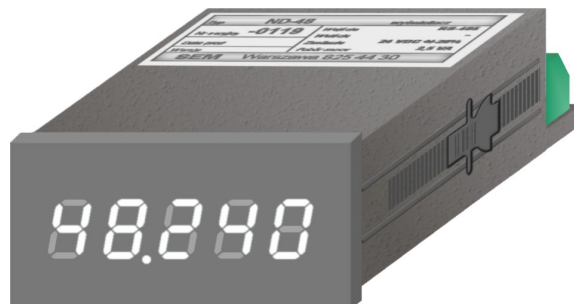






# ND48-RS Panel Display

## operation manual

### Device description

ND48-RS - is an electronic digital display dedicated for data presentation loaded through serial interface. Can be used in a wide range of industrial measurement and control applications.



SYMBOL	DESCRIPTION
	CAUTION or WARNING: Tells you about the risk of electrical shock.
	CAUTION, WARNING or IMPORTANT: Tells you of circumstances or practices than can effect the instrument's functionality and must refer to technical documentation.
	INFORMATION: Helpful information.
	INFORMATION: Discarded electronic equipment collecting



**READ THE MAUAL CAREFULLY BEFORE INSTALLATION AND USE!**

### Safety information



*Indicator is dedicated for SELV installations only!*

Safety recommendations:

- read operating manual carefully before use
- follow the manual safety recommendations
- disconnect power during display mounting and wiring
- do not use the display in corrosive and explosive atmosphere
- keep environmental conditions within specification
- provide proper ventilation by keeping appropriate spacing
- do not use even partially damaged display.

### EMC information



*Instrument meets EN-61326 EMC requirements for industrial environment.*

Follow listed below instructions to provide proper operation in real conditions:

- do not install the product near devices generating strong electromagnetic fields,
- wire the lines connected to the display separately from power lines carrying high voltages or currents,
- use twisted or shielded signal lines in noisy environment,

- always apply functional grounding,
- apply external surge protectors close to the unit if long lines are connected,
- apply additional filtering in noisy environment.

## Type identification

Type: **ND48-RS-M** ND48 panel display with RS485 interface, Modbus RTU protocol  
**ND48-RS-A** ND48 panel display with RS485 interface, ASCII protocol

## Theory of Operation

ND48-RS receives ASCII digital data from serial interface. ASCII data is decoded, formatted and displayed on 5 position, 7 segment LED display. Unit parameters can be programmed by the user. The user can set transmission parameters as address, communications speed, data format and display parameters like digit brightness, decimal dot position, leading zeros suppression. etc. Programmed parameter set is stored in non volatile memory and hardware protected.

## Display installation.

ND48-RS is intended for panel mount. It requires rectangular cut-out according to Fig.2. The unit must be introduced to the cut-out from the front and fixed on the rear side with 2 plastic clamps. The clamps should be placed on the guides on both sides of the housing and slid to the panel. Clamps can be removed by releasing them with small screw-driver and pulling back.

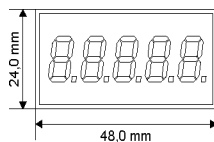


Fig.1 Device dimensions.

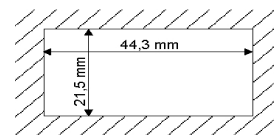
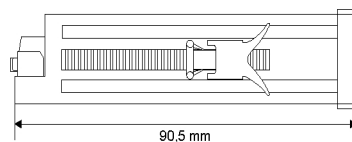


Fig.2 Panel cut-out.

## Wiring.



*Disconnect power before installation procedure! Incorrect connections or reversed supply polarity may damage the instrument!*

Before electrical connections the display should be fixed in it's working position. Pin assignment is shown on Fig.3.

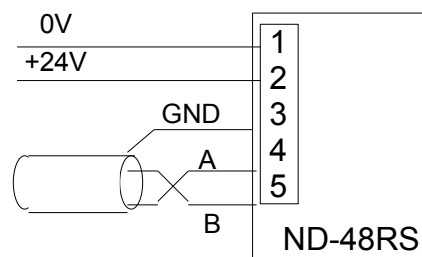


Fig.3 Electrical connections

<b>Pin No</b>	<b>Description</b>
1	0V supply
2	+24V supply
3	ground (shield)
4	line A (+)
5	line B (-)

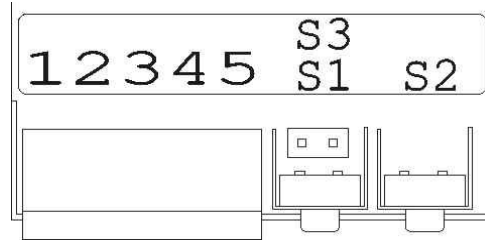


Fig.4 Rear view with connector and programming switches.

### Technical specification.

<b>Parameter</b>	<b>Value</b>	<b>Units</b>	<b>Comments</b>
Digit number	5		
Digit height	9	mm	
Digit colour	high efficient red		
Brightness adjustment	100, 75, 50,25	%	
Serial interface	RS-485		
Transmission speed	1200, 2400, 4800, 9600, 19200	bps	
Addressing range	0-255		1-247 for MODBUS protocol
Protocols	ASCII or MODBUS RTU		
Time-out range	0-25,5	s	ASCII protocol only
Symbol coding	ASCII		
Supply voltage	18 - 36	VDC	
Power consumption	1,5W	W	
Working temperature range	0 - 50	C	
Protection degree (front panel)	IP40		
Dimensions	48x24x90,5	mm	
Panel cut-out	44,3 x 21,5	mm	+0,5/-0 mm
Panel thickness	0 - 45	mm	
Wire cross-section	0,5 max	mm <sup>2</sup>	
Weight	90	g	
EMC standards	PN-EN61326:2002U		industrial environment

### Programming

ND48-RS should be programmed before use. Serial transmission parameters have to correspond to transmitter settings. Display options should be adequate to application requirements.

Programming switches are placed on the rear wall of the housing. Programming menu messages are displayed on the main display in front.

At first, programming mode should be activated by putting the jumper on S3 pin strip. S1 and S2 push-buttons are used for menu scrolling and value changes. S1 push-button scrolls the menu and changes edited values. S2 push-button is used to enter selected menu functions and accept edited values.

Programming procedure step by step:

1. Put the jumper on S3 pins - Edit message appears.
2. Press S2 key - the first menu function symbol appears ('Fc01', 'Fa01'...).
3. Choose function to be edited by pressing S1 key.
4. Press S2 key to enter chosen function.
5. Change function value or option with S1 key.
6. Accept change by pressing S2 key - function name reappears.
7. Edit other functions by repeating steps 3, 4, 5, 6.
8. Move to the end of function list until 'Edit' message reappears. Settings are stored in this moment.
9. Remove the jumper from S3. This way, settings memory is hardware protected.

**I** *The jumper must be removed from S3 while 'Edit' message is displayed.*

*Resetting parameters to default settings.*

1. Switch display power off.
2. Put the jumper on S3.
3. Keep S1 key pressed and turn display supply on - 'Eini' message should appear.
4. Press S2 key to accept the reset.
5. Remove the jumper from S3.

**I** *If S2 key will be pressed erroneously in step 3, 'Fabr' message will appear. Turn display power off and repeat the procedure correctly.*

### Data transmission protocols.

Two protocols are available in ND48-RS:

- ASCII A2.04 simple ASCII protocol.  
See appendix: „ND48-RS ASCII A2.04 ASCII communications protocol”
- Modbus RTU protocol.  
See appendix: „ND48-RS Modbus RTU M1.03 communications protocol”

Protocol type is fixed and must be specified in purchase order.  
Appropriate appendix is always attached to operating manual.

### DISCARDED ELECTRONIC EQUIPMENT COLLECTING INFORMATION.



*This equipment should be collected and treated according to 2002/96/EC European Directive on waste electric and electronic equipment (WEEE).*

Materials and substances to be removed:

<i>Material</i>	<i>Quantity</i>	<i>Comments</i>
Printed circuit boards	37 cm <sup>2</sup>	

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