Into USER menu were selected these items:

(keys 😑 + 🔼) > CL. Cnt., LIM. L 1, LIM. L 2, for which we have preset this sequence:

(tlačítky 😑 + 🔽):

CL. Cnt.   5
LIM. L 1   0 (sequence not determined)
LIM. L 2   1

Upon entering USER menu

(key ⦿) items will be projected in the following sequence: LIM. L 2 > CL. Cnt. > LIM. L 1

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

ASCII: 8 bit, no parity, one stop bit

The transfer rate is adjustable in the instrument menu and depends on the control processor used. 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 exchangeable card automatically identified by the instrument.

COMMANDS FOR INSTRUMENT OPERATION

Idividual commands are described in freely downloadable SW called OM Link and also in a description whin you can find at www.orbit.merret.cz/rs.
A command consists of a number and a letter. The size of the letters have a significance.

DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE

Activity	Data transferred										
Data solicitation (PC)	#	A	A	<CR>							
Data transfer (Instrument)	>	R	<SP>	D	D	D	D	D	(D)	(D)	<CR>
Command corfirmation (Instrument) - OK	!	A	A	<CR>							
Command corfirmation (Instrument) - Bad	?	A	A	<CR>							
Instrument identification	#	A	A	1Y	<CR>						
HW identification	#	A	A	1Z	<CR>						
One-time mesasurement	#	A	A	7X	<CR>						
Repeated measasurement	#	A	A	8X	<CR>						
Setting to transmit display + relay value	#	A	A	1X	<CR>						
Setting to transmit measured value	#	A	A	1x	<CR>						
Setting limit 1	#	A	A	1L	D	(D)	(D)	(D)	(D)	(D)	<CR>
Setting limit 2	#	A	A	2L	D	(D)	(D)	(D)	(D)	(D)	<CR>

LEGENDA

#	35	23$_H$	Beginning of the command
A A		0...31	Two signs of the inst. address (sending in ASCII - decades and units, ex. "01", "99" universal
<CR>	13	0D$_H$	Carriage return
<SP>	32	20$_H$	Space
D			Data - usually signs "0"..."9", "-", "."; (D) - DP and (-) may prolong data
R	50$_H$...57$_H$		Relay and Tare status
!	33	21$_H$	Positive command corfirmation (ok)
?	63	3F$_H$	Negative command corfirmation (bad)
>	62	3E$_H$	Beginning of the transmitted data

RELAY, TARE

Signs	Relay 1	Relay 2	Tare
P	0	0	0
Q	1	0	0
R	0	1	0
S	1	1	0
T	0	0	1
U	1	0	1
V	0	1	1
W	1	1	1

ERROR	CAUSE	ELIMINATION
E. d. Un	Number is too small (large negative) to be displayed	change DP setting, channel constant
E. d. Ou	Number is too large to be displayed	change DP setting, channel constant
E. t Un	Number is outside the table range	increase the table values, change input setting (channel constant)
E. t Ou	Number is outside the table range	increase the table values, change input setting (channel constant)
E. I. Un	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
E. I. Ou	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
E. Hu	A part of the instrument does not work properly	send the instrument for repair
E. EE	Data in EEPROM corrupted	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E. SEt	Data in EEPROM outside the range	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E. CLr	Memory was empty (presetting carried out)	upon repeated error statement send instrument for repair, possible failure in calibration

INPUT

Type:	upon contact, TTL, NPN/PNP
Measuring:	1x counter/frequency UP or DOWN
	1x counter/frequency UP/DOWN
	1x counter/frequency for IRC sensor
	1x stopwatch/timer
	- measuring range isadjustable
Input frequency:	0,1...50 kHz (Mode SINGLE)
	0,1...20 kHz (Mode UP/DW)
	0,1...20 kHz (Mode UP-DW)
	0,1...20 kHz (Mode QUADR. - Frequency)
	0,1...10 kHz (Mode QUADR. - Counter)
	(for frequency duty cycle of 50 %)
Voltage levels	9,7 - 14,4 - 19,2 - 23,9 - 28,7 - 33,5 - 38,3 - 43,0 V
	84 - 128 - 170 - 211 - 253 - 295 - 301 V

PROJECTION

Display:	999999, intensive red or green 7-segment LED, digit height 14 mm
Projection:	-99999...999999
Decimal point:	adjustable - in programming mode
Brightness:	adjustable - in programming mode

INSTRUMENT ACCURACY

Temperature coef.:	50 ppm/°C
Accuracy:	±0,02 % of the range + 1 digit (frequency)
Time base:	0,5/1/5/10 s
Multiplying constant:	±0,00001....999999
Division constant:	±0,00001....999999
Filtration constant:	allows for setting max. valid frequency, which is processed (OFF/5...1000 Hz)
Type of filter:	digital
Preset:	-99999...999999
Data backup:	preservation of measured data even after instrument switch-off (EEPROM)
Functions:	Tare - display resetting
	Summation - (grand total) registr of shifts
	Hold - stop measuring (upon contact)
	Lock - control keys locking
RTC:	the course of time is backed up by battery upon disconnection from the instrument supply (may be turned off - jumper inside the instrument)
	minimum lifetime 1 year
Battery:	Lithium cell CR 2032RV, 3V/220 mAh
OM Link:	Company communication interface for instrument operaion, setting and update
Watch-dog:	reset after 540 ms
Calibration:	při 25°C a 40 % r.v.

COMPARATOR

Type:	digital, adjustable in the menu, contact switch-on < 50 ms
Limits:	-99999...999999
Hysteresis:	0...999999
Delay:	0...99,9 s
Outputs:	2x relays with switch-on contact (Form A) (230 VAC/30 VDC, 3 A)*
Relay:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

DATA OUTPUTS

Protocols:	ASCII, Profibus
Data format:	8 bit + no parity + 1 stop bit
Rate:	600...230 400 Baud
RS 232:	isolated, two-way communication
RS 485:	isolated, two-way communication, addressing (max. 31 instruments)

ANALOG OUTPUTS

Type:	isolated, programmable with 12-bit D/A converter, type and range are selectable in programming mode
Non-linearity:	0,1 % of the range
TC:	15 ppm/°C
Rate:	response to change of value < 50 ms
Voltage:	0...2 V/5 V/10 V/±10 V
Current:	0...5/20 mA/4...20 mA
	- compensation of conduct up to 500 Ohm

EXCITATION

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

POWER SUPPLY

Options:	10...30 V AC/DC, 10 VA, isolated,
	- fuse inside (T 4000 mA)
	80...250 V AC/DC, 10 VA, isolated
	- fuse inside (T 630 mA)

MECHANIC PROPERTIES

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

OPERATING CONDITIONS

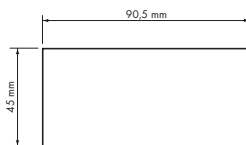|	
Connection:	connector terminal board, conductor cross-section <1,5 mm² /<2,5 mm²
Stabilisation period:	within 15 minutes after switch-on
Working temp.:	-10°...60°C
Storage temp.:	-10°...85°C
Cover:	IP65 (front panel only)
Construction:	safety class I
Overvoltage category:	EN 61010-1, A2

values apply for resistance load

Izolační pevnost: 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 input and data/analog output
Insulation resistance: for pollution degree II, measurement category III
                     Instrument power supply > 670 V (PI), 300 V (DI)
                     Input/output > 300 V (PI), 150 (DI)
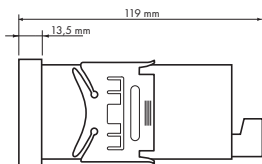EMC: EN 61326-1

PI - Primary insulation, DI - Double insulation

Front view

96 mm

48 mm

5 6 3 7 6 . 8

1   2
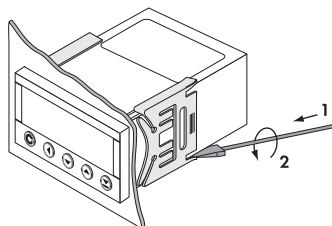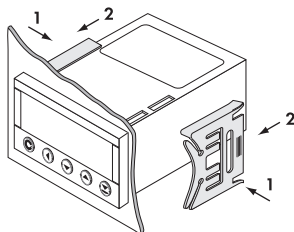
Panel cut

90,5 mm

45 mm

Side view

119 mm

13,5 mm
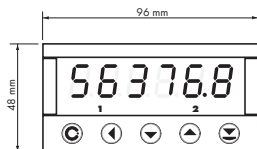
Panel thickness: 0,5...20 mm

Instrument installation

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

1   2

2

1

1

2

Instrument disassembly

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

Product	**OM 653UQC**
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: **OM 353/653**

Version: UNI, DC, AC, UQC

It has 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/EC)

The product qualities are in conformity with harmonized standard:

El. safety: EN 61010-1
EMC: EN 61326-1

Electrical measurement, EMC standards „Industrial use"
EN 50131-1, chap. 14 and chap. 15, EN 50130-4, chap. 7, EN 50130-4, chap. 8 (EN 61000-4-11, ed. 2), EN 50130-4, chap. 9 (EN 61000-4-2), EN 50130-4, chap. 10 (EN 61000-4-3, ed. 2),EN50130-4,chap.11 (EN 61000-4-6), EN 50130-4, chap. 12 (EN 61000-4-4, ed. 2), EN 50130-4, kap. 13 (EN 61000-4-5), EN 61000-4-8, EN 50130-5, chap. 20, prEN 50131-2-1, Cor. 9.93.1, EN 61000-4-9, EN 61000-6-1, EN 61000-3-2, EN 61000-3-3, EN 55022, chap. 5 and chap. 6

The product is furnished with CE label issued in 2010.

As documentation serve the protocoles of authorized and accredited organizations:

EMC   MO ČR, Zkušebna tech. prostředků, protocol No.: 80/6-280/2007 of 13/11/2007
MO ČR, Zkušebna tech. prostředků, protocol No.: 80/6-283/2007 of 26/10/2007

Place and date of issue: Prague, 1. March 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