
FA 2510

Digital Display

for parallel signal sources

Manual



ERMA

Electronic GmbH

Warranty

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All our products are warranted against defective material and workmanship for a period of two (2) years from date of delivery. If it is necessary to return the product, the sender is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit. The warranty does not apply to defects resulting from action of the buyer, such as mishandling, improper interfacing, operation outside of de-

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1. Description

The FA 2510 is a digital display for parallel signal sources. It can be used e.g. together with PLCs or absolut encoders to display angles or distances.

Programmable functions

- parallel input, 16 bit max. (or 15 bit + sign)
- BCD-, BINARY- or Gray-Code
- programmable skaling factor 0.0001 ... 9.9999
- programmable offset -9999 ... 99999
- external/internal decimal point controlexterner Strobeingang wählbar
- Input for display test

2. Safety instructions

This instrument is produced in accordance with Class II of IEC 348 and VDE 0411. When delivered the instrument has been tested to meet all functions described. Before installing the instrument please read the mounting and servicing instructions.

We have no liability or responsibility to customer or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by equipment or software sold or furnished by us. Read the installation instruction carefully. No liability will be assumed for any damage caused by improper installation.

Inspect the instrument module carton for obvious damage. Be shure there are no shipping and handing damages on the module before processing. Do not apply power to the instrument if it has been damaged.

ERMA's warranty does not apply to defects resulting from action of the buyer, such as mishandling, improper interfacing, operation outside of design limits, improper repair or unauthorized modifications.

2.1. Symbols in this manual



Caution



Attention



Instruction



Hint

Caution: Will be used at **dangerous for life and health !**

Attention: Will cause **damage**.

Instruction: If not noticed, **trouble** may occur.

Hint: Useful hints for **better operation**.

3. Mounting

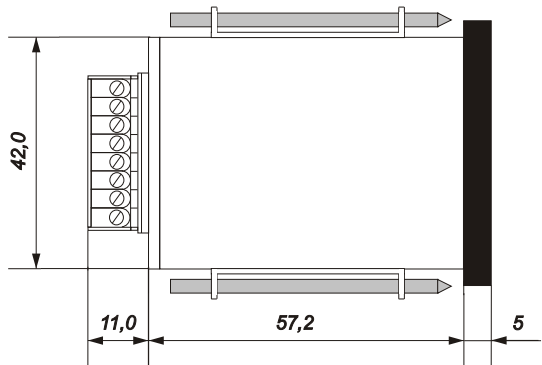
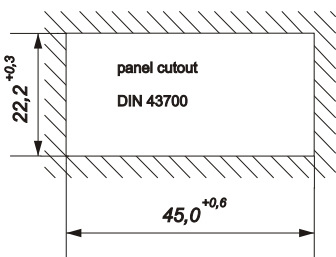
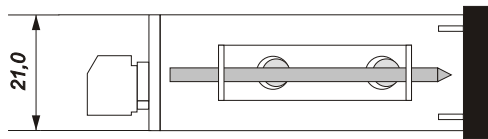
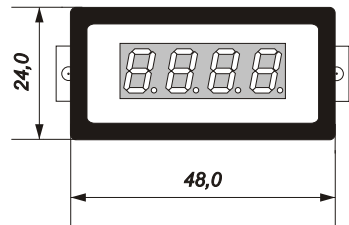
3.1. Place of operation

Attention must be paid to the protection against humidity, dust and high temperatures at the place of operation.

3.2. Mounting the display

3.2.1. Housing for switchboard

- For mounting in switch boards, insert the case into the panel cutout (according to DIN 43700: $45,0^{+0,6} \times 22,0^{+0,3}$ mm) from the front, using a fresh gasket for sealing as required. Click into and place at each side the two fastening clips (M2,5 x 50 mm).
- Tighten the screws alternately, using enough pressure to get good retention and sealing at the panel.

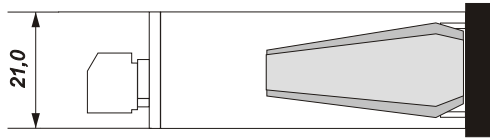
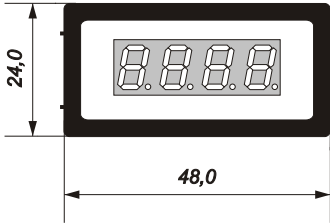


3.2.2. Housing for mosaic systems

Insert the case into one of the following mosaic-systems:

a) Mosaic system 8RU (M50x25) from Siemens

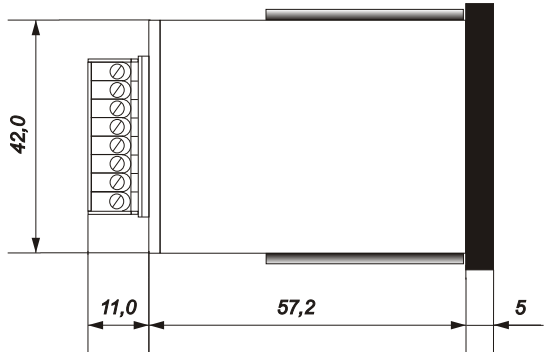
b) Mosaic system from Subklew



mosaic-system:

Siemens 8RU (M50x25)

Subklew



4. Electrical connections

4.1. General Instructions



- It is forbidden to plug or unplug connectors with voltage applied
- Attach input and output wires to the connectors only without voltages applied
- Cords must be provided with sleeves
- Attention must be paid that the power supply voltage applied will agree with voltage noticed at the name plate.
- The instrument has no power-on switch, so it will be in operation as soon as the power is connected.

4.2. Hints against noisy environments

All inputs and outputs are protected against noisy environment and high voltage spikes. Nevertheless the location should be selected to ensure that no capacitive or inductive interference can have an effect on the instrument or the connection lines.

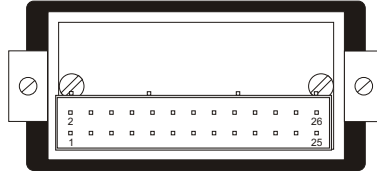
It is advisable:



- To use shielded cables.
- The wiring of shields and ground (0V) should be star-shaped.
- The distance to interference sources should be as long as possible. If necessary, protective screen or metal enclosures must be provided.
- Coils of relays must be supplied with filters.
- Parallel wiring of input signals and AC power lines should be avoided.

4.3. Connections and pin assignement

All inputs and outputs are connectors, designed as plug-in screw terminals.

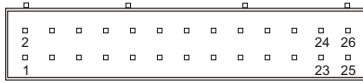


Anschlußbelegung					
Pin	Signal			Pin	Signal
	BCD	BINÄR	GRAY		
5	1	$2^0=1$	E1	1	Strobe
7	2	$2^1=2$	E2	2	decimal point 2^0 “+” button*
9	4	$2^2=4$	E3	3	decimal point 2^1 “-” button*
11	8	$2^3=8$	E4	4	display test “P” - button*
13	10	$2^4=16$	E5	21/22	Signal ground
15	20	$2^5=32$	E6		
17	40	$2^6=64$	E7		
19	80	$2^7=128$	E8		
6	100	$2^8=256$	E9		
8	200	$2^9=512$	E10	25/26	Power supply (+)
10	400	$2^{10}=1024$	E11		
12	800	$2^{11}=2048$	E12		
14	1000	$2^{12}=4096$	E13		
16	2000	$2^{13}=8192$	E14		
18	4000	$2^{14}=16384$	E15		
20	8000	$2^{15}=32768$	E16		
	or sign (-)	or sign (-)	or sign (-)		

* details to the
+ , - and P buttons see
page 19

Signal ground (Pin 21/22) and the minus connection of the power supply (Pin 23/24) are **not** connected internal.

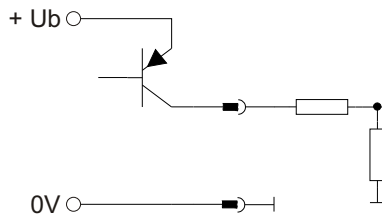
4.4. Connections of the power supply



23/24: GND
25/26: 18..36 V DC



4.5. Connections of the inputs



Unconnected signal inputs are detected as low signal.

5. Startup procedure

Attention must be paid to the correct power supply voltage. The used power supply have to agree with the voltage noticed at the type plate. Apply the correct voltage to pin 23/24 (-) und pin 25/26 (+)



Switch the power supply on. When delivered, the instrument is programmed to the default configuration. Please check the programming section of this manual for further details.



Attention: The configuration of the device has to be compatible to the surrounding it is connected. Otherwise malfunctions or damages may occur.

6. Programming

The programming of the display is made via the pins 2, 3 and 4. These pins are activated by a high level (5V, 12V or 24V). The easiest way to do this is to attach 3 push-buttons to pin2, 3 and 4. These buttons are named with "+", "-" and "P". Instead of push-buttons the pins can also be activated by any other digital signal source, e.g. by a PLC. **The push-buttons are not part of the device!**

High level-signal to	Function
Pin 4 "P" - button	Selecting - Programming levels - Parameters
Pin 2 "+" - button	Incrementing the - Programming level - Parameter number - Parameter value
Pin 3 "-" - button	Decrementing the - Programming level - Parameter number - Parameter value

Enter into the programming mode

- push "P"-button plus "+"-button
- the display shows "P-00"

Finish the Programming mode

- push "+"-button or "-"-button as long until the display shows "PEnd"
- push "P"-button
- return to the normal display mode

Selecting the next programming level

- select with the "+"-button or the "-"-button the wished programming level
- confirm the selected programming level with the "P"-button

- the parameter numbers of the selected programming level are displayed
e.g.: "0-00" => Parameter 0 of programming level 0

Return from the programming levels

- push "+"-button or "-"-button as long until the display shows "xEnd"
e.g.: "0End" =>Return from programming level 0
- confirm with the "P"-button
- the display shows the next higher programming level
e.g. "P-00" => for programming level 0

Selecting the Parameters

- push the "+"-button or the "-"-button to select the wished Parameter
- confirm the parameter with the "P"-button
- the display shows the last programmed value of the selected parameter

Change and confirm changes of the selected parameter

- change the parameter value with the "+"-button or "-"-button
- confirm the parameter value with the "P"-button
- the display shows the programming level and the parameter number
e.g.: "0-05" => parameter 5 of programming level 0

6.1. Available programming levels

The FA 2510 has one programming level.

P-00: Programming level for device configuration

This programming level can be used to adjust the device to the customers applications.

6.2. Programming level P-00

Param.	Fuction	Range	Default
0-00	Input configuration 0 -> BCD-Code 1 -> Binary-Code 2 -> Gray-Code	0 .. 2	0
0-01	Display configuration 0 -> Display = 5-digits 1 -> Display = 4-digits + sign	0 .. 1	0
0-02	Activating the offset value 0 -> Offset value deactivatet 1 -> Offset value activated	0 .. 1	0
0-03	Offset value	-9999 .. 99999	0
0-04	Selecting the decimal point control 0 -> External decimal point control 1 -> Internal decimal point control	0 .. 1	0
0-05	Internal decimal point control 0 -> XXXXX 1 -> XXXX.X 2 -> XXX.XX 3 -> XX.XXX 4 -> X.XXXX	0 .. 4	0
0-06	Display brightness 0 -> Display brightness 50% 1 -> Display brightness 100%	0 .. 1	1
0-07	Scaling factor	0.0001 .. 9.9999	1.0000
0-08	Configuration of the strobe input 0 -> externa strobe activated 1 -> externe Strobe deactivated	0 .. 1	1
0-09	Reserve:no function		
0End	Leaving programming level P-00		

7. Functions

The parallel signal data are read via an I/O chip from the microprocessor of the device. After processing the data the result is displayed. The parallel data can be processed BCD, binary or GRAY coded.

Parallel inputs


- Driven by 24 V, 12 V or 5 V signal level, high active
- Inputs BCD-, Binary- or GRAY-coded

7.1. External decimal point control

The pins 2 and 3 can be used for the external decimal point control. To use this function parameter P 0-04 has to be set to 0.

Pin 3 (2^1)	Pin 2 (2^0)	Anzeige
low	low	XXXXX
low	high	XXXX.X
high	low	XXX.XX
high	high	XX.XXX

External decimal point control

- Set parameter 0-04 to 0
- inputs are high side switched, high active and binary coded.
- 
 • If the function 'external strobe signal' (P 0-08 set to 1) is activated the external decimal point signals are processed with the rising edge of the strobe signal.
 The first decimal point from the left (X.XXXXX) can only be activated by the internal decimal point control.

7.2. Strobe input

The data on the inputs are displayed with the rising edge of the strobe signal (pin 1). The display will be refreshed with every new strobe signal.

Strobe input

- Set parameter 0-08 to 0
- the strobe input is high side switched; take-over with the rising edge of the signal.

7.3. Display overflow

If the input value plus the offset value (parameter 0-03) is greater than "99999" you will get an overflow. In this case the display shows "nnnnn".

7.4. Display test

With the display test (set pin 4 to high level) you can check the complete display. The display shows **8.8.8.8.8**.

Activating the display test

- high side switched, high active (set pin 4 to high level)
- if the external strobe is activated (parameter 0-08 is set to 0) the display test will be activated with the rising edge of the strobe signal.

8. Technical Data

8.1. Electrical Data

Digital input	:max. 16 bit, parallel
Logic	:PNP, high-active
Signal level	:5 V, 12 V or 24 V
Refresh time	:ca. 300 ms
Strobe signal duration	:> 100 μ s
Input code	:BCD-, BINAR- or GRAY-Code programmable
Power supply DC	:18 .. 36 V DC
Current	:max. 25 mA (red display) :max. 35 mA (green display)
optional	:12 V DC, \pm 10 % :5 V DC, \pm 10 %
Isolation	:500 V / 1 min

8.2. Mechanical Data

Display	:5-digit, 8 mm, red
optional	:Vornullenunterdrückung :green Display
Housing	:switchboard DIN 43 700
Dimensions (W x H x D)	:48 x 24 x 107 mm
Mounting depth	:ca. 120 mm w/o plug
Weight	: ca. 200 g
Connections	: Flat cable-connector DIN 41 651 : 26-pin

8.3. Environment

Temperature	: 0 .. 50 °C
Storage temperature	: -20 .. 70 °C
Relative humidity	: < 80 %, not condensing
Schutzart	: Frontside IP 40 : Connector IP 20
CE	:
EG-Rules 89/336/EWG	:

9. Order information

FA 2510-						
						Input level 0 5 V 1 12 V 2 24 V
						Housing 0 Switchboard 1 Panel-Clip
						Front frame color 0 black 1 mouse grey RAL 7037
						Front foil design 0 without Frontfoil 1 Frontfoil ERMA METER 2 Frontfoil NEUTRAL
						Display color 0 red 1 green
						Power supply 0 5 V DC, $\pm 10\%$, isolated 1 12 V DC, $\pm 10\%$, isolated 2 18 bis 36 V DC, isolated

Dimensions printing on the front: (e.g. mm², cm, cm³)

Please specify with your order

10. Notes

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