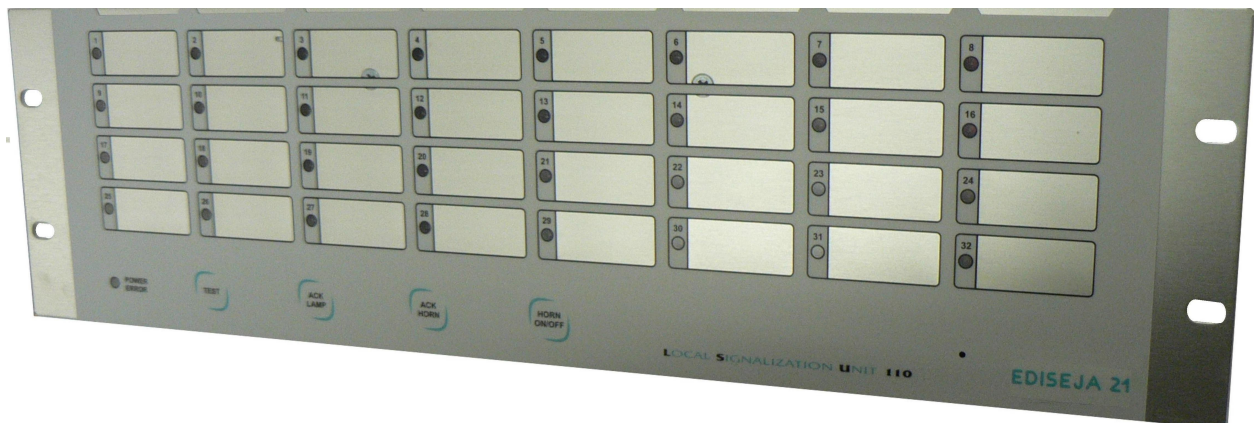


LSU 110 / 32

Local Signalization Unit

User manual



Device:
LSU 110 / 32

Document: User manual
Code: LS3MUE01

Date:
15.01.2021

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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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Copyright

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Explanation of the symbols



Read the instructions!



Device was tested with AC 2,5 kV 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:

Device:	Document:	Code:	Date:	Page:
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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 DESCRIPTION

LSU 110 / 32 device is intended for local signalization in power distribution substations. It is also called alarm annunciator.

Power supply and binary inputs are made for standard voltages in substations; DC 24 V, DC 48 V, DC 110 V, DC 220 V or AC 230 V depends on ordering.

Device has 32 signal binary inputs (»DI1-DIn«), which controls dependent lamp (lamp1-n). Speed and mode of lamp flashing depends on setting and can be changed by buttons on front side of device.

Two modes of operation and four flashing lamp time can be set. First operation mode is latched until acknowledged, second mode just follow the binary input. In first mode following flash lamp time can be set: 0,5 s, 0,75 s, 1 s and 1,5 s. Each DI can be delayed, from 0 ms to 65,535 s. Additional 4 binary inputs »DIA«, »DIB«, »DIC«, »DID« for special purpose like remote horn and lamp acknowledge and test.

Function of 6 binary outputs »DO1-DO6« is remote lamp and remote horn control, lamp acknowledge, and device ready function.

For sound alarming, device is equipped with the buzzer.

Red/green lamp on front side of device has a function of visual inspection of device operation.

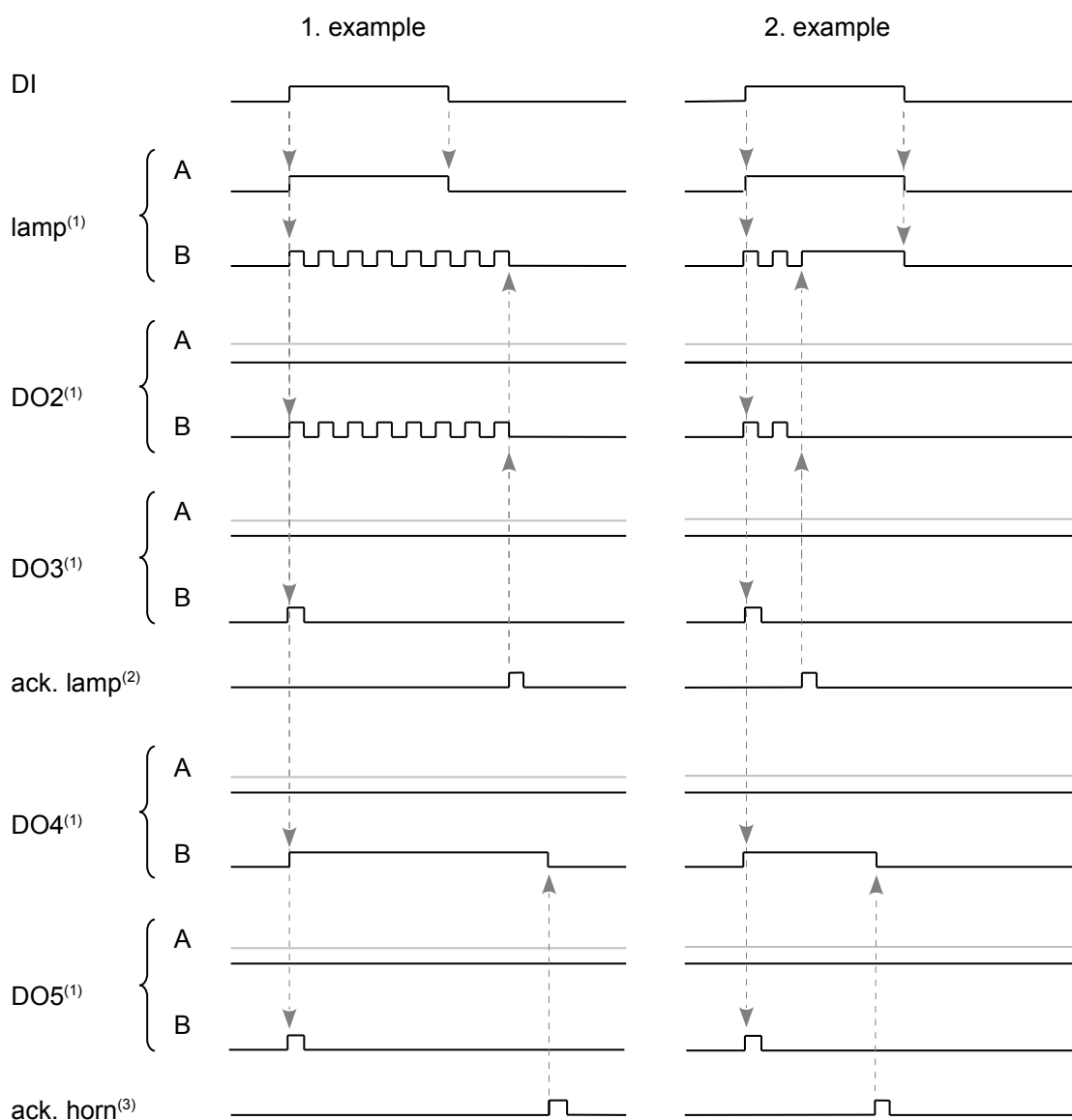
<i>Device:</i>	<i>Document:</i>	<i>Code:</i>	<i>Date:</i>	<i>Page:</i>
LSU 110 / 32	User manual	LS3MUE01	15.01.2021	5

3 OPERATION

3.1 POWER ON

After power is applied, lamp »Power/Error« illuminate red. After all lamps are illuminated one by one, »Power/Error« lamp illuminate green. When »Power/Error« lamp is green, device is ready to operate and DO6 is activated (only device without special option (see ordering option 2)).

3.2 NORMAL OPERATION

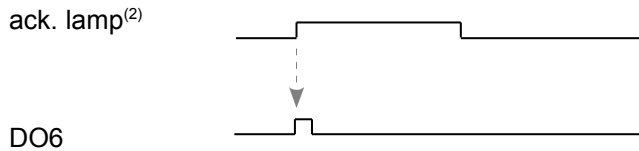


Operation of DO6:

device without special option (see ordering option 2):

DO6 has device ready function

device with special option 6 (see ordering option 2):



(1) depends on device setting (see chapter „SETTINGS“)

(2) button »ACK LAMP« pressed or input »DIB« activated

(3) button »ACK HORN« pressed or input »DIC« activated

When any binary input is activated, belonging lamp is also activated. Lamp flashing mode depends on device setting (see chapter „SETTINGS“):

A) when input is activated, lamp lights. When input is deactivated, lamp lights no more, without any acknowledgement. No DOs are activated.

B) (1. example) when input is activated, lamp start to flash. When input is deactivated, lamp flashes until lamps are acknowledged (button »ACK LAMP« pressed or input »DIB« activated).

(2. example) when input is activated, lamp start to flash. When lamps are acknowledged (button »ACK LAMP« pressed or input »DIB« activated) lamp lights until binary input is deactivated.

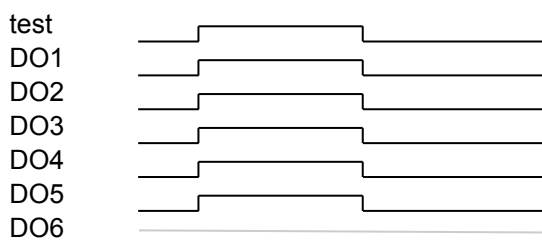
DO2 normal position is OFF. At activation of any binary input set at B mode, binary output DO2 starts to alternate from OFF to ON position and vice versa. Alternation time depends on lamps flashing time setting. When lamps are acknowledged (button »ACK LAMP« pressed or input »DIB« activated), DO2 goes to OFF position no matter of binary input states.

DO3 normal position is OFF. At activation of any binary input set at B mode, binary output DO3 goes to ON position for 500 ms.

DO4 normal position is OFF. At activation of any binary input set at B mode, binary output DO4 goes to ON position. It stays in that position until horn is acknowledged (button »ACK HORN« pressed or input »DIC« activated).

DO5 normal position is OFF. At activation of any binary input set at B mode, binary output DO5 goes to ON position for 500 ms.

3.3 OPERATION DURING TEST



When test is activated (button »TEST« pressed or inputs »DIA« activated) all lamps lights. Binary outputs »DO1« to »DO5« are also activated.

When test is deactivated (button »TEST« not released and inputs »DIA« deactivated) all lamps start to flash as they were triggered by binary input in normal operation. DOs are set to the position as they were triggered by binary input in normal operation.

3.4 LAMPS, BUTTONS, BINARY INPUTS AND OUTPUTS DESCRIPTION

Each lamp 1-32 has its dependent binary input 1-32. Lamp lightning depends on state of binary input and software settings.

Additional two colour lamp »POWER/ERROR« signalize state of device. Red lamp means device is starting or device is not operating correctly. Green lamp means device is fully operational.

On front side there are four buttons:

- ◆ »TEST« - testing device
- ◆ »ACK LAMP« - acknowledge active lamps and lamp dependent DOs
- ◆ »ACK HORN« - acknowledge horn and dependent DOs
- ◆ »HORN ON/OFF« - enabling and disabling internal horn

Additional inputs:

- ◆ »DIA« – external test; activation of that input has equal effect as pressing button »TEST«.
- ◆ »DIB« – external acknowledge of lamps; activation of that input has equal effect as pressing button »ACK LAMP«.
- ◆ »DIC« – external acknowledge of horn; activation of that input has equal effect as pressing button »ACK HORN«.
- ◆ »DID« – without function.

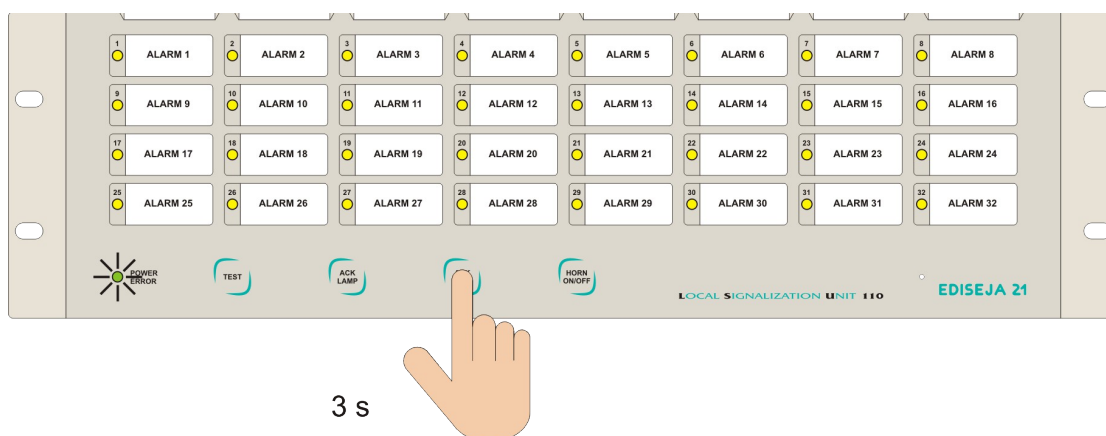
Additional outputs:

- ◆ »DO1« – external test, active until button »TEST« is pressed or input »DIA« is active.
- ◆ »DO2« – external lamp control, alternating until button »ACK LAMP« pressed or »DIB« activated.
- ◆ »DO3« – external lamp activation, active for 500 ms.
- ◆ »DO4« – external horn control, active until button »ACK HORN« pressed or »DIC« activated.
- ◆ »DO5« – external horn activation, active for 500 ms.
- ◆ »DO6« – device without special option (option 2): device ready function
– device with special option (option 2) 6: external lamp acknowledge, active for 500 ms.

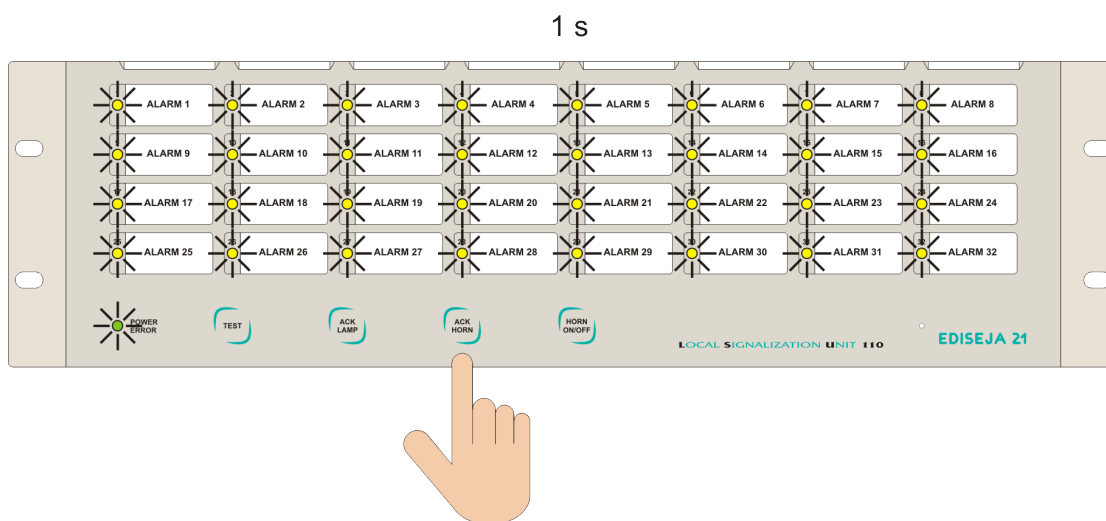
4 SETTINGS

Setting procedure:

- ◆ Press and hold button »ACK HORN« for approximately 3 s.

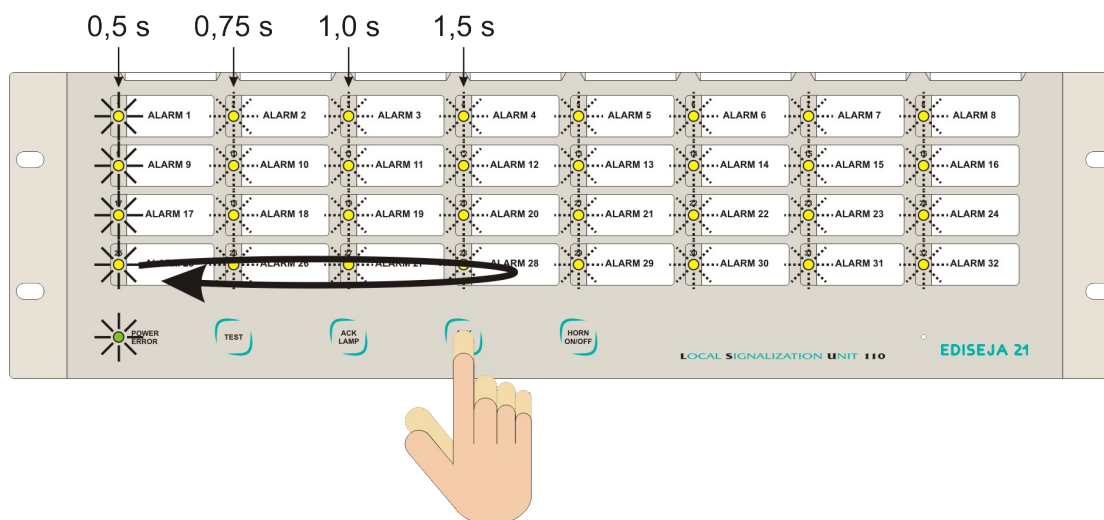


- ◆ All lamps goes ON for 1 s.

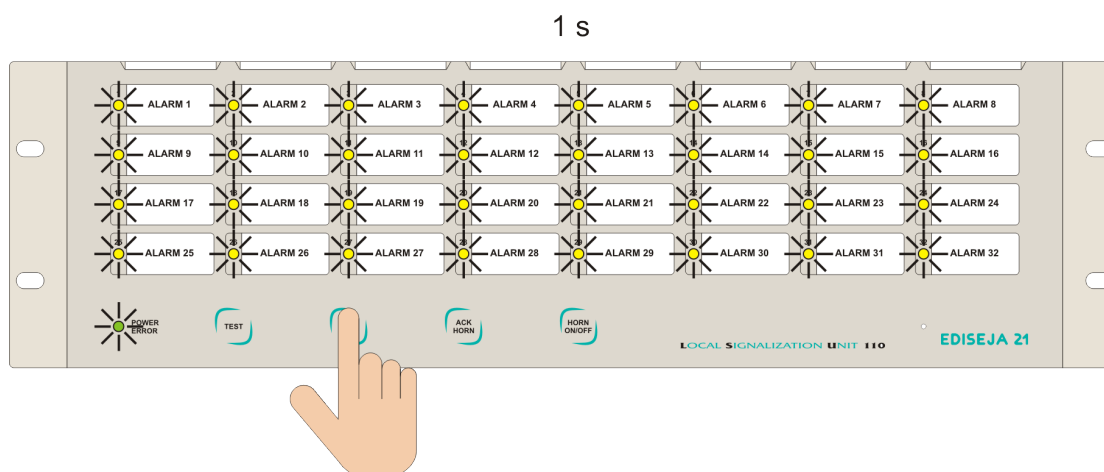


- ◆ **Lamp flashing speed mode:** All lamps are flashing except first, second, third or fourth row column. Which column is ON depends on current setting. Column which is ON marks the speed of lamp is flashing:
 - ◆ first column ON - flashing on 0,5 s
 - ◆ second column ON - flashing on 0,75 s
 - ◆ third column ON - flashing on 1 s
 - ◆ fourth column ON - flashing on 1,5 s.

- ◆ Change the speed of lamp flashing with button »ACK HORN«.

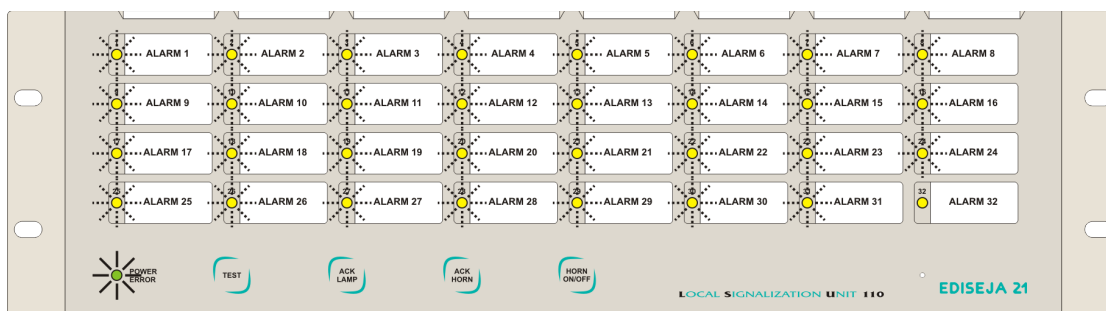


- ◆ Lamp flashing speed setting is confirmed with button »ACK HORN«. All lamps goes ON for 1 s. Device is now in set lamp logic mode.

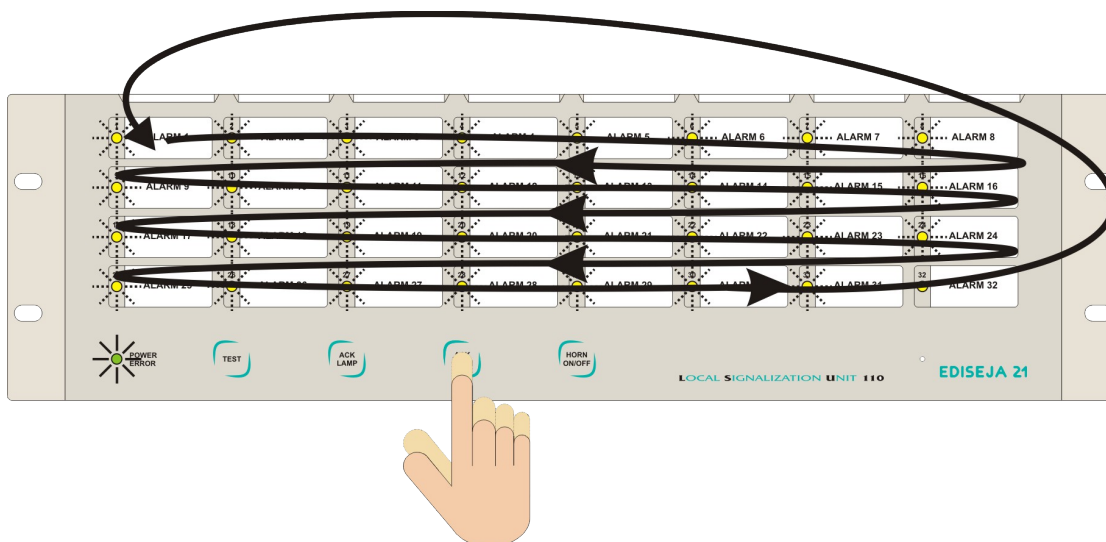


◆ Lamp logic setting:

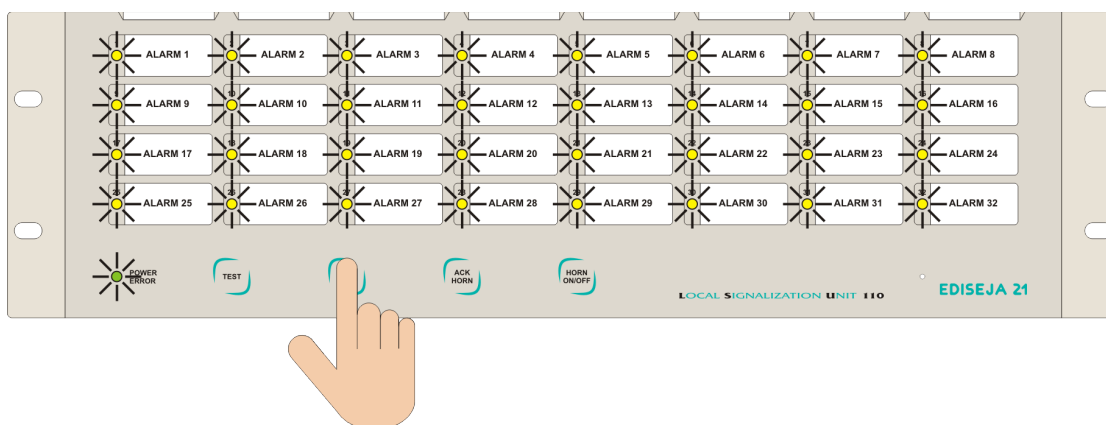
- ◆ lamp flashing means, that when dependent input will go active, lamp will flash until »ACK LAMP« is pressed („OPERATION„ („lamp – B«))
- ◆ lamp ON means, that lamp will follow the input state; active inpute lamp ON, non active input lamp OFF (chapter „OPERATION„ („lamp – A«))
- ◆ lamp OFF means lamp we are currently set (lowest right).



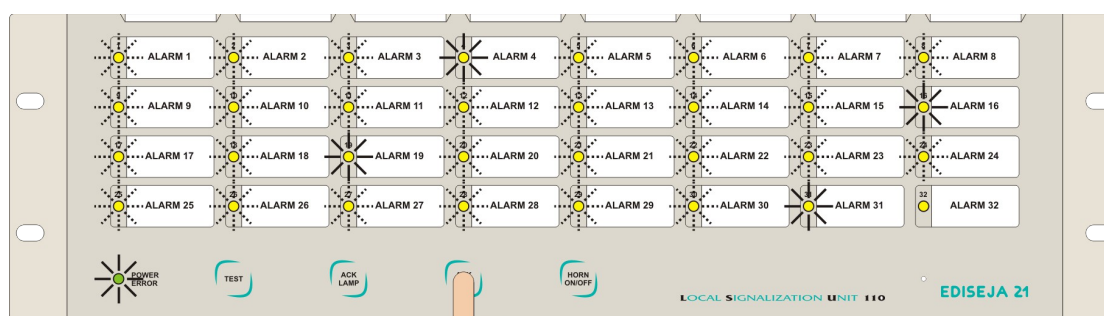
- ◆ Move to lamps by pressing button »ACK HORN«.



- ◆ Single lamp logic setting is changed with button »ACK LAMP«.



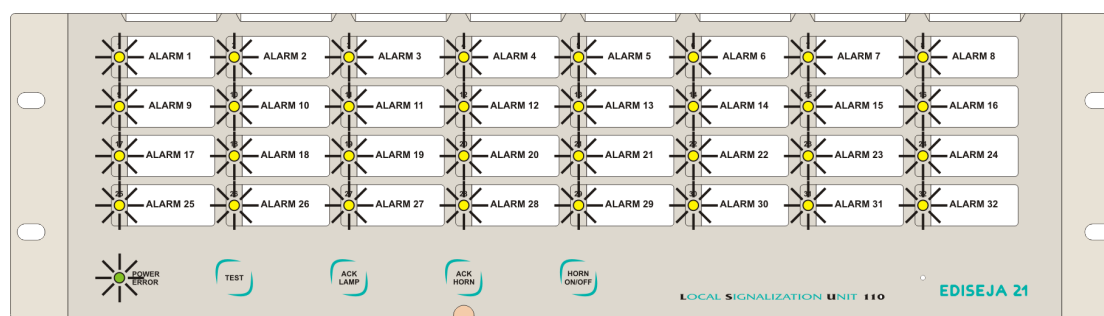
- ◆ When all lamps logic are set press and hold button »ACK HORN« for approximately 3 s.



3 s

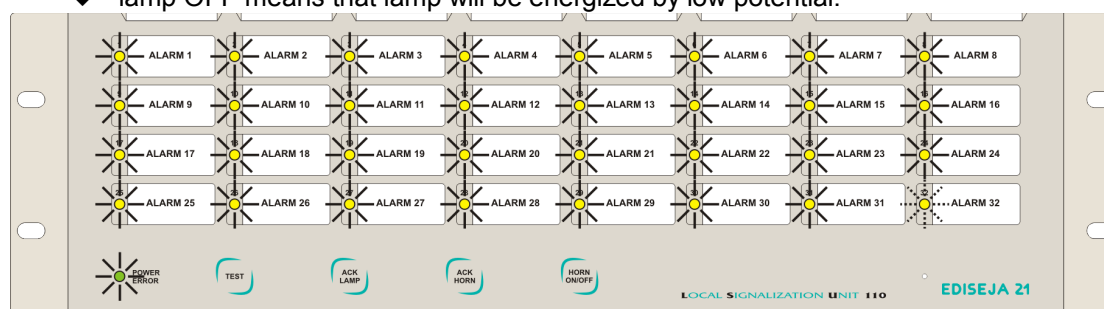
- ◆ All lamps goes ON for 1 s. Device is now in set rising edge mode.

1 s

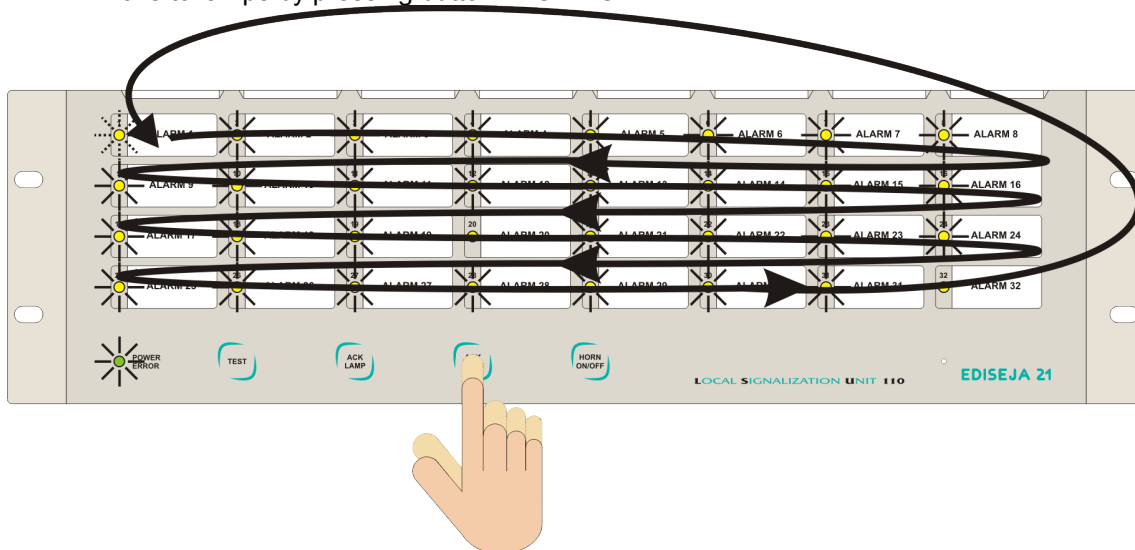


- ◆ **Rising edge setting:**

- ◆ lamp flashing means lamp we are currently set (lowest right)
- ◆ lamp ON means that lamp will be energized by high potential
- ◆ lamp OFF means that lamp will be energized by low potential.

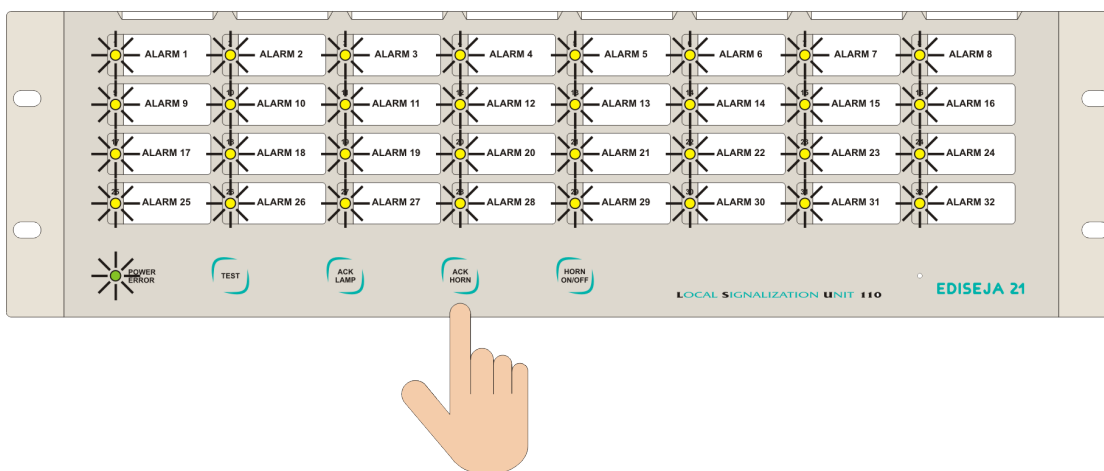


- ◆ Move to lamps by pressing button »ACK HORN«.



- ◆ All lamps goes ON for 1 s. Device is now in set time delay mode.

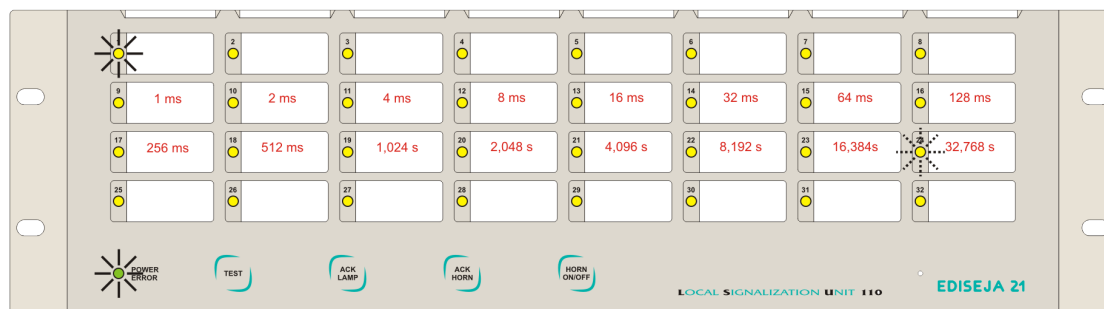
1 s



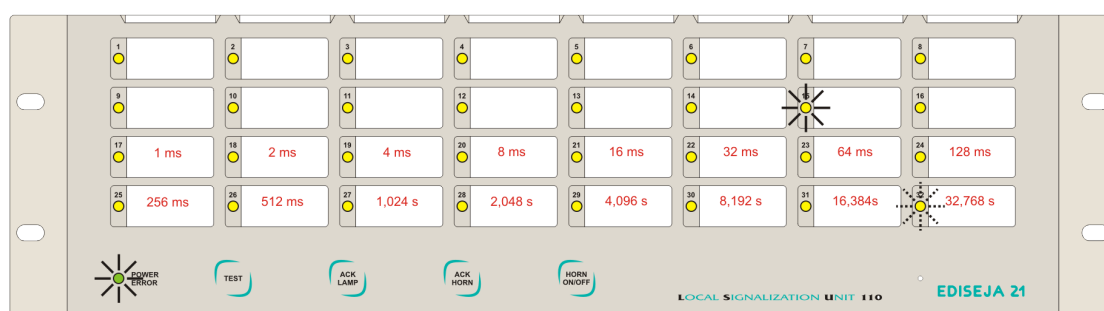
- ◆ **Set time delay mode:**

- ◆ First left lamp is ON and it marks the lamp (binary inputs) to be set. Last right lamp is flashing. Flashing lamp marks the setting position.
- ◆ Set time delay for each lamp according to the pictures:

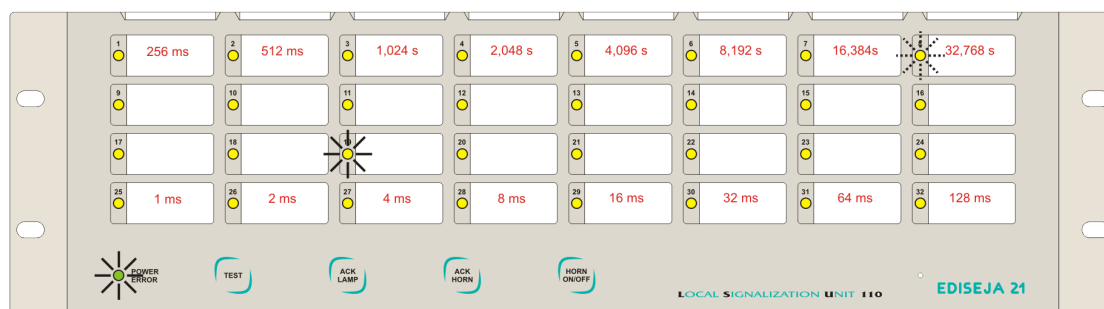
TIME SETTINGS LEDS 1-8



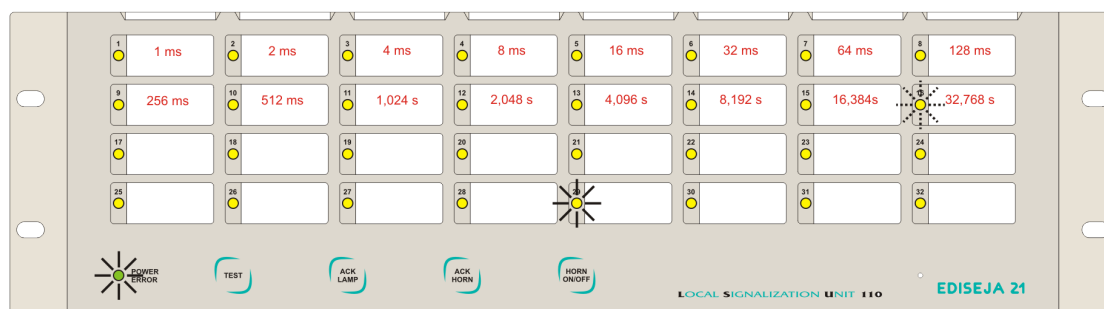
TIME SETTINGS LEDS 9-16



TIME SETTINGS LEDS 17-24

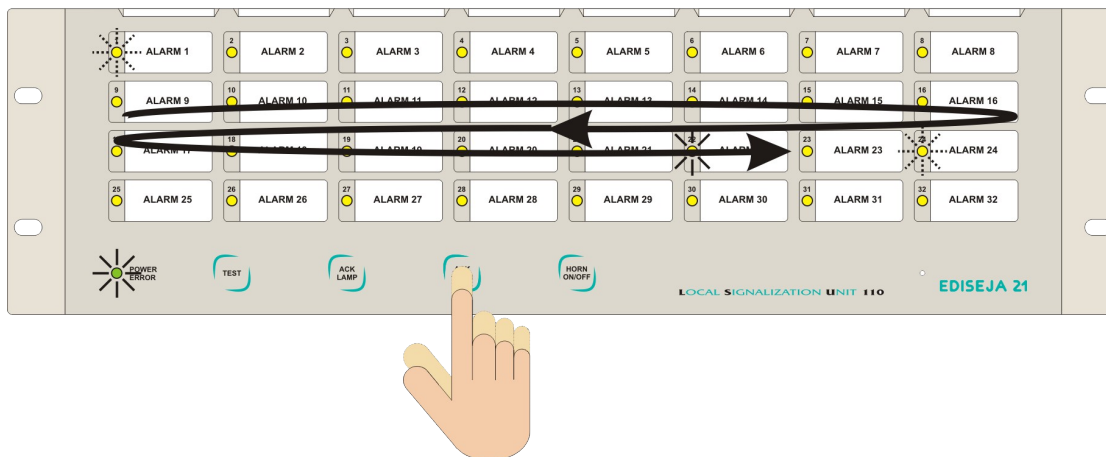


TIME SETTINGS LEDS 25-32



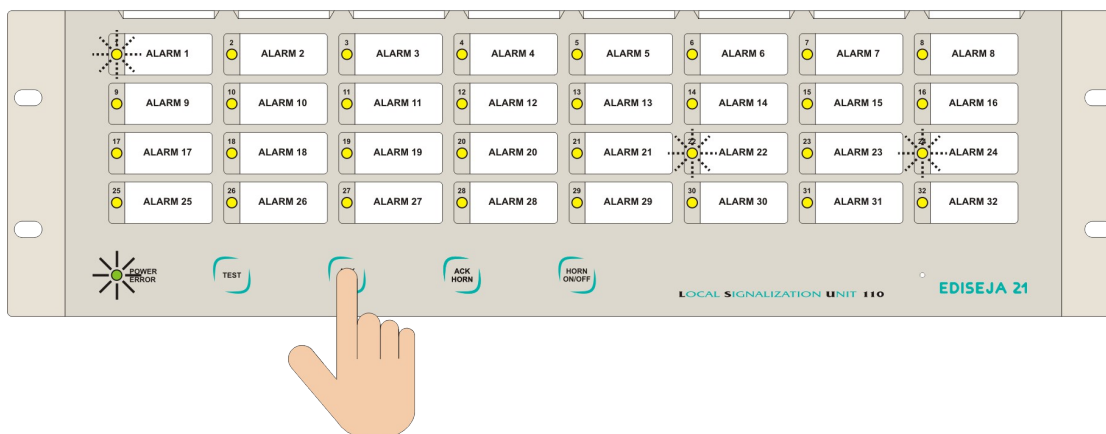
- ◆ Move between time settings by pressing button »ACK HORN«.

TIME SETTINGS CIRCULATION



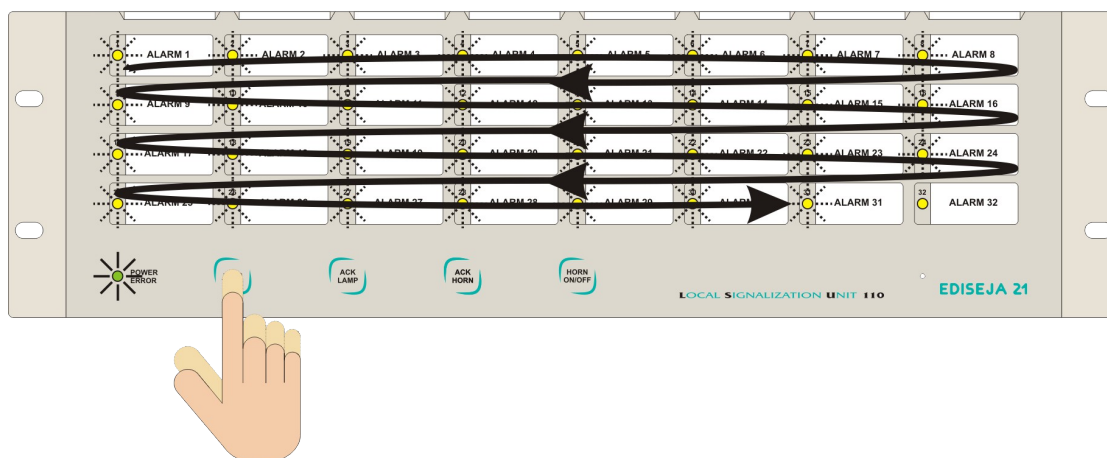
- ◆ Select / deselect time setting by pressing button »ACK LAMP«. If lamp is ON, selected time delay is active. If lamp is OFF, selected time delay is not active.

SELECT / DESELECT TIME SETTING

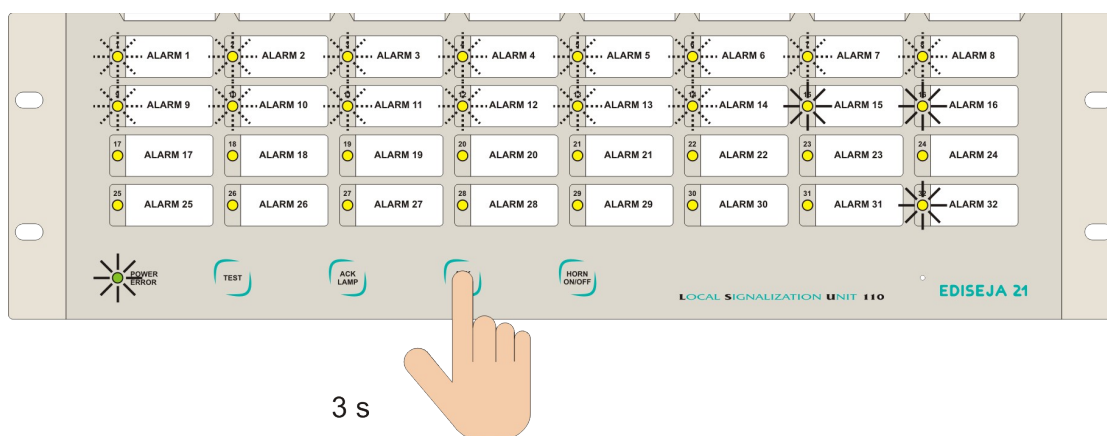


- ◆ Move between lamps by pressing button »TEST«.

LEDS (DIGITAL INPUT) CIRCULATION



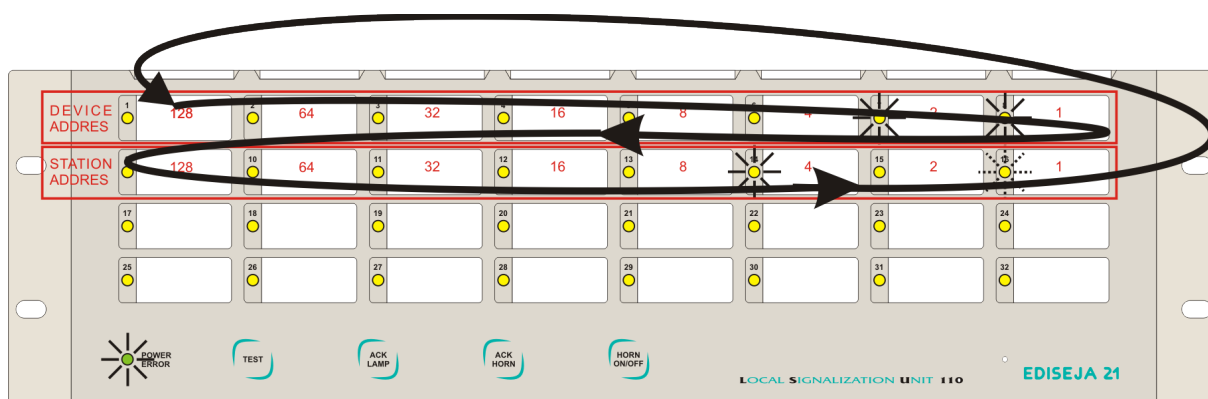
- ◆ When time delays for all lamps are set press and hold button »ACK HORN« for approximately 3 s.



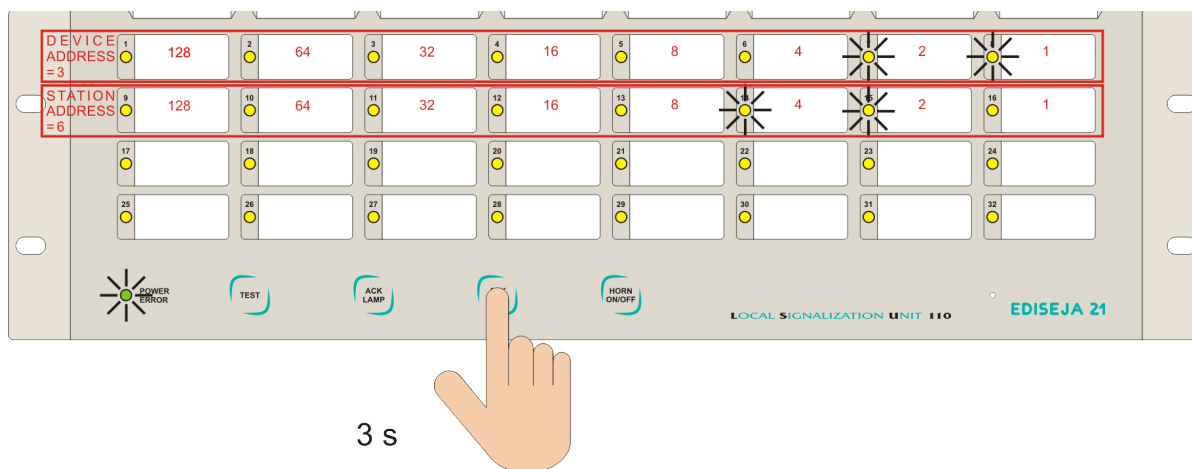
- ◆ All lamps goes ON for 1 s.

◆ IEC 60870-5-103 settings:

- ◆ First row marks the device address (on the picture device address = 3). Second row marks station address (on the picture device address = 4). Last right lamp in second row is flashing. Flashing lamp marks the setting position.
- ◆ Move between lamps by pressing button »ACK HORN«.
- ◆ Select / deselect address bit setting by pressing button »ACK LAMP«. If lamp is ON, selected bit is active. If lamp is OFF, selected bit is selected bit is not active.



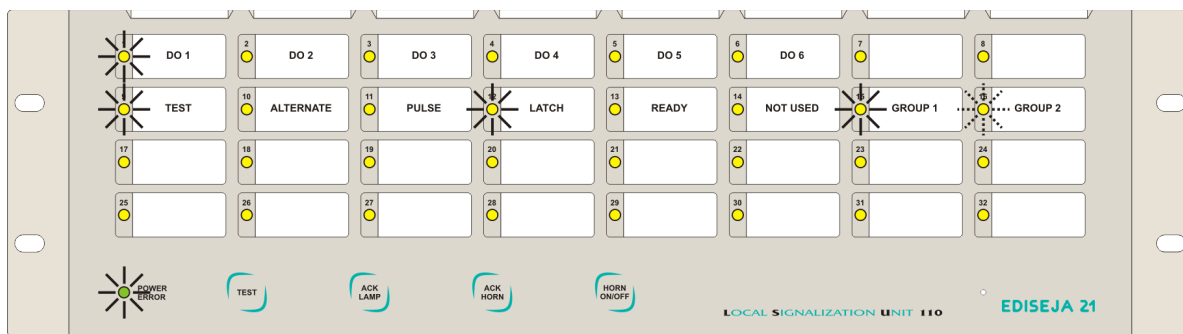
- ◆ When IEC 60870-5-103 device address and IEC 60870-5-103 station address are set, press and hold button »ACK HORN« for approximately 3 s.



- ◆ All lamps goes ON for 1 s.

◆ **DO function settings:**

- ◆ First row marks the device DO number (on the picture DO number = 1). Second row marks DO function. Last right lamp in second row is flashing. Flashing lamp marks the setting position.
- ◆ Move between DO functions by pressing button »ACK HORN«.
- ◆ Select / deselect DO function setting by pressing button »ACK LAMP«. If lamp is ON, selected bit is active. If lamp is OFF, selected bit is not active.
 - ◆ TEST - DO is activated during test (button test or DIA is active)
 - ◆ ALTERNATING & GROUPx - DO is alternating after DI (in selected group) is activated.
 - ◆ PULSE & GROUPx - DO make one pulse after DI (in selected group) is activated.
 - ◆ LATCH & GROUPx- DO is latched after DI (in selected group) is activated. DO is reset by pressing button »ACK LAMP« or activation of »DIB«.
 - ◆ LATCH & ALTERNATE & GROUPx- DO is latched after DI (in selected group) is activated. DO is reset by pressing button »ACK HORN« or activation of »DIC« .
 - ◆ GROUP1 - DO is enabled to perform function, if DI in group 1 is activated
 - ◆ GROUP2 - DO is enabled to perform function, if DI in group 2 is activated.
- ◆ Move between DOs by pressing button »TEST«. Device has 6 DOs.



- ◆ When all DOs are set, press and hold button »ACK HORN« for approximately 3 s.
- ◆ All lamps goes ON for 1 s.

- ◆ **DI group 1 settings:**
 - ◆ Last right lamp in last row is flashing. Flashing lamp marks the setting position.
 - ◆ Move between DIs by pressing button »ACK HORN«.
 - ◆ Select / deselect DO function setting by pressing button »ACK LAMP«. If lamp is ON, selected DI is set in group 1. If lamp is OFF, selected DI is not set in group 1.
- ◆ When all DIs for group1 are set, press and hold button »ACK HORN« for approximately 3 s.
- ◆ All lamps goes ON for 1 s.

- ◆ **DI group 2 settings:**
 - ◆ Last right lamp in last row is flashing. Flashing lamp marks the setting position.
 - ◆ Move between DIs by pressing button »ACK HORN«.
 - ◆ Select / deselect DO function setting by pressing button »ACK LAMP«. If lamp is ON, selected DI is set in group 2. If lamp is OFF, selected DI is not set in group 2.
- ◆ When all DIs for group2 are set, press and hold button »ACK HORN« for approximately 3 s.
- ◆ All lamps goes ON for 1 s.
- ◆ Device goes into reset.
- ◆ After reset device is in operating mode.

5 IEC 60870-5-103 PROTOCOL

5.1 INFORMATION TABLE

Communication	
Protocol	IEC 60870-5-103 (slave)
Supported responds	link reset, class I, class II, general interrogation, time synchronization (broadcast & single device), general command
Device address	1 - 255
Station address	1 - 255
Baud rate	19200 (fixed)
Number of data bits	8 (fixed)
Parity	even (fixed)
Number of stop bits	1 (fixed)

Device IEC 60870-5-103 information table			
Signal description	Function	Information number	GI respond number
digital input 1	240	160	1
digital input 2	240	161	2
digital input 3	240	162	3
digital input 4	240	163	4
digital input 5	240	164	5
digital input 6	240	165	6
digital input 7	240	166	7
digital input 8	240	167	8
digital input 9	240	168	9
digital input 10	240	169	10
digital input 11	240	170	11
digital input 12	240	171	12
digital input 13	240	172	13
digital input 14	240	173	14
digital input 15	240	174	15
digital input 16	240	175	16
digital input 17	240	176	17
digital input 18	240	177	18

Device IEC 60870-5-103 information table			
digital input 19	240	178	19
digital input 20	240	179	20
digital input 21	240	180	21
digital input 22	240	181	22
digital input 23	240	182	23
digital input 24	240	183	24
digital input 25	240	184	25
digital input 26	240	185	26
digital input 27	240	186	27
digital input 28	240	187	28
digital input 29	240	188	29
digital input 30	240	189	30
digital input 31	240	190	31
digital input 32	240	191	32
digital output 1	200	160	NO GI
digital output 2	200	161	NO GI
digital output 3	200	162	NO GI
digital output 4	200	164	NO GI
digital output 5	200	165	NO GI
digital output 6	200 (*)	166 (*)	NO GI

(*) Valid for LSU 110 / 32.x.x.x.**S** types only! For LSU 110 / 32.x.x.x.**N** devices, this output indicates device "ready" status!

5.2 EXAMPLES OF REQUEST RESPOND SEQUENCES

(Device address: 1)

Telegrams legend:

-master request

-slave respond

"Link reset"

10 40 01 41 16

10 00 01 01 16

"Time synch - broadcast"

68 0F 0F 68 44 FF 06 81 08 FF FF 00 9C 01 33 91 45 05 14 8F 16

"GI start"

68 09 09 68 53 01 07 81 09 01 FF 00 00 E5 16

10 00 01 01 16

10 7B 01 7C 16

Device:	Document:	Code:	Date:	Page:
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68 0E 0E 68 08 01 01 81 09 01 F0 A0 01 E5 01 33 11 00 50 16

10 5A 01 5B 16

68 0E 0E 68 08 01 01 81 09 01 F0 A1 01 72 05 33 11 00 E2 16

10 7A 01 7B 16

68 0E 0E 68 08 01 01 81 09 01 F0 A2 01 6C 09 33 11 00 E1 16

10 5B 01 5C 16

68 0E 0E 68 08 01 01 81 09 01 F0 A3 02 CF 09 33 11 00 46 16

"GI end"

10 7A 01 7B 16

68 09 09 68 08 01 08 81 0A 01 FF 00 00 9C 16

"Class 1 read"

10 5A 01 5B 16

10 09 01 0A 16

10 7B 01 7C 16

10 09 01 0A 16

10 5A 01 5B 16

10 09 01 0A 16

10 7A 01 7B 16

10 09 01 0A 16

10 5B 01 5C 16

10 09 01 0A 16

"DO2"

68 0A 0A 68 73 01 14 81 14 01 C8 A1 02 01 8A 16

10 00 01 01 16

"DO3"

68 0A 0A 68 73 01 14 81 14 01 C8 A2 02 02 8C 16

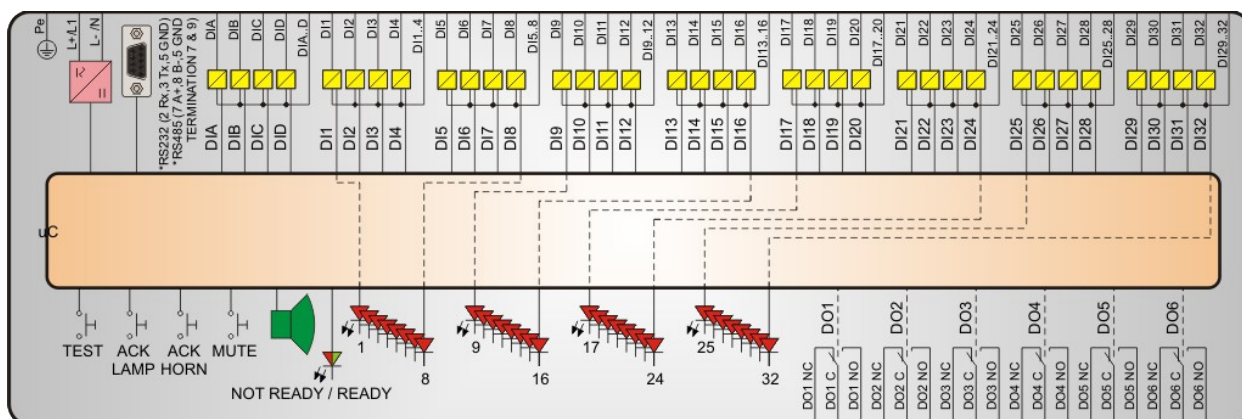
10 00 01 01 16

"DO4"

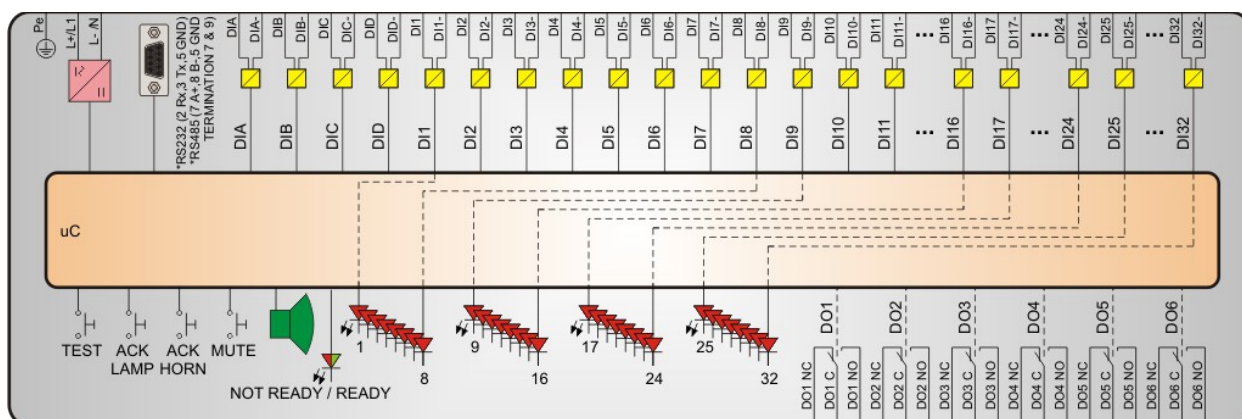
68 0A 0A 68 73 01 14 81 14 01 C8 A3 02 03 8E 16

10 00 01 01 16

6 SCHEMATICS



Picture 1: LSU 110 / 32.x.x.V.x.N.x.5 schematic (4DIs in group (9 groups), 5 - RS485 & RS232)
LSU 110 / 32.x.x.V.x.N.x.N schematic (4DIs in group (9 groups), N - no commun. port)



Picture 2: LSU 110 / 32.x.x.V.x.S.x.5 schematic (S - separated DIs (36 groups), 5 - RS485 & RS232)
LSU 110 / 32.x.x.V.x.S.x.N schematic (S - separated DIs (36 groups), N - no commun. port)

7 INSTALLATION



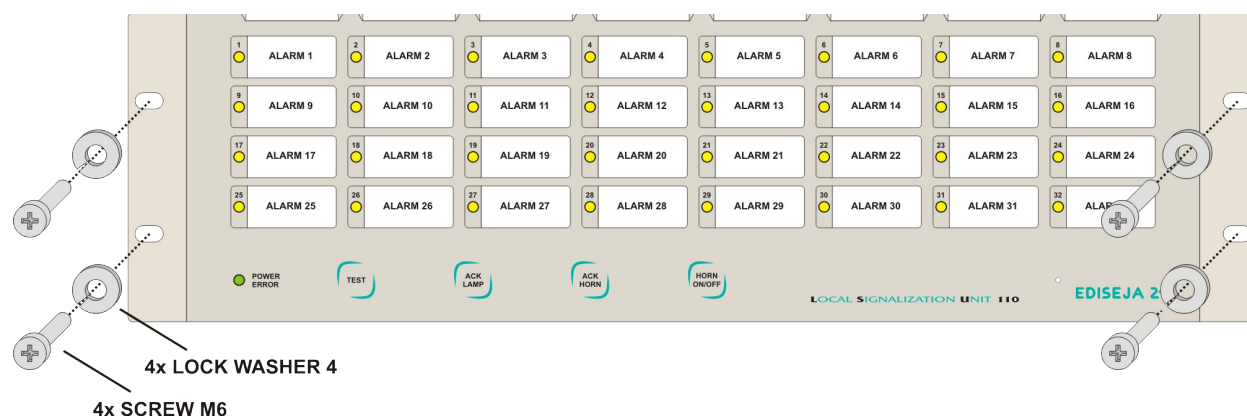
Warning!

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

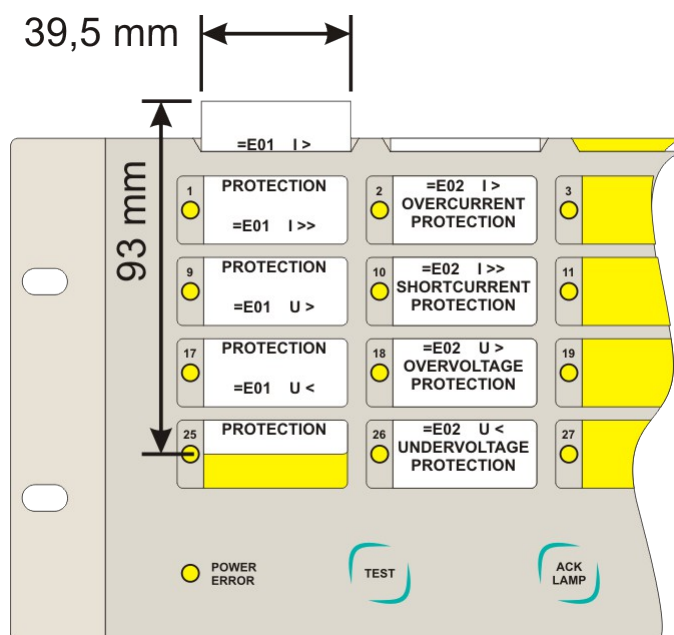
Only qualified personnel may work with described devices after being familiar with warnings and safety notices in this paper and other safety regulations.

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 device is intended for mounting in 19" rack cabinet.
- ◆ The admisible 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.
- ◆ 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.



Picture 3: LSU 110 / 32 installation



Picture 4: LSU 110 / 32 inserted papers dimensions

8 COMMISSIONING AND 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 devices 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.

8.2 MAINTENANCE

Device is maintenance-free. Do not use liquids for cleaning the unit. Use water moisturised mop. Disconnect all connectors before cleaning.

9 TECHNICAL DATA

Power supply			
Rated input voltage	LSU 110 / 32.1....	DC 24 V	
	LSU 110 / 32.2....	DC 48 V	
	LSU 110 / 32.3....	DC 110 V	
	LSU 110 / 32.4....	DC 220 V	
	LSU 110 / 32.5....	AC 230 V	
Permissible voltage range	LSU 110 / 32.1....	DC 19,2 V – 29 V	
	LSU 110 / 32.2....	DC 38 V – 53 V	
	LSU 110 / 32.3....	DC 88 V – 250 V, AC 100 V – 253 V	
	LSU 110 / 32.4....	DC 88 V – 250 V, AC 100 V – 253 V	
	LSU 110 / 32.5....	DC 88 V – 250 V, AC 100 V – 253 V	
Frequency	50 Hz		
Power consumption	all types	7 W (max)	< 3 W (typical)
Fuse (internal)	2 A T		
Voltage dips	> 20 ms		
Connector type	screw type „MSTB“ Phoenix 2pin		
Power supply wire	crossection	0,5 – 2,5 mm ²	
	type	single or stranded wire	
	voltage rating	500 V	
	colour	depends on used standard	
Ground wire	crossection	Cu flat, 2,5 mm ²	
	colour	yellow-green or natural (non isolated)	

Binary input		
Rated input voltage	LSU 110 / 32.x.1....	DC 24 V
	LSU 110 / 32.x.2....	DC 48 V
	LSU 110 / 32.x.3....	DC 110 V – 125 V
	LSU 110 / 32.x.4....	DC 220 V
	LSU 110 / 32.x.5....	AC 230 V
Permissible voltage range	LSU 110 / 32.x.1....	DC 19,2 V – 29 V
	LSU 110 / 32.x.2....	DC 38 V – 53 V
	LSU 110 / 32.x.3....	DC 88 V – 140 V
	LSU 110 / 32.x.4....	DC 176 V – 242 V

Binary input		
	LSU 110 / 32.x.5....	AC 180 V – 253 V
Input current	all types	1,2 mA
Frequency	50 Hz	
Connector type	screw type „MSTB“ Phoenix 5 pin	
Wire	crossection	0,5 – 2,5 mm ²
	type	single or stranded wire
	voltage rating	500 V
	colour	depends on used standard
Time delay setting	0-65535 ms, 1 ms step, ± 5 %	

Binary output		
Max breaking voltage	AC 440 V	
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 3 pin	
Wire	crossection	0,5 – 2,5 mm ²
	type	single or stranded wire
	voltage rating	500 V
	colour	depends on used standard

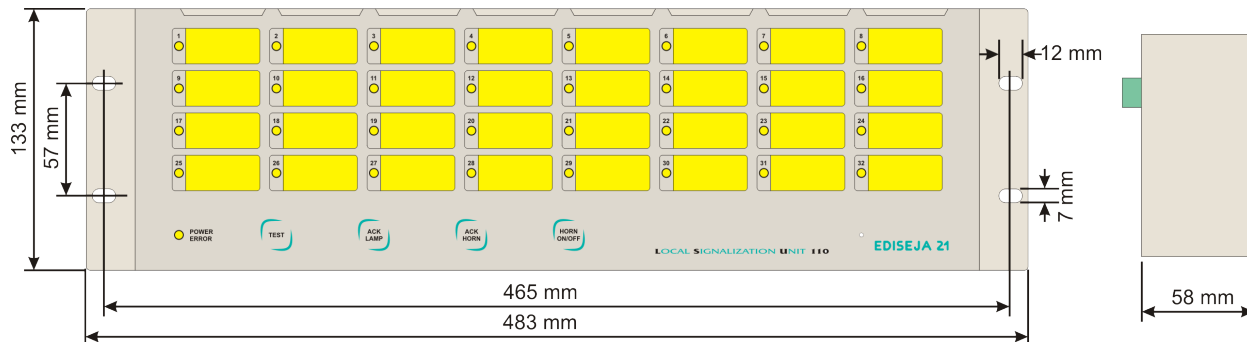
Buzzer	
Sound power level	85 dB

Operation	
Flash lamp time	Programmable 0,5 s, 0,75 s, 1 s or 1,5 s
Time to trigger	DC: > 13 ms, AC: > 35 ms

Device			
Weight	1 kg		
Dimensions (see picture)	483 mm	133 mm	58 mm
Temperature range	-10 °C to + 55 °C		
Humidity operating	up to 95 % (noncondensing)		
Enclosure	Material	Al	
	Protection - front	IP 40	

Device	
Class	I
Overvoltage category	III
Altitude	up to 2000 m

10 DIMENSIONS



Picture 5: LSU 110 / 32 dimensions

11 ORDERING

ORDERING CODE:

 LSU 110 /

Number of lamps:

number of lamps* 32

Power supply voltage:

DC 24 V	1
DC 48 V	2
DC 110 V-125 V	3
DC 220 V	4
AC 230 V	5

Binary input voltage:

DC 24 V	1
DC 48 V	2
DC 110 V-125 V	3
DC 220 V	4
AC 230 V	5

Enclosure:

19" 3U rack mount V

Lamp colour:

yellow	Y
red	R
green	G
white	W
mixed colour	M

Option 1: (see chapter „Schematics“)

none; without additional option 1	N
separated digital inputs	S

Option 2: (see chapter „Operation“)

none; without additional option 2	N
DO6 output intended for lamp acknowledge	6

Communication:

none;	N
RS485 + RS232 (IEC 60870-5-103 protocol)	5

Software Version:

software version (leave empty)

Software Revision:

software revision (leave empty)

* if only 16 lamps are needed, see LSU 100 / 16 user manual

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

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