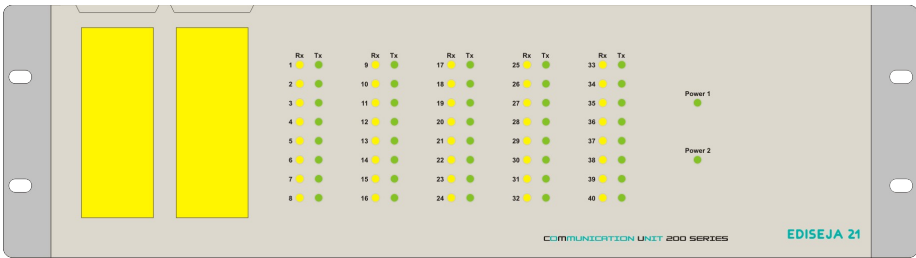


CMU 200
User manual

CMU 200 / HACx2 . 485x4 . FOTx36 – 18
CMU 200 / MDCx2 . 485x4 . FOTx36 – 18



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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.

Contact

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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.

Company:	Device:	Document:	Code:	Version:	Date:	Page:
Ediseja 21	CMU200/XXXx2.485x4.FOTx36	User manual	CMUMU202	V1	28.08.2015	3

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 CMU 200 SYSTEM

2.1 DESCRIPTION

Communication unit (CMU 200) is modular system of communication devices that can be used for various of tasks such as:

- ◆ communication converter (for example 20 channels RS232 to Fiber Optic converter)
- ◆ star coupler (for example RS232 to 39 fiber optic)

CMU 200 device is a couple of software and hardware. For different purposes, different software versions and different hardware configuration have been developed.

2.1.1 SOFTWARE

Software is application dependent and allows different hardware configurations. Software's task is switching between communication ports and allows almost any combination between them.

2.1.2 HARDWARE

CMU 200 can handle up to 40 different interface boards. Currently available interface boards:

- ◆ (non)isolated RS232
- ◆ isolated RS485
- ◆ Multimode Fiber Optic ST or SMA connectors
- ◆ USB
- ◆ ethernet (with one virtual com port)
- ◆ power supply

There is possibility to use additional redundancy power supply.

Housing is made from inox and is intended for mount on standard 19"rack.

3 DESCRIPTION

3.1 DESCRIPTION

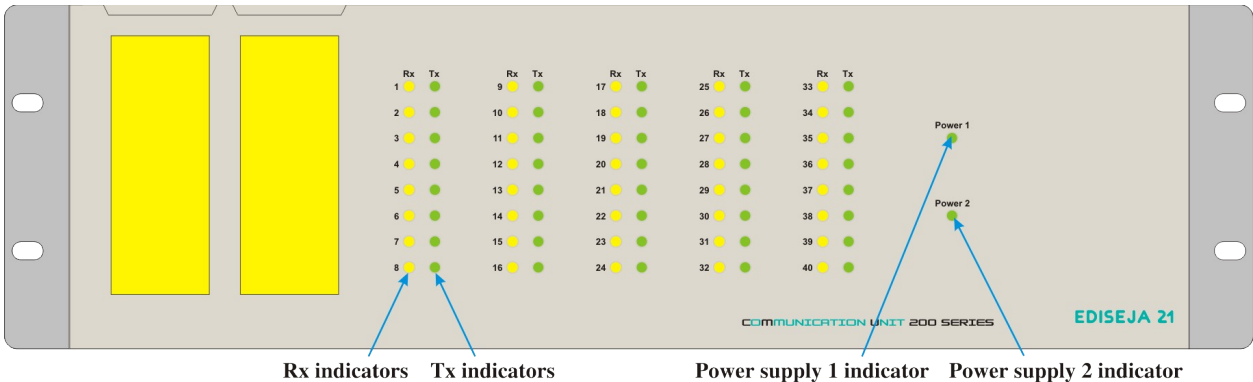
Star coupler is communication device that transfer data from one (master) to more than one (slave) port.

This device contains 4 RS485 and 36 multimode fiber optic ports. One master and nine slave ports made one group. Data is send from master port to all slave ports in the same group. On the other hand, data from either slave port is send to master port in the same group only.

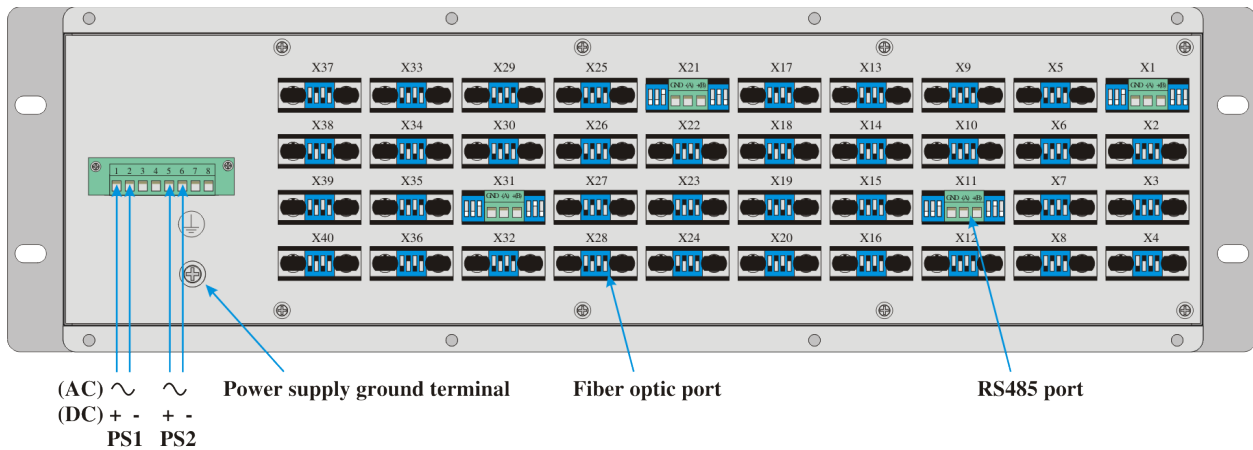
Power supply voltage allows connection to all common station batteries. Additionally it can be also connected to standard AC voltages.

This device is intended for use in cubicles and cabinets in all kinds of power production, transmission and distribution stations. It requires no maintenace. All normally used connectors, switches and light indicators are accessed at the back side of the device. Two light indicators indicates power supply voltage, others indicate communication transfer.

3.2 APPERANCE



Picture 1: Front view



Picture 2: Back view

3.3 HARDWARE DESCRIPTION

3.3.1 PORTS CONFIGURATION

Port	1	2	3	4	5	6	7	8	9	10
Inter.	RS485	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM
Port	11	12	13	14	15	16	17	18	19	20
Inter.	RS485	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM
Port	21	22	23	24	25	26	27	28	29	30
Inter.	RS485	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM
Port	31	32	33	34	35	36	37	38	39	40
Inter.	RS485	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM	FO MM

3.3.2 RS485 INTERFACE BOARD

Description

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.

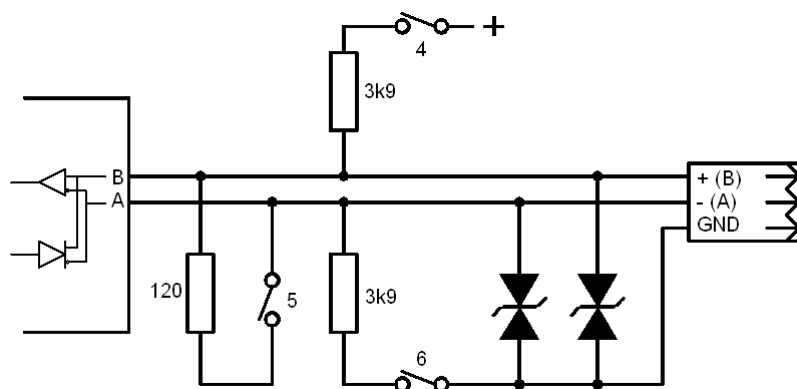
STABILISATION

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 3: RS485 BUS schematic

Switches at the upper side of connector:

BAUD rate

BAUD rate			Switch		
Interface 5	Interface M	Interface L	1	2	3

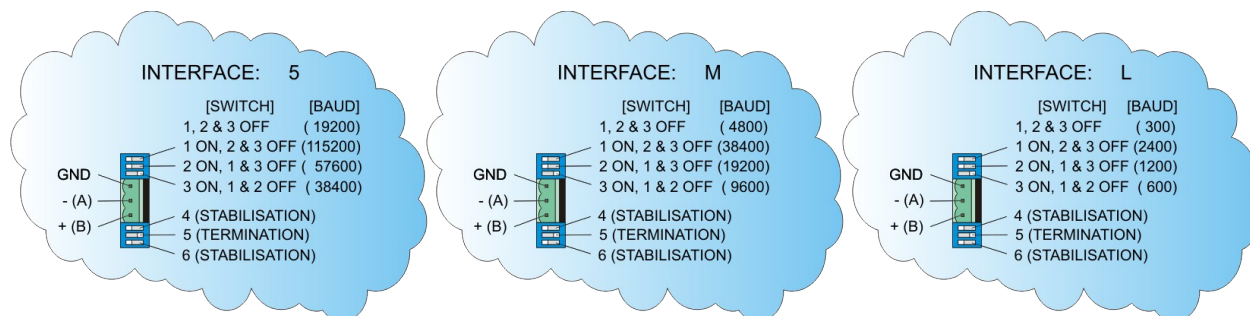
BAUD rate			Switch		
19200	4800	300	OFF	OFF	OFF
38400	9600	600	OFF	OFF	ON
57600	19200	1200	OFF	ON	OFF
115200	38400	2400	ON	OFF	OFF

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.

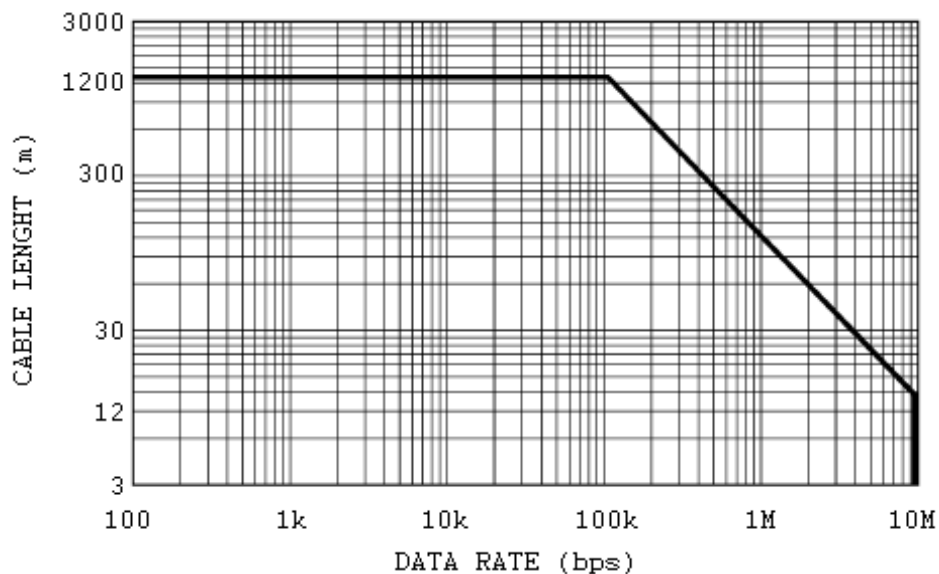
NOTE! If there are problems with communication, try using higher speed setting. Some manufacturer have different markings for B and A line. Try to switch A and B wires. See <http://en.wikipedia.org/wiki/RS-485> for detailed information.

Connector pin table

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



Picture 4: RS485 interface board appearance with switch settings



Picture 5: Data rate vs cable length

3.3.3 MULTIMODE FIBER OPTIC INTERFACE BOARD

Description

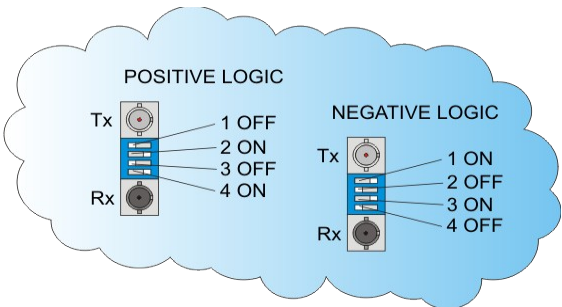
Single, full duplex, multimode, fiber optic port with ST connectors with positive or negative logic.

Hardware settings

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

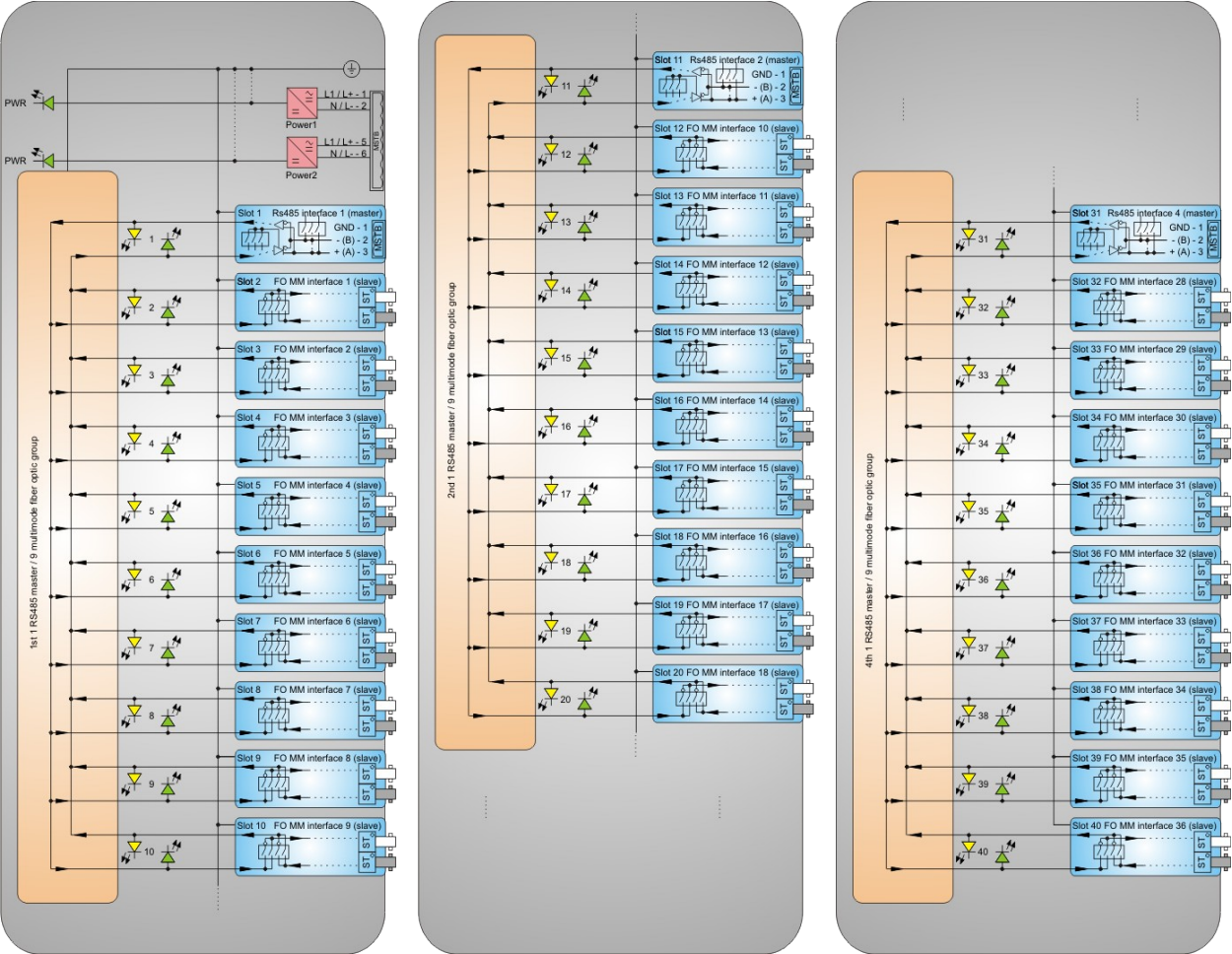
Fiber optic logic settings

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 6: Multimode fiber optic interface board appearance

4 SCHEMATIC



Picture 7: Schematic

5 INSTALLATION

5.1 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 sent to the manufacturer for repair.
- ◆ The device should not be opened.
- ◆ The device should be mounted on 19" rack via 4x M6x10 mm screws
- ◆ 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 length 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.

6 COMMISSIONING & MAINTENANCE

6.1 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.

6.2 MAINTENANCE

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

7 TECHNICAL DATA

Power supply		
Rated voltage	HAC	230 V AC, +10 %, -10 %
		220 V DC, +10 %, -10 %
	MDC	110 V DC, +10 %, -10 %
Rated current	HAC	0,3 A
	MDC	0,5 A
Fuse (internal)	6,3 A T	
Power supply indicator	green LEDs marked Power 1 and Power 2	
voltage dips	20 ms	
Connector type	screw type „MSTB“ Phoenix 8pin	
Wire crossection	0,5 – 2,5 mm ²	

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	
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 FOx)	
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)

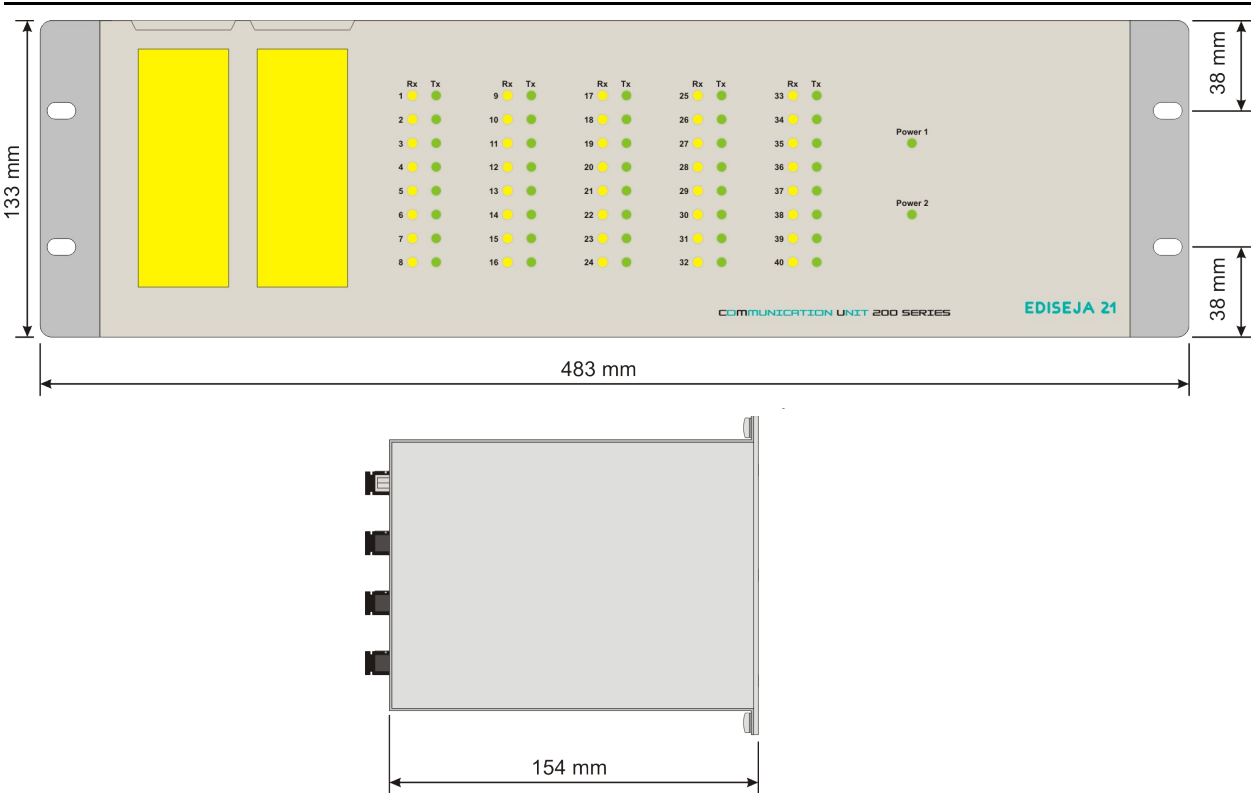
TECHNICAL DATA

Communication port Multimode Fiber Optic (interface type FOx)	
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

* slowest interface defines device's maximum speed

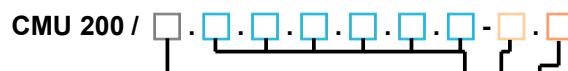
Device			
Weight	6 kg		
Dimensions (see picture)	(W)	(H)	(D)
	19" rack	3U (133 mm)	154 mm + connectors
Temperature range	0 °C to +55 °C		
Humidity operating	up to 95 % (noncondensing)		
Enclosure	Material	inox	
	IP	20	
Mount type	4x M6 screw 19" rack		
Class	I		
Overvoltage category	II		
Communication indicator	Receiveing	yellow LED marked Rx	
	Tranmitting	green LED marked Tx	

8 DIMENSIONS



Picture 8: Dimensions

(enclosure width: 19", height: 3U, depth: 154 mm)



single 230 V AC, 220 V DC power supply	HACx1
double 230 V AC, 220 V DC power supply	HACx2
single 110 V DC power supply	MDCx1
double 110 V DC power supply	MDCx2

RS232 nonisolated, Rx & Tx support	232 x n
RS232 isolated, Rx & Tx support	23I x n
RS232 nonisolated, Rx, Tx, CTS & RTS support	23R x n
RS232 isolated, Rx, Tx, CTS & RTS support	2RI x n
RS485 isolated, half duplex (19200-115200 baud)	485 x n
RS485 isolated, half duplex (38400 - 4800 baud)	48M x n
RS485 isolated, half duplex (300-2400 baud)	48L x n
FO multimode ST	FOT x n
FO multimode SMA	FOA x n
Ethernet (one virtual com port)	ETH x n

n ... number of interfaces - maximum number of interfaces in CMU 200 is 40!
Each 23R and 2RI interface must be treated as two interfaces!

three ports star coupler (up to 13 groups)	2
1 on 1 converter (up to 20 groups)	7
40 port star coupler (1 master, up to 39 slaves)	12
39 port star coupler (2 masters to 4 slaves (3 groups), 2 masters to 5 slaves (3 groups))	15
40 port star coupler (1 master to 9 slaves, up to 4 groups)	18
For other functions please contact us.	

software version leave empty

- 1x RS232 to 9x fiber optic, 3 groups star coupler with
- two 230 V AC power supply
- 3 RS232 interfaces
- 27 fiber optic interfaces with ST connector

- power supply cable with „schuko“ plug, 2 m
- RS232 cable to PC (state the length up to 15 m)
- fiber optic cables (state the length)

Contact:**Ediseja 21, razvoj elektronskih naprav, d.o.o.**

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