



OMM 350

3 1/2 DIGIT PROGRAMMABLE UNIVERSAL INSTRUMENT

AC/DC VOLTMETER/AMMETER
PROCESS MONITOR
OHMMETER
THERMOMETER FOR PT 100/500/1 000
THERMOMETER FOR NI 1 000
THERMOMETER FOR THERMOCOUPLES
DISPLAY INST. FOR LINEAR POTENTIOMETERS



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 OMM 350 series conform to the European regulation 89/336/EWG and the Ordinance 168/1997 Coll.

They are up to the following European and Czech standards:

CNS EN 55 022, class B

CNS EN 61000-4-2, -4, -5, -6, -8, -9, -10, -11

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

CONNECTION

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



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



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2.1

POPIS

The OMM 350 model series are small 3 1/2 digit lowcost panel programmable instruments designed for maximum efficiency and user comfort while maintaining their favourable price. Three models are available: UNI and DC.

Type OMM 350UNI is a multifunction instrument with the option of configuration for 7 various input options, easily configurable in the instrument menu.

The instrument is based on an 8-bit microcontroller with a multichannel 10-bit sigma-delta converter, which secures good accuracy, stability and easy operation of the instrument.

The OMM 350 is a multifunction instrument available in following types and ranges

type UNI

DC:	0...20/60/1000 mV
PM:	0...20 mA/4...20 mA/0...2 V/0...5 V/0...10 V
OHM:	0...300 Ω; 0...1500 Ω; 0...3 kΩ; 0...30 kΩ
RTD-Pt:	Pt 50; Pt 100; Pt 500; Pt 1000
RTD-Cu:	Cu 50; Cu 100
RTD-Ni:	Ni 1 000; Ni 10 000
T/C:	J/K/T/E/B/S/R/N/L
DU:	Linear potentiometer (min. 500 Ω)

type DC

DC:	0...500 mA/0...1 A/0...5 A/ 0...20 V/0...40 V/0...200 V
------------	---

PROGRAMMABLE PROJECTION

Selection:	of type of input and measuring range
Measuring range:	adjustable or fixed
Setting:	manual, optional projection on the display may be set in the menu for both limit values of the input signal , e.g. input 0...20 mA > 0...150,0
Projection:	±1999, (for 20 mm display -999...9999)

LINEARIZATION

Linearization:*	by linear interpolation in 25 points (solely via OM Link)
-----------------	---

COMPENSATION

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

DIGITAL FILTERS

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

MATHEMATIC FUCTIONS

Tare*:	designed to reset display upon non-zero input signal
--------	--

EXTERNAL CONTROL

Hold	display/instrument blocking
Lock	locking the control keys for access into Configuration menu
Tára*	tare activation

* Does not apply for version RTD, T/C

2.2 Operation

The instrument is set and controlled by 4 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).



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.

The OM LINK program version „Standard“ allows you to connect an unlimited number of instruments with the option of visualization and storage in PC.

2.3 Extension

Comparators are assigned to control two limit values with relay output. 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.

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.

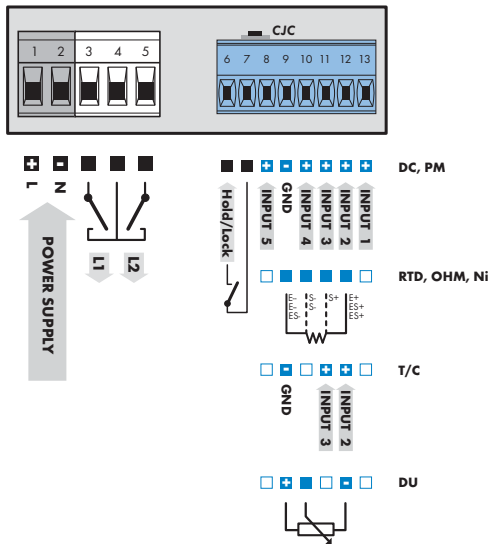
Measuring ranges

OMM 350UNI

Type	Input 1	Input 2	Input 3	Input 4	Input 5
DC	0...1 000 mV		0...60 mV	0...20 mV	
PM	0...5/10 V			0...2 V	0/4...20 mA
OHM	0...300 Ω • 0...1,5 kΩ • 0...3 kΩ • 0...30 kΩ				
RTD-Pt	Pt 100 • Pt 500 • Pt 1 000				
RTD-Cu	Cu 50 • Cu 100				
RTD-Ni	Ni 1 000 • Ni 10 000				
T/C			E/J/K/N/L	B/R/S/T	
DU	Linear potentiometer (min. 500 Ω)				

OMM 350DC

Type	Input 1	Input 2	Input 3	Input 4	Input 5
DC	0...100/200 V	0...20/40 V			0...1/5 A



!
 Grounding on terminal „E“ has to be connected at all times.
 In case of RTD and OHM inputs with 2- or 3- wire connection it is necessary to link the unconnected inputs on the terminal board (9+10/11+12 or 11+12).

!
 The OM Link connector has galvanic interconnection with bracket 9.

Setting

Setting

profi

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

Setting

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

Setting

*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 4 control keys located on the front panel. All programmable settings of the instrument are performed in three adjusting modes:

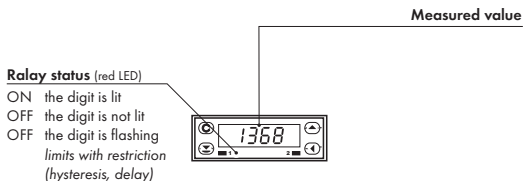
- LIGHT** **Simple programming menu**
- contains solely items necessary for instrument setting and is protected by optional number code
- PROFI** **Complete programming menu**
- contains complete instrument menu and is protected by optional number code
- USER** **User programming menu**
- may contain arbitrary items selected from the programming menu (LIGHT/PROFI), which determine the right (see or change)
- access 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.

Setting and controlling the instrument is performed by means of 4 control keys located on the front panel. With the aid of these keys it is possible to browse through the operation menu and to select and set required values.



Symbols used in the instructions

AC DC PM

DU OHM RTD T/C

Indicates the setting for given type of instrument

DEF

values preset from manufacture



symbol indicates a flashing light (symbol)



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



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 **1** with transition beyond the highest decade, when the decimal point starts flashing. Positioning is performed by **2**.

THE MINUS SIGN

Setting the minus sign is performed by the key **3** on higher decade. When editing the item subtraction must be made from the current number (e.g.: 013 > **3**, 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
	tare value (DC, PM) resistance measured (RTD) cold junctions temperature (T/C)	back to previous level	move to higher decade
	cancel Tare	move to next item	move up
	Tare	confirm selection	setting/selection confirmation
+			numeric value is set to zero
+	access into LIGHT/PROFI menu		
+	direct access into PROFI menu - temporary (remains LIGHT)		
+		configuration of an item for "USER" menu	
+		determine the sequence of items in "USER - LIGHT" menu	

Setting items into „USER“ menu

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

user

Legend is flashing - current setting is displayed



- item will not be displayed in USER menu
- item will be displayed in USER menu with the option of setting
- 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

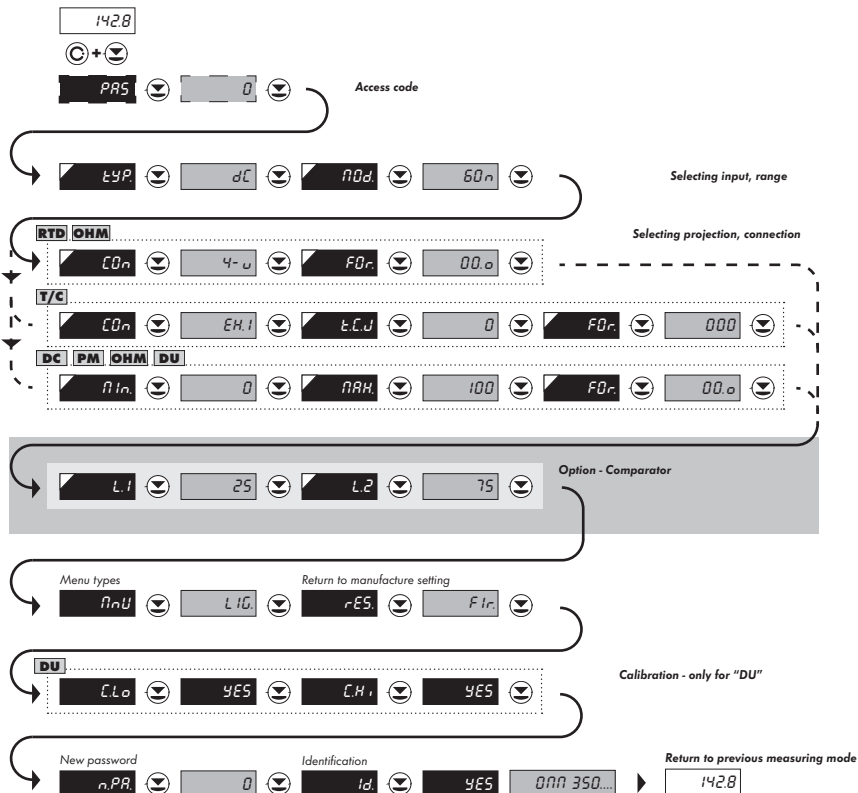
SETTING LIGHT

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



!

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

1428



PAS



0

Entering access password
for access into the menu



PAS 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 by number code

Set "Password" = 42 Example

0 1 2 02 10 22
32 42 n0d

tYP



dC PM OHM Pt tU
n tL dU



tYP Selection of the type of instrument

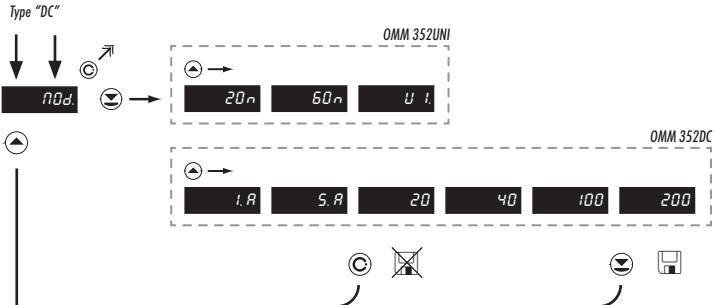
- primary selection of the type of instrument
- performs default setting **DEF** of values from manufacture, incl. calibration

Menu	Type of instrument
DC	DC voltmeter
PM	Process monitor
OHM	Ohmmeter
RTD	Thermometer for sensors Pt
Cu	Thermometer for sensors Cu
Ni	Thermometer for sensors Ni
TC	Thermometer for thermocouples
DU	Display for lin. potentiometer

Type "PM"

dC PM n0d

Type "DC"	16
Type "PM"	18
Type "OHM"	20
Type "Pt"	22
Type "Cu"	24
Type "Ni"	26
Type "T/C"	28
Type "DU"	30



nDd. Selection of the instrument measuring range

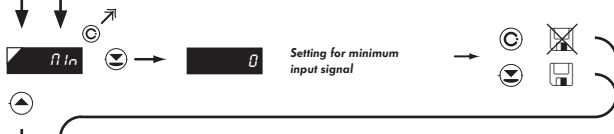
DEF = 60 mV (OMM 350UNI)
DEF = 200 V (OMM 350DC)

Menu	Measuring ranges
20m	0...20 mV
60m	0...60 mV
U 1.	0...1 000 mV
10.5	0...500 mA
i1.0	0...1 A
i5.0	0...5 A
u20	0...20 V
u40	0...40 V
200	0...200 V

MOD.

Range 0...20 mV Example

60n U 1. nIn



nIn Setting display projection for minimum value of input signal

- range of the setting is ± 1999

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 0

Projection for 0 mV > MIN = 0 Example

0 NAH



100 Setting display projection for maximum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 100

Zobrazení pro 20 mV > MAX = 1500 Příklad

100	100	100	200	300	400
500	0500	500	F0r		



F0r Setting projection of the decimal point

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

DEF = 00.0

Projection of DP on display > 00,0 Example

00.0	00.0	00.0	00.0	FL.P.

*subsequent item on the menu depends on instrument equipment



MOD. Selection of the instrument measuring range

DEF = 1 4

Menu	Measuring ranges
U 2.	0...2 V
U 5.	0...5 V
U 10.	0...10 V
I 0.	0...20 mA
I 4.	4...20 mA

Range 4...20 mA Example

I 4. **PM**



PM Setting display projection for minimum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 0

Projection for 4 mA > Min = 25 Example



PMH Setting display projection for maximum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 100

Zobrazení pro 20 mA > Max = 250 Příklad

100	100	110	120	130	140
150	150	250	FDr		



FDr Setting projection of the decimal point

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

DEF = 00.0

Projection of DP on display > 00,0 Example

00.0	FDr
------	-----

*subsequent item on the menu depends on instrument equipment



F0r **Setting projection of the decimal point**

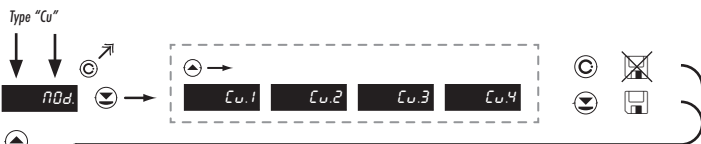
- positioning of the DP is set here in the measuring mode

000. > for measuring range -50°...400°C
00.0 > for measuring range -50,0°...199,9°C

DEF = 00.0

Projection of DP on display > 00,0 *Example*

*subsequent item on the menu depends on instrument equipment



MOD. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

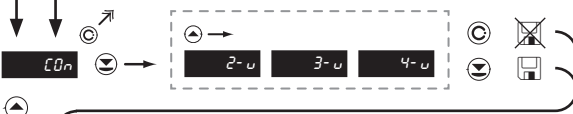
DEF = Cu.2

Type of sensor: Cu 100/4 280 ppm > Cu.2 Example

Menu	Measuring range	Cu
Cu.1	Cu 50 [4 280 ppm/°C]	
Cu.2	Cu 100 [4 280 ppm/°C]	
Cu.3	Cu 50 [4 260 ppm/°C]	
Cu.4	Cu 100 [4 260 ppm/°C]	

MOD.

2-w 3-w 4-w



CON. Selection of the type of sensor connection

- in 2- or 3- wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

DEF = 4-wire

Type of connection: 2-wire > CON = 2-w Example

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

CON.

4-w 2-w 3-w



F0r Setting projection of the decimal point

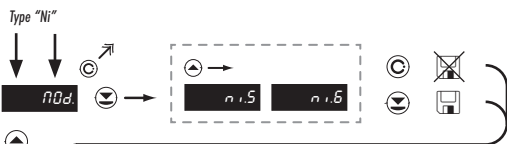
- positioning of the DP is set here in the measuring mode

DEF = 00.0

Projection of DP on display > 00,0 Example

00.0 *subsequent item on the menu depends on instrument equipment





NiD. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

DEF = Ni.5

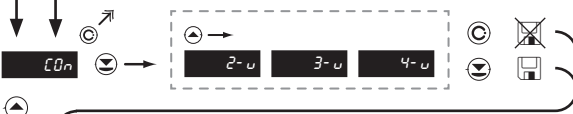
Type of sensor Ni 1 000/5 000 ppm > Ni.5

n.i.5 CO_n

Menu	Measuring range	Ni
Ni.5	Ni 1 000 (5 000 ppm/°C)	
Ni.6	Ni 1 000 (6 180 ppm/°C)	
Ni.5	Ni 10 000 (5 000 ppm/°C)	
Ni.6	Ni 10 000 (6 180 ppm/°C)	

* letter in the first column marks the measuring range as per the order

Example



CON. Selection of the type of sensor connection

- in 2- or 3-wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

DEF = 4-wire

Type of connection - 2 wire > CO_n = 2-w

4-w 2-w FO_n

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

Example



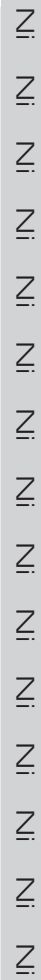
F0r Setting projection of the decimal point

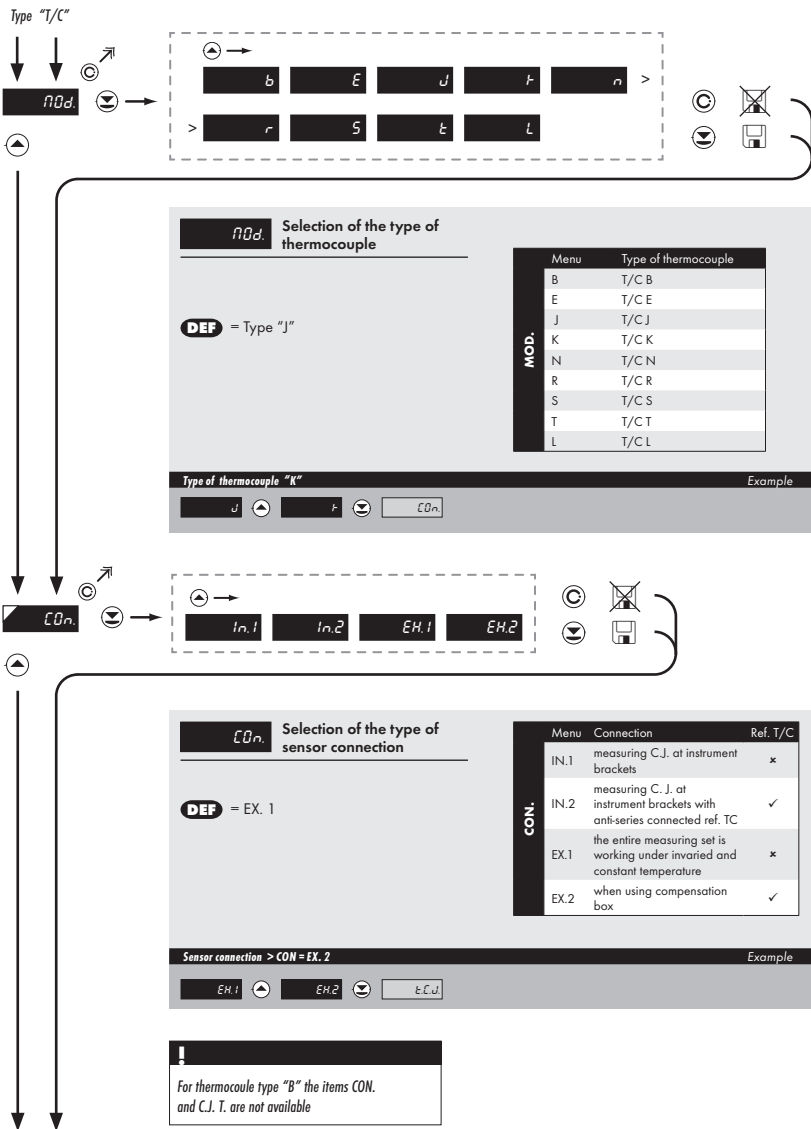
- positioning of the DP is set here in the measuring mode

DEF = 00.0

Projection of DP on display > 00,0 Example

00.0 *subsequent item on the menu depends on instrument equipment





→
 Setting temperature of cold junction
 →

Setting temperature of cold junction
DEF = 0

- range -20...99 °C with compensation box

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

!

Measuring cold junction on the instrument bracket.
(Method - In. 1)

→

Setting projection of the decimal point
DEF = 000

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

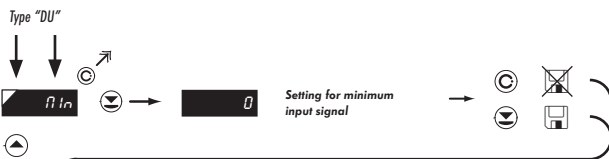
Projection of DP on display > 00,0
Example

*subsequent item on the menu depends on instrument equipment

!

Method and procedure of setting the cold junctions is described in separate chapter on page 58

34



0 Setting display projection for minimum value of input signal

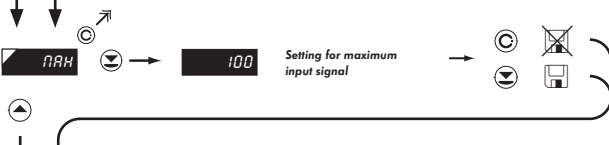
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 0

Projection for begin > MIN = 0 Example

0



100 Setting display projection for maximum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 100

Projection for end > MAX = 250 Example

100 ◀	100 ▶	110 ▶	120 ▶	130 ▶	140 ▶
150 ▶	150 ▶	250 ▼	<input type="text" value="FO-"/>		



FD_r

Setting projection of the decimal point

DEF = 00.0

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

Projection of DP on display > 0.00

Example

00.0
▲
0.00
▼

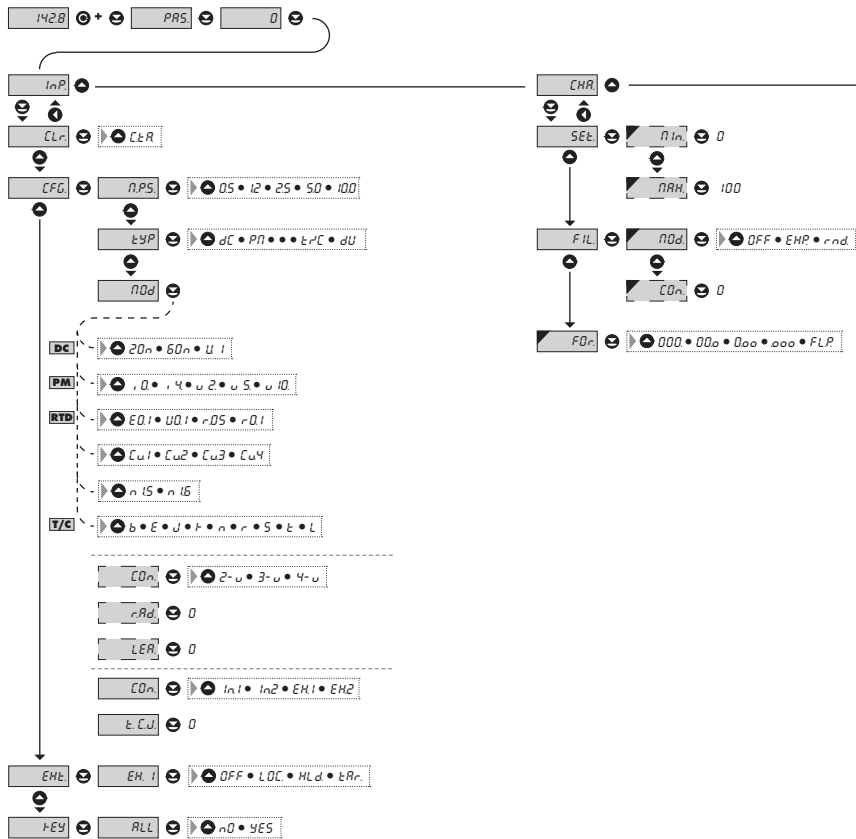
n.n.U

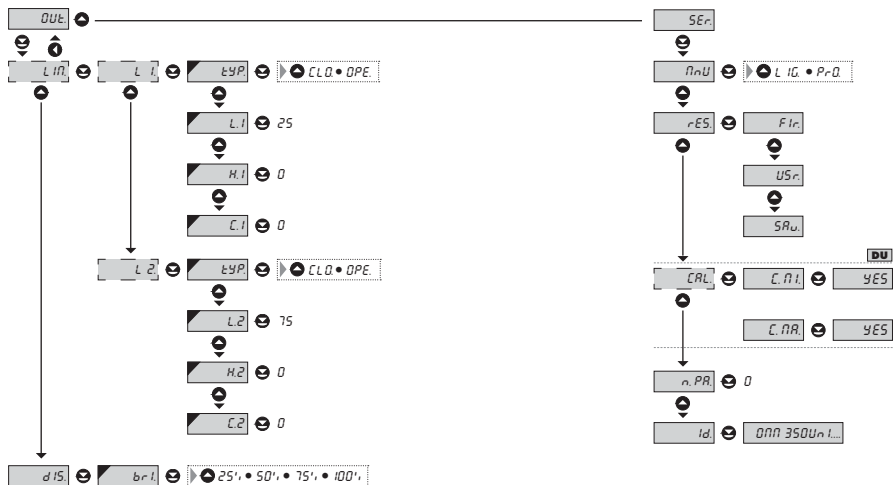
*subsequent item on the menu depends on instrument equipment

34

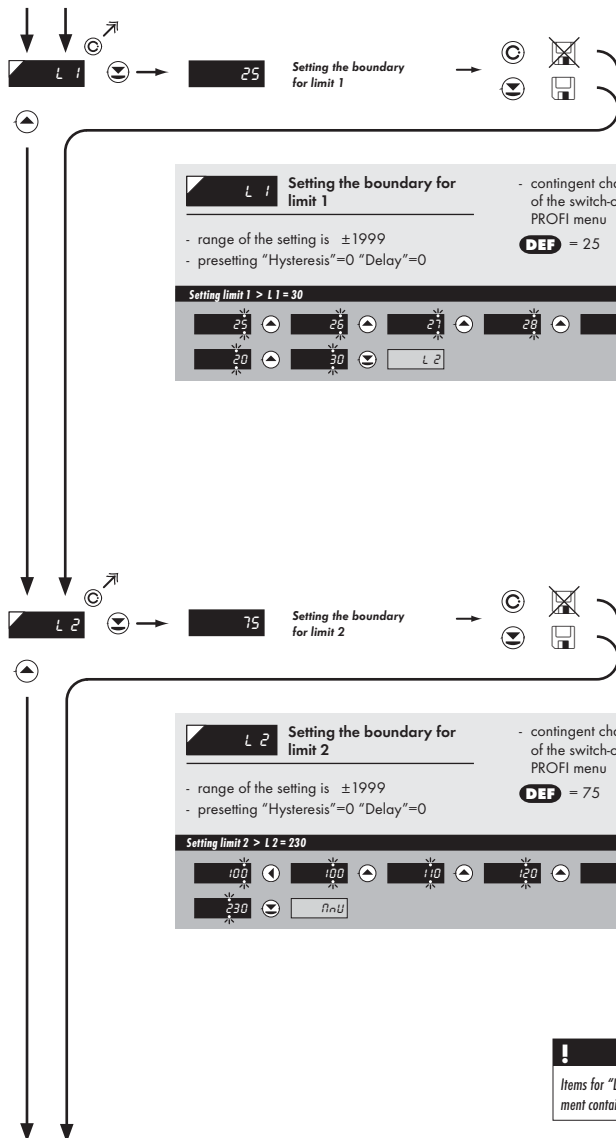
Calibration of the beginning and the end of range of linear potentiometer is on page 37



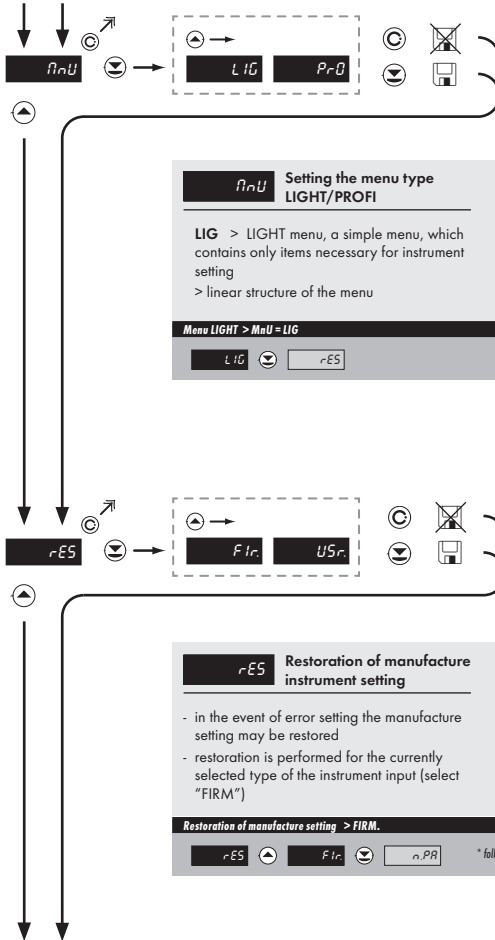




Upon delay exceeding 60 s the programming mode is automatically discontinued and the instrument itself restores the measuring mode



!
Items for "Limits" are accessible only if the instrument contains them.



MaU

Setting the menu type LIGHT/PROFI

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

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

DEF = LIG

Menu LIGHT > MaU = LIG

Example

LIG

MaU

rES

Restoration of manufacture instrument setting

- in the event of error setting the manufacture setting may be restored
- restoration is performed for the currently selected type of the instrument input (select "FIRM")

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

Restoration of manufacture setting > FIRM.

Example

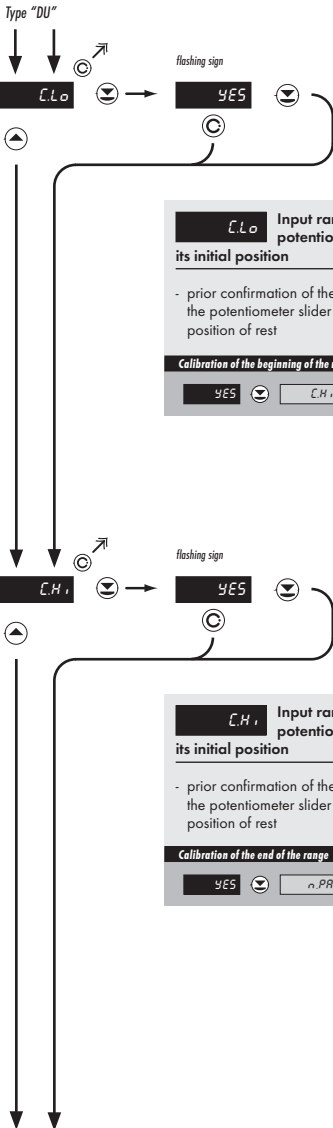
rES

FIRM

MaU

* following item depends on the instrument type, for "DU" > "CLa"

Type „DC“	38
Type "PM"	38
Type "OHM"	38
Type "PI"	38
Type "Cu"	38
Type "Ni"	38
Type "T/C"	38
Type "DU"	37



C.Lo Input range calibration - potentiometer slider is in its initial position Only for type "DU"

- prior confirmation of the flashing sign "Yes" the potentiometer slider has to be in given position of rest

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

YES

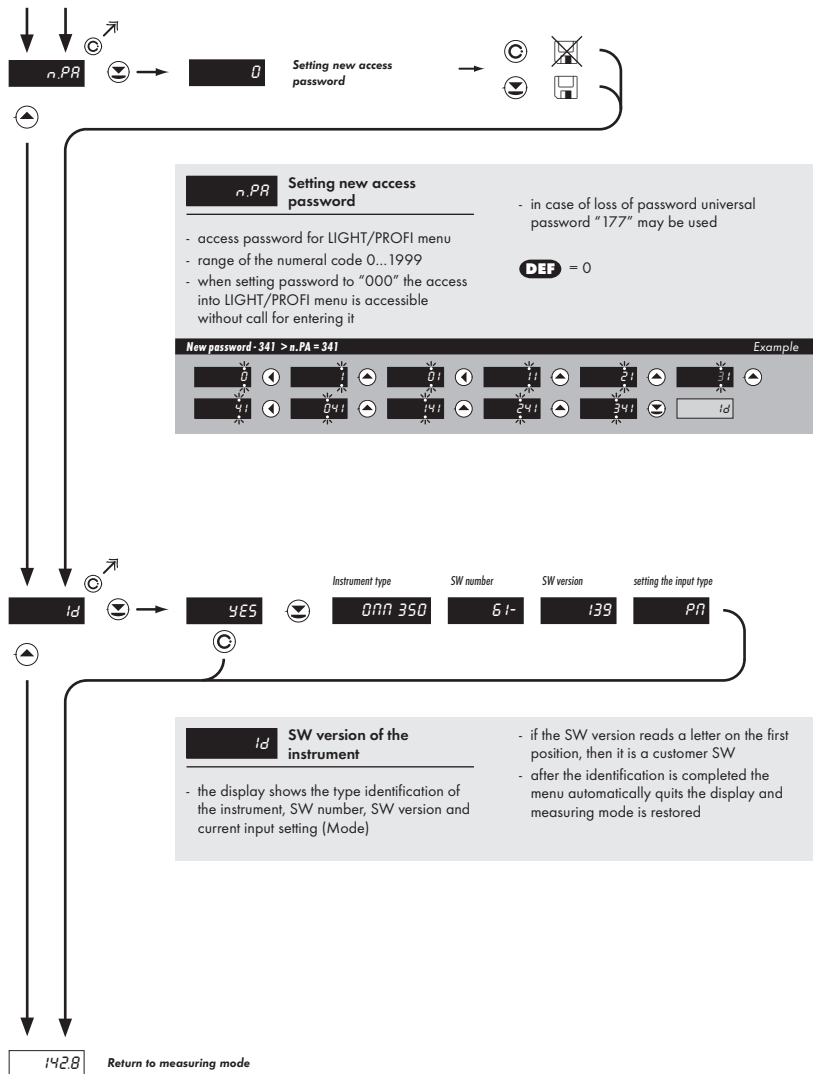
C.Hi Input range calibration - potentiometer slider is in its initial position Only for type "DU"

- prior confirmation of the flashing sign "Yes" the potentiometer slider has to be in given position of rest

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

YES





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**

SETTING
PROFI

- 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

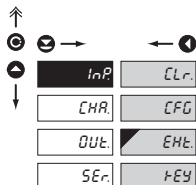


- temporary switch-over to **PROFI** menu, which is suitable to edit a few items
- after quitting **PROFI** menu the instrument automatically switches to **LIGHT** menu
- access is password protected (if it was not set under item N. PA. =0)







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

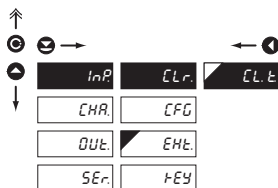
6.1 Setting "PROFI" - INPUT



The basic instrument parameters are set in this menu

-  Tare resetting
-  Selecting the measuring range and rate
-  Setting the external input function
-  Setting the ENTER key function

6.1.1 Tare resetting

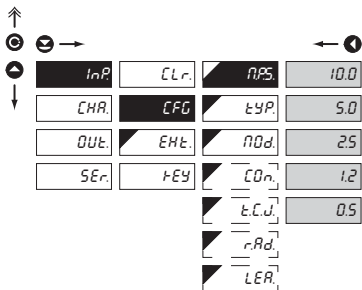


 Tare resetting

!
Does not apply for version RTD, T/C

6.1.2 Setting the input parameters

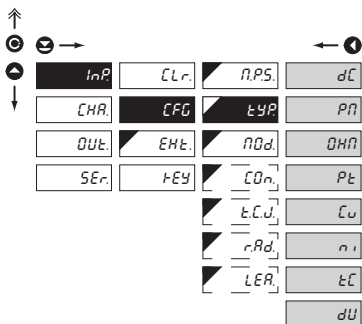
6.1.2a Selection of measuring rate



nPS Selection of measuring rate

10.0	10,0 measurements/s
5.0	5,0 measurements/s
2.5	2,5 measurements/s
1.2	1,2 measurements/s
0.5	0,5 measurements/s

6.1.2b Selection of „instrument“ type



LYP Selection of "instrument" type

- selection of particular type of "instrument" is bound to relevant dynamic items

dC	DC voltmeter
Pn	Process monitor
OHn	Ohmmeter
Pt	Thermometer for Pt
Cu	Thermometer for Cu
nI	Thermometer for Ni
tC	Thermometer for thermocouples
dU	Display for linear potentiometers

6.1.2c Selection of measuring range

↑
 Ⓞ →
 ▲
 ↓

		DC		350DC ←	
inP	CLr	NPS	20n	1R	
CHR	CFG	LYP	60n	5R	
OUT	EHL	NOd	U 1	20	DEF
SER	FEY	EO_n		40	
		PM			
		t.C.J.	1.0	100	
		r.A.d.	1.4	200	
		LER	U 2		
			U 5		
		T/C			
	DEF	U10		b	
		RTD		E	
	DEF	EO.1		J	
		U0.1		F	DEF
		r.D.5		n	
		r.D.1		r	
		Ni		S	
	DEF	n.5		t	
		n.6		L	
		Cu			
	DEF	CU.1			
		CU.2			
		CU.3			
		CU.4			

NOd Selection of instrument measuring range

- setting the input range depends on the measured range ordered

Menu	Measuring range	DC
20m	0..20 mV	
60m	0..60 mV	
U 1.	0..1 000 mV	
1. A	0..1 A	
5. A	0..5 A	
20	0..20 V	
40	0..40 V	
100	0..100 V	
200	0..200 V	
Menu	Measuring range	PM
1.0.	0..20 mA	
1.4.	4..20 mA	
U 2.	0..2 V	
U 5.	0..5 V	
U 10.	0..10 V	
Menu	Measuring range	OHM
A	0..300 Ohm	
B	0..1 500 Ohm	
C	0..3 000 Ohm	
D	0..30 000 Ohm	
Menu	Measuring range	PI
EO.1	Pt 100 [3 850 ppm/°C]	
U0.1	Pt 100 [3 920 ppm/°C]	
R.05	Pt 50 [3 910 ppm/°C]	
R0.1	Pt 100 [3 910 ppm/°C]	
EO.5	Pt 500 [3 850 ppm/°C]	
E1.0	Pt 1000 [3 850 ppm/°C]	
Menu	Measuring range	Ni
Ni.5	Ni 1 000 [5 000 ppm/°C]	
Ni.6	Ni 1 000 [6 180 ppm/°C]	
Ni.5	Ni 10 000 [5 000 ppm/°C]	
Ni.6	Ni 10 000 [6 180 ppm/°C]	
Menu	Measuring range	Cu
Cu.1	Cu 50 [4 280 ppm/°C]	
Cu.2	Cu 100 [4 280 ppm/°C]	
Cu.3	Cu 50 [4 260 ppm/°C]	
Cu.4	Cu 100 [4 260 ppm/°C]	
Menu	Type of thermocouple	T/C
B	T/C „B“	
E	T/C „E“	
J	T/C „J“	
K	T/C „K“	
N	T/C „N“	
R	T/C „R“	
S	T/C „S“	
T	T/C „T“	
L	T/C „L“	

** letter in the first column marks the measuring range as per the order

6.1.2d Selection of type of sensor connection

RTD **OHM**

inP	CLr	NPS	2-w
CHr	CFG	LYP	3-w
OUT	EHt	NOd	4-w
SEr	LEY	CO _n	DEF
		rAd	
		LEr	

CO_n Selection of type of sensor connection

- in 2- or 3-wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

2-w 2-wire connection

3-w 3-wire connection

4-w 4-wire connection

6.1.2e Offset of the beginning of the range

RTD **OHM**

inP	CLr	NPS	0
CHr	CFG	LYP	
OUT	EHt	NOd	
SEr	LEY	CO _n	
		rAd	
		LEr	

rAd Offset of the beginning of the measuring range

- in cases when it is necessary to offset the beginning of the range by certain value, e.g. while using sensor in measuring head
- entered directly in Ohm (0...19,99)

DEF = 0

6.1.2f Compensation of 2-wire conduct

RTD **OHM**

inP	CLr	NPS	YES
CHr	CFG	LYP	
OUT	EHt	NOd	
SEr	LEY	CO _n	
		rAd	
		LEr	

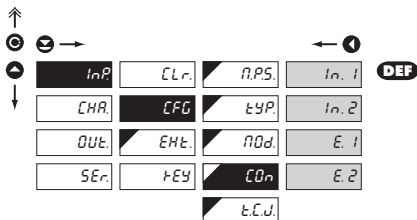
LEr Compensation of 2-wire conduct

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

DEF = 0

6.1.2g Selecting the instrument measuring range

T/C



For thermocouple type "B" the items CON. and C.J. T. are not available

Method of evaluation of the cold junction

Measurement without reference thermocouple
- measuring cold junction at instrument brackets

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

Measurement without reference thermocouple
- the entire measuring set is working under invaried and constant temperature

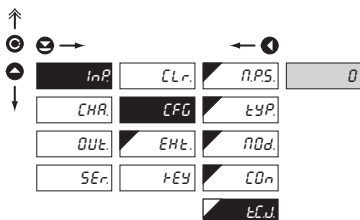
Measurement with reference thermocouple
- when using compensation box



Method and procedure of setting the cold junctions is described in separate chapter on page 58

6.1.2h Setting temperature of cold junction

T/C



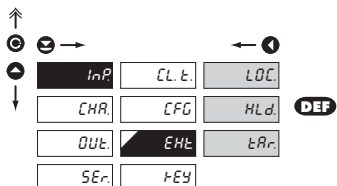
Setting temperature of cold junction

- range -20...99 °C with compensation box
- = 0 °C



For thermocouple type "B" the items CON. and C.J. T. are not available

6.1.3 External input function selection



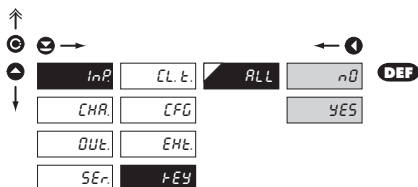
EHL External input function selection

- OFF** Input is off
- LDC** Locking keys on the instrument
- HLD** HOLD, stop measuring of the entire instrument
- LRr.** TARE - Tare activation*

*

Does not apply for version RTD, T/C

6.1.4 Optional accessory functions of the keys



TEY Assigning further functions to instrument keys

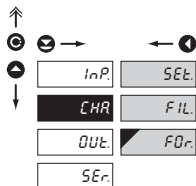
ALL Setting all keys

- owing to limited space in the instrument's memory it is not feasible to set the keys' functions one by one

- n0** Accessory functions are off
- YES** Accessory functions are on

- ⊕ projection of temperature of cold junction (T/C)
- ⊕ projection of line resistance (RTD)
- ⊕ Tare value displayed (DC, PM, DU)
- ⊖ Display taring (DC, PM, DU)

6.2 Setting "PROFI" - CHANNEL



In this menu the instrument input parameters are set

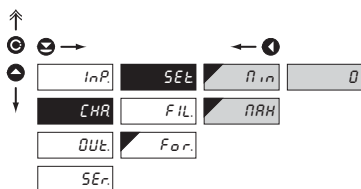
SEt. Setting display projection

FIL. Setting the digital filters

FOR. Setting the decimal point

6.2.1 Zobrazení na displeji

DC PM DU OHM

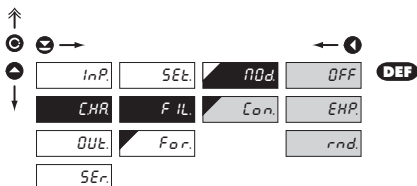


SEt. Setting display projection

nIn Setting display projection for minimum value of input signal
 - range of the setting is ± 1999
 - **DEF** = 0

nRH Setting display projection for maximum value of input signal
 - range of the setting is ± 1999
 - **DEF** = 100

6.2.2 Setting the digital filters



NoD. Setting the digital filters

- the instrument allows for classic projection of a number with decimal point as well as with floating DP, allowing for projection of a number in its most precise form "FLP."

Con. Setting the constant

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

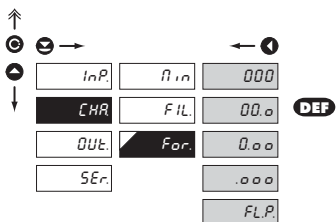
EHP. Selection of exponential filter

- the value is calculated from a number of measurements selected in „CON“
- range 2...100

rnd. Selection of value round-up

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

6.2.3 Volba desetinné tečky



For. Setting the decimal point

- the instrument allows for classic projection of a number with placement of the decimal point as well as projection with floating point, enabling projection of a number in its most precise form "FLP."

000. Setting the DP - XXXX.

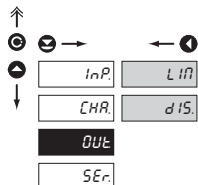
00.o. Setting the DP - XXX.x

0.o.o. Setting the DP - XX.xx

.o.o.o. Setting the DP - X.xxx

FLP. Floating decimal point

6.3 Setting „PROFI“ - OUTPUTS

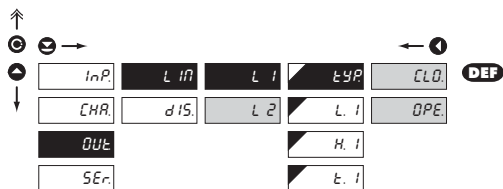


It is possible to set the parameters of the instrument output signals in this menu

- Setting the type and the switching of limits
- Setting the display brightness

6.3.4 Setting the limits

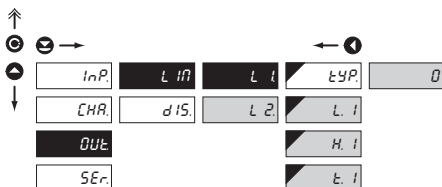
6.3.1a Limits - relay functions



Setting the type of relay function

- Relay switches on when the condition is met
- Relay switches off when the condition is met

6.3.1b Limits - boundaries



The process of setting the Limit 2 is identical with the setting for Limit 1

L 1 Setting the boundaries

L 1 Setting the boundary for relay switch-on

- within the full display range (± 1999)
- **DEF** = 25 (L 1), 75 (L 2)

H 1 Setting hysteresis

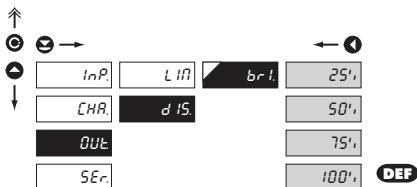
- within the full display range (± 1999)
- **DEF** = 0

t. 1 Setting the offset of the relay switch-on

- within the range 0...99,9 s
- **DEF** = 0

6.3.2 Display setting

6.3.2a Display brightness



br i Setting the display brightness

- by selecting the display brightness we may react properly to light conditions in place of location of the instrument
- brightness in the programming menu is always 100 %

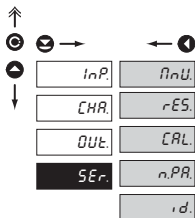
25% Display brightness - 25 %

50% Display brightness - 50 %

75% Display brightness - 75 %

100% Display brightness - 100 %

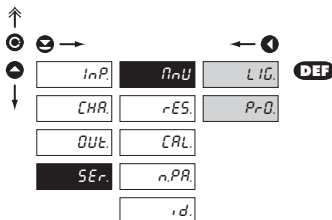
6.4 Setting "PROFI" - SERVICE



The instrument's service functions are set in this menu

n.n.U.	Selection of menu type LIGHT/PROFI
r.ES.	Restoration of the manufacture setting and instrument calibration
ERL	Calibration of input range for version „DU“
n.PR.	Setting new access password
.d.	Instrument identification

6.4.1 Selection of the type of programming menu



n.n.U. Selection of menu type LIGHT/PROFI

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

L.LG. Active LIGHT menu

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

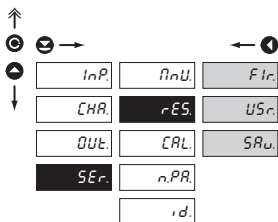
P.r.D. Active PROFi menu

- complete programming menu for expert users
- tree menu



Change of setting is valid upon next access into menu

6.4.2 Restoration of the manufacture setting



After restoration the instrument switches off for couple seconds

rSE. Restoration of manufacture setting

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

FIr. Restoration of instrument manufacture setting

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

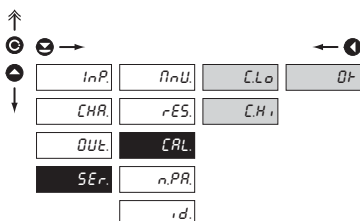
USr. Restoration of instrument user setting

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

SRu. Save instrument user setting

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

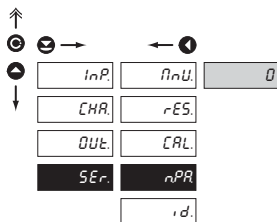
6.4.3 Calibration of the input range

DU


CR.L. Calibration of the input range

- when MIN is displayed move the potentiometer slider into required minimum position and confirm by „Enter“, calibration is confirmed by showing sign „OK“
- when MAX is displayed move the potentiometer slider into required maximum position and confirm by „Enter“, calibration is confirmed by showing sign „OK“

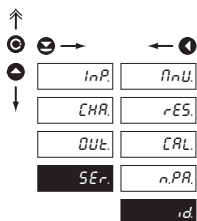
6.4.4 Setting new access password



n.PR. Setting new password for access into the LIGHT and PROFI menu

- this option allows to change the numeral code, which protects the access into the LIGHT and PROFI Menu.
- numeral code range is 0...1999
- universal password in case of loss „177“


6.4.5 Instrument identification



id. 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
- after the identification is completed the menu automatically quits the display and measuring mode is restored

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  **Li**
- 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



n0 item will not be displayed in USER menu

YES item will be displayed in USER menu with the chance of editing

SH0 item will be solely displayed in USER menu

Setting sequence of items in "USER" menu

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



Example:

Into USER menu were selected these items

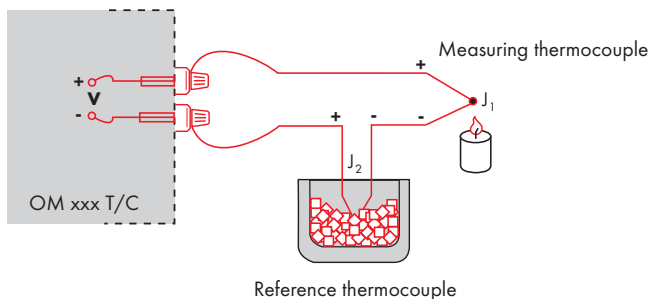
(keys +) > C. TA., LIM 1, LIM 2 for which we have preset this sequence (keys +):

C. TA.	5
LIM 1	0 (sequence not determined)
LIM 2	1

Upon entering USER menu

(key) items will be projected in the following sequence: LIM 2 > C.TA . > LIM 1

An instrument with input for temperature measurement with thermocouple allows for setting of two types of measurement of the cold junction.



WITH REFERENCE THERMOCOUPLE

- a reference thermocouple may be located in the same place as the measuring instrument or in place with stable temperature/compensation box
- when measuring with reference thermocouple set \mathcal{E}_{J_2} in the instrument menu to $1n\ 2$ or $E\ 2$
- when using a thermostat (a compensation box or environment with constant temperature) set in the instrument menu \mathcal{E}_{J_2} its temperature (applies for setting \mathcal{E}_{J_2} to $E\ 2$)
- if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu \mathcal{E}_{J_2} to $1n\ 2$. Based on this selection the measurement of the surrounding temperature is performed by a sensor located in the instrument terminal board.

WITHOUT REFERENCE THERMOCOUPLE

- inaccuracy originating from the creation of dissimilar thermocouples on the transition point terminal-conductor of the thermocouple is not compensated for in the instrument
- when measuring without reference thermocouple set \mathcal{E}_{J_2} in the instrument menu to $1n\ 1$ or $E\ 1$
- when measuring temperature without reference thermocouple the error in the measured data may be even 10°C (applies for setting \mathcal{E}_{J_2} to $E\ 1$)

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

INPUT - OMM 350UNI

range is adjustable in configuration menu		DC
0...20 mV	> 10 MOhm	Input 4
0...60 mV	> 10 MOhm	Input 3
0...1000 mV	1,25 MOhm	Input 1

range is adjustable in configuration menu		PM
0/4...20 mA	< 200 mV	Input 5
0...2 V	10 MOhm	Input 4
0...5 V	1,25 MOhm	Input 1
0...10 V	1,25 MOhm	Input 1

range is fixed, as per order		OHM
0...300 Ohm		
0...1,5 kOhm		
0...3 kOhm		
0...30 kOhm		

Connection: 2, 3 or 4-wire

range is fixed, as per order		RTD
EU > Pt xxxxx	-50°...450°C	
US > Pt xxxx	-50°...450°C	
RU > Pt 50	-200°...1100°C	
RU > Pt 100	-200°...450°C	
Cu 100/4280	-200°...200°C	
Cu 100/4260	-50°...200°C	
Ni xxxxx	-50°...250°C	

Type Pt: EU > 100/500/1 000 Ohm, with 3 850 ppm/°C
 US > 100 Ohm, with 3 920 ppm/°C
 RU > 50/100 Ohm with 3 910 ppm/°C

Type Ni: Ni 1 000/ Ni 10 000 with 5 000/6 180 ppm/°C
 Cu 50/Cu 100 with 4 260/4 280 ppm/°C

Connection: 2, 3 or 4-wire

range is adjustable in configuration menu		T/C
Type:	J (Fe-CuNi)	-200°...900°C
	K (NiCr-Ni)	-200°...1 300°C
	T (Cu-CuNi)	-200°...400°C
	E (NiCr-CuNi)	-200°...690°C
	B (PtRh30-PtRh6)	300°...1 820°C
	S (PtRh10-Pt)	-50°...1 760°C
	R (Pt13Rh-Pt)	-50°...1 740°C
	N (Omega alloy)	-200°...1 300°C
	L (Fe-CuNi)	-200°...900°C

Lin. pot.supply 2,5 VDC/6 mA
 min. potentiometer resistance is 500 Ohm

INPUT - OMM 350DC

range is adjustable in configuration menu		DC
0...500 mA	< 6 mV	Input 5
0...1 A	< 12 mV	Input 5
0...5 A	< 60 mV	Input 5
0...20 V	8,66 MOhm	Input 2
0...40 V	8,66 MOhm	Input 2
0...200 V	8,66 MOhm	Input 2

ZOBRAZENÍ

Display: 999999, intensive red or green 7-segment LED, digit height 9,1 mm

Projection: ±1999

Decimal point: adjustable - in programming mode

Brightness: adjustable - in programming mode

INSTRUMENT ACCURACY

Temperature coef.: 100 ppm/°C

Accuracy: ±0,2 % of the range + 1 digit**
 ±0,3 % of the range + 1 digit

Rate: 0,5 - 1,2 - 2,5 - 5 - 10 measurements/s

Overload capacity: 10x (t < 100 ms), 2x (long-term)

Digital filter: adjustable in configuration menu

Comp.of conduct.: max. 30 Ohm

Comp.of cold junct.: adjustable

-20°...99°C or automatic

Functions: Tare - display resetting

Hold - stop measuring (upon contact)

Lock - control keys locking

OM Link: Company communication interface for instrument operation, setting and update

Watch-dog: reset after 25 ms

Calibration: at 25°C and 40 % r.h.

COMPARATOR

Type: digital, adjustable in the menu

Limits: ±1999

Hysteresis: 0...999

Delay: 0...99,9 s

Outputs: 2x bistabil relays with switch-on contact (Form A)
 (48 VAC/30 VDC, 3 A)**

Relay: 1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

POWER SUPPLY

Options: 10...30 V AC/DC, 5 VA, isolated,
 - fuse inside (T 4000 mA)
 80...250 V AC/DC, 10 VA, isolated
 - fuse inside (T 630 mA)

** type "PM" has for range 0...5 V accuracy ±0,4 %

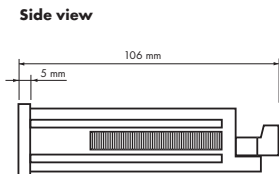
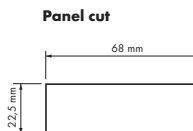
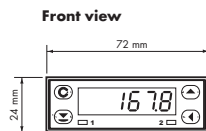
* values apply for resistance load

MECHANIC PROPERTIES

Material:	Noryl GFN2 SE1, incombustible UL 94 V-1
Dimensions:	72 x 24 x 106 mm
Panel cut-out:	68 x 22,5 mm

OPERATING CONDITIONS

Connection:	connector terminal board, conductor cross-section $<1,5 \text{ mm}^2$ / $<2,5 \text{ mm}^2$
Stabilisation period:	within 15 minutes after switch-on
Working temp.:	0°...60°C
Storage temp.:	-10°...85°C
Cover:	IP42 (front panel only)
Construction:	safety class I
Overvoltage category:	EN 61010-1, A2
Insulation resistance:	for pollution degree II, measurement category III Input/output/power > 300 V (PI), 150 (DI)
EMC:	EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11; EN 55022, A1, A2



Panel thickness: 0,5...20 mm

Product **OMM 350 UNI DC**
 Type
 Manufacturing No.
 Date of sale

GUARANTEE

A guarantee period of 60 months from the date of sale to the user applies to this instrument.
 Defects occurring 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.

YEARS

Stamp, signature

DECLARATION OF CONFORMITY

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

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

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

Product: 3 ½-digit programmable panel instrument

Type: **OMM 350/650**

Version: UNI, DC, AC

Conformity is assessed pursuant to the following standards:

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

and government ordinance:

Electrical safety:	No. 168/1997 Sb.
EMC:	No. 169/1997 Sb.

The evidence are the protocols of authorized and accredited organization:

VTÚE Praha, experimental laboratory No. 1158, accredited by ČIA
VTÚPV Vyškov, experimental laboratory No. 1103, accredited by ČIA

Place and date of issue: Prague, 1. September 2006

Miroslav Hackl
Company representative

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