

## 16 digits IGP-17 Panaplex Clock/Counter. Newly designed!

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

**By buying this clock, you agree to not use this clock without enclosure, that protects you from accidentally touching high voltage parts.**

**WARNING! Display panel wires and some internal components are under High Voltage (about 180V DC), before handling or maintenance work, be sure that it's fully switched off.**

Thanks for purchasing my 16 digits IGP1-7 panaplex Clock/Counter.

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

Clock/Counter key features:

Sixteen 12mm high digits (IGP-17 panaplex display panel)

Displays modes: Time and Date, 2 Alarm clock sets, Blank or 16 digits info or counter via TTL serial port.( easy to use with USB to TTL serial converter)

Accurate time clock source from internal crystal (not 50/60Hz from mains).

Integrated 2 Alarm Clocks

Easy control with only 2 buttons

Now you can control and setup Date, Time and alarms from your PC via serial interface too

Uses standard 12V DC wall plug Power Supply

Precision Seconds setup

Internal battery for data protection in case of main power failure

Will generate alarm buzz even main power is off !!!

Internal buzzer for Alarm1 and Alarm2

Blank Mode – all digits switched off, but alarms set and clock is running.

TTL serial port connection to display or count 16 digits information from PC or other device for example Arduino or Raspberry PI.

The Clock functions in two main modes:

**Display Mode** and **Setup mode**

**Display mode:**

In the Display Mode Clock indicates the following information:

**Time** and Date in format HH-MM-SS DD.MM.YY ,

where HH is Hours (00-12 or 00-23), MM is Minutes (0-59), SS is Seconds (00-59), DD is day

(1-31), MM is Month(1-12), YY is Year (00-70)

**Alarm1** in format AL-01 On/oFF HH-MM 1, where 01 indicates Alarm 1

**Alarm2** in format AL-02 On/oFF HH-MM 1, where 02 indicates Alarm 2

**Blank/SerialData**, all digits are switched off or displays the information loaded via TTL Serial Port in format NNNNNNNNNNNNNNNNNN, where N is a digit (0-9)

### Setup Mode:

Setup mode is for changing configurable parameters, allowing:

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

## How to connect and control your Clock/Counter

Please use Direct Current Regulated 12V at minimum 300mA DC Current Power Supply , which is widely available to buy on eBay or in your local shops.

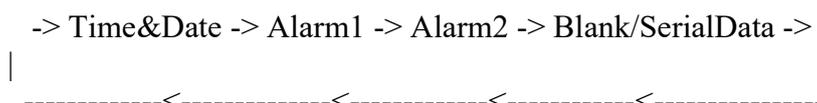
**Warning!** Do not use or try to avoid using unregulated 12V power adapters, as under no load it could provide up to 19v. More than 15.5v could damage your clock's build-in dc-dc converter.

Connect your Clock/Counter to 12V power supply.  
Always check that you have not mixed polarity, it would not destroy the clock, as it has wrong polarity protection, but clock will not run.

Switch your Power Supply on, Clock/Counter should start to run in **Display Mode** and it should display the default current time 00-00-00 and date 23.12.15

Easily control your Clock with only 2 buttons:

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



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



## More detailed description of buttons use:

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

Button1. Normal push changes information to display – Time and Date , Alarm1, Alarm2 or Blank/RS232\_Info and back to Time.

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

Button2. Normal push shuts alarm buzzer off, if it was buzzing at this 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 & 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 this mode and come back to the normal **Display mode** is to switch your Clock off and disconnect backup battery. All your current time, date, alarms sets or loaded serial interface info will be lost, so you'll need to load or set it up again.

In **Setup Mode** you can do:

Button1. Normal push changes the position of highlighted digit.

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

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).

## How to setup Time, Date and Alarms

To set or adjust the **Current Time and Date**, push Button1 until Clock starts to display time and date.

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

Release Button1. You are in the Setup Mode now.

Year Ones digit is highlighted by flashing, so Year value can be set by pushing Button2 now.

Push Button1 to highlight next digit. It highlights Year Tens digit. You can push Button2 to set year tens value.

Push Button1 to highlight next to the left digit. Now Month 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. Month 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. Day Ones digit should be flashing.

Use Button2 to set correct value.

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

Use Button2 to set correct value.

Now you set the current Date.

Push Button1 and it will highlight Seconds Ones. Push Button1 to reset seconds value when you need to synchronize the seconds.

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

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

Use Button2 to set correct value.

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

Use Button2 to set correct value.

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

Use Button2 to set correct value.

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

Use Button2 to set correct value.

Push Button1 and Year ones digit will be flashing again, so you can correct values if you need to.

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 Time to display then push and hold Button1 until Alarm Minute Ones digit starts to flash. You are in the alarm setup mode now. In this case only 4 digits can be set up from Alarm Minutes Ones.

In the Alarm setup mode, when digit is flashing, as soon as you change Alarm digit Value by pressing Button2, "On" sign appears on the middle of display and this Alarm will be activated.

To de-activate Alarm, go to the Alarm Setup mode, then push and hold Button1 for 3-5 seconds until you see "Off" sign in the middle of display.

To leave Alarm setup mode, push and hold Button2 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 and how to set MM.DD.YY date format**

To make these changes you have to do it via **Config Mode**.

### **How to change parameters in Config Mode:**

Change display mode to **Blank/SerialData** mode. To do so, in **Display Mode** Using Button1 set your clock to indicate Rs232 info or when all digits are off.

Push and hold B2 button until clock enters **Config Mode** and displays any digit from 1 to 8 in the far left position. You are now in **Config Mode**. If you are doing it first time, clock will display Parameter 1 and far left digit will be 1. On the right you see group on 11 digits set as 0's by default.

Use B1 button to choose config parameter from 1 to 8. At the moment only 1 parameter string available to set there.

**Parameter 1** displays and available to set when far end left digit indicates 1

**Parameter 2** displays when far end left digit indicates 2  
and so on.

## **Here is what parameters means and how to set it up:**

**Parameter 1 string** defines format of Date to display and hours scale (0-12 or 0-24)

To define Date format 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

To define Hours scale format to display, third digit from the right can be set to 0 or 1.

When it set to 0, Date displays in **24 hours** format

When it set to 1, Date displays in **12hours** format

While your Clock in **Config Mode** and Parameters string 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.

Push B1 to highlight the digit you would like to set. Please note that 2 digits are grouped for 1 parameter, so if you choose digit 1 or 2 from the right, then Date format can be set. When you select digit 3 or 4 from the right, then Hours scale format can be set.

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 scroll through parameters string 2 to 8.

Parameter string 8 is not settable, but shows your clock HW and SW release. Digits 1 and 2 from the right display HW release, but digits 4 and 5 from the right display SW release.

**Parameters strings 2 to 7** are not implemented yet and reserved for the future use.

To leave **Config Mode** push and hold B2 button until clock comes back to **Blank/SerialData** mode and your clock indicates Rs232 info or when all digits are off.

## **Using Backup battery**

Just put jumpers on the Backup battery connector to activate your current time and Alarm Sets power failure protection.

## **How to load data and control Clock/Counter via TTL serial port**

Component layout diagram contains clocks TTL serial interface pin out diagram. 3 wire serial port cable should be used for Clock – PC/another controller interconnection.

Please use the following parameters to configure serial port:

Bits per second: 9600

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

Clock/Counter will automatically switch into Blank/SerialData Mode and display data as soon it gets and recognises the first byte.

Information on the display can be updated as quick as above data bit rate allows.

You can send various data package length by not more than 16 bytes of data in one go

Although you can send one byte commands.

Clock/Counter 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.

Send 0-9 ASCII characters to display 8 digits information on the clock Nixie tubes.

Send “Space” ASCII character to switch off the digit.

Send “i” ASCII character as command to increment number displayed Blank/SerialData Mode .

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

Use “c” ASCII character as command to reset its cursor position. ( every time you send ASCII digit code (not command), internal cursor shifts to the right, so this command puts cursor to the least left position)

Use “a” ASCII character as command to switch into Alarm1 or between Alarm1 and Alarm2 Display Modes.

## **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 - switched 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

## **Notice:**

Please do not use this clock outside, it's not for use in bathroom, not for use in wet condition.

Use only good quality, certified Wall Plug Power Supply, which can provide regulated, not less than 300mA Direct Current at 9V.

Do not leave clock without main power for more than 24 hours, as It discharges your backup battery and you need to replace it.

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

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

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 and other related information can be found on my WEB page at [www.kosbo.com](http://www.kosbo.com)