

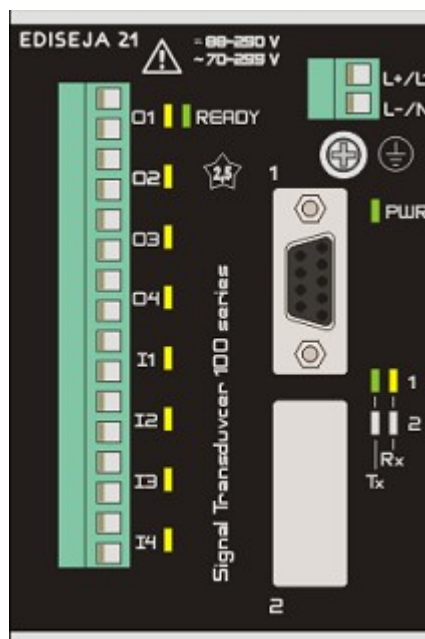
STR 100 Signal Transducer User manual

STR 100 / xxx.232.NON.IOxx

STR 100 / xxx.485.NON.IOxx

STR 100 / xxx.FOT.NON.IOxx

STR 100 / xxx.ETH.NON.IOxx



Company:	Device:	Document:	Code:	Version:	Date:
Ediseja 21	STR 100	User manual	STRMUED1	V3	05.11.2014

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1 PREFACE

Liability statement

We have checked the contents of this manual to ensure that the descriptions of both hardware and software are as accurate as possible. However, deviations may occur so that no liability can be accepted for any errors or omissions contained in the information given.

The contents of this manual will be checked in periodical intervals, corrections will be made in the following editions.

We reserve the right to make technical improvements without notice.

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Explanation of the symbols



Read the instructions!



Device was tested with 2,5 kV AC voltage to check the device insulation.



Device ground terminal.



Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC; the affixed product label indicates that you must not discard this electrical/electronic product in domestic household waste.

Warnings

In this paper the following terms are used:

Danger

indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.

Warning

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.

Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken. This particularly applies to damage on or in the device itself.

General information

These paper contain the information that is necessary for the proper and safe operation of the described devices. This paper is intended for technically qualified personnel.



Warning!

Hazardous voltage is present inside the device during operation. Disregarding of safety rules can result in severe personal injury or property damage.

Only qualified personnel may work with described devices after being familiar with warnings and safety notices in this paper and other safety regulations.



Warning!

Device must operate completely assembled! Device must be used as described. No modifications of the device should be made.



Warning!

Do not open device while it is energized! Hazardous voltage is present inside the device. Disconnect all connectors before opening!

**Warning!**

If device is damaged disconnect it from power supply! Send it to the manufacturer for inspection.

**Warning!**

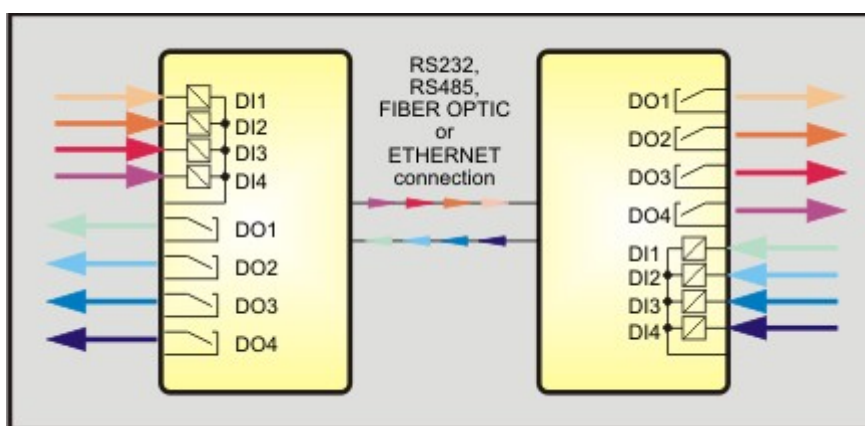
Connect to earth before attaching power supply!

2 STR 100 SYSTEM

2.1 DESCRIPTION

STR 100 is modular system of communication devices that can be used for various of tasks such as:

- ◆ distance protection criteria transfer
- ◆ disconnector and circuit breaker statuses transfer between substations
- ◆ signal transfer via communication through noisy industrial enviroment



Picture 1: STR 100 block schematic

2.2 FEATURES

- ◆ Wide range power supply
- ◆ Digital input voltage suitable for substation's power supply
- ◆ RS232, RS485, Fiber Optic or Ethernet communication interface
- ◆ Switch selected BAUD rate
- ◆ Fast response time
- ◆ 4 digital inputs
- ◆ 4 digital outputs
- ◆ DIN 35 rail mount
- ◆ Short response time

2.3 FUNCTION

Two devices from STR 100 system works in pair. Input statuses from one device are transfered to second device outputs and vice versa.

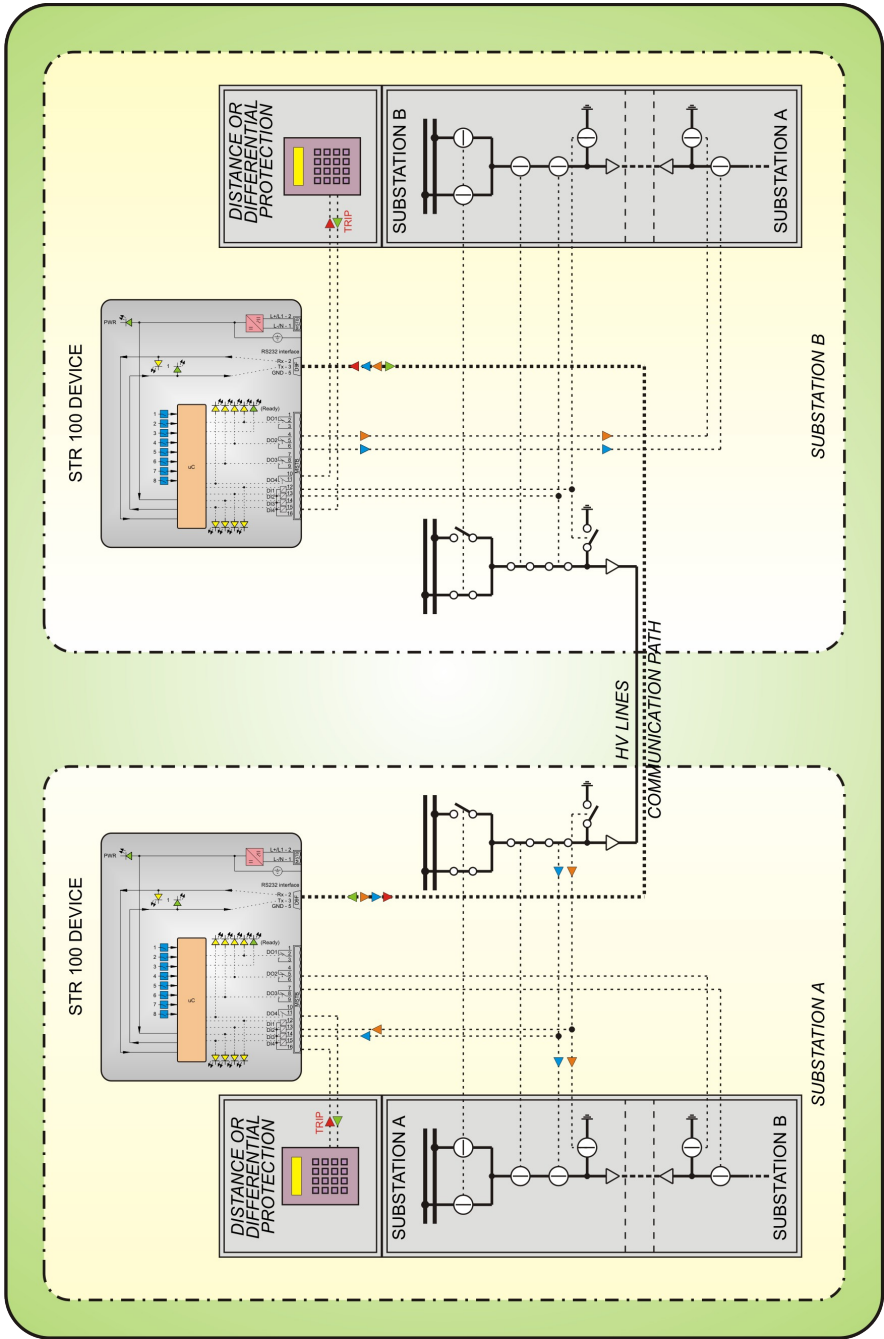
Devices are coupled through full duplex communication link. Communication is based on special protocol. If communication link is broken DO statuses of both devices are returned to their initial states. Speed of communication can be selected by switches.

One of DOs has two functions. It can operate as normal DO or as communication failed signalization. Selection between functions is made by switch.

All normally used connectors, switches and light indicators are accessed at the front side of the device. One light indicator indicates power supply voltage, others indicate communication and IOs activity.

2.4 TYPICAL APPLICATION

Typical application is transfer of trip command and circuit breaker status between two substations.



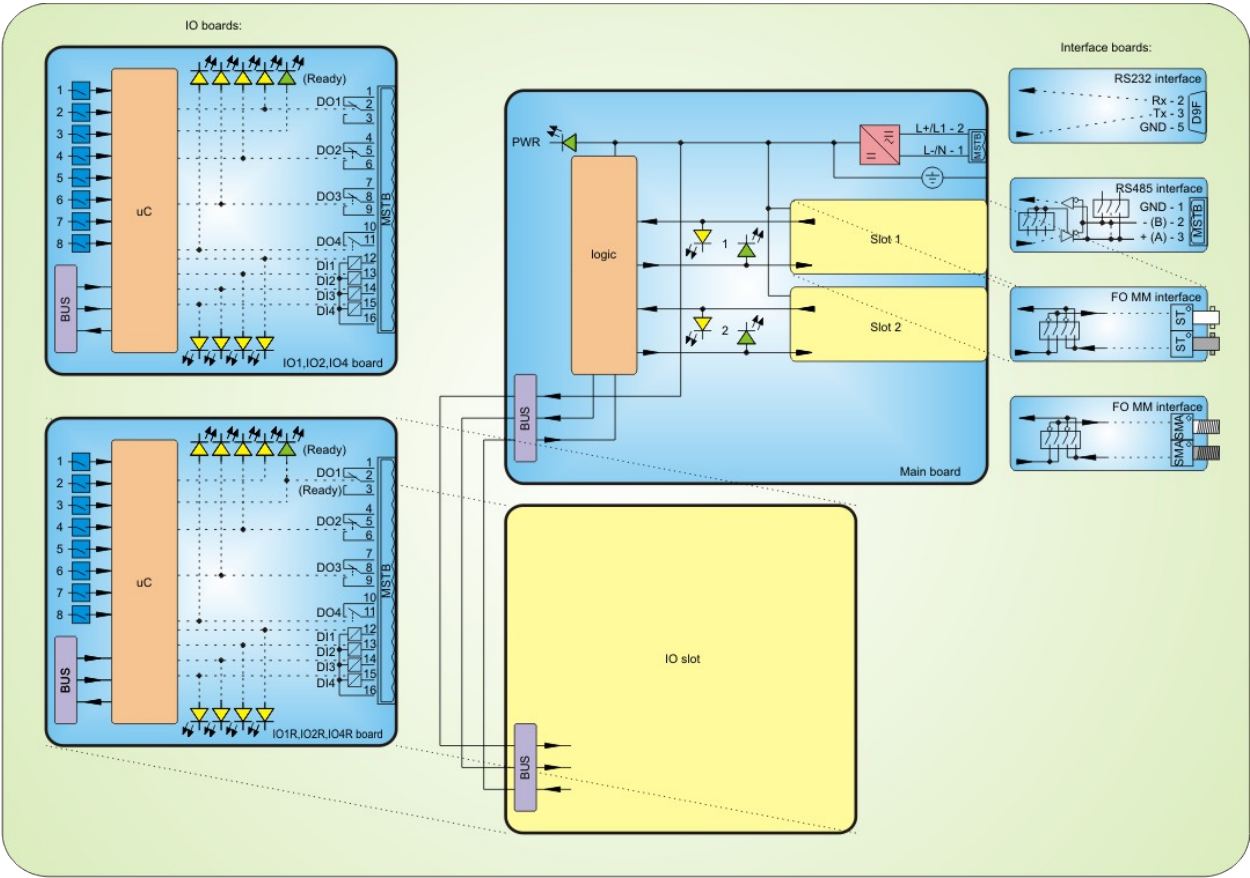
Picture 2: STR 100 typical application

2.5 CONSTRUCTION

All devices from STR 100 system are based on various boards. There are three groups of boards. One main board, one or two communication boards and one IO board is used in one device :

- ◆ main board with power supply
 - ◆ HI – high voltage power supply board
 - ◆ MD – medium voltage power supply board
 - ◆ LO – low voltage power supply board
- ◆ communication interface
 - ◆ RS232 board
 - ◆ RS485 board
 - ◆ Multimode Fiber Optic (ST connector) board
 - ◆ Ethernet board
- ◆ IO board
 - ◆ IOL – 4 Digital Input (24 V DC), 4 Digital Output board
 - ◆ IO4 – 4 Digital Input (48 V DC), 4 Digital Output board
 - ◆ IO1 – 4 Digital Input (110 V DC), 4 Digital Output board
 - ◆ IO2 – 4 Digital Input (220 V DC), 4 Digital Output board

User can order any combination that suits him or her best.



Picture 3: STR 100 system general diagram

2.6 HOUSING

Housing of STR 100 system devices is aluminium and intended for mount on standard DIN 35 rail (acc. to DIN EN 50022). Housing is same for all combinations.

2.7 INTENDED USE

Device are intended for use in cubicles and cabinets in all kinds of power production, transmission and distribution stations as well as in industry. It requires no maintenance.

3 DEVICES

3.1 DEVICE MARKINGS

STR 100 system of devices is modular so many variants of STR 100 device exists:

First mark after „STR 100 /“ declares device's power supply:

Device \ Power supply	15-24V AC or 18-36 V DC	30-60V AC or 38-80 V DC	70-250V AC or 88-250 V DC
STR 100 / LO.x.x.x	YES	-	-
STR 100 / MD.x.x.x	-	YES	-
STR 100 / HI.x.x.x	-	-	YES

Second mark declares device's communication interface 1:

Device \ Interface1	RS232	RS485	FO MM	ETH
STR 100 / x.232.x.x	YES	-	-	-
STR 100 / x.485.x.x	-	YES	-	-
STR 100 / x.FOT.x.x	-	-	YES	-
STR 100 / x.ETH.x.x	-	-	-	YES

Third mark declares device's communication interface 2: reserved for future use.

Device \ Interface2	RS232	RS485	FO MM	ETH
STR 100 / x.x.232.x	YES	-	-	-
STR 100 / x.x.485.x	-	YES	-	-
STR 100 / x.x.FOT.x	-	-	YES	-
STR 100 / x.x.ETH.x	-	-	-	YES

Fourth mark declares device's digital inputs and outputs:

Device \ IOs	4DI (24 V DC), 4DO	4DI (48 V DC), 4DO	4DI (110 V DC), 4DO	4DI (220 V DC), 4DO	4DI (48 V DC), 3DO + READY	4DI (110 V DC), 3DO + READY	4DI (220 V DC), 3DO + READY
STR 100 / x.x.x.IOL	YES	-	-	-	-	-	-
STR 100 / x.x.x.IO4	-	YES	-	-	-	-	-
STR 100 / x.x.x.IO1	-	-	YES	-	-	-	-

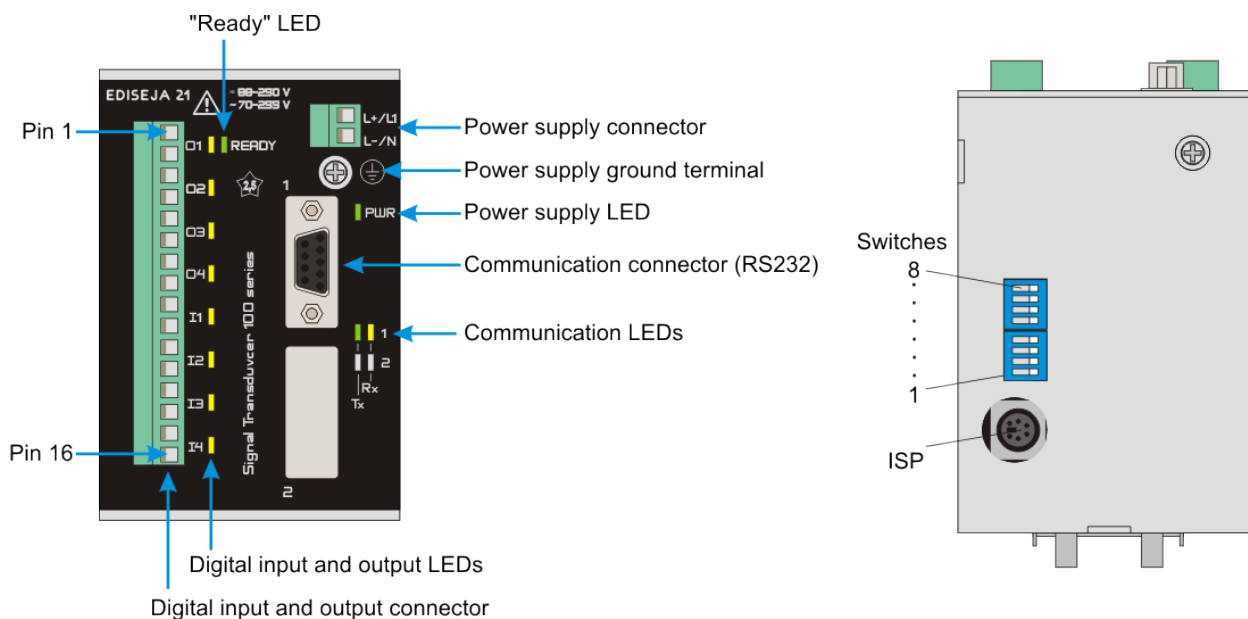
Device \ IOs	4DI (24 V DC), 4DO	4DI (48 V DC), 4DO	4DI (110 V DC), 4DO	4DI (220 V DC), 4DO	4DI (48 V DC), 3DO + READY	4DI (110 V DC), 3DO + READY	4DI (220 V DC), 3DO + READY
STR 100 / x.x.x.IO2	-	-	-	YES	-	-	-
STR 100 / x.x.x.IO4R	-	-	-	-	YES	-	-
STR 100 / x.x.x.IO1R	-	-	-	-	-	YES	-
STR 100 / x.x.x.IO2R	-	-	-	-	-	-	YES

For further details see chapter „HARDWARE DESCRIPTION“.

3.2 APPEARANCE

3.2.1 FRONT SIDE OF THE DEVICE

Other types of device are same except communication interface connectors are different.



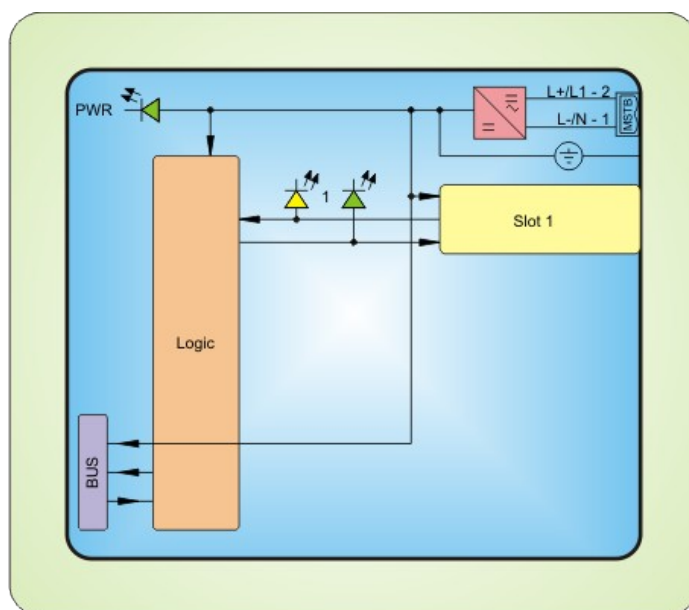
Picture 4: STR 100 / x.232.NON.x front view (left), bottom view (right)

Other types of device are same except communication interface connectors are different.

4.1 MAIN BOARD

Main board provides necessary power to other parts of the device and place for interface board. On the board there are also three LEDs. The yellow LED shows activity on receive (Rx) line and the green one shows activity on transmit (Tx) line. Additional green LED indicates the device power supply activity.

- ◆ HI – high voltage power supply board
- ◆ LO – low voltage power supply board



Picture 5: Main board schematic

Phoenix MSTB	1	2
Description	L- , N	L+, L1

For further technical data see chapter „TECHNICAL DATA“.

4.2 INTERFACE BOARDS

User can choose between following interface boards:

- ◆ RS232 board
- ◆ RS485 board
- ◆ Multimode Fiber Optic (ST connector) board
- ◆ Multimode Fiber Optic (SMA connector) board

Although STR 100 device can have two interfaces it can communicate only with one at the time. Data is always received and transmitted to both interfaces (ports).

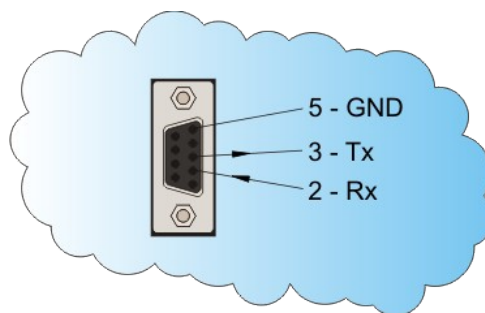
4.2.1 RS232 INTERFACE BOARD

Description

Single, nonisolated, full duplex, RS232 port with DB9 female connector. Supported Rx, Tx and GND pins.

Connector pin table

DB9 F	2	3	5
Description	RX	TX	GND
Direction	IN	OUT	-



Picture 6: DB9 Female connector

4.2.2 RS485 INTERFACE BOARD

Description

Company:	Device:	Document:	Code:	Version:	Date:	Page:
Ediseja 21	STR 100	User manual	STRMUED1	V3	05.11.2014	15

Single, galvanically isolated, half duplex, RS485 port with Phoenix 3 pin screw connector, with automatic switch to receive after end of transmission and with additional terminating and stabilizing resistors.

Hardware settings

For proper functioning of that board some settings must be done:

- ◆ RS485 bus termination and stabilisation
- ◆ baud rate

RS485 bus termination and stabilisation

TERMINATION

At high transmission rates or long distance, RS485 bus termination is necessary.

The termination on RS485 bus must be set on both ends of the RS485 bus.

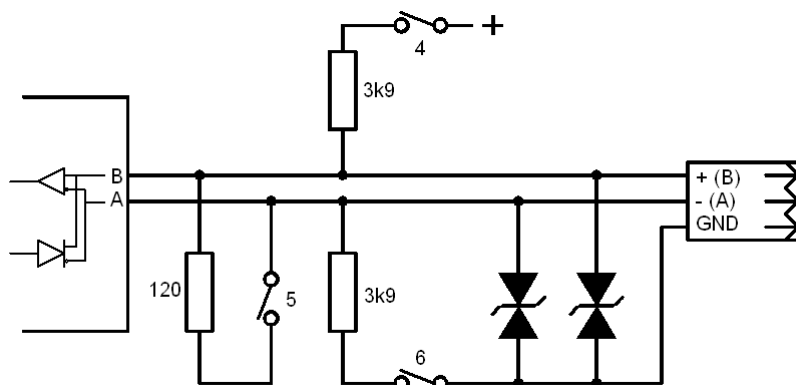
STABILISATION

Some device, to work properly, demands that RS485 must always be in known and valid state. That is, when + (positive) pin is more than 200 mV positive than – (negative) pin. Pins + and – are sometimes marked as A and B. In case that no device on RS485 bus is transmitting or in case of short circuit, there is no voltage difference between those pins and some device do not work correctly.

On this port board so called „true fail-safe“ RS485 chip is used so board works correctly without stabilisation at invalid RS485 bus state. But still switches for stabilisation are provided on port board. **The stabilization on RS485 bus may be set on one device only!**

Switches at the lower side of connector:

Switch	4	5	6
Description	RS485 stabilisation	RS485 termination	RS485 stabilisation



Picture 7: RS485 BUS schematic

INTERFACE BOARDS

Switches at the upper side of connector:

BAUD rate

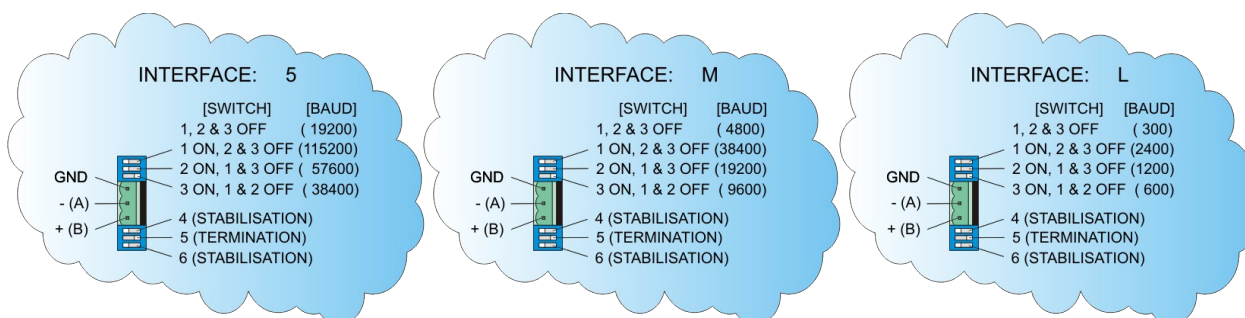
BAUD rate			Switch		
Interface 5	Interface M	Interface L	1	2	3
19200	4800	300	OFF	OFF	OFF
38400	9600	600	OFF	OFF	ON
57600	19200	1200	OFF	ON	OFF
115200	38400	2400	ON	OFF	OFF

BAUD rate setting 19k2 (bps) is valid for all standard communication protocols, that do not request special timings. If special protocols (small request-respond time required) are used please note it in order.

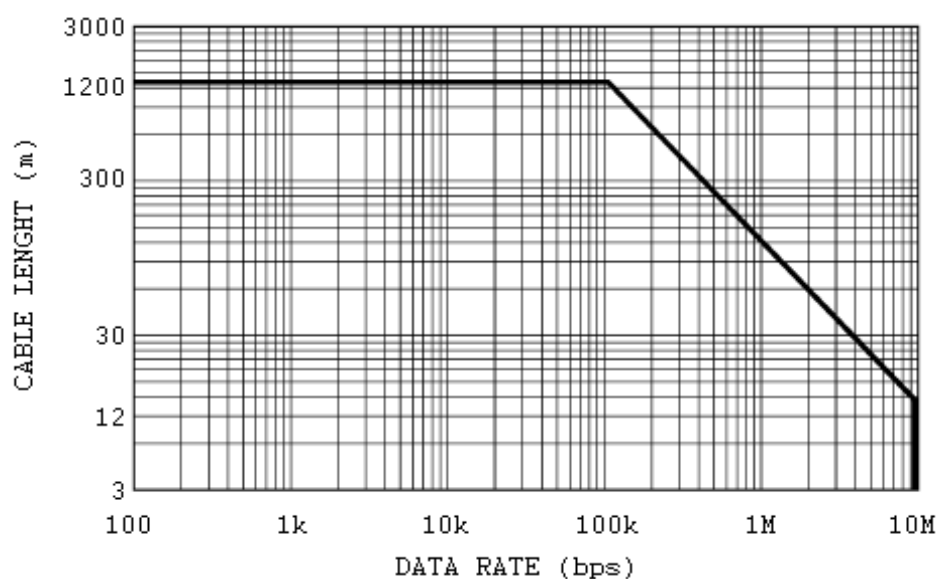
NOTE! If there are problems with communication, try using higher speed setting. Some manufacturer have different markings for B and A line. Try to switch A and B wires. See <http://en.wikipedia.org/wiki/RS-485> for detailed information.

Connector pin table

MSTB	1	2	3
Description	GND	- (A)	+ (B)



Picture 8: RS485 interface board appearance with switch settings



Picture 9: Data rate vs cable length

4.2.3 MULTIMODE FIBER OPTIC INTERFACE BOARD

Description

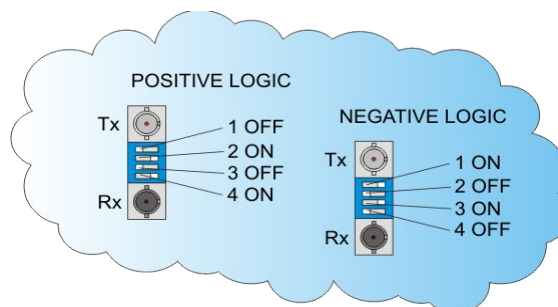
Single, full duplex, multimode, fiber optic port with ST connectors with positive or negative logic.

Hardware settings

For proper functioning of that board, optic logic must be set:

Fiber optic logic settings

Switch SW1	Light in idle state	1	2	3	4
Positive logic	OFF	OFF	ON	OFF	ON
Negative logic	ON	ON	OFF	ON	OFF



Picture 10: Multimode fiber optic interface board appearance

4.2.4 ETHERNET INTERFACE BOARD

Description

Ethernet port with single virtual com port and RJ45 connector.

Interface signals

Signal	Direction	Contact	Function
TX+	Out	1	Differential Ethernet transmit data +
TX-	Out	2	Differential Ethernet transmit data -
RX+	In	3	Differential Ethernet receive data +
RX-	In	4	Differential Ethernet receive data -
Not used		5	Terminated
Not used		6	Terminated
Not used		7	Terminated
Not used		8	Terminated

LED functions

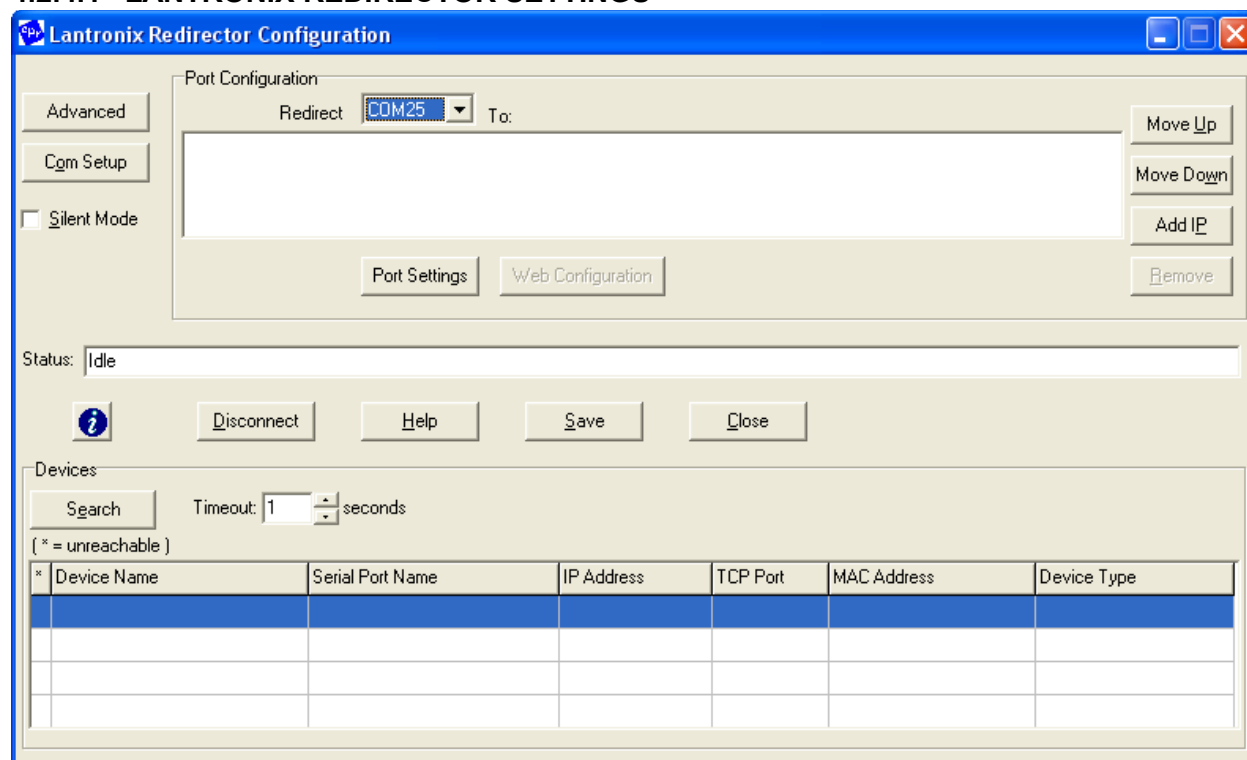
Upper LED - Link	
Description	Meaning
Off	No Link
Amber	10 Mbps
Green	100 Mbps

Lower LED - Activity	
BAUD rate selection	BAUD rate selection
Off	No Activity
Amber	Half Duplex
Green	Full Duplex

Software setting

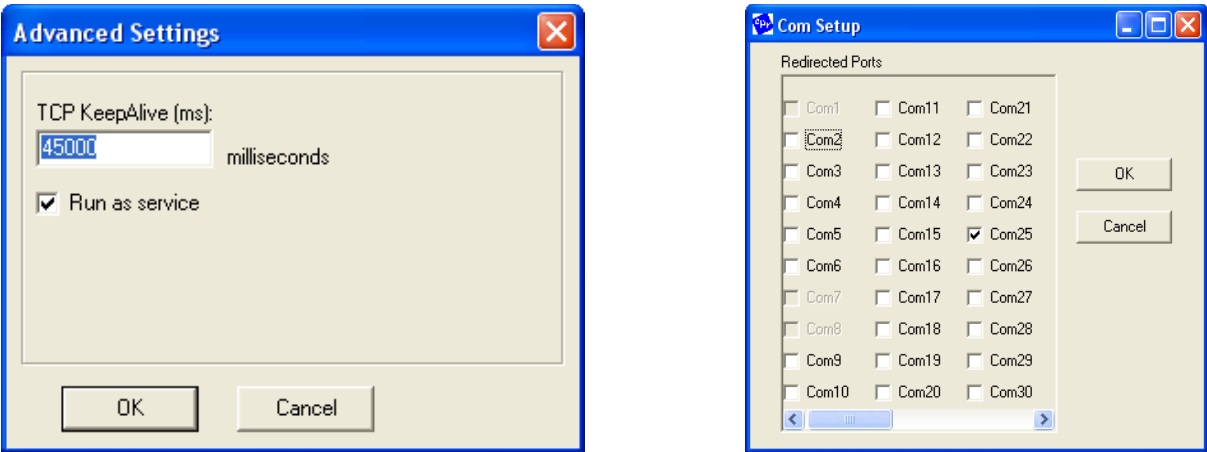
For using this interface two programs are needed: Redirector and Installer. Both can be obtained from www.ediseja21.com\cmu100-2ports.htm. Redirector is needed for setting and redirecting Ethernet port to the virtual com port on PC. Installer is needed for setting serial com port speed, parity, flow control,... Software can be obtained from www.lantronix.com.

4.2.4.1 LANTRONIX REDIRECTOR SETTINGS

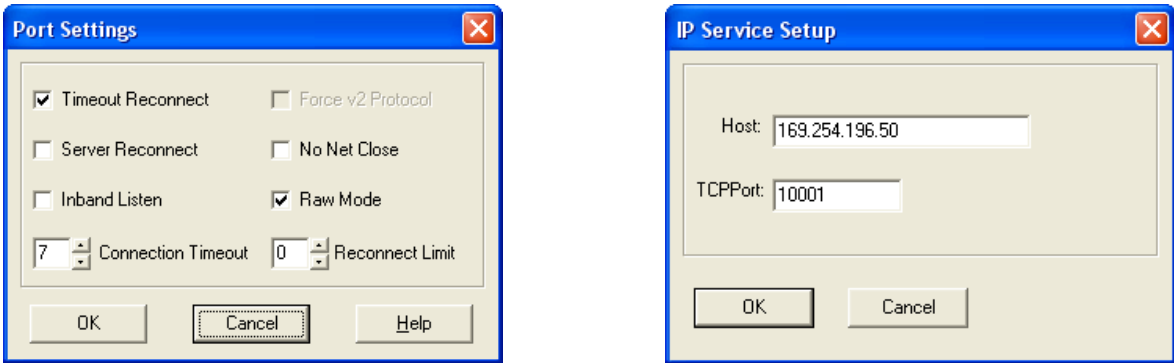


Picture 11: Start Redirector program

INTERFACE BOARDS

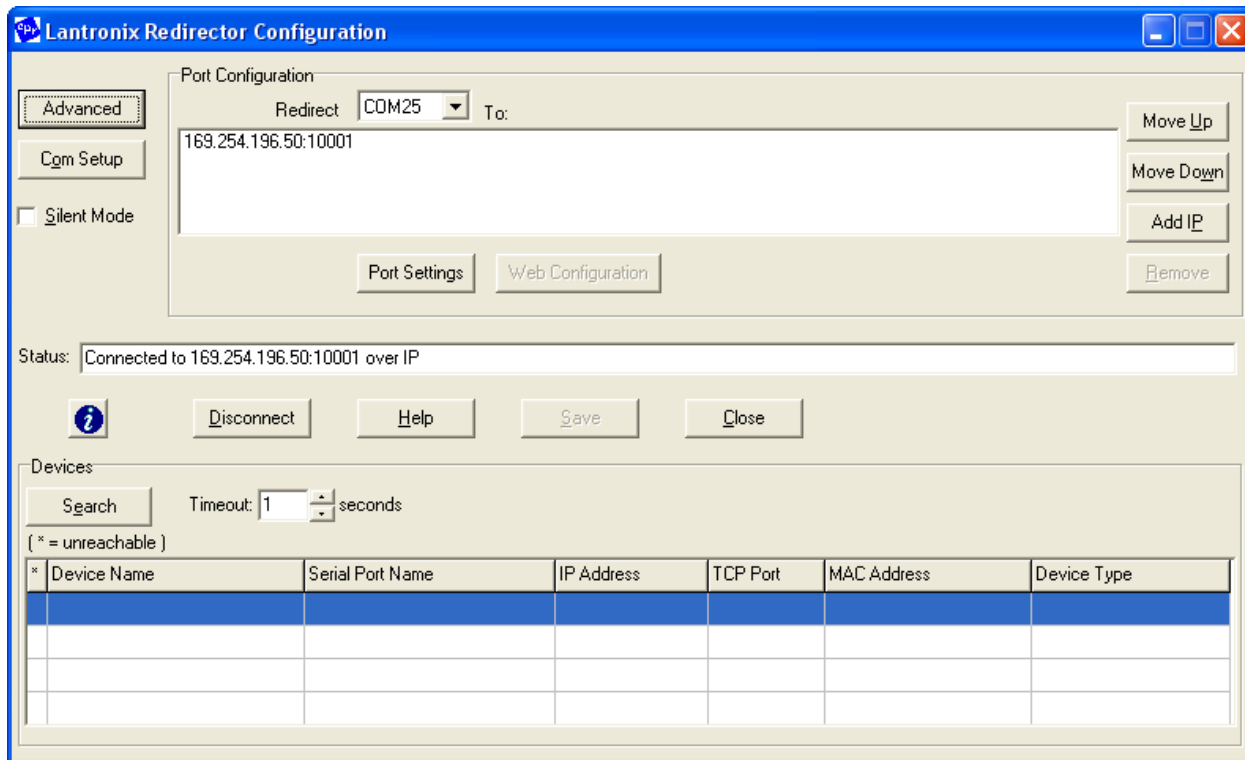


Picture 12: Set Advanced Settings as shown (left picture) and set com port as needed (right picture)



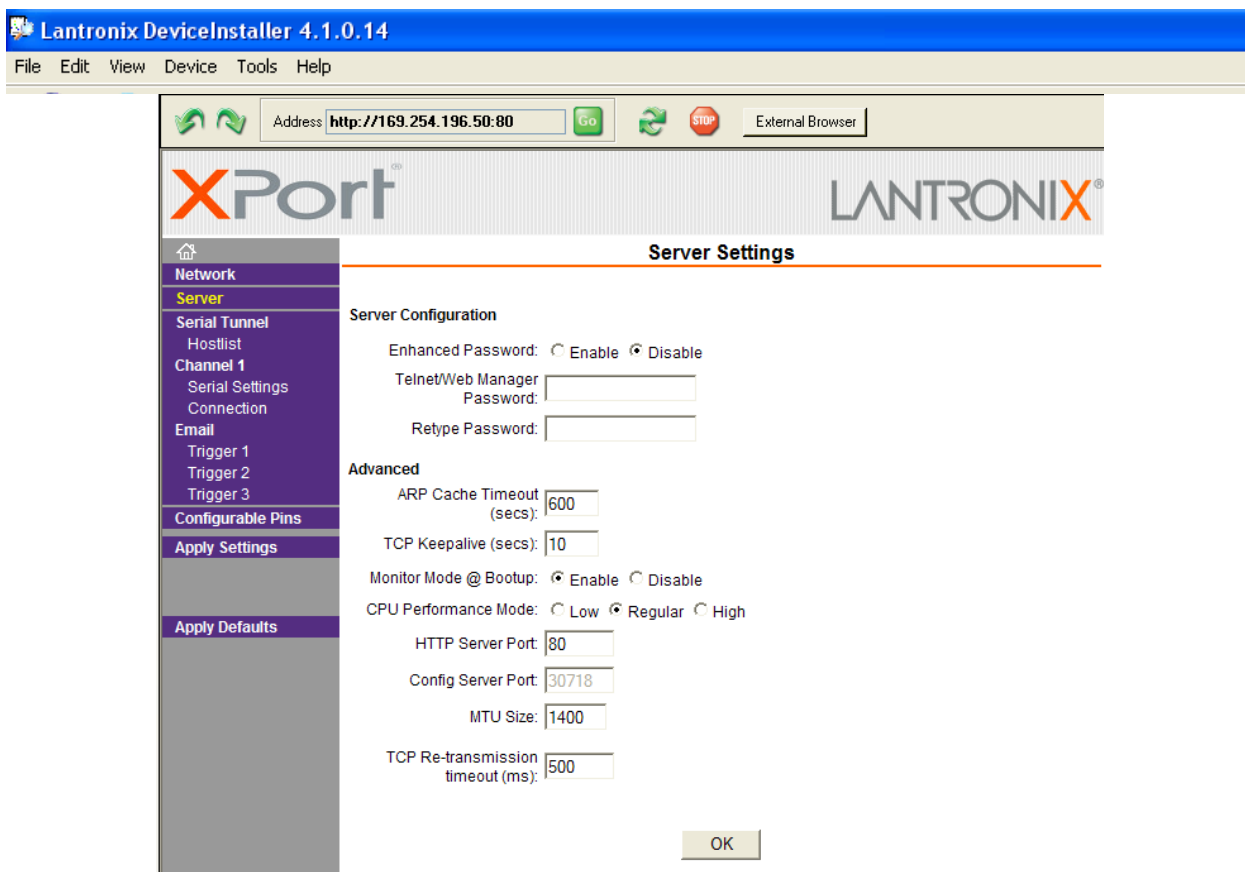
Picture 13: Set as as shown (left picture), set Host as needed and TCPPort as shown

NOTE! Press „Save“ to save settings!



Picture 14: Example of Lantronix Port Redirector settings

4.2.4.2 LANTRONIX INSTALLER SETTINGS



Picture 18: Set as shown.

Address: <http://169.254.196.50:80> Go External Browser

XPort LANTRONIX

Hostlist Settings

Retry Settings

Retry Counter: Retry Timeout:

Host Information

No.	Host Address	Port	No.	Host Address	Port
1	0.0.0.0	0	2	0.0.0.0	0
3	0.0.0.0	0	4	0.0.0.0	0
5	0.0.0.0	0	6	0.0.0.0	0
7	0.0.0.0	0	8	0.0.0.0	0
9	0.0.0.0	0	10	0.0.0.0	0
11	0.0.0.0	0	12	0.0.0.0	0

OK

Picture 20: Hostlist settings

Address: <http://169.254.196.50:80> Go External Browser

XPort LANTRONIX

Serial Settings

Channel 1

☐ Disable Serial Port

Port Settings

Protocol: Flow Control:

Baud Rate: Data Bits: Parity: Stop Bits:

Pack Control

☐ Enable Packing

Idle Gap Time:

Match 2 Byte Sequence: ☐ Yes ☒ No Send Frame Immediate: ☐ Yes ☒ No

Match Bytes: Send Trailing Bytes: ☐ None ☒ One ☐ Two

(Hex)

Flush Mode

Flush Input Buffer

With Active Connect: ☐ Yes ☒ No

With Passive Connect: ☐ Yes ☒ No

At Time of Disconnect: ☐ Yes ☒ No

Flush Output Buffer

With Active Connect: ☐ Yes ☒ No

With Passive Connect: ☐ Yes ☒ No

At Time of Disconnect: ☐ Yes ☒ No

OK

Picture 21: „Port settings/Protocol“ settings must be set at RS232! Set other port settings according to your needs.

Address: External Browser

XPort[®] LANTRONIX[®]

Connection Settings

Channel 1

Connect Protocol
Protocol:

Connect Mode

Passive Connection:
Accept Incoming:
Password Required: ☐ Yes ☒ No
Password:
Modem Escape Sequence Pass Through: ☒ Yes ☐ No

Active Connection:
Active Connect:
Start Character: 0x (in Hex)
Modem Mode:
Show IP Address After RING: ☒ Yes ☐ No

Endpoint Configuration:
Local Port: ☐ Auto increment for active connect
Remote Port: Remote Host:

Common Options:
Telnet Com Port Cntrl: Connect Response:
Terminal Name: Use Hostlist: ☐ Yes ☒ No LED:

Disconnect Mode
On Mdm_Ctrl_In Drop: ☐ Yes ☒ No Hard Disconnect: ☒ Yes ☐ No
Check EOT(Ctrl-D): ☐ Yes ☒ No Inactivity Timeout: : (mins : secs)

Picture 22: „Endpoint Configuration/Local Port“ settings must be set at 10001!

NOTE! Always press "OK" when settings is changed. Press „Apply Settings“ to save settings into device! Wait for device to reset.

4.3 IO BOARDS

On boards are:

- ◆ microcontroller
- ◆ 4 DIs
- ◆ 4 DOs or 3DOs + 1 „device ready“ DO (depends on ordering)
- ◆ 8 switches

Microcontroller is the heart of device. It scans DIs, controls DOs and communicates via protocol.

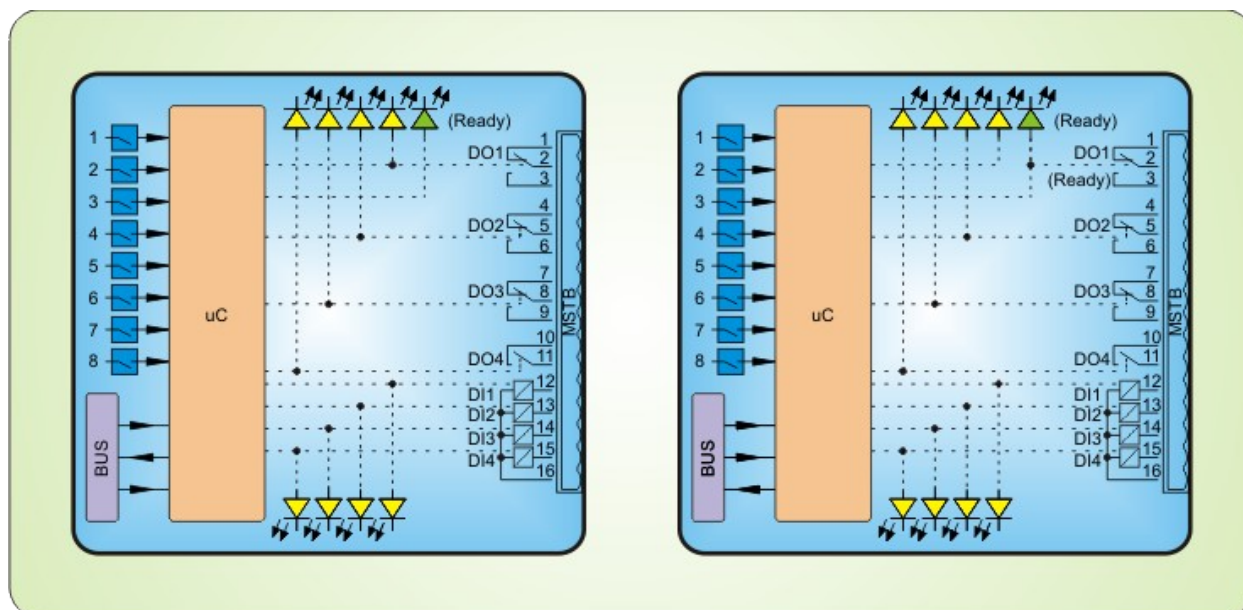
Digital inputs are scanned every 0,1 ms. Debounce filter is 20. That means that digital input will be recognized as active, if in all 20 cycles status of digital input will be high.

Digital outputs 1-3 are controlled by communication. After positive command request, requested digital output will be activated for 500 ms. After that time, digital output will be automatically returned to its initial state.

Digital inputs and digital outputs statuses are indicated by LEDs on front side of device.

User can choose from following list:

- ◆ IOL – 4 Digital Input (24 V DC), 4 Digital Output board
- ◆ IO4 – 4 Digital Input (48 V DC), 4 Digital Output board
- ◆ IO1 – 4 Digital Input (110 V DC), 4 Digital Output board
- ◆ IO2 – 4 Digital Input (220 V DC), 4 Digital Output board
- ◆ IO4R – 4 Digital Input (48 V DC), 3 Digital Outputs + 1 „device ready“ DO board
- ◆ IO1R – 4 Digital Input (110 V DC), 3 Digital Outputs + 1 „device ready“ DO board
- ◆ IO2R – 4 Digital Input (220 V DC), 3 Digital Outputs + 1 „device ready“ DO board



Picture 23: (left) IO1, IO2 & IO4 board schematic
 Picture 24: (right) IO1R, IO2R & IO4R board schematic

IO connector pin table (all IO board types)

Pin	Description
1	potential free DO1 N ormally C lose contact pin
2	potential free DO1 C ommon pin
3	potential free DO1 N ormally O pen contact pin
4	potential free DO2 N ormally C lose contact pin
5	potential free DO2 C ommon pin
6	potential free DO2 N ormally O pen contact pin
7	potential free DO3 N ormally C lose contact pin
8	potential free DO3 C ommon pin
9	potential free DO3 N ormally O pen contact pin
10	potential free DO4 N ormally O pen contact pin
11	potential free DO4 N ormally O pen contact pin
12	DI1 input
13	DI2 input
14	DI3 input
15	DI4 input
16	DIs common GND

Difference between IOx and IOxR board is in operation of first DO (DO1).

Operation of DO1 on IOx boards

On IOx boards DO1 has two functions. They can operate as:

- ◆ normal DO which is activated by activation of DI1 on other device
- ◆ communication activity indicator. If communication is established DO1 is activated. If communication is not established DO1 is in its initial position.

Function of DO1 is set by switch 5 at the bottom of device.

Operation of DO1 on IOxR boards

On IOxR boards DO1 has ready function. DO1 is energized when device is operating normally. DO1 is deactivated when device has no power or device is not working correctly.

Operation of DO2 on IOx and IOxR boards

DO2 has two functions. It can operate as:

- ◆ normal DO which is activated by activation of DI2 on other device
- ◆ communication activity indicator. If communication is established DO2 is activated. If communication is not established DO2 is in its initial position.

Function of DO2 is set by switch 6 at the bottom of device.

LEDs operation

LED ready signalize when device normally operates. If power is on and green LED ready:

- ◆ blinks or does not light; device does not operate correctly
- ◆ lights; device operates normally

Switches at the bottom of the device

Switch	1	2	3	4
Description	BAUD rate selection	BAUD rate selection	BAUD rate selection	BAUD rate selection
Position OFF	see table „BAUD rate selection“			
Position ON				
Default position	ON	OFF	ON	OFF

Switch	5	6	7	8
Description	DO1 operation	DO2 operation	not used	not used
Position OFF	normal DO (IOx bards) or	normal DO	not used	not used

Switch	5	6	7	8
	„ready“ DO (IOxR bards)			
Position ON	communic. active (IOx bards) or „ready“ DO (IOxR bards)	communic. active	not used	not used
Default position	OFF	OFF	OFF	OFF

If device is not ready, all DOs are deactivated!

It is recommended, that device setting is made before device is powered up.

*** Device settings set by this swithes are not regarded during operation, but only once after power up! If change during operation is made, disconnect power supply for a few moments (until power LED stops emitting) and connect power supply back. New settings are then accepted.**

On the bottom side of device are switches for device setting and ISP connector which is intended for upgradeing software. Do not connect anything to that connector.

BAUD rate selection *

BAUD \ Switch	1	2	3	4
1200	OFF	OFF	OFF	OFF
2400	ON	OFF	OFF	OFF
4800	OFF	ON	OFF	OFF
9600	ON	ON	OFF	OFF
14400	OFF	OFF	ON	OFF
19200	ON	OFF	ON	OFF
38400	OFF	ON	ON	OFF
57600	ON	ON	ON	OFF
76800	OFF	OFF	OFF	ON
115200	ON	OFF	OFF	ON

Note that setting of the BAUD rate must be same on both devices working in pair.

For further technical data see chapter „TECHNICAL DATA“.

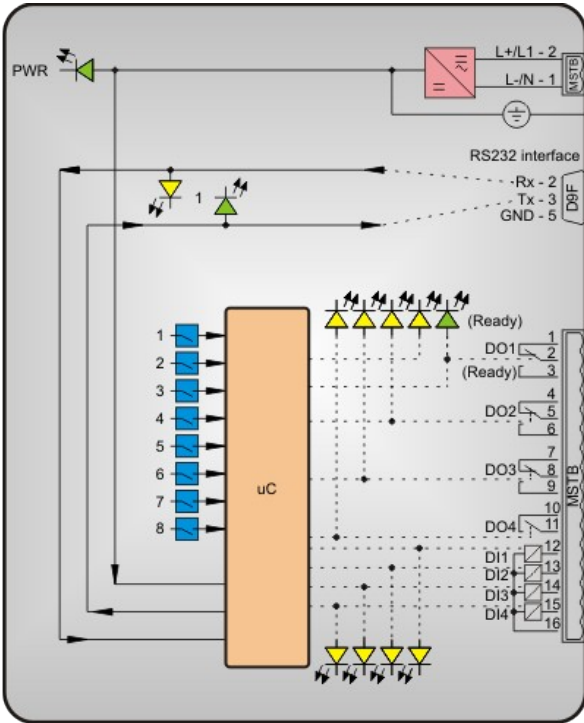
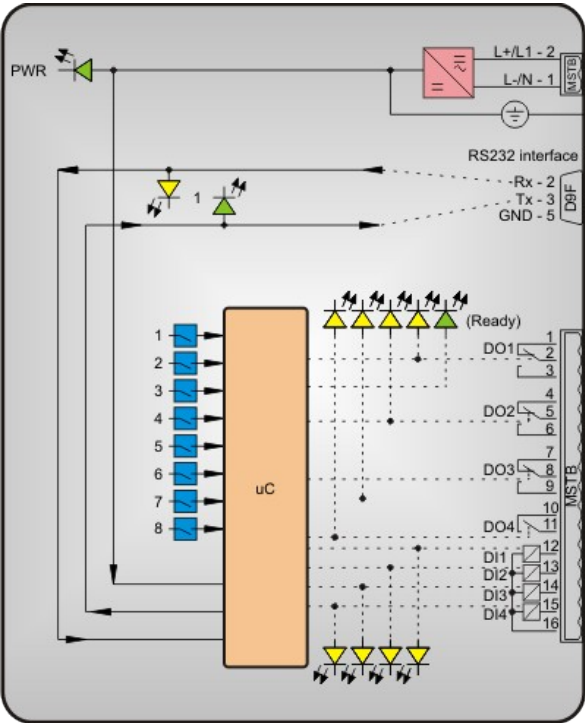
5 SCHEMATIC

5.1 STR 100 / x.232.NON.x

x - means any type, for types description see chapter Ordering.

Configuration of device

Power supply	interface 1	interface 2	IO type
any	RS232	none	any



Picture 25: (left): STR 100/x.232.NON.IOx schematic
Picture 26: (right): STR 100/x.232.NON.IOxR schematic

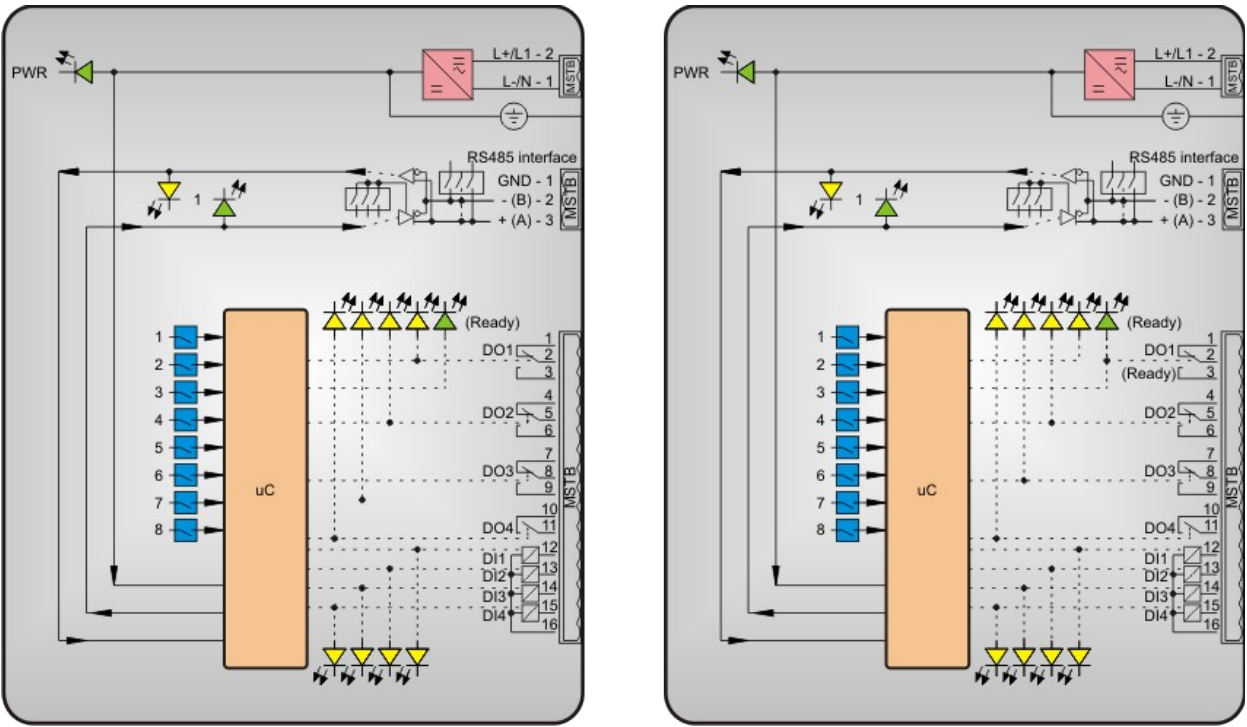
Difference between schematics is in operation of DO1. On left picture DO1 is normal digital output. On right picture DO1 works as „ready“ indicator. For further details see chapter „HARDWARE DESCRIPTION/IO BOARDS“.

5.2 STR 100 / x.485.NON.x

x - means any type, for types description see chapter Ordering.

Configuration of device

Power supply	interface 1	interface 2	IO type
any	RS485	none	any



Picture 27: (left): STR 100/x.485.NON.IOx schematic
Picture 28: (right): STR 100/x.485.NON.IOxR schematic

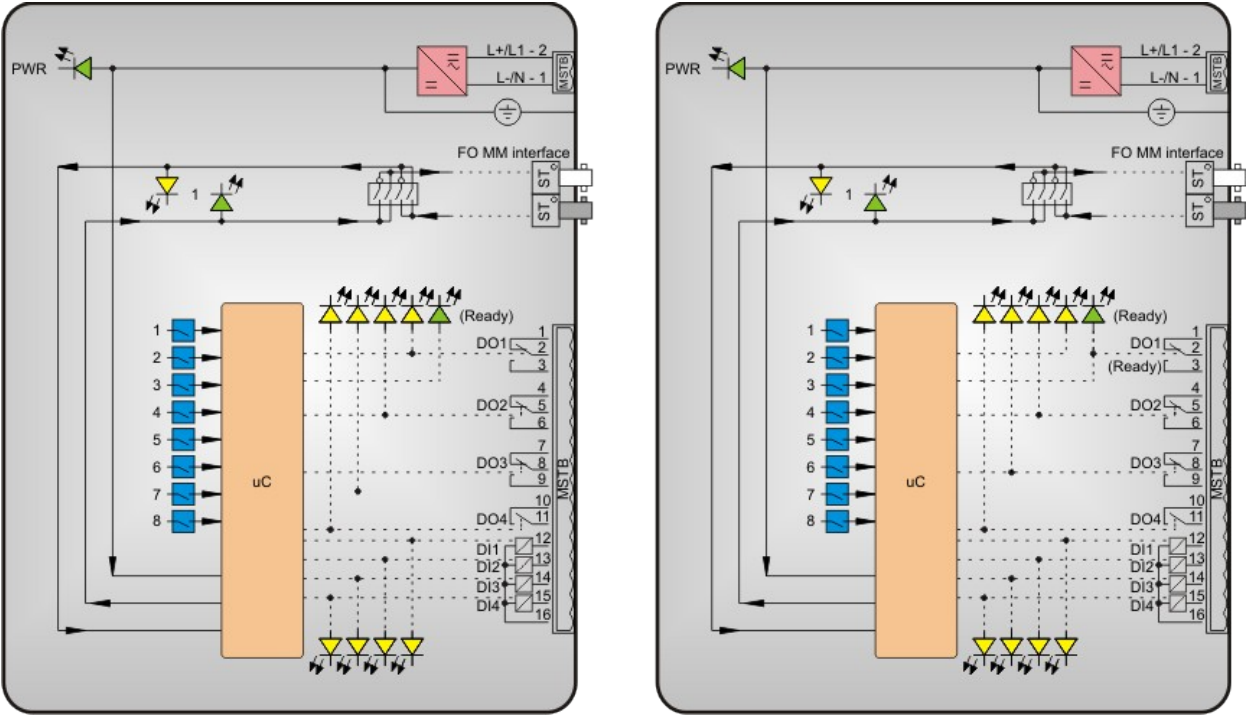
Difference between schematics is in operation of DO1. On left picture DO1 is normal digital output. On right picture DO1 works as „ready“ indicator. For further details see chapter „HARDWARE DESCRIPTION/IO BOARDS“.

5.3 STR 100 / x.FOT.NON.x

x - means any type, for types description see chapter Ordering.

Configuration of device

Power supply	interface 1	interface 2	IO type
any	multimode FO (ST)	none	any



Picture 29: (left): STR 100/x.FOT.NON.IOx schematic
Picture 30: (right): STR 100/x.FOT.NON.IOxR schematic

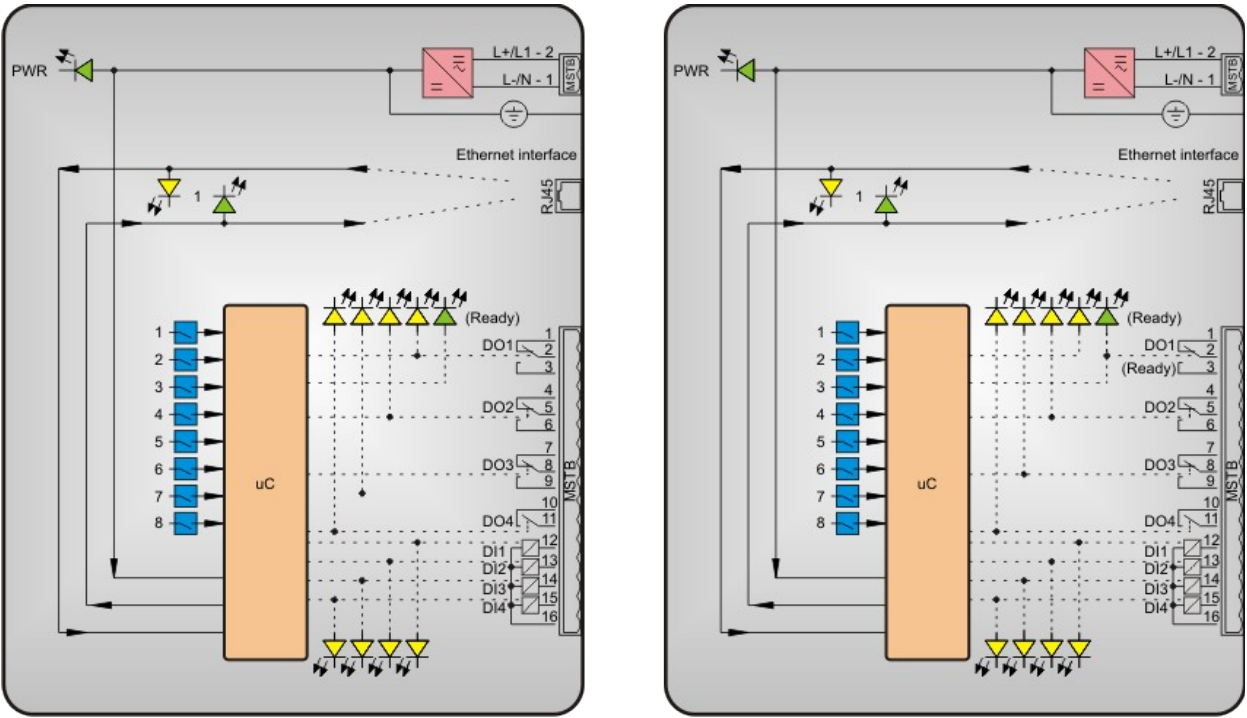
Difference between schematics is in operation of DO1. On left picture DO1 is normal digital output. On right picture DO1 works as „ready“ indicator. For further details see chapter „HARDWARE DESCRIPTION/IO BOARDS“.

5.4 STR 100 / x.ETH.NON.x

x - means any type, for types description see chapter Ordering.

Configuration of device

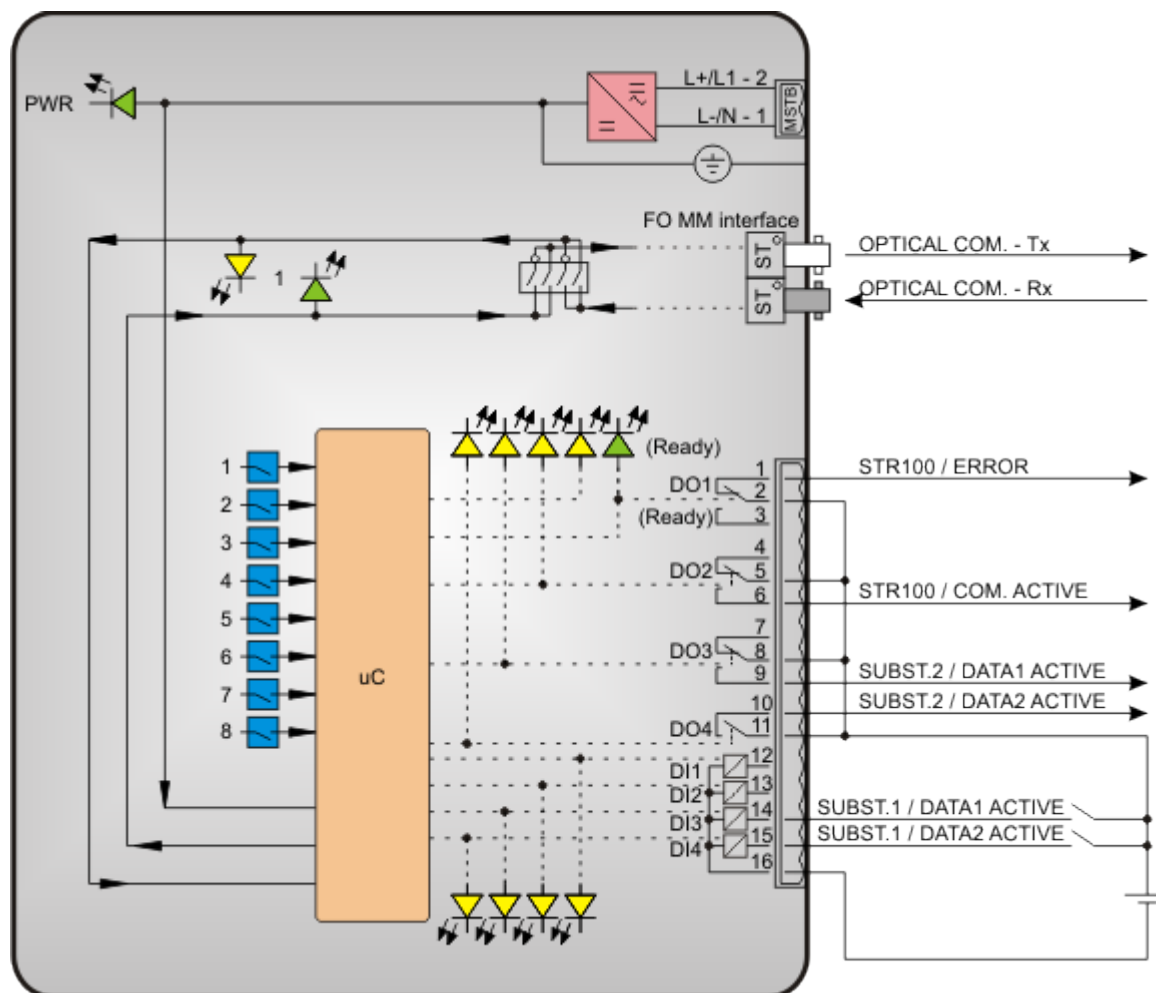
Power supply	interface 1	interface 2	IO type
any	ethernet	none	any



Picture 31: (left): STR 100/x.ETH.NON.IOx schematic
Picture 32: (right): STR 100/x.ETH.NON.IOxR schematic

Difference between schematics is in operation of DO1. On left picture DO1 is normal digital output. On right picture DO1 works as „ready“ indicator. For further details see chapter „HARDWARE DESCRIPTION/IO BOARDS“.

6 TYPICAL CONNECTION



Picture 33: STR 100 / x.FOT.NON.IOxR typical connection

7 INSTALLATION

7.1 INSTALLATION



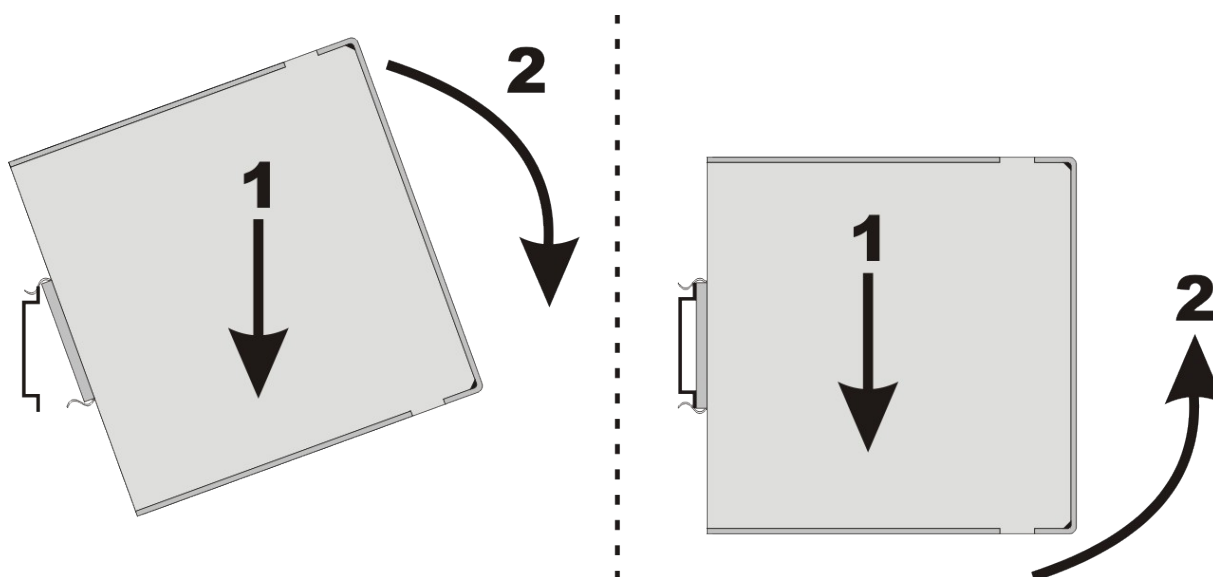
Warning!

Hazardous voltage is present inside the device during operation. Disregarding of safety rules can result in severe personal injury or property damage.

Only qualified personnel may work with described devices after being familiar with warnings and safety notices in this paper and other safety regulations.

Following instruction must be taken into consideration:

- ◆ The device must be accessible to qualified personnel only.
- ◆ The device is permitted to operate in enclosed housing or cabinet only.
- ◆ The device location must be vibration-free.
- ◆ The admissible operating temperature must be observed.
- ◆ Check the device for damage at unpacking. If device is damaged it must not be installed but it should be send to the manufacturer for repair.
- ◆ The device should not be opened.
- ◆ The device should be mounted on a 35 mm rail (acc to EN 50022).
- ◆ Attach ground wire before attaching power supply. Device must be grounded during operation!
- ◆ Single core or stranded wire 0,5 – 2,5 mm² must be used for power supply connection. If stranded wire is used, ferrules must be used to prevent fraying. Recommended stripping lenght is 5 mm.
- ◆ Protective earthing wire must be terminated with tinned copper ear terminal.
- ◆ The prescribed bending radius of the optical fibre cables must be observed.



Picture 34: left. installation, right: deinstallation

7.2 DEVICE SETTING

It is recommended, that device setting is made before device is powered up.

Some device settings are not regarded during operation, but only once after power up! If change during operation is made, disconnect power supply for a few moments (until power LED stops emitting) and connect power supply back. Settings are then accepted.

For further details see chapter „HARDWARE DESCRIPTION“.

8 COMMISSIONING & MAINTENANCE

8.1 COMMISSIONING



Warning!

Hazardous voltage is present inside the device during operation. Disregarding of safety rules can result in severe personal injury or property damage.

Only qualified personnel may work with described device after being familiar with warnings and safety notices in this paper and other safety regulations.

Following instruction must be taken into consideration:

- ◆ Device must operate completely assembled! Device must be used as described. No modifications of the device should be made.
- ◆ Attach ground wire before attaching power supply. Device must be grounded during operation!
- ◆ Check if the power supply voltage complies with device operation voltage.
- ◆ Do not open device while it is energized! Hazardous voltage is present inside the device.
- ◆ If single mode fiber optic interface is used, do not look into the laser beam.

8.2 MAINTENANCE

The device is maintenance-free. Disconnect power supply before cleaning it. Use moist cloth. Do not use liquids.

9 TECHNICAL DATA

Power supply				
		Type HI	Type MD	Type LO
Rated voltage	DC	110 - 250 V	48 - 60 V	24 V
	AC	230 V	48 V	18 V
Permissible voltage range	DC	88 - 350 V	38 - 72 V	18 - 36 V
	AC	70 - 264 V	30 - 50 V	15 - 24 V
Input current	DC	30 - 14 mA	64 - 52 mA	140 mA
	AC	22 mA	120 - 80 mA	200 mA
Fuse (internal)	2 A T			
Power supply indicator	green LED marked PWR			
Voltage dips	20 ms			
Connector type	screw type „MSTB“ Phoenix 2pin			
Wire crossection	0,5 – 2,5 mm ²			

Communication port RS232 (interface type 232)	
Type	RS232
Direction	full duplex
Speed	up to 230 k BAUD
Number of ports	1
Distance	up to 15 m
Isolation	none; (GND earthed)
Connector type	DB9 female
Lines in	1 (RX)
Lines out	1 (TX)

Communication port RS485 (interface type 48x)		
Type	RS485	
Direction	half duplex	
Speed	Interface type 5	19200 - 115200 BAUD
	Interface type M	4800 - 38400 BAUD
	Interface type L	300 - 2400 BAUD
Number of ports	1	
Distance	up to 1200 m	

Communication port RS485 (interface type 48x)	
Isolation	1000 V DC
Connector type	„MSTB“ Phoenix 3pin
Termination	120 Ohm
Max number of devices on BUS	32

Communication port Multimode Fiber Optic (interface type FOT)	
Type	multimode fiber optic
Wave lenght	820 nm
Fiber size	50/125 µm, 62,5/125 µm, 100/140 µm, 200 µm
Optical output power	-18 dB
Reciver sensitivity	-24 dB
Laser class	I (IEC 60825-1)
Direction	full duplex
Speed	up to 230 k BAUD
Input	1 receiver (grey connector)
Output	1 transmitter (white connector)
Logic	light ON or OFF in idle state set by switch (see table)
Number of ports	1
Distance	up to 500 m
Connector type	ST

Communication port ETH (interface type ETH)	
Type	ethernet
Direction	full duplex
Speed	300 to 230 k BAUD
Number of ports	1
Manufacturer	Lantronix
Type	Xport XP1001000-03R
Link	WWW.lantronix.com

TECHNICAL DATA

Digital inputs		
Input voltage	IOL	24 V DC (+/- 20%)
	IO4 and IO4R	48 V DC (+/- 20%)
	IO1and IO1R	110 V DC (+/- 20%)
	IO2 and IO2R	220 V DC (+/- 20%)
Consumption	1 mA	
Activation time	2,1 ms max	
Debounce	20	
Scan repetition	0,1 ms	
Connector type	screw type „MSTB“ Phoenix 16 pin	
Wire crossection	0,5 – 2,5 mm ²	

Digital outputs		
Max breaking voltage	440 V AC	
Max current	AC	5 A at 250 V
	DC	5 A at 32 V (resistive bourden)
		1,3 A at 48 V (resistive bourden)
		0,4 A at 110 V (resistive bourden)
		0,35 A at 220 V (resistive bourden)
Connector type	screw type „MSTB“ Phoenix 16 pin	
Wire crossection	0,5 – 2,5 mm ²	

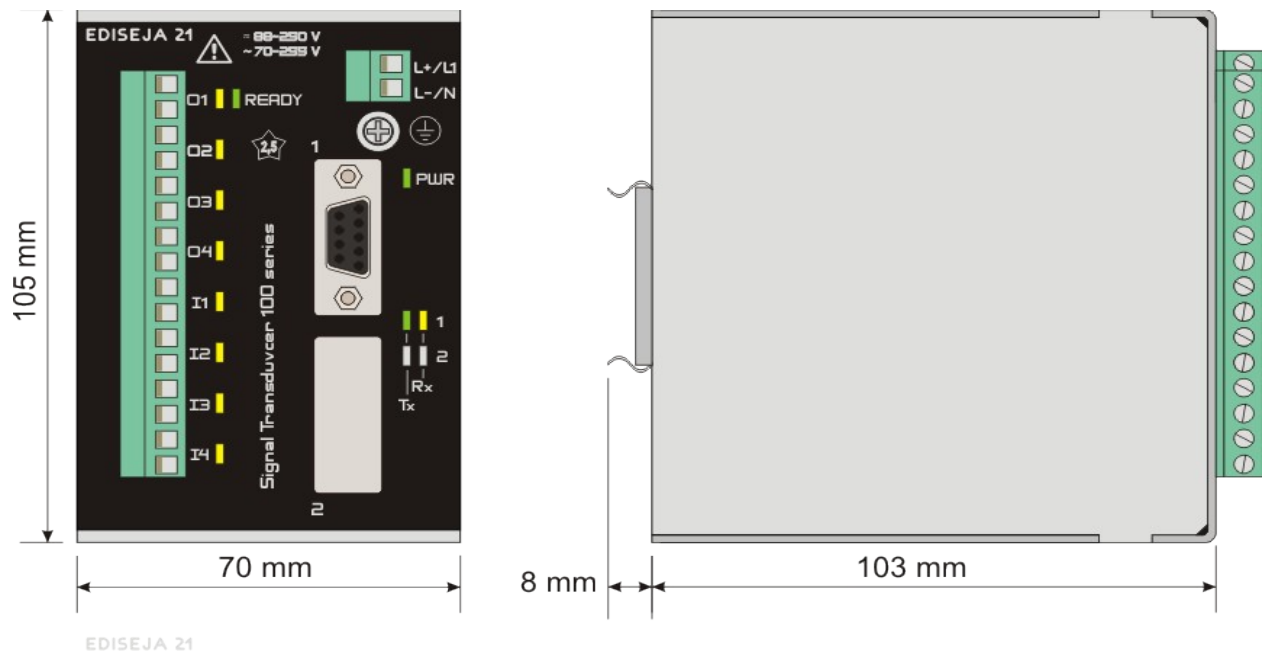
Communication speed		
Transition time	1200 BAUD	110 ms
	2400 BAUD	61 ms
	4800 BAUD	34 ms
	9600 BAUD	20 ms
	14400 BAUD	14 ms
	19200 BAUD	13 ms
	38400 BAUD	10 ms
	57600 BAUD	9 ms
	76800 BAUD	8 ms
	115200 BAUD	7 ms

For device **STR 100/x.ETH.x** transition time depends on network.

Device (Types: all)	
Weight	0,35 kg

Device (Types: all)			
Dimensions (see picture)	(H)	(D)	(W)
	105 mm	111 mm + connectors	70 mm
Temperature range	0 °C to +55 °C		
Humidity operating	up to 95 % (noncondensing)		
Enclosure	Material	Al	
	IP	20	
Mount type	standard DIN 35 rail (acc. to DIN EN 50022)		
Class	I		
Overvoltage category	III		
Communication indicator	Receiveing	yellow LED marked Rx	
	Tranmitting	green LED marked Tx	

10 DIMENSIONS



Picture 35: Dimensions

11 ORDERING

ORDERING NUMBER:

STR 100 / . . . - .

Power supply:

70 - 264 V AC or 88 - 350 V DC	HI
30 - 50 V AC or 38 - 72 V DC	MD
15 - 24 V AC or 18 - 36 V DC	LO

Interfaces:

none (mark second interf. with „NON“ in case that second interf. is not needed)	NON
RS232 nonisolated, Rx & Tx support	232
RS485 isolated, half duplex (19200 - 115200 BAUD)	485
RS485 isolated, half duplex (4800 - 38400 BAUD)	48M
RS485 isolated, half duplex (300 - 2400 BAUD)	48L
FO multimode ST	FOT
FO single mode ST (in development)	FOS
Ethernet (in development)	ETH

Digital input & output:

4 DI (24 V DC), 4 DO (250 V AC, 5 A)	IOL
4 DI (48 V DC), 4 DO (250 V AC, 5 A)	IO4
4 DI (110 V DC), 4 DO (250 V AC, 5 A)	IO1
4 DI (220 V DC), 4 DO (250 V AC, 5 A)	IO2
4 DI (24 V DC), 3 + 1 ready DO (250 V AC, 5 A)	IOLR
4 DI (48 V DC), 3 + 1 ready DO (250 V AC, 5 A)	IO4R
4 DI (110 V DC), 3 + 1 ready DO (250 V AC, 5 A)	IO1R
4 DI (220 V DC), 3 + 1 ready DO (250 V AC, 5 A)	IO2R

Software Version:

software version leave empty

Software Revision:

software revision leave empty

Accessories:

Description	Ordering code
- power supply cable with „schuko“ plug, 2 m	
- communication cable RS232 port to PC, 2 m	
- fiber optic cable ST-ST connector, 2 m	

For other cable lengths please contact us.

Contact:

Ediseja 21, razvoj elektronskih naprav, d.o.o.

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1360 Vrhnika

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Tel: 00 386 51 643 411, 051 643 411

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