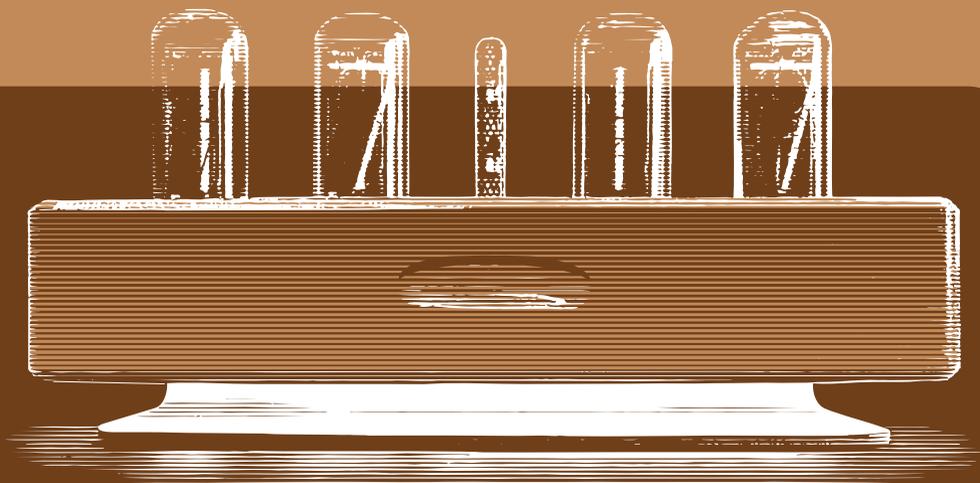


DESKTOP CLOCK AIV NIXIE



AiV Electronics



user manual

Attention! Danger!

Electric shock hazard! The clock contains high-voltage part of the Nixie tubes power supply.

Never:

- Immerse the clock into the water or other liquids or flush them with water
- Disassemble the clock or replace Nixie tubes with the power supply on

Warning

Before connecting the clock make sure the supply voltage corresponds to the output voltage of the AC power adaptor and the voltage of the local grid corresponds to that of the adaptor.

In case of the AC power adaptor damage replace it for a similar one. To ensure the clock safe operation use only recommended AC power adaptor.

The clock contains fragile glass elements – Nixie tubes. Be careful during the operation, cleaning and care.

Put the clock in the locations not accessible for children aged under 8. Do not allow the children to play with the clock or disassemble it.

Make sure the power-supply cord does not hang off the table, cabinet or another clock installation position.

The clock body is made of wood which makes it susceptible to humidity and ambient temperature effects. The clock storage and operation in high or low humidity and temperature as well as their sharp changes are not admissible. Failure to observe these requirements may result in the body damage, cracking and deformation.

The clock is intended for the use inside heated rooms only. In case of the clock improper use, failure to observe operation conditions or non-observance of the requirements stated herein the warranty becomes null and void and AiV Electronics Company assumes no responsibility for any resulting damage.

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AiV Nixie Clock delivery set:

1. AiV Nixie clock – No. 1.
2. IN-18 Nixie tubes – No. 4.
3. AC power adaptor 12 V, 1 A – No. 1.
4. User Manual – No. 1.
5. Warranty Card – No. 1.
6. Package – No. 1.

Congratulations on buying an AiV Electronics product!

To receive support, additional information or information of the Company new products visit our web-site www.aivelectronics.ru

1. IMPORTANT INFORMATION

Before using AiV Nixie clock carefully read this Manual and retain it for future use as reference guide. The warranty does not cover any damage caused by the failure to observe this Manual.

Should you have any questions or need additional information, visit the Company site: www.aivelectronics.ru

Or contact us by e-mail: support@aivelectronics.ru

2. INTRODUCTION

AiV Nixie electronic clock is intended to display exact time using the data from GLONASS/GPS satellite navigation system using a built-in receiver with an active antenna ensuring the reception of the satellite signals in a standard room (apartment, office).

The clock body is made of solid exotic wood, steel and plexiglass.

The information is displayed using IN-18 Nixie tubes filled with inert gas with the digits glowing red-orange colour (the digit height is 40 mm). The glowing brightness is adjustable.

The clock is equipped with LED illumination to perform night lamp functions. The illumination colour and brightness are adjustable.

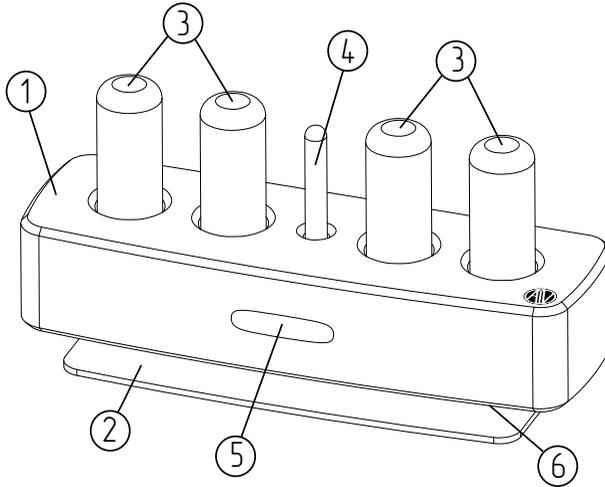
On the clock front panel there is a touch slider to facilitate the clock set-up and illumination control.

AiV Nixie Clock Features:

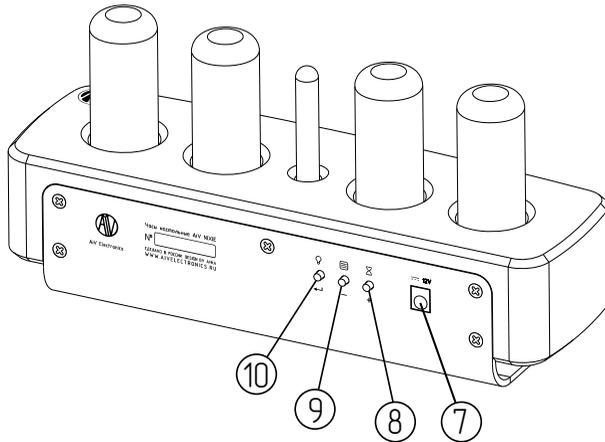
Feature	Advantages
IN-18 Nixie tubes for time display	<ul style="list-style-type: none"> • Exclusive appearance • Large digit size (40 mm.) • No heating
Built-in GLONASS/GPS receiver with an active antenna	<ul style="list-style-type: none"> • Exact time determination • Does not need to set and adjust the time
Real-time clock backup power supply from the ionistor	<ul style="list-style-type: none"> • Real-time clock operation without power-supply for max. 3 days • Does not need replacement (like batteries) and degradation (like accumulators)
Built-in adjustable RGB-illumination	<ul style="list-style-type: none"> • Stylish appearance • Night lamp function
Touch slider	<ul style="list-style-type: none"> • Convenient and fast set-up, illumination brightness adjustment
Electronic components with unlimited service life*	<ul style="list-style-type: none"> • Expanded service life
“Day” and “Night” modes	<ul style="list-style-type: none"> • Individual user set-up • Power saving • IN-18 Nixie tube expanded service life
GLONASS/GPS satellite loss indication	<ul style="list-style-type: none"> • Notice of the impossibility to determine the time by GLONASS/GPS
IN-18 Nixie tube glow adjustable brightness	<ul style="list-style-type: none"> • Digit brightness adjustment depending on the room illumination

* – excluding AC power adaptor and IN-18 Nixie tubes.

3. APPEARANCE AND CONTROLS



- | | |
|---------------------------------------|-------------------------|
| 1. The clock wooden body | 6. LED RGB-illumination |
| 2. Steel pedestal | 7. +12 V power terminal |
| 3. IN-18 Nixie tubes (hours, minutes) | 8. TIME (+) button |
| 4. Divider (second mark) | 9. MENU (-) button |
| 5. Touch slider | 10. LED (input) |



4. PRE-OPERATION PROCEDURE

Before Switching On

Before switching the clock on for the first time please carefully read this Manual.

After the transportation take the clock out of the package and leave it for 2 hours at room temperature. Remember that the clock wooden body is extremely susceptible to the environmental impacts.

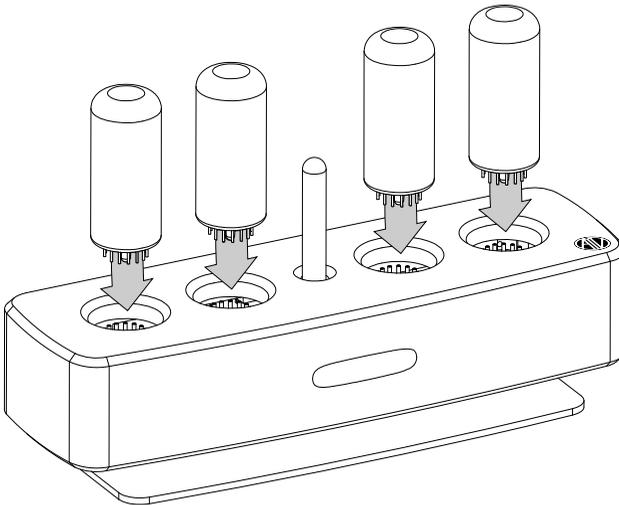
IN-18 Nixie Tube Installation

Install IN-18 Nixie tubes into the sockets on the clock top side.

Attention! Be careful when installing the tubes!

Negligence and haste may result in the damage of the tubes and the clock itself.

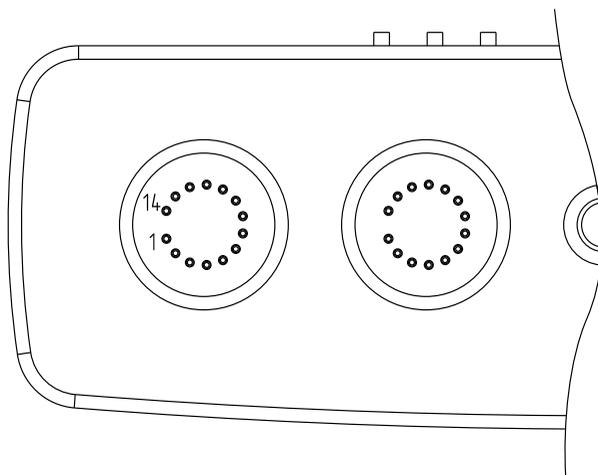
The tubes **MUST** be installed one by one.



Install the tubes only in the vertical position by pressing the tubes! Do NOT attempt to sway the tubes to facilitate the installation: it may result in the tube connector and contact failure.

Observe the tube orientation!

IN-18 tubes have fourteen contacts. The spacing between the first and the last contacts is increased – use it as the marker of the tube correct position during their installation.



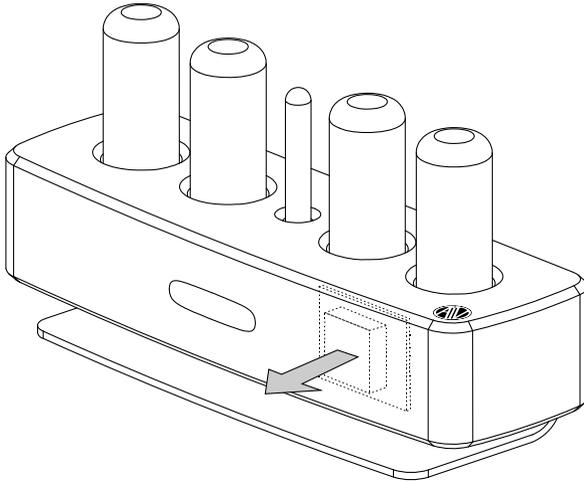
Only after making sure that all the outputs of IN-18 Nixie tubes fit the relevant contacts of the clock terminal perform the indicator final installation by the vertical pressing onto it with a slight effort until it stops holding the clock body.

Positioning Location Selection

After installing all the four tubes select the place for the clock permanent location. During the location selection consider the possibility of the signal reception from GLONASS/GPS satellite navigation systems. The signal reception depends on the clock position indoors, from the room position inside the building and adjacent buildings covering the sky. Toner films on the windows also substantially affect the clock operation. It is not recommended to install the

clock in the rooms without windows, in the basements etc. because the exact time signal reception there will be impossible which will bias the time readings.

It is not recommended to install the clock at the distance of more than 3 m from the window. GLONASS/GPS built-in antenna location and direction is shown in the Figure below.



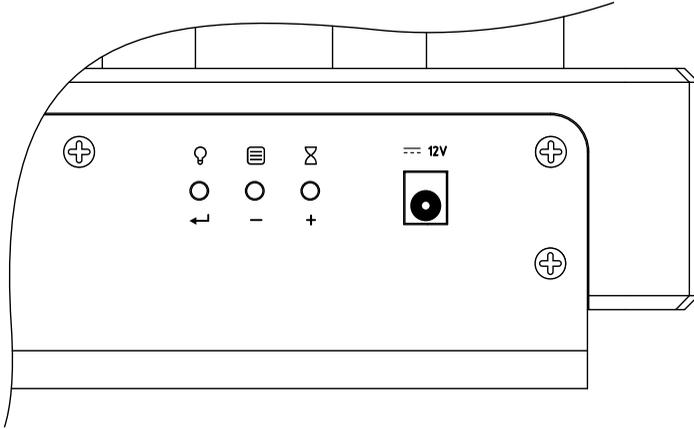
Automatic Time Determination Using GLONASS/GPS

Connect the AC power adaptor. The clock will be switched on and start working. During the first actuation wait until the clock identify the satellites and automatically set the exact time. It may take from ten seconds to one hour. If the time is determined within one minute, you selected the location with an excellent satellite signal level. If the time is determined within 5–10 minutes, the clock position is good.

If the time is not determined for one hour we recommend selecting a different location in the room. If this is impossible, see Section 8 for more detailed information.

5. SET-UP AND CONTROLS

AiV Nixie clock has a slider and 3 set-up and control buttons.

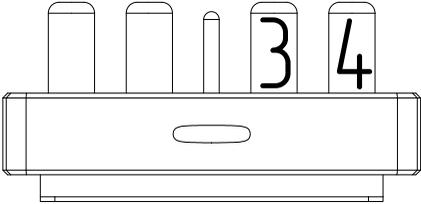
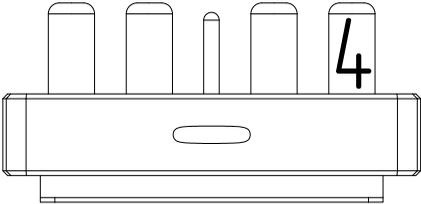
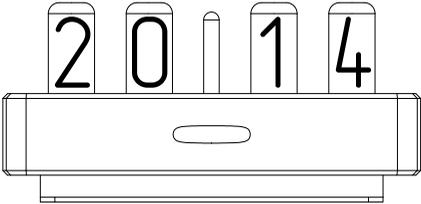
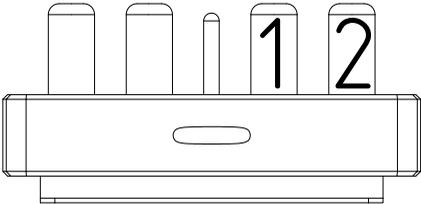
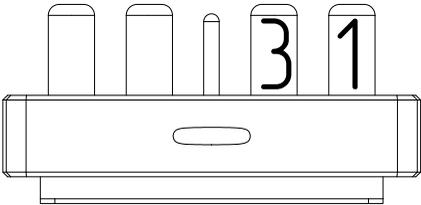


Use “+” and “-” buttons (or the slider) for the menu navigation or changing the parameter current value. Use “←” to enter the menu section or save the current value. To exit the set-up mode, press and hold “←”.

5.1. TIME Button

Press and hold TIME button the switch the clock over to the time/date/time zone set-up mode.

<p>1. Set the current hour by UTC+0 (zero time zone) using “+” and “-” buttons or the slider.</p> <p>Press “←”.</p>	A line drawing of a Nixie tube display. The first two tubes show the digits '1' and '2'. The remaining three tubes are blank. The display is housed in a rectangular frame with a small oval-shaped slider or button on the front panel.
---	--

<p>2. Set the minutes by UTC+0 (zero time zone) using “+” and “-” buttons or the slider. Press “←”.</p>	
<p>3. Set your time zone by UTC using “+” and “-” buttons or the slider (see the Notes below). Press “←”.</p>	
<p>4. Set the current year using “+” and “-” buttons or the slider. Press “←”.</p>	
<p>5. Set the current month using “+” and “-” buttons or the slider. Press “←”.</p>	
<p>6. Set the current date using “+” and “-” buttons or the slider. Press “←” to exit the time/date/time zone set-up mode.</p>	

Note. If the clock automatically determined the time by the GLONASS/GPS satellite signals, the manually input data will be ignored and replaced.

Note. The GLONASS/GPS time is transmitted for UTC+0 time zone to which the time set for your time zone is added. The correspondence between the value input and your time zone is provided in the table below.

For plus time zones	
UTC+0	0
UTC+1	1
UTC+2	2
UTC+3	3
UTC+4	4
UTC+5	5
UTC+6	6
UTC+7	7
UTC+8	8
UTC+9	9
UTC+10	10
UTC+11	11
UTC+12	12
UTC+13	13

For minus time zones	
UTC-1	14
UTC-2	15
UTC-3	16
UTC-4	17
UTC-5	18
UTC-6	19
UTC-7	20
UTC-8	21
UTC-9	22
UTC-10	23
UTC-11	24
UTC-12	25

5.2. MENU Button

Press and hold MENU button to enter the clock operation parameter main menu.

Press “+” and “-” for the navigation over the main menu items. Press “” to enter the menu section.

Use “+” and “-” buttons (or the slider) for changing the parameter current value in the menu section. Use “” to save the current value and return to the main menu.

To exit the set-up mode, press and hold “”.

The table below provides the items of the main menu, section descriptions and potential set-up options. See Section 6 for more details of the purpose of all the settings.

No.	Menu Section Description	Parameter Value Options
1	Digit scroll effect during the minute change	0 – Off 1 – Fast scroll* 2 – Slow scroll
2	First Zero Display	0 – Do not display the first zero 1 – Display the first zero*
3	Display the date/year every 15 seconds	0 – Off* 1 – Display of the date only MM/DD 2 – Date/year display MM/DD → YYYY
4	“Night” mode	0 – Off* 1 – On If off, the menu items 5–8 are not accessible
5	“Night” mode ON time	Setting the time of the “Night” mode actuation 23:30*
6	“Night” mode OFF time	Setting the time of the “Night” mode de-actuation 7:00*
7	Tube brightness in the “Night” mode	Tube glow brightness (0–10) 5* If the Brightness is 0, the tubes will be completely off in the night time
8	Illumination brightness in the “Night” mode	Illumination brightness (0–255) 50* If the Brightness is 0, the illumination will be completely off in the night time выключается
9	“Day” mode	0 – Off* 1 – On If off, the menu items 10–12 are not accessible
10	“Day” mode ON time	Setting the time of the “Day” mode actuation 8:00*
11	“Day” mode OFF time	Setting the time of the “Day” mode de-actuation 18:00*
12	Selection of the Days of the Week for “Day” Mode	Setting of the days of the week 1 (Mo) → 2 (Tu) → 3 (We) → 4 (Th) → 5 (Fr) → 6 (Sa) → 7 (Su)

		0 – this day the “Day” mode is off 1 – this day the “Day” mode is on Mo, Tu, We, Th, Fr – ON; Sa, Su – OFF.*
13	Tube Brightness	Tube glow brightness (1–10) 10*
14	GLONASS/GPS Satellite Loss Indication	0 – Off 1 – On*

* – *Default value*

5.3. LED Button

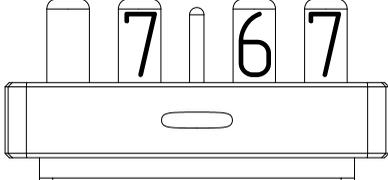
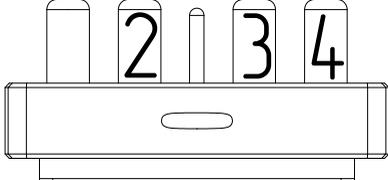
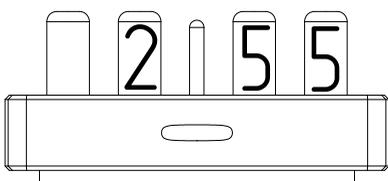
Fast pressing of the LED button switches over the illumination colour from the colours saved. The first of the colours saved is the user one. It is followed by six preset colours. The last one is the mode of the smooth colour change mode.

The illumination colours are set in HSB (Hue, Saturation, Brightness) mode. The table below provides the parameters of the preset colours.

No.	Description
1	User
2	Red-orange (IN-18 Nixie tube colour)
3	Green
4	White warm
5	White cold (maximum brightness)
6	Blue
7	Pink
8	Changing colours

Note. After the power is switched on the user colour and default brightness are set.

Press and hold LED button to enter the menu of setting the user illumination colour and default brightness.

<p>1. Set the hue using “+” and “-” buttons or the slider. Press “←”.</p> <p><i>Possible hue values are 0–767.</i></p>	 A Nixie tube display with four tubes showing the digits 7, 6, and 7. The first tube is blank.
<p>2. Set the saturation using “+” and “-” buttons or the slider. Press “←”.</p> <p><i>Possible saturation values are 0–255.</i></p>	 A Nixie tube display with four tubes showing the digits 2, 3, and 4. The first tube is blank.
<p>3. Set the default brightness using “+” and “-” buttons or the slider. Press “←” to exit the user colour settings mode.</p> <p><i>Possible brightness values are 0–255.</i></p>	 A Nixie tube display with four tubes showing the digits 2, 5, and 5. The first tube is blank.

5.4. Manufacturers Values Reset

If the clock setting resulted in the wrong settings which caused its complete or partial inoperability, use the function of the manufacturers values reset. To do this, switch the clock power off, press and hold the middle button (MENU), simultaneously switching the power supply on. When switched on the clock will restore the manufacturers settings.

6. FUNCTIONS

6.1. Digit Scroll during the Minute Change

This function actuation adds an original “slot machine” effect of scrolling the digits every minute when the time changes.

Apart from the peculiar visual effect this function prevents the tube cathode poisoning (for more details see Section 7.2).

6.2. First Zero Display

Switch the first zero display on/off for the time interval from 00 to 09 hours.

6.3. Date/Year Display

Switch the display of the current date only or the current date and year every 15 seconds on/off. This function actuation prevents the tube cathode poisoning (for more details see Section 7.2).

6.4. “Night” Mode

“Night” mode enables reducing the tube glow and illumination brightness for a better comfort in the night time.

Set the time of the “Night” mode as well the tube glow and illumination brightness actuation/de-actuation time (complete de-actuation is possible).

Note. If you press any button or touch the slider when the “Night” mode is active, the clock will exit the “Night” mode for 1 minute.

Note. If the set intervals of the “Night” and “Day” intervals overlap, the “Night” mode has a priority.

6.5. “Day” Mode

“Day” mode enables reducing the clock energy consumption and extends the IN-18 tubes service life by means of their complete de-actuation in the day (working) time when there are no people in the room and the time display is not required. In this mode the indicators and illumination is completely off.

Set the “Day” mode actuation/de-actuation time and the days of the week on which the mode will be activated automatically.

Note. If you press any button or touch the slider when the “Day” mode is active, the clock will exit this mode for the whole current day.

Note. If the set intervals of the “Night” and “Day” intervals overlap, the “Night” mode has a priority.

6.6. Tube Brightness

Enables setting the IN-18 Nixie tube glow brightness. Reduced brightness extends the tube service life and substantially reduces the power consumption.

6.7. GLONASS/GPS Satellite Loss Indication

If within 24 hours the clock did not synchronize the time by GLONASS/GPS satellites, the satellite loss indication is on. The indication is performed by double blinking of the second mark. To recover the normal reception, see Section 8.

If for some reasons the clock is located in the place where GLONASS/GPS satellite system reception is impossible, switch the satellite loss indication off for the second time mark normal operation.

7. CARE AND MAINTENANCE

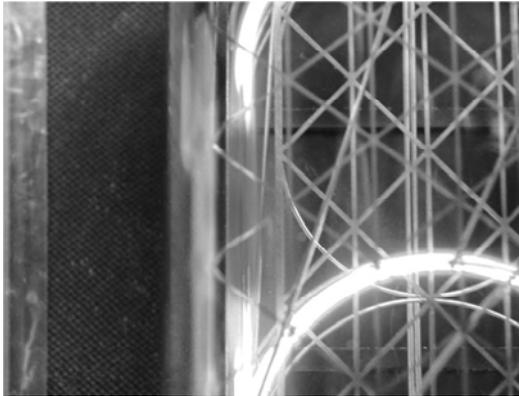
7.1. The Clock Body Care

The clock body does not need any special care or protection coating application throughout the entire service life. To remove the dust accumulated off the body and tubes use dry or slightly wet cloth without any detergents.

Do NOT wash the clock or wipe them with wet cloth! Do NOT wipe the clock body with alcohol-containing liquids!

7.2. Tube Care (Cathode Recovery)

IN-18 Nixie tubes, like any other glow-discharge tubes, are susceptible to cathode poisoning effect. This effect is demonstrated in case of the long-term glow of one digit in the tube which results in the oxidation of the local areas of the tube cathodes. This effect is manifested as non-uniform glow areas in the digit as shown in the picture below.



In AiV Nixie clock cathode recovery mode is provided. The cathodes are recovered by means of their multi-hour heating caused by increased current. The recovery should be performed for each tube and each digit in the tube. Only one digit may be recovered at a time. The clock function hereby is not accessible. Depending on the poisoning degree the recovery of each digit may take from 1 to 10 hours.

To recover the cathodes perform the following steps:

1. Remember the tubes and digits with non-uniform glow.
2. Switch the clock power supply off.
3. Remove the tubes out of the clock by pulling them strictly vertically upwards.
4. Insert the tube to be recovered into the extreme right socket (minute units socket). Other sockets may be left empty.

Attention! Electric shock hazard! The tube sockets are under high voltage. Do not touch the contacts to avoid electrical shock.

5. Press and hold the right-hand (TIME) and left-hand (LED) buttons simultaneously and switch the power supply on. The clock will switch over to the tube cathode recovery mode.
6. Using “+” and “-” buttons select the digit to be recovered in the tube.
7. The Nixie tube recovery process will start. Hereby the tube will glow brighter and heat stronger. It is necessary to visually check the recovery process end. For this purpose the cathode recovery mode is de-actuated for 3 seconds every 30 seconds and the tube operates in the normal mode (with a normal brightness). At this time visually assess whether the non-uniform glow areas are still present in the digit selected. Continue the process until the digit uniform glow has been completely recovered.
8. Using “+” and “-” buttons select the next digit to be recovered in the tube and repeat Step 7 until all the digits in the current tube have been recovered.
9. Switch the clock power supply off. Remove the recovered tube. If another tube needs recovery, repeat Steps 4-8. When all the tubes have been recovered, install them into the clock and switch the power supply on for the clock normal operation.

8. TROUBLESHOOTNG

If any problems with AiV Nixie clock operation are observed, try solving them using the instructions below. If the problem persists, address the support service at: support@aivelectronics.ru or by visiting the Company site: www.aivelectronics.ru

Power Supply

Symptom	Possible Reason and Troubleshooting Method
The clock does not work completely (indicators and illumination do not work).	<ul style="list-style-type: none">• Check the AC power adaptor serviceability. If the adaptor is faulty replace it for a similar one.

Nixie Tubes

Symptom	Possible Reason and Troubleshooting Method
The second mark started blinking twice a second.	<ul style="list-style-type: none">• The clock did not determine the time by the satellites over the last 24 hours. For more details see Section 6.7.
Some digits glow non-uniformly (with gaps).	<ul style="list-style-type: none">• Tube cathodes are poisoned. For cathode recovery see Section 7.2.

Illumination, Touch Slider

Symptom	Possible Reason and Troubleshooting Method
The illumination brightness changes arbitrarily.	<ul style="list-style-type: none">• Possibly the slider picks up electrostatic interference resulting from: air ionizer, microwave oven etc. Place the clock away from the powerful radiation sources.

Automatic Time Determination by GLONASS/GPS

Symptom	Possible Reason and Troubleshooting Method
<p>The clock does not determine the time by the satellites – satellite loss indication is on.</p>	<ul style="list-style-type: none"> ● For some time put the clock in a location with a better satellite reception level, wait until the time is determined and then relocate the clock to the initial position. ● Restart the clock by switching the power supply on and off.
<p>The time was not determined within one hour after the start.</p>	<ul style="list-style-type: none"> ● You selected the bad place for the clock installation, try to find the place with a better satellite reception. ● If it is impossible to select another location, wait for another 12 hours. This is the time of the GLONASS/GPS system satellites orbit around the Earth. It is possible that the time will be determined at a certain satellites position.
<p>The time was not identified in the selected location even after 12 hours.</p>	<ul style="list-style-type: none"> ● The receiver sensitivity in the satellite tracking mode is a lot higher than in the search mode. Put the clock in a location with a good signal level for some time, wait until the time has been determined, and then relocate the clock to the initial position. ● May be there is a metal barrier between the clock and the window. Remove it to improve the satellite signal reception. ● If the toner film is pasted onto the windows remove it to improve the satellite signal reception. ● The satellite signal is not received in this location. The synchronization with the exact time system is not accessible. Set the time in manual mode (see Section 5.1).

9. SPECIFICATIONS

Electrical Specifications:

Supply voltage: 12 ± 1 V DC

Maximum continuous current: 650 mA

Maximum constant power consumption: 7.8 W

Constant power consumption in “Day” mode: 0.3 W

Mechanical Specifications:

Outline dimensions: L x W x H: 268 x 89 x 128 mm

Package outline dimensions: L x W x H: 325 x 265 x 125 mm

Net weight (without AC power adaptor): 1.25 kg

Gross weight: 1.9 kg



AiV Electronics

Contact Information:
www.aivelectronics.ru
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support@aivelectronics.ru