Days-Left Clock
Operating Manual

KABtronics.com

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Document version 1.0 for use with PC board version 1

What is It?

The Days-Left Clock displays a number that decreases each day at midnight and can be used to indicate the number of days left to an event or deadline. The large 2 ¼ digits are readable from across a large room.

This clock was developed to display the days remaining to keep a team focused on a delivery date. This is the main use of this clock.

The "Days Left" markings can be removed and the clock operated in either 12 hour or 24 hour format, if one is looking for a large format time piece.

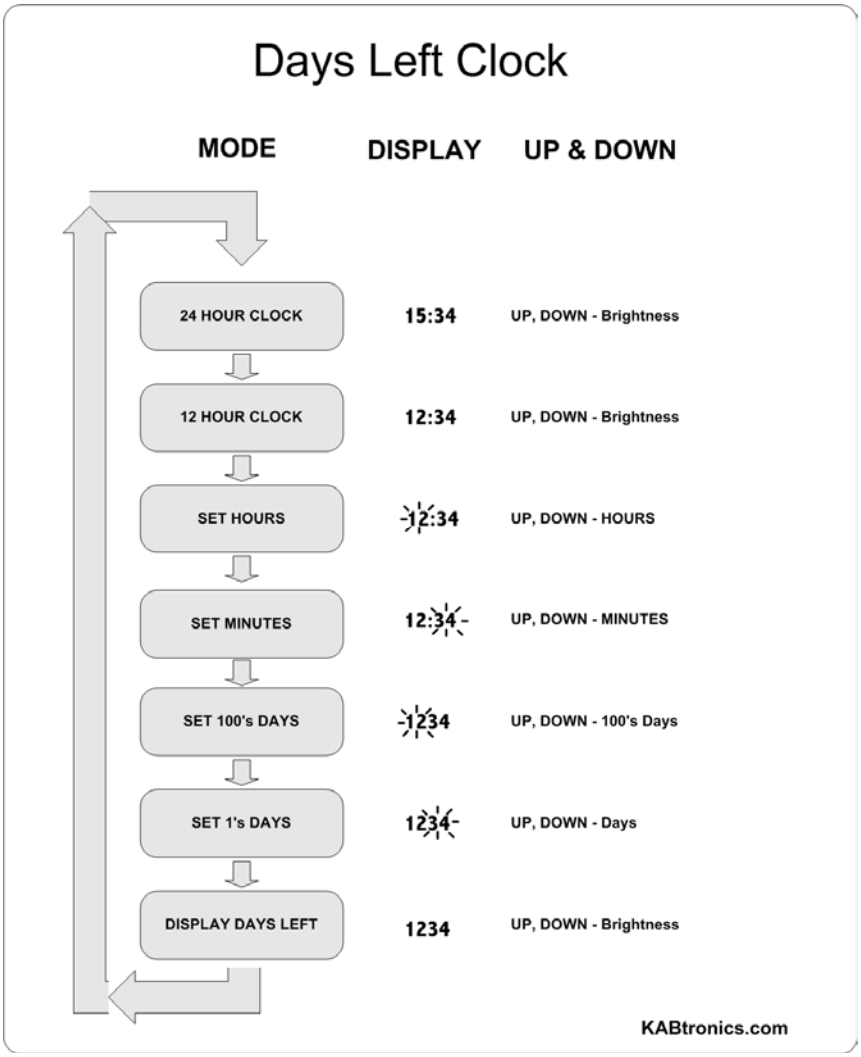
What Can It Do?

One of the following modes needs to be chosen before hanging it on the wall;

- Display Days Left
- Display 12 Hour Time
- Display 24 Hour Time

In any case, the current time needs to be set. If Days Left will be displayed, then that needs to be set also.

How Do I Operate It?



Operating mode map.

Modes

The clock is always in one of the 7 modes shown in the operating mode map above. Which mode it is currently in need to be determined by the display.

Every mode looks different, with the exception of three hours during the day, when 24 Hour and 12 Hour time look identical (10AM to 12:59), otherwise you can differentiate the time mode by sight.

The three operating modes (12 and 24 hour time, and days left) don't have a flashing set of digits. In these operating modes, the UP/DOWN buttons control the brightness of the display.

Setting Time

The Time setting modes are 24 Hour only, and allow setting the hours first, then the minutes. The flashing digits indicate set-ability using the UP and DOWN button.

When setting the time, use the UP/DOWN buttons to set that group (hours or minutes) to the correct time. You should set the minutes to the next upcoming minute and then use the mode button to advance to the next mode (100's days) to start the clock and automatically reset the seconds to zero. While you can never see the seconds counter, this setting technique allows the clock to be set accurately to the top of the minute.

Setting Days Left

The leading zeros are displayed in the days setting mode, primarily to identify the modes. The two days setting modes independently set the hundreds-of-days left (0-99) and the ones-of-days left (0-99). A rollover of 99 days left does not affect the hundred of days left in the setting mode.

Computing Number of Days Left

There are web sites that will tell you the Julian Day number given a date. The Julian day number of the deadline day minus the Julian day number of today is the number of days left.

Days Left = Julian (deadline) – Julian (today's date)

Display Brightness

In all three display modes the UP and DOWN buttons control the brightness. The brightness cannot be adjusted while in any of the setting modes.

Special Power Loss Mode

This clock has a capacitor backup that allows for about an hour of power loss without losing the time or days left count.

Specifications

Finished Clock:

Weight: about 24 Oz + 10 Oz Wall transformer (needs refining)

Finished Size: 9 x 11 inches, 1.25 thick

Power: 8 Watts Max, 3.5 Watts Typical
(depends upon # of digits lit and brightness setting)

Accuracy: ±2ppm over 0-40°C, less than 2 minutes error per year

Digit Size: 2.24 inch high x 1.28 inch wide

PC Board Specs:

Loaded PCB Weight: 12.5 Oz

PCB Size: 9.9 x 7.9 inches

Memory Volatility Statement

Kabtronic Days-Left Clock, Part number KAB-300

This device contains FLASH memory , EEPROM memory, and RAM.

The 128 Bytes of EEPROM are not used, are inaccessible by the user, and remain in the factory cleared state.

The 2Kx14bit (28672bits) of FLASH memory hold the operating code, are programmed by KABtronics, are inaccessible by the users, and remain unchanged in operation.

The 224 Bytes of SRAM are used for program operation, and can hold the time and a 4 digit number, both of which will be set by the user. The SRAM memory is retained through power loss by a hold-up capacitor with an expected date retention time of 1 hour.

Clearing procedure:

Unplug the unit and wait 24 hours to fully deplete the hold-up capacitor. Alternatively, the hold-up capacitor can be shorted and depleted to cause immediate loss of data. A last alternative, if required, is to remove the socketed PIC processor and destroy the IC. (contact KABtronics for replacement)

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