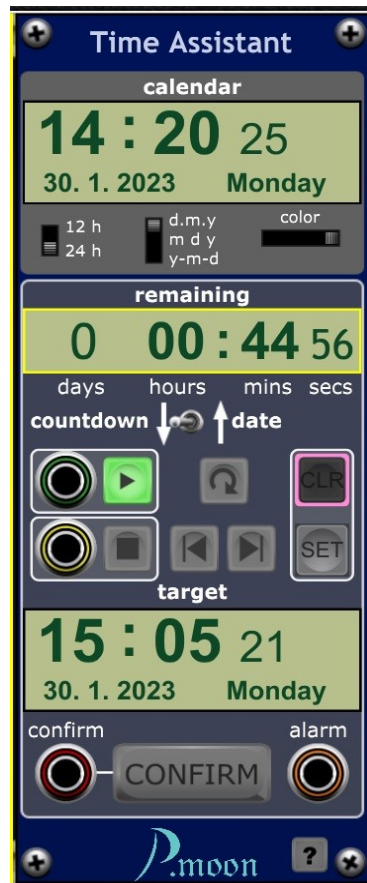# Time Assistant

Version h3, build #22, 2023-04-13

Time Assistant is a digital calendar / clock with additional functions:

1. A target **date** / time is set, for example a birthday or the planned project release day. The module will show you remaining time.

2. A **remaining** time interval is set. The module will treat it as **countdown** timer and show you resulting date with it's target display. The timer can be paused. While countdown is interrupted, target date and time will keep on running. Countdown timer can repeat it's operation, if **repeat function** is activated.

When remaining time has reached zero, alarm field will start blinking and a 5 volt signal is sent from it's output jack until alarm is confirmed by clicking onto CONFIRM button ore a trigger pulse at confirm input jack is received.

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1 Data Input

1.1 Number fields

Number fields are used for remaining days, day of month, hour, minute, second. You can use two ways to input values:

- Click with left mouse button and hold it, drag mouse pointer up or down to increase or decrease field content. This will be best method, when you use a touch screen monitor or a tablet computer.

- Click shortly with left mouse button. Field changes color. Type number with PC keyboard and press ENTER key to confirm input.

1.2 Text Fields

In *12h* time format an *am/pm field* gets visible and in SET mode editable. You need letter keys to input valid data:

- *midnight* or *am* for first twelve hours of day,

- *noon* or *pm* for last twelve hours of day.

Only first letter will be checked. Upper and lower case will not be distinguished.

If another letter than "A", "M", "N", "P" is input, am/pm field will show "??" and hour field will show "- -" until a valid letter is input.

For "*target*" there is a date field. Input text must match date format, that is selected in *calendar* area.

- **d.m.y** (dd.mm.yyyy)

Day of month:	1 ... 31
Month:	1 ... 12
Year:	actual year ... actual year plus 27
Separator:	exactly two dots (".") in total, spaces are allowed and will be removed

- **m d y** (MMM dd yyyy)

Month:	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
	upper or lower case (or mixed), at least three letters, only first three letters will be checked
Day of month:	1 … 31
Year:	actual year … actual year plus 27
Separator:	only spaces

- **y-m-d** (yyyy-mm-dd)

Year:	actual year … actual year plus 27
Month:	1 … 12
Day of month:	1 … 31
Separator:	exactly two minus signs ("-") in total, spaces are allowed and will be removed

A year from actual year to next 27 years can be input only, because remaining time must be less than 10000 days.

Day of month will be limited to maximal number of days for input month.
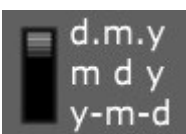

2 Basic Settings

Calendar gets it's values from your computer system automatically. So time zone and daylight saving time ("summertime") are set as you did in your computer.

time format selection

- "**12 h**": 0 … 12 h am/pm
- "**24 h**": 0 … 23 h

date format selection:

- day. month. year
- month day year
- year – month – day

display color selection:

- "dark"

- "light"

- "Nixie style"

- "VFD style"

- "LCD style"

3 Controls and connectors

Calendar field shows actual date and time of your computer.

Remaining field displays remaining time interval until an alarm occurs. This interval is the difference between *calendar* and *target* values. The picture shows maximal possible values for countdown mode.

In *date mode target* are the manually set date and time.

In *countdown mode target* values are resulting from sum of *calendar* and *remaining* time. That means, *target* stays constantly while *countdown* is running. It goes forward while *countdown* is paused.

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 mode switch

- **countdown** *mode*: time interval is set as "remaining"

- **date** *mode*: target date / time is set

 SET toggle button activates *data set mode*.

In **countdown** mode it is only usable while countdown is stopped.

When this button gets toggled *on*,

> - a pending alarm will be cleared,

> - it enables **CLR** push button,

> - it disables *countdown* controls,

 - an enlarged and highlighted frame around input area starts changing it's color periodically,

> - you can enter date / time for **countdown** or **target**.

 When **SET** button gets toggled off,

> - **CLR** button gets disabled,

> - preset area frame gets smaller and keeps yellow color,

> - *countdown* controls get enabled (in *countdown mode* only),

> - in *date* mode **remain** values start decreasing at each second.

 CLR button (usable in *SET mode* only)

When clicked,

> - in *countdown* mode it sets all data fields to zero in *remaining* area,

> - in date mode:

>> + first click sets minutes and seconds to zero in *target* area.

>> + At a second click actual calendar values will be copied to target fields.

>> + A third click sets minutes and seconds to zero.

RUN button (in countdown mode only) gets enabled after *SET mode* was active or **RESTART** button was pushed. It starts countdown decreasing at each second.

A trigger pulse with a CV > 2.5 volts sets RUN toggle button too. *)

A click on **STOP** button or a CV trigger pulse (*countdown mode* only) interrupts countdown and allows change to *SET mode*. *)

While countdown is interrupted, target date / time will change forward.

*) Please note: because of Voltage internal data processing, visible states of RUN and STOP toggle buttons sometimes may do not match their actual states.

When **REPEAT** toggle button is on, countdown timer restarts with initial values, after it reached zero and initiated an alarm.

RESTART button reloads preset values to countdown timer instantly, even when countdown is running.

FINISH button lets countdown timer jump to zero and activate alarm state. The button is only effective while countdown is running.

On the bottom there is the "alarm area". It's background will start blinking light orange, when *remaining* values reach zero. Additionally *alarm out jack* sends a 5 volt signal.

A trigger pulse at *confirm in jack* or a click on **CONFIRM** button resets alarm state.

When REPEAT button is ON, it might make sense to cable link alarm out jack with confirm in jack. This will quit each alarm state automatically. In this case alarm out jack sends only a trigger pulse each time when an alarm occurs.

4 Final Remarks

4.1 Valid values

When you input target values (in **SET** mode), resulting remaining time will be displayed on remaining field instantly.

While entering a time interval in countdown mode, target display will show resulting time and date.

You cannot enter negative values. That's why target date and time can never be before actual date and time. So if you try to input such an invalid target value, remaining field will show something like "– –   – – : << : <<". Hereby "<<" indicates negative values.

4.2 Changing operation modes

4.2.1 Countdown to date mode

Operation mode can be changed at any time. Changing operation mode does not effect preset value as long as **SET** mode is not active.

When you switch to **date mode** while countdown is running, countdown stops. Actual remaining interval will be stored in module's memory. Target will be reloaded with last set values. Then remaining interval starts decreasing at each second.

It can happen, that restored target date/time is before actual date/time. Then remaining field will indicate that with "– –" or "<<".

4.2.2 Date mode to countdown mode

Remaining fields will be reloaded with last countdown state. Countdown stays in STOP state. Target will display increasing sum of actual time/date and remaining value.

4.2.3 Mode change while SET mode is active

Time Assist will remember your former settings. A change from date mode to countdown mode while SET is on will result in loss of stored actual countdown values because they will be replaced by the initial countdown preset values.

P.moon DOC files: https://p-moon-modules.de/modules.htm

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