

Nokeval

No 011002

Manual

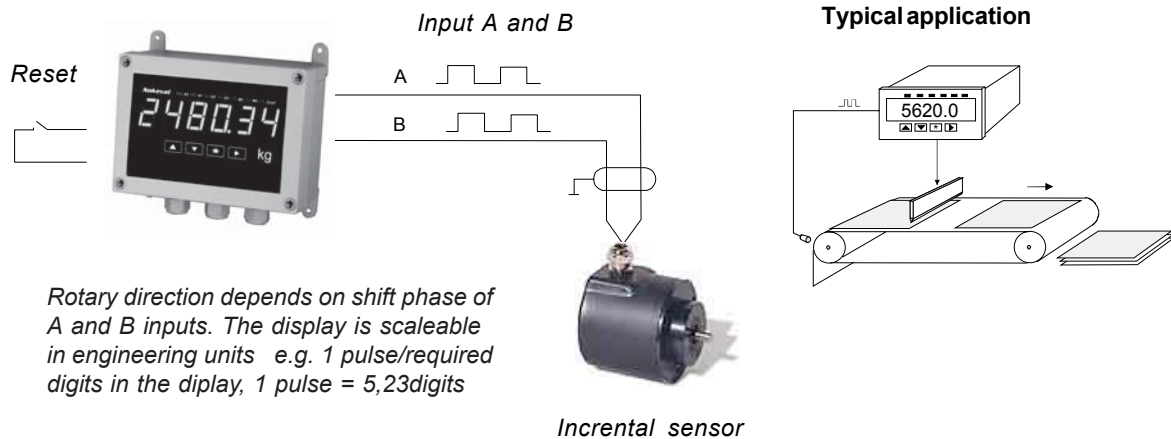
**Model 2800-2064
for incremental sensors**



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Panelmeter 2064 for incremental sensors



Description

The field indicator 2800-2064 is designed for incremental sensors for position applications. The display counts both up or down direction which depends on the shift phase of two outputs A and B of incremental sensor. The scaling of display can be set as floating value e.g. 1 input pulse=4.2345 digits. External reset is available for zeroing of the display. After resetting you can start new counting from starting value automatically or manually. By using automatic resetting and alarm relay the 2064 can be used as batch controller for different kind of applications as length measurements in moving lines. Alarm relay changes its stage when limit value is reached.

Serial output RS-232 and RS-485 is available as option for transferring display value to other systems.

The field display 2800-2064 is part of 2000 indicator series which includes over 100 different combinations by changing only input and outputs cards without tools. The front panel protection class is IP65.

For other sensor types as relay contact or inductive sensors is available model 2800-2061.

Technical specification

Sensors:

For Incremental Encoder with A and B outputs

Sensor supply:

5V, 12V tai 24 VDC, max. 100 mA

Display scaling:

-99999..999999

Input frequency range:

0..25 kHz

Decimal selection:

0,001..1

Measuring method:

Pulse counting up or down depend on phase shift between A and B inputs. Reset by external contact. Scaling of display can be set in engineering unit.

Relays:

You can set alarm value by front panel keys. Relay contacts max. 230 VAC, 0,5 A. Alternatively semiconductor relays 60 V / 0,5 A

Serial output (optional):

Serial output card RS232 and RS485 (both)

General:

6 digits

Display height 20 mm

display colour red LED, brighting adjustable

Power supply 85..240 VAC or 12..32 VDC / 24 VAC

Protection IP65

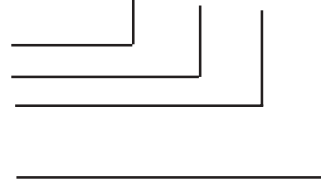
Weight 500 g

Type codes:

Type specification

2800-2026-MEM-REL2-24VDC

2026 input card
Memory card MEM
Relay card REL2
Power supply
12..32 VDC, 24VAC
or 85..240 VAC



Optional add-on cards:

Memory 2000-MEM
Relay card for 2 relays 2000-REL2
Mother board has two slots (B and C) for add-on cards.

Optional cards:

Serial output card 2000-RS232485
Relay card 2000-REL2
I/O card 2000-I/O

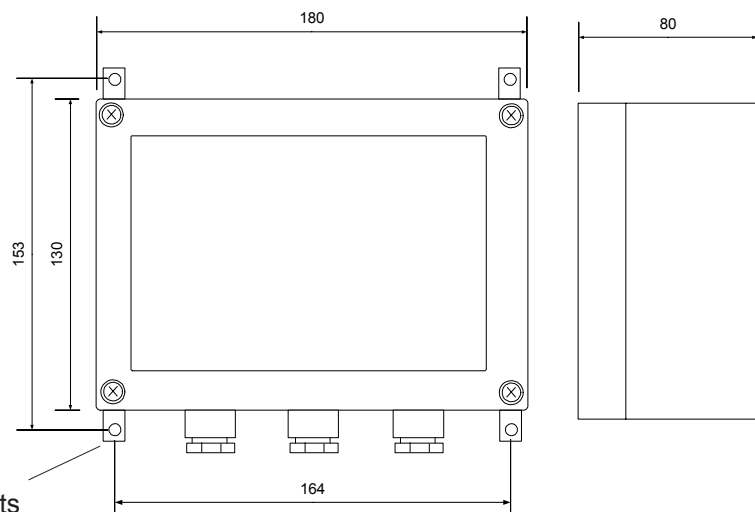
Motherboard accepts two optional cards

Case dimensions:

Enclosure:

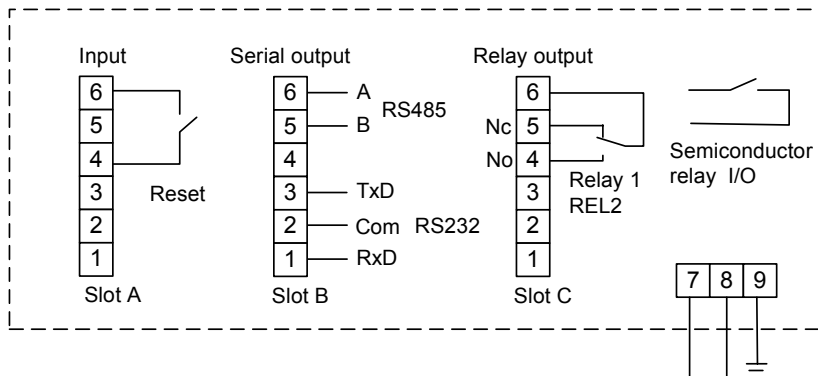
Light gray
Polykarbonate
Glands PG11
(3).

Removable
mounting brackets



Connection

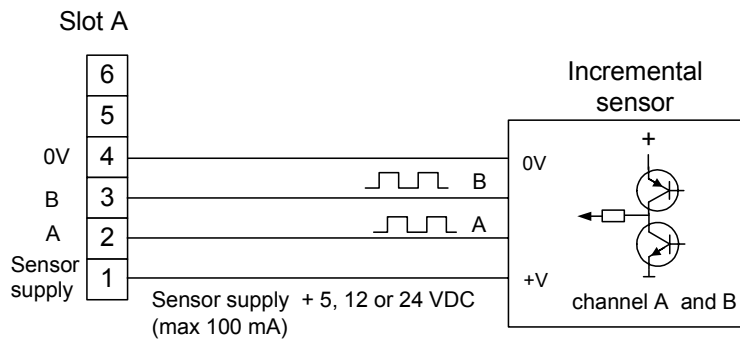
Input and output cards



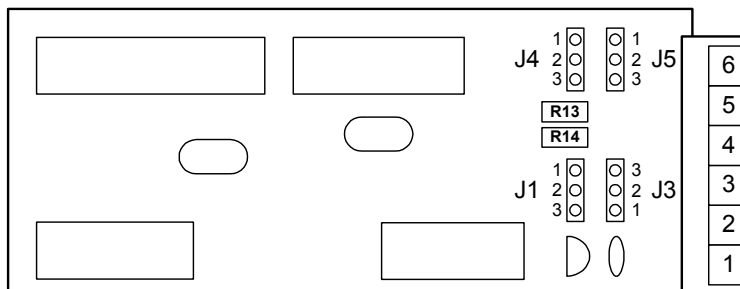
External reset of the display is obtained by connecting closing key to connectors of input card (A) 4 and 6. Display can also be reset by pressing ▼ and ▲ simultaneously.

Power supply 85..240 VAC
or 12..32 VDC /24 VAC
No polarity

Incremental sensor connection



Voltage supply and load resistance selection for sensors



Sensor lines can be connected 1 kΩ load resistance for currents increasing. This prevents of the failures appearance on the longer transfer distance. See table 2.

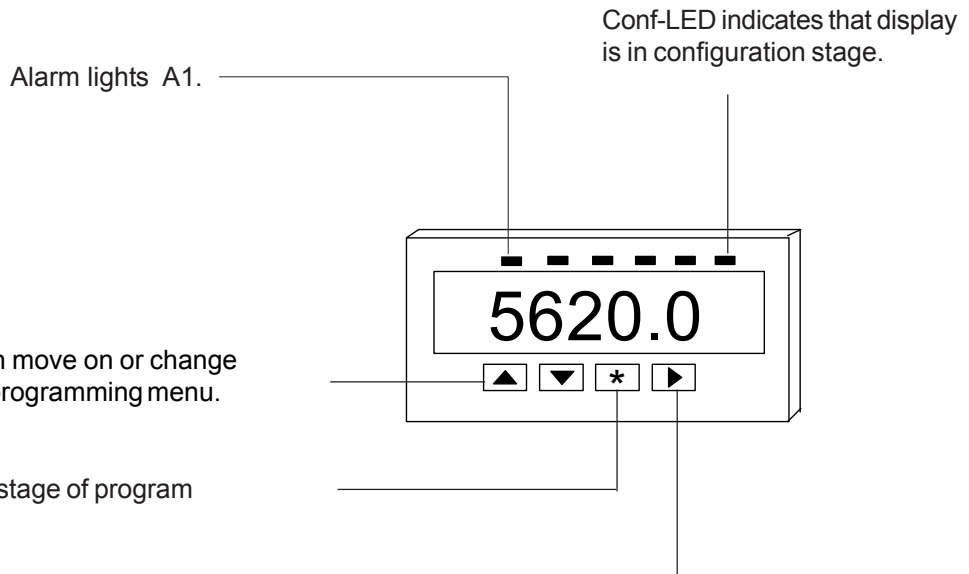
Table 1.
Jumper selection for sensor supply:

	J1	J3
5 V	-	1-2
12 V	2-3	2-3
24 V	1-2	2-3

Table 2.
Jumper selection for sensor line load resistance selection 1 kΩ:

	J4	J5
1 kΩ	1-2	1-2

Programming keys



With ▲▼-keys You can move on or change numbers and values in programming menu.

Acceptance of chosen stage of program

Programming state

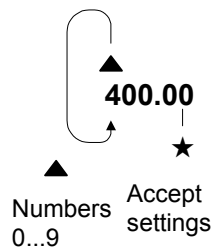
The programming state is achieved by pressing the button H and s simultaneously for 2 seconds. In the programming state, among others, the scaling of the display, sensors and alarm form are being placed. See up the programming in more detail in the section.

Move numbers from left to right when you change alarms or settings.

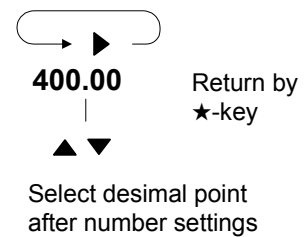
Setting of number value

You can set number value by ▲▼-keys number by number. Setting starts from largest number from left to right. You may go to next number by ►-key. Exit by ★-key.

Numbers setting



Move to right



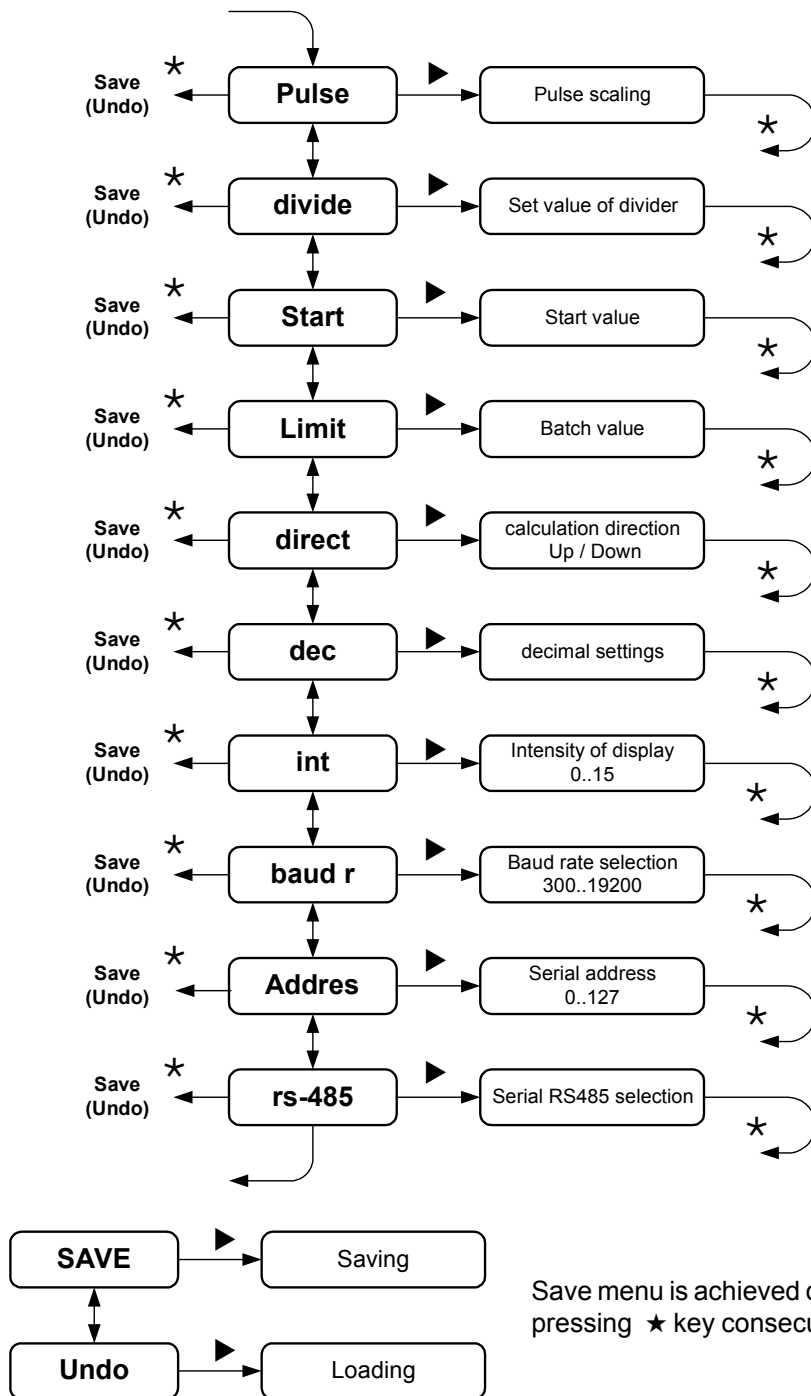
Programming

In the programming state can be selected sensor, pulse scaling and alarms. The programming state is achieved by pressing the ▲ buttons and ★ buttons simultaneously for about 2 seconds. The text **Pulse** appears in the display. By arrow keys (▲▼) can be move upwards and downwards in main menu. By pressing ► button can be enter configuration stage at wished point. Main menu can be returned with ★ button, when configuration are made. When all arrangements have been made, can

be move to SAVE or UNDO - menu, with ★ button. SAVE or UNDO accepts with the ► button, UNDO cancels the changes.

Pulse scaling happens by setting multiplier and divide, which gives possibility to use a very small value of multiplier, (>6 digits), for example 0.000673 digits/pulse.

Start: press ★ and ▲ buttons simultaneously with 2 seconds.



Function keys:

▲▼ Move up or down or change values

★ Return

► Start settings or move to right

Pulse factor
e.g. 1m³/10 pulses =0.1

Divider of pulse factor
e.g. divider=100, pulse=0.123
Display =0,123/100=0.00123

Start value after resetting

Alarm value or batch item

UP or Down counting from start value

Number of decimals

Brightness of display : 0...15
Brightest=15

Baud rate of serial output:
300...19200 bps

Serial address: 0...127:

Serial output selection:
RS485=ON or OFF
When serial RS232 is used,
set this selection=OFF

Save menu is achieved directly by pressing ★ key consecutively

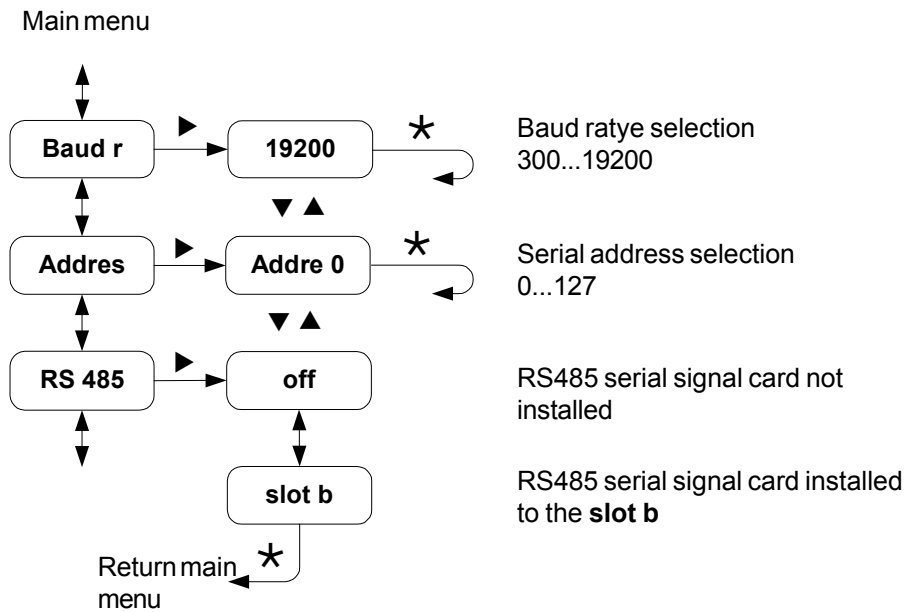
Serial output RS485/RS232 (option)

Meter may be provided with optional serial output and you can read measurements by e.g. PC. Display programming can not be made via serial port. Additional card provides serial signal RS232 and RS485, only one of those can be selected.

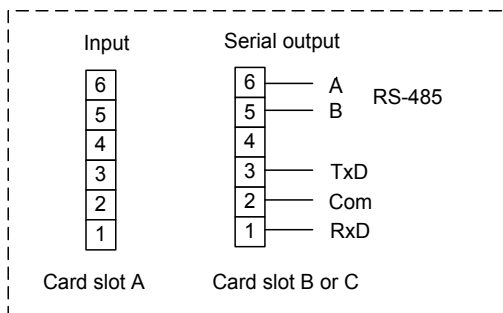
Serial signal is isolated from both input signal and power supply. Meters with RS485 can be max. 31 in same loop and longest distance 1000m. RS232 enables only connection of two devices and max. distance 10..20 m.

In programming stage you can first select card type (serial) mounted to slot B or C and then address and Baud rate. Baud rates are: 300, 1200, 2400, 4800, 9600, 19200 and addresses 0...127.

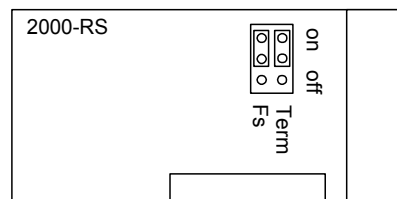
Accept selection and move forward by ►-key. You come back to previous level always by ★-key. Program remembers card type mounted, if it has been saved by save command when leaving program. In case you can not choose serial card, slot has automatically recognized card (plug and play).



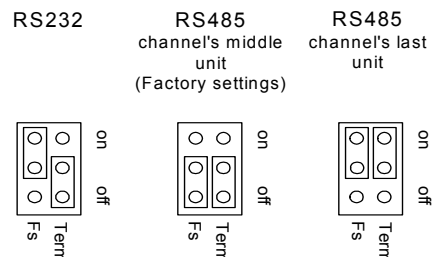
Terminal connections:

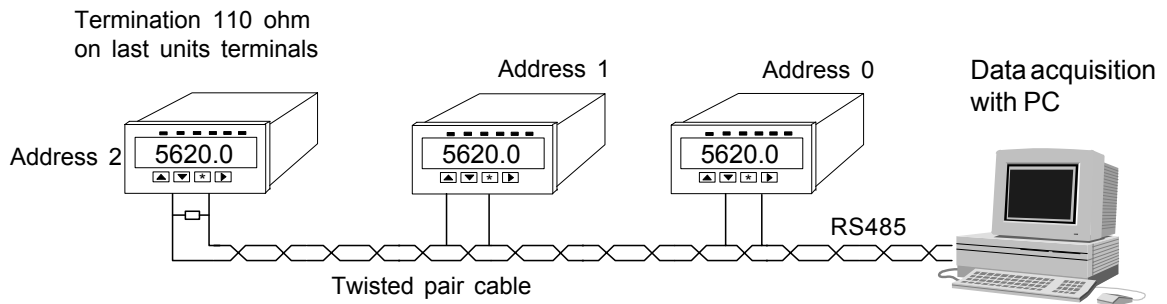


Serial card



By serial signal RS485 last unit must be terminated by 110 ohm resistor. you can make termination at terminal connectors or by connecting jumper J1 to ON-position.





Serial communication

Baudrate: 300, 1200, 2400, 4800, 9600 and 19 200
 1 Start, 8 Data and 1 Stop bit, no parity.

Serial protocol (SCL):

MESSAGES: When asking the measurement data from the panelmeter 2064 through the serial port, a command sequence which is in accordance with the SCL protocol is used for the inquiry:
 (Only the measurement results can be asked from the panelmeter 2064)

<ADDR+80h>COMMAND STRING<ETX><BCC>

<ADDR>

The first byte character to be sent contains the ADDR (0..127) of the address of the destination device and at the same time functions as the start bit of the command. 80H (in a decimal 128) with which an uppermost bit is set as the number one is added to the address.

COMMAND STRING: When measurement data is requested, the actual command is: MEA CH 1 ? , in which 1 means the channel number. (there is only one channel in the panelmeter 2064 so the number is always 1).

<ETX>

<ETX> mean the end mark of the command, ASCII character 03h.

<BCC>

Finally the checksum is calculated using the XOR operation on the byte characters of the actual command including the ETX. In the example the ASCII codes have been presented in hexadecimal.

e.g.

One wants the measurement result from the display unit address 1. To the channel an inquiry is sent:
 MEA CH 1 ? (ASCII codes shown for <BCC> calculation)

M E A C H 1 ? <ETX> <BCC>
 4Dx45x41x20x43x48x20x31x20x3F x03 = 6F

(Presented the XOR operation with a character x)
 (ASCII code 20h corresponds to space character)

So the following bytes are sent to 2064:
 81 4D 45 41 20 43 48 20 31 20 3F 03 6F

RETURN MESSAGE: The answer from the panelmeter 2064 is obtained in the following format:

<ACK>RETURN MESSAGE<ETX><BCC>

<ACK>

The first byte of the answer contains the start of the answer <ACK> (ASCII-code 06h) and the answer itself, endmark <ETX> (ASCII-03h) and the checksum of the answer which is calculated from all the byte characters of the answer including <ACK> and <ETX>. 2064 counts the checksum in which case the receiver does not need necessarily to care about it,

e.g.

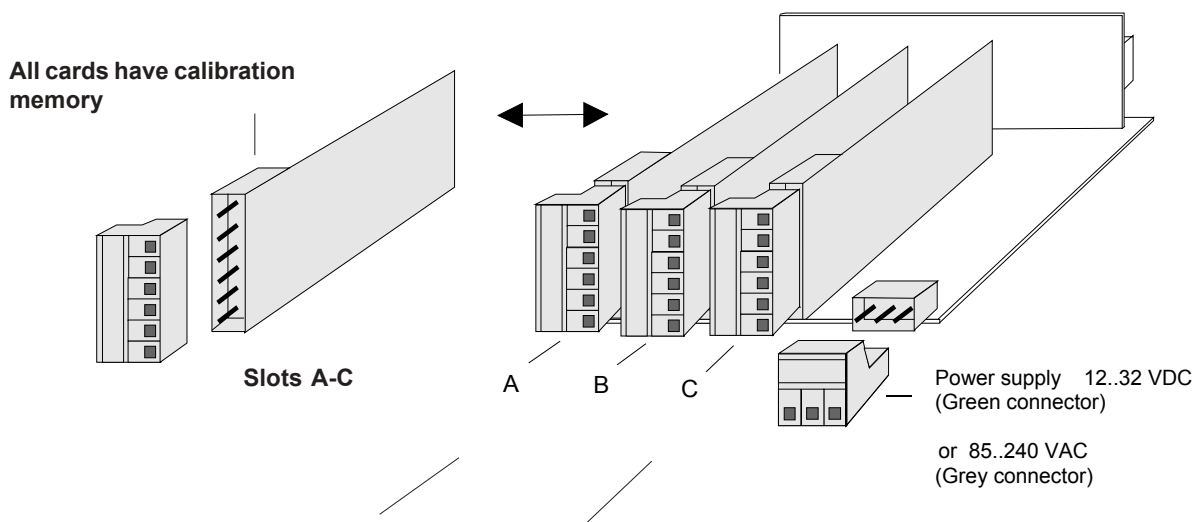
e.g. When a measurement result is for example 21.3, it will be obtained from the panelmeter in the following form

<ACK> 2 1 . 3 <ETX> <BCC>
 Answer: 06 32 31 2E 33 03 1B

Panelmeter 2800-construction

The 2800 series field displays are modular and easy to assemble. According to customers wishes. The basic construction consists of mother board with three slots, A, B and C. Slot A determines meter type and provides always input signal. Slot B and C are interchangeable. As factory delivery input signal is always installed into slot A, mA output into slot B and alarms into slot C. In case of f.ex 4 alarms and relay card with 2 change-over contact (2 + 2 relays) are used, you must place second relay card into slot B. If you accept

only closing or opening relay contacts, you need only one relay card with 4 relays placed into slot C. The slot B is now usable for other optional outputs. You can have different types of meters by only changing the input card in slot A. Data sheet of each type of meter dictates the possible combinations. Recalibration of card is not needed; only scaling and other settings must be set by front panel keys.

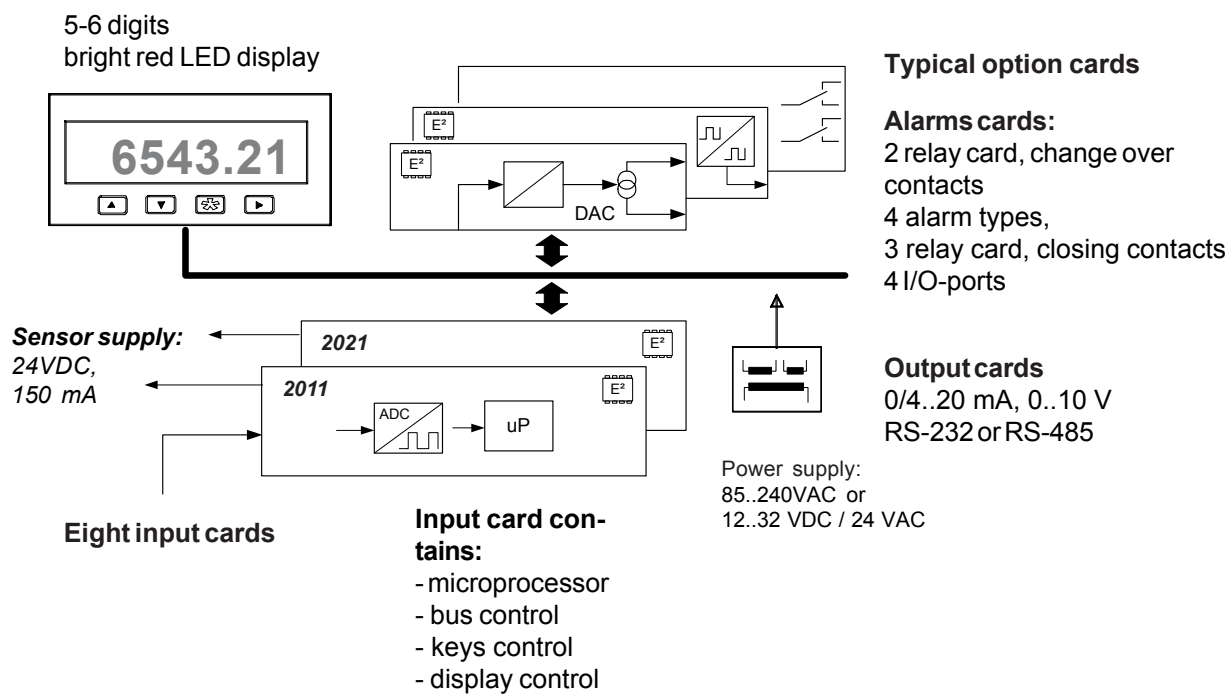


Change of meter type:
Input card is placed always to slot A. By changing input card you can get an other type of meter. You can change meter with pulse input to meter with current input, thermocouple, strain gage etc.

Additional slots:
Additional cards provide output 4..20 mA, alarms, serial interface, BCD output etc. Meter data sheet dictates possible combinations. grey connectors allow line voltage 110..240 VAC (relay contacts).

Power supply:
There are two different mother boards power supply 85..240VAC and 12..32 VDC. mother board accepts 24 VAC. Connectors are colour coded.

Modular indicator seriesS 2800-xxxx



2000 series input and option cards:

2011-IN	Process input	2000-BASE	Base card with power supply
2021-MU	Multi input	2000-REL2	Alarm card, NO/NC
2031-IR	Infrared sensor input	2000-REL3	Alarm card, Closing contacts
2041-SG	Strain gage measurement	2000-OUT	Output card, U and I
2051-PU	Scaleable frequency indicator	2000-RS	Serial output RS232 or RS485
2061-CO	Counter input (max 5 kHz)	2000-I/O	4 pcs input /output ports (60 V / 100 mA)
2071-RS	Serial input RS232 / RS485		
2081-BCD	BCD-input (1-5 digits)		

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