SET UP AND OPERATION MANUAL

NIXIE SIX [version 1.0]

Nixie Six time and date indication device (hereinafter "The clock") is designed to display the exact time and date. The indication is performed via gas-discharge tubes of various designs. The backlighting of the tubes is carried out by the RGB LEDs. The device is equipped with the built-in power battery for counting time, in case the device is off the power.

Depending on the version of the clock, it can have the following supplementary features:

- Remote control for setting up the menu parameters, changing the program of the backlight;

- GPS module for setting up the exact time and date;

- Sensor of temperature.

The main parameters of the device:

1. Power Supply, V	12 … 18
2. Maximum current consumption, A	1
3. Average current consumption, A	0.35
4. Accuracy, %, not more than*	1.5
5. Applicable backup power battery	CR1220

* Adjustable

Warnings!

The device is under high voltage of not less than 150V. It is not recommended to turn on the device when it is unassembled, because if you touch certain parts of the circuit board you will feel painful and unpleasant electric strike.

The device includes vacuum tubes, which are rather sensitive to strikes, falls and other impacts. Also, the glass tubes are quite thin and their broken sharp parts can cause injuries. Such use of the device is not allowed.

To support the operation ("run") of the clock when the power is off, the device is equipped with the backup battery of the size CR1220. Please note that when the battery is missing or corrupted and when the power is off, the clock does not count time, and all the settings and pre-settings are reset to default.

Operation procedure

Setting up

To enter the Set up mode, press the "**Menu**" button on the control panel or press the grid key "**#**" on the remote control [if remote control is supported]. Immediately, the device will go to the first page of settings to set up the time of the clock. The parameter you are setting up will be highlighted with a different color, or otherwise (eg. The parameter will be highlighted brighter than other numbers, or other numbers will not be highlighted at all).

The further actions are carried out via control panel buttons: plus "**+**" (adding a value), minus "**-**" (subtracting a value), "**Menu**" (switching of the values that are being set and the pages of settings; the sequence of items corresponds to the table). The setting up is also available via the remote control (if it is not disabled in the settings).

The exit from the menu is carried out by pressing the "**Menu**" button on the control panel and flipping though the items till the end of the table, via pressing the asterisk key "*****" on the remote control, or if none of the buttons or keys was pressed, the device will switch to the standby mode by default in 30-45 seconds (depending on version of the software).

Page of settings	Color	Pair of lamps 1 (Left)		Pair of lamps 2 (Center)		Pair of lamps 3 (Right)	
1	Crimson	Set clock		Set minutes		Reset seconds	
2	Green	Set date		Set month		Set year	
3	Blue	Time zone UTC[1]		Correction of time		Gradual switching of numbers	Mode of separation colons
4	Yellow-Green	Turn on GPS[1]	Backlight	Display time format 12/24	Program of flipping through colors	Summer time on	Remote control on/off[2]
5	Purple	Set red light of manual color setting		Set green light of manual color setting		Set blue light of manual color setting	
6[3]	Orange	Set hours of the alarm clock		Set minutes of the alarm clock		0 - alarm clock off 1 – alarm clock on	

Notes. 1 - provided that the program of controller supports GPS (version G); 2 - provided that the program of controller supports remote control (version I); 3 - present only in versions of the program that support alarm clock.

The time zone as related to UTC: the zone of the time that is calculated based on the time of UTC. From 0 to 12 – increasing of hours, from 13 to 24 – decreasing of hours (the calculation is carried out according to the formula $t = 12-x$. This means that the times zone of "minus 2" is the number $(12 - (- 2)) = 14$, and the time zone of "plus 3" as related to UTC is number $(12 - (+ 3)) = 9$). The UTC time cannot be divided into winter time or summer time, it is always constant. In order to set the device to transfer to summer time by default, turn on the corresponding function in the menu.

Setting summer time: 0: Disabled; 1: Time according to the European standard (transfer on the last Saturday of September and of March); 1: Time according to the European standard (transfer on the last Saturdays of October and March); 2: Time according to the American standard (transfer on the second Sunday of March and the first Sunday of November). For more information about this function, please see the following pages:

https://en.wikipedia.org/wiki/Daylight_saving_time
https://en.wikipedia.org/wiki/Daylight_saving_time_by_country
https://en.wikipedia.org/wiki/Summer_Time_in_Europe
https://en.wikipedia.org/wiki/Daylight_saving_time_in_the_Americas
https://en.wikipedia.org/wiki/Daylight_saving_time_in_Oceania
https://en.wikipedia.org/wiki/Daylight_saving_time_in_the_United_States

Correction of time means adjustment of time when the clock is losing or gaining. The FFL is figure 50. The calculation of deviation is carried out according to the formula:

Correction (sec per 24 hours) = (50 - (fixed number)) * 5.2 sec

Thus, the possible deviation can be set by plus or minus 260 sec per 24 hours. If the clock is losing, set the higher number of correction and if the clock is gaining set the lower number.

Gradual switching of numbers means smooth change of numbers of hours, minutes and seconds. The new value gradually covers the previous one.

Mode of separation colons includes two types of behavior of neon dividing points:

0 - separation colons blink at frequency of 0.5 Hz (1 time per 2 seconds);

1 - separation colons blink at frequency of 1 Hz (1 time per 1 second).

Menu page 5 is meant for manual presetting of backlight colors in the 0 operation mode (it can be selected by pressing the "Program of flipping though colors" menu item).

The *Program of flipping though colors* enables the mode of setting the color of backlights that depends on the program. The device has 9 backlight modes. Mode 0 – means manual setting of colors. In other modes, the colors are changed according to the program.

The *Backlight* menu item turns the backlight on and off in the Operation mode. Also, in the Set up mode, the backlight is always on (to select the modes of setting).

Step-by-step set up instructions

1. Apply power to the device and wait till the time is shown. By default, the time is set to 00:00:00.

2. Press the "**Menu**" button (far left) one time. The backlight will turn crimson, and the backlight of the first pair of lamps will be lighted brighter. Use the buttons "**Minus**" (medium) and "**Plus**" (far right) to set up the hours of the current time.

3. Press the "**Menu**" button again. The highlight of the second pair of lamps (medium) will be lighted brighter. Use the "**Plus**" and "**Minus**" buttons to set up the minutes of the current time.

4. Press the "**Menu**" button. The highlight of the third pair of lamps (far right) will be lighted brighter. Use the "**Plus**" and "**Minus**" buttons to set the seconds of the current time to zero.

5. In accordance with the configuration table (see above), follow the sections 2-4 to set up all the rest menu items. After the last item has been set, the set up procedure is finished.

The Buttons

In the Operation mode, the buttons have the following functions:

Left button – enter the Set up mode.

Middle button - call the current date.

Right button – turn on or turn off the backlight.

Note: if the backlight program mode is set to 0 (manual setting of colors) and the levels of colors are also set to 0 (menu item 5), there won't be any response to pressing this button – the lights will not be turned on. This effect can be observed, for example, when the device is turned on for the first time.

To read more about functions of the buttons in the Set up mode, please see above and the table below.

Mode	Left button	Middle button	Right button
Operation	Enter Set up menu	Show date	Turn on/off backlight
Set up	Switch parameters that are being set	Minus (decreasing)	Plus (increasing)

Additional options

Additional options are available if they are supported by the software of the microcontroller in the device.

The GPS function

When you are setting up the GPS function, connect the special antenna to the device to receive the GPS signal. Also, you need to place the device in such a way that you can directly see the GPS transmitter (for example, by the window).

The time is being called constantly that ensures its high accuracy. In case the signal is lost for short- or long-term, the device connects to the internal source of synchronization, and after the signal has been resumed, the device immediately disconnects from the source.

The Remote control

In the state of development.

The Temperature sensor

In the state of development.

The Alarm clock

Menu item 6 sets the time of alarm, enables or disables it. Triggered alarm signals with light (bright white glow and LED blinking) and sound (at 1-3kGts frequency). The alarm sounds for about 2 minutes. It can be manually turned off by pressing one of the buttons. The alarm signal will be repeated in 24 hours (if the alarm clock was not manually turned off in the menu item 6).

The Model line

The name of the model consists of its brand name and the characters that determine presence or absence of additional functions. The brand name is provided by the owner of the trademark.

Character	Definition
- (absent)	standard set of functions - clock with RGB backlight
A	alarm clock, signals every day, total number – 1
G	GPS functions: set up and control of time
R	support of IR remote control
T	temperature sensor is mounted

Please see examples.

Brand name	Description
NIXIE SIX	standard set of functions
NIXIE SIX AG	standard set of functions + GPS + alarm clock
NIXIE SIX R	standard set of functions + IR remote

Warranty of the manufacturer

The manufacturer guarantees uninterrupted operation of the electronic part of the device within 1 year from the production date. The average service time of the electronic part of the device is 5 years.

This warranty does not cover gas-discharge indicators and batteries.