6 digits IV-18 VFD Clock with 2 Alarms. Best seller!

Thanks for your interest in my 6 digits IV-18 VFD Clock.

I have tried to create stylish, reliable, accurate and easy to use Clock and I hope you will love it and this Clock is what you are really expected to see when you was looking for something new.

Please read carefully the information below as it will help you to use your Clock efficiently and in proper way and hopefully will avoid any negative moments which could arise in case of incorrect or careless use.

Clock key features:
Based on Soviet IV-18 tube from USSR time
Six 10mm high digits IV-18 Vacuum Fluorescent Display (VFD) Tube
Displays Time , Date and 2 Alarm clock sets
Scrolling Time and Date display mode.
Accurate time clock source from internal crystal.
Integrated 2 Alarm Clocks
Easy control with only 2 buttons
Uses standard 9V or 12V wall plug Power Supply
Precision Seconds setup
Internal buzzer for Alarm1 and Alarm2
2 external outputs trigger on Alarm1 and Alarm2 events

The Clock functions in two main modes:
Display Mode and **Setup mode**

Display mode:

In the **Display Mode** Clock indicates the following information:

Time in format HH-MM-SS (dash separators),
where HH is Hours (00-12 or 00-23), MM is Minutes (0-59), SS is Seconds (00-59)

Alarm1 in format HH-MM: 1, where number 1 indicates Alarm1

Alarm2 in format HH-MM: 2, where 2 indicates Alarm2

Date in format : DD.MM.YY (dot separators),
where DD is day (1-31), MM is Month(1-12), YY is Year (00-70)

Scrolling Time and Date in format HH-MM-SS and DD.MM.YY
with 10 seconds display interval

Blank/Serial Port Info, all digits are switched off or
Displays the information loaded via RS232 Serial Port

Setup Mode:
Setup Mode is for changing configurable parameters, allowing:

Set Current Time
Set Alarm1 time and switch it on/off
Set Alarm2 time and switch it on/off
Set Date
Set 12 or 24 Time Display mode

Config Mode has been introduced into the clock recently. This mode allow you to change several configurable parameters. All parameters numerated from 1 to 8 and in Config mode the parameter number displays in the least left digit position
Parameter 1 defines format of Date to display, date can be set to display in the following formats: **DD.MM.YY** or **MM.DD.YY** format
Parameter 2 defines Tube Slip Mode Off time
Parameter 3 defines Tube Slip Mode On time
The rest parameters are not is use yet

How to connect and control your Clock

Please use 9V or 12V at minimum 150mA DC Current Power Supply , which is widely available to buy on eBay or in your local shops.

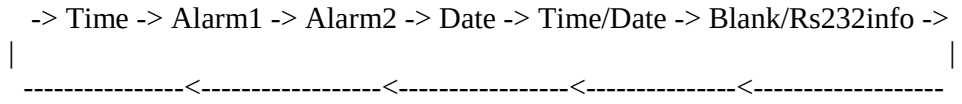
Connect your Clock to 9V power supply.
Wrong polarity does not destroy your Clock, but it will not be functioning.

Please refer to Connection Diagram to be sure you have connected it properly.

Switch your Power Supply on, Clock should start to run in **Display Mode** and it should display the default current time 00:00:00.

Easily control your Clock with only 2 buttons:

Use Button1 to change displaying information. Every single push will change it in the following order:



When Clock displays Time, Alarm1 or Alarm2, dash separators are used, but when Date is displayed, dots are used to separate Day, Month or Year digits.

Use Button2 to shut off buzzer when Alarm1 or Alarm2 happens.

Indicator:

PM Indicator:
There is no AM/PM time indicator, so please set 12H display mode in after lunch time, when you can spot the difference between 12 and 24 hours display modes.

Active Alarm indicates by dot on the right side of the IV-18 tube:
In Time **Display Mode**, It's on when either Alarm1 or Alarm 2 or both are active.
In Alarm 1 **Display Mode**, it's on when Alarm 1 is active.
In Alarm 2 **Display Mode**, it's on when Alarm 2 is active.
In Date **Display Mode**, it's on when either Alarm1 or Alarm 2 or both are active.

More detailed description of buttons use:

In the **Display mode** you can do:

Button2. Normal push shuts alarm buzzer off, if it was buzzing at the moment.

Button2. Long push changes time **Display Mode** from 24h to 12 hours scale. Second long push will change it back from 12h to 24 hours scale.

Button1. Normal push changes information to display – Time , Alarm1, Alarm2, Date or Time/Date and back to Time.

Button1. Long push leads to **Setup Mode**, where you can modify the appropriate values.

Button1 & Button2 together. Long push leads to Frequency Test Mode. Clock will display 200000, which means 200kHz frequency output has been activated.
Please note, that the only way to leave these mode and come back to the normal **Display mode** is to switch your Clock off . All your current time, date and alarms setups will be lost, so you'll need to set it up again.

In **Setup Mode** you can do:

Button 2. Normal push increments the value of highlighted digit.

Button2. Long push switches off Active Alarm
(works only in Alarm1 or Alarm2 **Setup Mode**).

Button1. Normal push changes the position of highlighted digit

Button1. Long push goes back to Display Mode, where Clocks displays the current Time, Date, Alarm1 or Alarm2 sets.

How to setup Time, Date and Alarms

To set or adjust the current time, push Button1 until Clock starts to display time.

Now push and hold Button1 until Seconds Ones digit starts to flash.

Release Button1. You are in the **Setup Mode** now.

Seconds Ones digit is highlighted by flashing, so Seconds value can be reset by pushing Button2 now.

Push Button1 to highlight next digit. Push Button1 and it highlights Seconds Tens digit. You can push Button2 to reset seconds value.

Push Button1 to highlight next to the left digit. Now Minutes Ones are flashing.

Use Button2 to set correct value. Every Button1 push will increase value by one.

Push Button1 to choose next digit to set. Minutes Tens will be flashing.

Push Button1 again in case don't need to change Minutes tens value

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Hours Ones digit should be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Hours Tens should be flashing.

Use Button2 to set correct value.

Now you set the current Time.
Push Button1 and it will highlight Seconds Ones again. Push Button1 to reset seconds value when you need to synchronize the seconds.

Push and hold Button1 until Digit stops flashing. You have left **Setup Mode**.

To set the current date push Button1 until clock displays Date.
Use the same technique to set up Date.
Now push and hold Button1 until Years Ones start to flash.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Year Tens will be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Month Ones will be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Month Tens will be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Day Ones will be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Day Tens will be flashing.

Use Button2 to set correct value.

If some digits still don't have the correct value, push Button1 until this digit is highlighted again. Use Button2 to correct the value.

To leave **Setup Mode** push and hold Button1 until Digit stops flashing.

Use the same technique to **set Alarm1 or Alarm2.**

To go to the Alarm **Setup Mode** just choose the Alarm to display then push and hold Button1 until first Alarm digit starts to flash. You are in the alarm **Setup Mode** now.
In this case only 4 digits can be set up and first digit is to be highlighted is Alarm Minutes Ones.

In the Alarm **Setup Mode**, when digit is flashing, as soon as you change Alarm digit value by pressing Button2, Active Alarm Indicator will be switched on and this Alarm is activated.

To de-activate Alarm, go to the Alarm **Setup Mode**, then push and hold Button2 until Active Alarm Indicator is switched off, which means this alarm is no longer active. To leave Alarm **Setup Mode**, push and hold Button1 until digit stops to flash. You are now in the **Display Mode**.

How to change from 24 to 12 or from 12 to 24 Hours displaying

I recommend to do this procedure sometime after lunch, when PM time is started. It gives you clear sign that you have changed the time scale, as PM should be on when you set 12h time scale.

Please make sure you are in **Display Mode** with Current Time indication.

Push and hold Button1 until Clock changes time from 24h to 12 hours scale. If you do it after lunch, hours indication value will be changed and PM indicator lamp should be switched on.

Release Button1. Check that Clock is displaying time correctly.

Second long push will change it back from 12h to 24 hours scale and if you do it after lunch, PM indicator should be switched off.

Release Button1. Check that Clock is displaying time correctly.

Another way to understand Button1 and Button2 usage:

Button1 in **Display Mode**:
Normal push – switches between Display Modes
Long push - go to the **Setup Mode**

Button1 in **Setup Mode**:
Normal push – choose parameter to configure
Long push - go back to the Display mode

Button2 in **Display Mode**:
Normal push – switch off alarm buzz
Long push – change time **Display Mode** 12 or 24 hours

Button2 in **Setup Mode**:
Normal push – change parameter value
Long push - switch off selected alarm

Button1 and Button2 together:
In **Display Mode**:
Normal push – not defined yet
Long push - go to Frequency test Mode

In **Setup Mode**:
Normal push – not defined yet
Long push - go to Frequency test Mode

How to load and display data via RS232 serial port

Component layout diagram contains RS232 pin out diagram. 3 wire serial port cable should be used for Clock – PC interconnection.
Please not that you have to use TTL level to proper Rs232 level converter to be able to connect this clock to Personal Computer. This converter can be easily build on MAX232 Integrated Circuit.
For Clock – microcontroller/device interconnection, your clock uses standard TTL levels on serial interface. Make sure that your microcontroller/device, which you are going to connect to the clock works with TTL signals too and understand following serial protocol parameters:
Bits per second: 9600
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None

Clock will automatically switch into Blank/Rs232_Info mode and display data as soon it gets and recognises the first byte from PC or microcontroller/device.

Information on the display can be updated as quickly as above data bit rate allows.
Always send 6 bytes of data or one command byte.

Clock accepts standard ASCII symbols, which could be sent to clock by Terminal or any other program via serial Communication port.
To prevent incorrect digit indication and increase the reliability, limited set of ASCII symbols can be send to the clock. All symbols are out of the below table are non-valid and will be ignored by clock.

Use “t” ASCII symbol as command to switch into Time Display Mode

Use “d” ASCII symbol as command to switch into Date Display Mode

Use 0-9 ASCII symbols to display 6 digits information on the clock Nixie tubes.

How to change parameters in Config Mode:

Change display mode to Blank/Rs232 mode. In **Display Mode** Using Button1 set your clock to indicate Rs232 info or when digits are blank.

Push and hold B2 button until clock enters **Config Mode** and displays digit 1 to 8 in the far left position. You are now in **Config Mode**.

Use B1 button to choose config parameter 1 to 8. At the moment only 3 parameters are available to set there
Parameter 1 displays and available to set when far end left digit indicates 1
Parameter 2 displays and available to set when far end left digit indicates 2 and so on.

Parameter 1 defines format of Date to display. Far right digit can be set to 0 or 1.
When it set to 0, Date displays in **DD.MM.YY** format
When it set to 1, Date displays in **MM.DD.YY** format
While your Clock in **Config Mode** and Parameter 1 has been chosen, press and hold B1 button until parameter value digit starts blinking. You are now in **Config Setup Mode**. Use B2 button to set this parameter to 0 or 1.
Leave **Config Setup Mode** by pushing and holding B1 button until digit stops blinking. You now have left Config Setup Mode, but still in **Config Mode**.

Push B1 button to choose next parameter to set.

Parameter 2 defines Tube Slip Mode Off time. It’s time when your tubes will be switched off, but clock continues to run.
Four digits value represents time in HHMM format, where HH – hours (00-23), MM is for Minutes (00-59)
While your Clock in **Config Mode** and Parameter 2 has been chosen, press and hold B1 button until Minutes Ones digit is highlighted by flashing. You are now in **Config Setup Mode**.

Use Button2 to set correct value. Every Button1 push will increase value by one.

Push Button1 to choose next digit to set. Minutes Tens will be flashing.

Push Button1 again in case don’t need to change Minutes tens value

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Hours Ones digit should be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Hours Tens should be flashing.

Use Button2 to set correct value.

Now Tube Slip Mode Off time has been set.
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Leave Config Setup Mode by pushing and holding B1 button until digit stops blinking.
You now have left **Config Setup Mode**, but still in **Config Mode**

Push B1 button to choose next parameter to set.

Parameter 3 defines Tube Slip Mode On time. It's time when your tubes will be switched on coming back to normal Display Mode from Tube Slip Mode.
Four digits value represents time in HHMM format, where HH – hours (00-23), MM is for Minutes (00-59)
While your Clock in Config Mode and Parameter 3 has been chosen, press and hold B1 button until Minutes Ones digit is highlighted by flashing. You are now in **Config Setup Mode**.

Use Button2 to set correct value. Every Button1 push will increase value by one.

Push Button1 to choose next digit to set. Minutes Tens will be flashing.

Push Button1 again in case don't need to change Minutes tens value

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Hours Ones digit should be flashing.

Use Button2 to set correct value.

Push Button1 to choose next digit to set. Hours Tens should be flashing.

Use Button2 to set correct value.

Now Tube Slip Mode On time has been set.
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Leave **Config Setup Mode** by pushing and holding B1 button until digit stops blinking.
You now have left **Config Setup Mode**, but still in **Config Mode**

Leave Config Mode by pushing and holding B1 button until you clock come back to Rs23/Blank Mode and all digits are off.

You now have left Config Mode. Check that you are back in Display Mode bu pushing B1 button. Clock should be switching between Display Modes –Time, Alarm1, Alarm2, Date. modes

Important Notice:

This clock is designed for inside use only. Do not use this Clock outdoor under any circumstances.

Use only good quality, certified Wall Plug Power Supply, which can provide not less than 150mA DC current at 9V or 12V.

This clock does not have backup battery, so be sure that your clock is connected to the good quality main with no power failure.

Due to high voltage on the board, do not use this clock in bathroom, under rain or in the wet and/or dusty conditions

Some internal components are under High Voltage, so before handling or do any maintenance work, be sure that power supply is switched off.

Do not use the Clock without proper designed and manufactures enclosure. Only leave the Clock in the place, where it can not be reached by children.

I do not accept any liability may cause during improper or care less use of this Clock.

Even this Clock is fully functioning, it sells in the form of kit, meaning you have enough knowledge, skills to put it in the case and connect it properly.

Due to constant improvement, you clock design could be slightly different from the sale description, but technical parameters and functionality will be the same or better.

The latest User Manual can be found on WEB page at

http://www.kosbo.com

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