

www.Kama-Labs.com

(Assembly instructions and latest firmware you can find on my website)

NUMITRON v4

Made my own hands 😊

Thanks for purchase!!!

Features:

- * 6 **IV-9** Russian numitron tubes (made in 1982)
- * 2 KM separators (show am/pm and on/off of alarm)
 - * 32bit STM32F100C8 processor
 - * 15 parameters
 - * 12/24 hours mode
 - * 1 Alarm
- * Turn off at night (increase lifetime of tubes in twice!)
 - * Turn off leading zero
 - * Smooth PCB routing
- * Countdown timer 99days:23hour:59mins:59sec
 - * Full remote control
 - * Anti-cathode poisoning system
- * USB connection to PC (for update firmware)
- * Double **Multicolour** led glow (independent random color leds and **RGB** leds under each tube)
 - * Adjustable brightness of **RGB** and AUTO leds
- * **RGB** led (6 colors of backlight or autochange color mode)
 - * 10 modes of switch digits
 - * 2 modes of separator tubes
 - * **IV-9** tubes works in **static mode**
- * 6 Russian chips KR514ID2 in sockets
 - * Thermometer

- * Correction of temperature
- * Accurate to +/- 1 minute/year
 - * Setup of clock accuracy
- * Date in format DD.MM.YY or MM.DD.YY
- * Backup battery. Data is not lost when power off
 - * 3 button - Time, Alarm, Color.
- * Power source - DC 5V(not 4.6V) barrel plug 5.5mm/2.1mm ("+" inside, "-" outside)
- * Clock can powered from USB-port (if your USB-port can provide more than 500mA ONLY)
 - * Consuming current - 900mA
 - * Noiseless work
- * Dimensions of the clock - 115mm x 50mm x 50mm
- * Dimensions of the clock in plastic case - 145mm x 81mm x 65mm

| № | Parameter | Value |
|---|--------------------------|---|
| 1 | 12/24 time format | 0 - 12h time format 1 - 24h time format |
| 2 | Hi.Hour tube fading | 0 - disable fading 1 - enable |
| 3 | Show time mode | 0 - hard mode 1 - soft mode №1 2 - soft mode №2 3 - random mode №1 4 - random mode №2 5 - slot machine 6 - wave 7 - fade one by one 8 - shift 9 - run 10 - all effects one by one |
| 4 | Backlight mode | 0 - all leds off 1..5 - brightness 6 - AUTO brightness 7 - AUTO brightness + turn off at night 8 - turn off at night |
| 5 | Show current temperature | 0 - disable 1 - every 2 minutes 2 - every 5 minutes |
| 6 | Work of separators | 0 - disable |

| | | 1 - work together 2 - work alternately | | | | | | | | | | | | | | | | | | | | |
|------------|---|---|------------|---------------|---|---|---|----|---|---|---|----|----|-----|----|----|---|---|---|---|----|-----|
| 7 | Show current date | 0 - off 1 - every 2 minutes 2 - every 5 minutes | | | | | | | | | | | | | | | | | | | | |
| 8 | Correction of temperature coefficient | 0 .. 9 Current temp. - temp.coeff. = real temperature <table border="1" data-bbox="746 517 1497 1010"> <thead> <tr> <th>Temp.coeff</th> <th>Current temp.</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>-1</td></tr> <tr><td>.</td><td>.</td></tr> <tr><td>.</td><td>..</td></tr> <tr><td>10</td><td>-10</td></tr> <tr><td>11</td><td>+1</td></tr> <tr><td>.</td><td>.</td></tr> <tr><td>.</td><td>.</td></tr> <tr><td>19</td><td>+10</td></tr> </tbody> </table> | Temp.coeff | Current temp. | 0 | 0 | 1 | -1 | . | . | . | .. | 10 | -10 | 11 | +1 | . | . | . | . | 19 | +10 |
| Temp.coeff | Current temp. | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | | | | | | | | | | | | |
| 1 | -1 | | | | | | | | | | | | | | | | | | | | | |
| . | . | | | | | | | | | | | | | | | | | | | | | |
| . | .. | | | | | | | | | | | | | | | | | | | | | |
| 10 | -10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | +1 | | | | | | | | | | | | | | | | | | | | | |
| . | . | | | | | | | | | | | | | | | | | | | | | |
| . | . | | | | | | | | | | | | | | | | | | | | | |
| 19 | +10 | | | | | | | | | | | | | | | | | | | | | |
| 9 | Clock accuracy correction | 0 .. 9 Bigger value - slowly clock | | | | | | | | | | | | | | | | | | | | |
| 10 | Date format | 0 - DD.MM.YY 1 - MM.DD.YY | | | | | | | | | | | | | | | | | | | | |
| 11 | Temperature format | 0 - Celsius 1 - Fahrenheit | | | | | | | | | | | | | | | | | | | | |
| 12 | Brightness of BOTTOM LEDs | 0 .. 6 | | | | | | | | | | | | | | | | | | | | |
| 13 | Firmware type | 0 - for IN-14, IN-4, IN-16, IN-8 and IN-18 nixie clocks 1 - for IV-9 Numitron clock | | | | | | | | | | | | | | | | | | | | |
| 14 | Anti-cathode poisoning For NIXIE clocks only | 0 - Off 1 - Every 1 minute 2 - Every 5 minutes 3 - Every 10 minutes | | | | | | | | | | | | | | | | | | | | |
| 15 | Night fading | 0 - Off 1 - On | | | | | | | | | | | | | | | | | | | | |

Button function:

Short click = ~0.5 sec.

Long click = ~1 sec

First button - Time: Short click - on/off alarm (indicates by KM separators tubes)
Long click - time setup

Second button - Alarm: Short click - parameters mode
Long click - alarm setup

Third button - Color: Short click - change color of backlight or disable leds
Long click - date setup

If you will press and hold one button and then will press second:

1 + 2 = show current temperature

1 + 3 = show current date

2 + 3 = test mode for checking nixie tubes

3 + 1 = show countdown timer

How to set time?

- 1) Press and hold 1 button ~1 sec
- 2) Hours tubes start to blink
- 3) Press 1 button for increment value and 2 button for decrement value
- 4) Press 3 button for go to next value
- 6) Seconds will reset to "00" if you will press 1 or 2 button
- 7) Press 3 button for exit from setting time mode

How to set alarm?

Similarly. However, use 2 button for enter into setting mode (press and hold ~1 sec).

How to change parameters?

- 1) Press 2 button for enter into parameters mode
- 2) You will see number of parameter (1) and value of parameter (0):
1_ : __ : _ 0
- 3) Press 1 button for increment value and 2 button for decrement value

4) Press 3 button for go to next parameter

How to set current date?

1) Press and hold 3 button for 1 sec

2) You will see date in DD.MM.YY format

3) Press 1 button for increment value and 2 button for decrement value of days in month

4) Press 3 button again for set the month and year

How to change color of backlight?

Press 3 button to change color or to set autochange color.

How to set countdown timer?

Press 3 + 1 for show countdown timer. Here buttons have next function:

1 - Short click – on/off timer

Long click – exit

2 - Short click – DD:HH:MM or HH:MM:SS time format

Long click – timer setup

3 - Short click – reset to previous timer value

In timer mode first separator show DD:HH:MM / HH:MM:SS time format, second separator show on/off alarm.

For set countdown timer push 2 button for 1 sec. You will enter in timer setup mode and you will see:

Days : Hours : Months

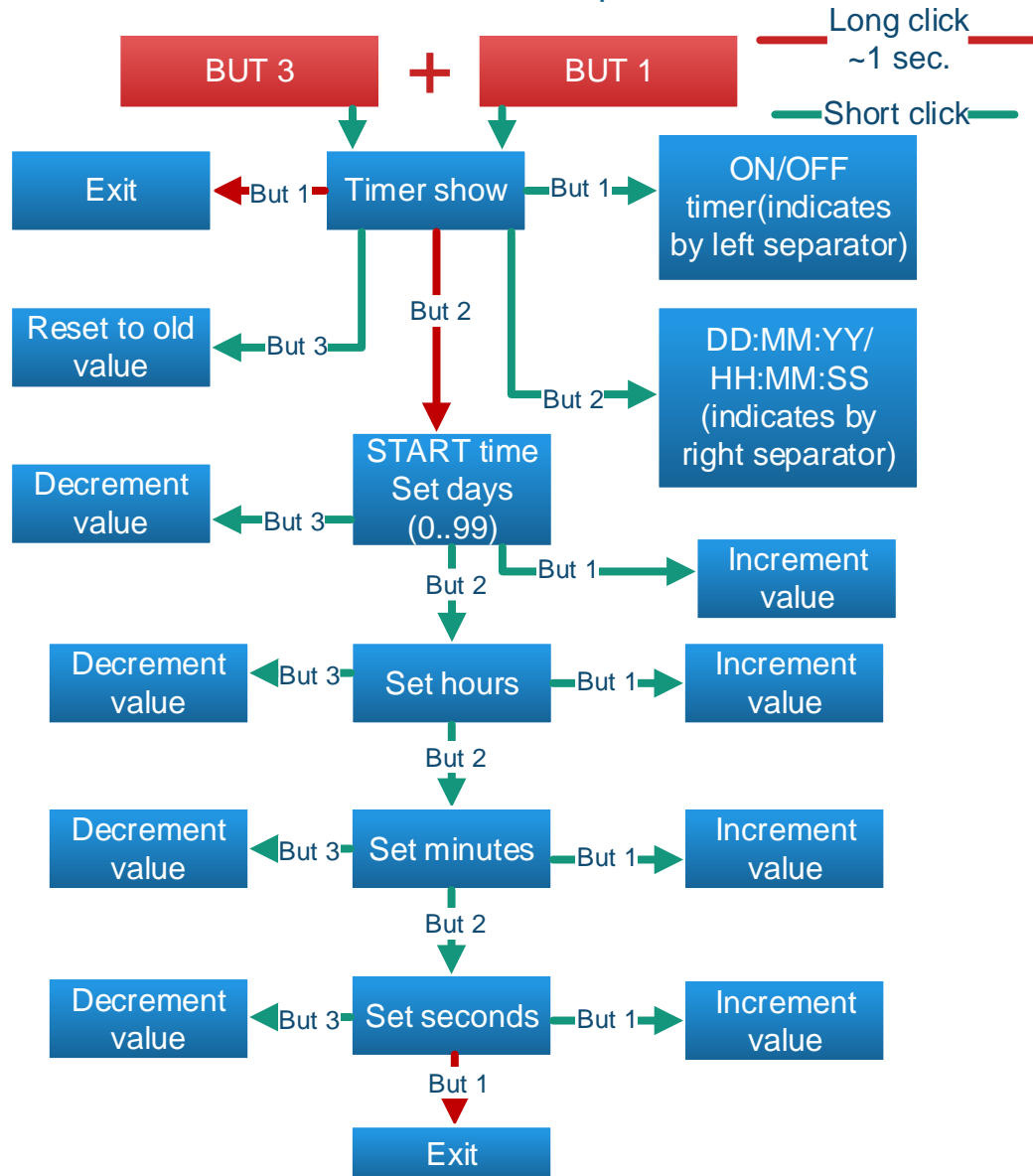
00 : 00 : 00

Use 1 button for increase value and 3 button for decrease value. Push 2 button for change position. For set seconds you will see next format:

__ :SS: __

1 __ :00: __ 1

Press and hold Button 3 and then press Button1



Remote control in timer mode

| Button | Action |
|--------|-------------------------------|
| OK | On/off timer |
| ▶ | DD:HH:MM / HH:MM:SS |
| ◀ | Reset to previous timer value |
| 1 | Timer setup |
| 7 | Exit |

How to make HARD RESET if something wrong?

When your clock starts, you hear short melody. If you will press 1 button for 1-2 second in this moment, clock will reset all your setting.

You will hear p-i-i-i-i-i-p p-i-p p-i-p. That's mean HARD RESET is done.

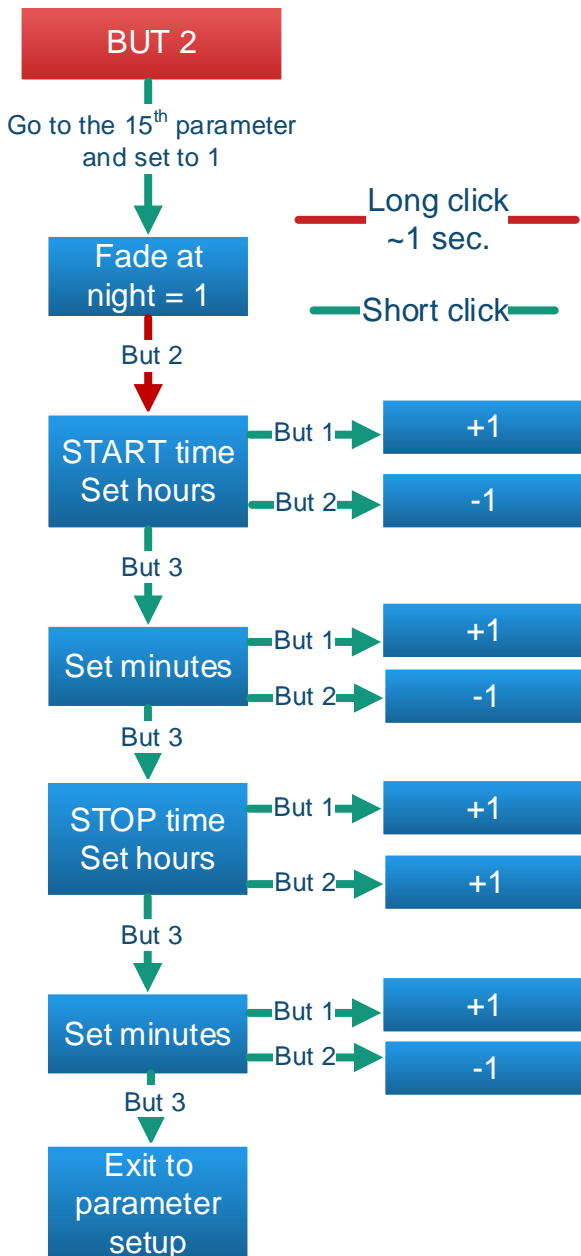
How to set night fading?

Set 15th parameter to 1 and press 2 button for ~1sec and you will enter into setup. You will hear b-i-i-i-p and will see:

00 : __ : __

Now, you need set time of START fading. Use 1 and 2 button for increase/decrease value and 3 button for change digit. After that, you need to set time of STOP fading similarly.

Example: you go to sleep at 11:10PM and get up 6:30AM. So, you need to set START time as 23:10 and STOP time as 6:30.

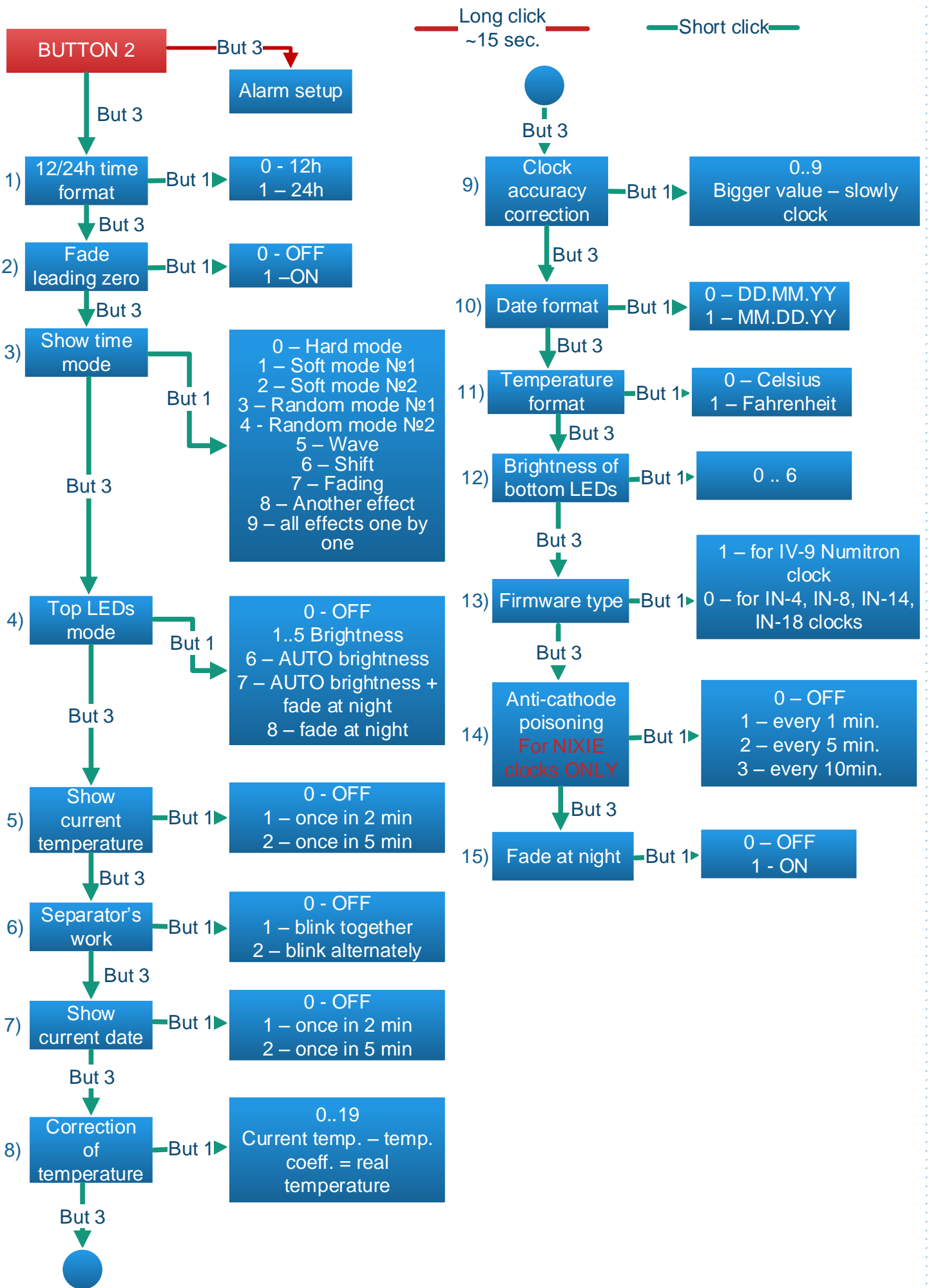


How to use remote control?

| Button | Action |
|--------|-------------------------------|
| OK | Enter/exit in parameters mode |
| ◀ ▶ | Next effect of switch time |
| ▲ ▼ | Change value |
| 1 | Time setup |
| 2 | Alarm setup |
| 3 | Date setup |
| 4 | Show temperature |
| 5 | Show date |
| 6 | On/off alarm |
| 7 | Countdown timer setup |
| 8 | Turn off LEDs and tubes |
| 9 | Brightness of bottom LEDs |
| * | Change brightness of top LEDs |
| # | Change color of top LEDs |

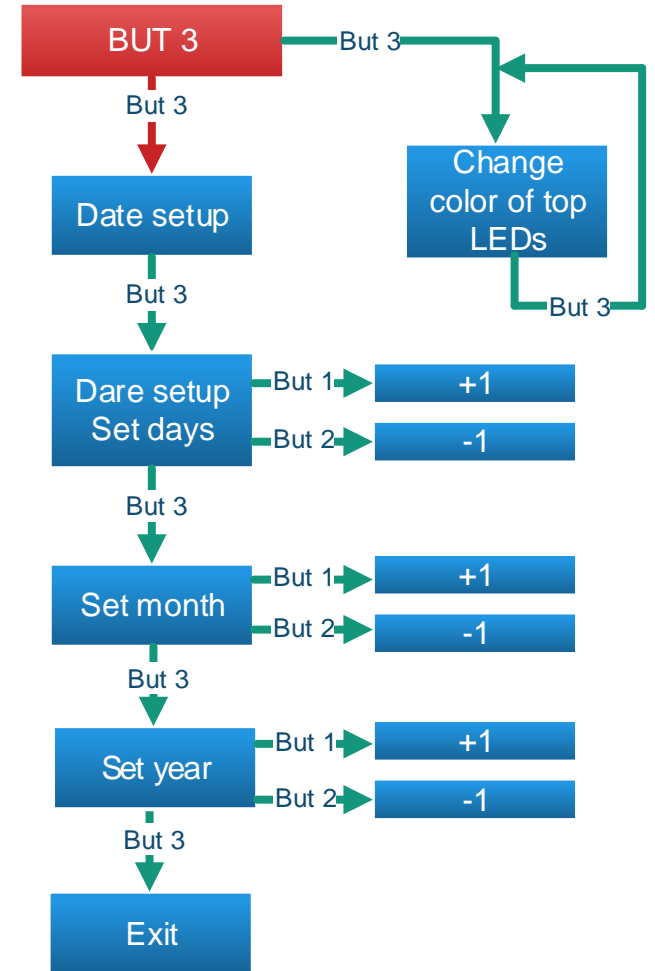
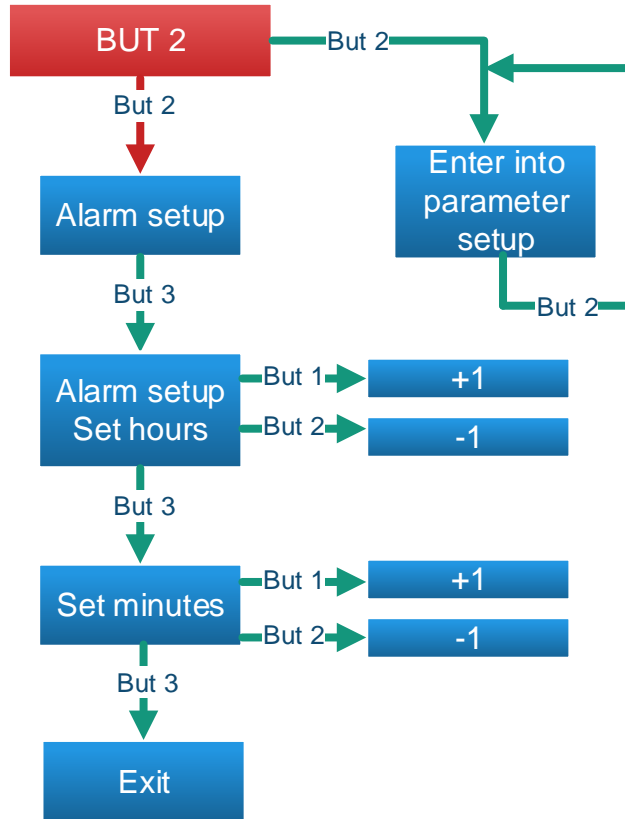
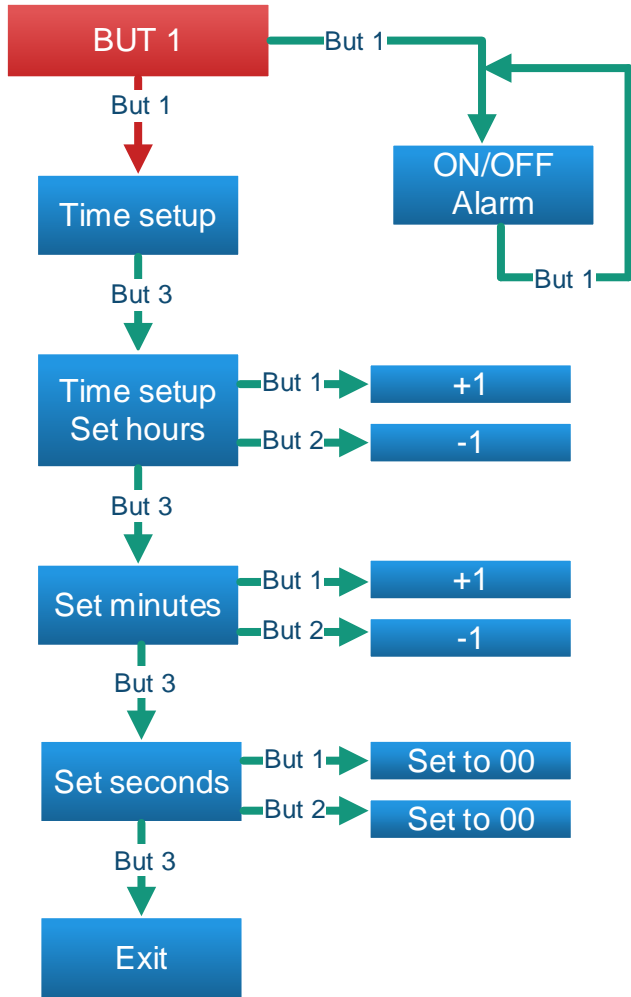
- Use ◀ ▶ for change position in setup modes
- For change value you can use ▲ ▼ or use any number buttons





Long click
~1 sec.

Short click



Power plug for 5V DC power adapter

Diagnostic socket/
socket for USB-UART
converter

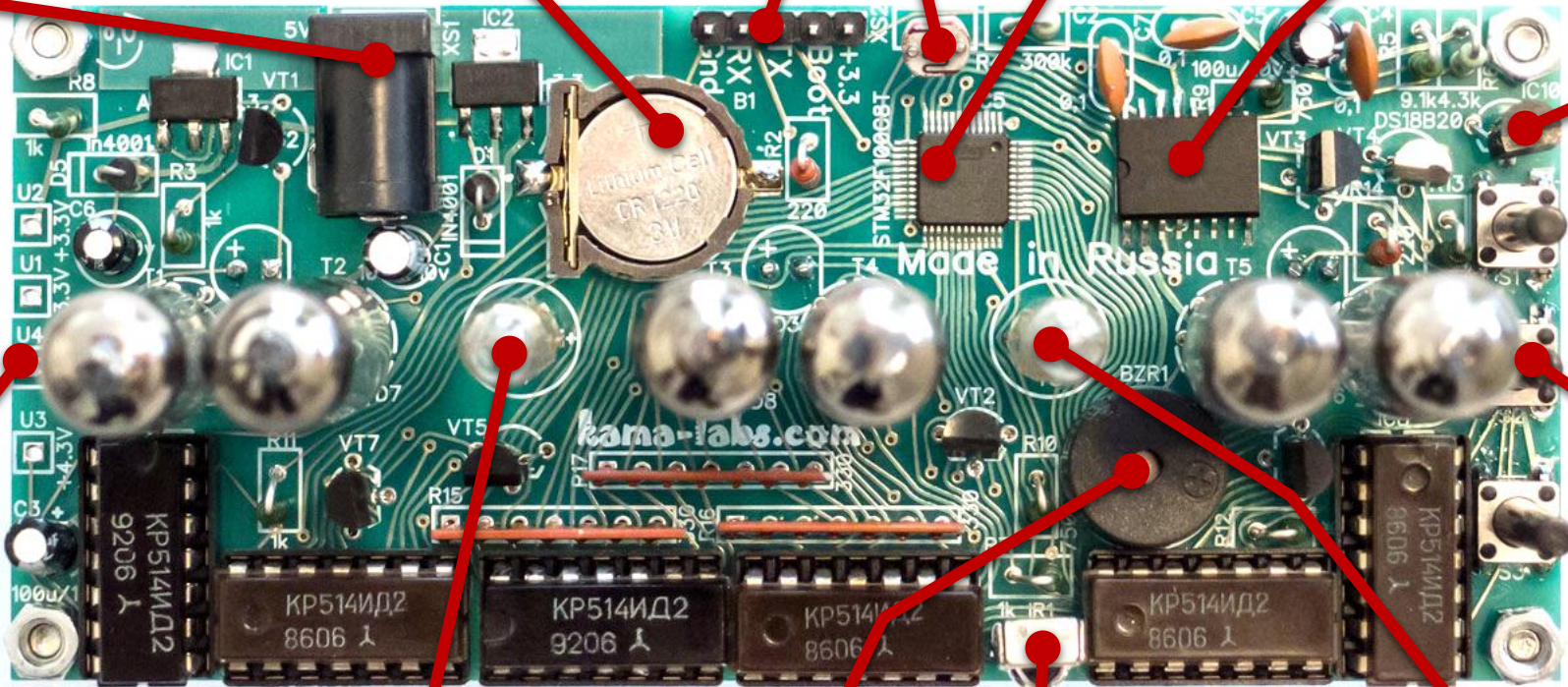
Light sensor

Temperature sensor

Battery

CPU

High-precision time chip



Diagnostic points

Buzzer

Alarm separator

Buttons: 1
2
3

Am/Pm separator

Infrared Receiver