

Installation & Wiring Instructions

TM-365 Timer Module

The TM-365 is a full-functioned 365 day event timer with the following features:

- 16 Individually Programmable Daily Events
- 14 Programmable Holiday Events
- Non-volatile Flash Memory for Timer Events and Holiday Settings
- Automatic Leap Year Adjustment
- Crystal controlled
- 9V Battery Back-Up with Low Battery Detect!
- Liquid Crystal Display (LCD)
- Form "C" Contacts for Latching or Momentary Operation. Rated 10 Amps at 120V AC/28V DC
- Standby Current: 10mA, 50mA with Relay On
- Optional Automatic Daylight Saving Time Adjust
- Supports Latest DST Changes from the Energy Bill of 2005!
 - Extended DST automatically takes effect in 2007 – no programming changes or service calls required!

A. PROGRAMMING SYSTEM DATE AND TIME

POWER UP / DEFAULT SETTINGS

Hint: To delete all programmed timer events, press and hold SW1 and SW3 during power up. The system will erase all events, load factory default settings and enter Program Mode. Program Mode may also be accessed from Run Mode by pressing and holding SW2 for 3 seconds (no events will be erased when using this method).

On power up, the TM-365 will automatically enter Program Mode and you will be prompted to program the system date and time. This is mandatory, as proper operation depends on the timer having the correct date and time.

The user will be prompted with:

01/01/00

← **OK** →

Use the arrow buttons (SW1 and SW3) to decrease or increase the value of the month. Once the correct month is displayed, press OK (SW2) to program the day. Use the arrow buttons (SW1 and SW3) to decrease or increase the value of the day. Once the correct day is displayed, press OK (SW2) to program the year. The TM-365's Real Time Clock supports two digits for the year, giving the TM-365 Timer Module an accurate calendar through the year 2099. Once again, use the arrow buttons (SW1 and SW3) to decrease or increase the value of the year. Once the correct year is displayed, press OK (SW2) to proceed to the time setting.

The user will be prompted with:

00:00:00

← **OK** →

Stealth Labs TM-365 Timer Module

The allowable values for the system time are 00:00 to 23:59. Time is always entered in the 24 hour (military) format.

Use the arrow buttons (SW1 and SW3) to decrease or increase the value of the hour, then press OK (SW2) to program the minutes. Again, use the arrow buttons (SW1 and SW3) to decrease or increase the value of the minutes. It is best to set the time ahead by one minute in order to properly synchronize the seconds. Once the correct minutes are displayed, press OK (SW2). The seconds will freeze at "00" and line two of the LCD will display OK (with no arrows). Use a watch or other accurate timepiece with a seconds display. Press OK (SW2) when the seconds reach "00".

Daylight Saving Time adjustment is fully automatic, if enabled (see next section).

B. ENABLING / DISABLING DAYLIGHT SAVING TIME (DST)

After setting the time, the user will be prompted with:

Set Clk

x OK →

Press the right arrow button (SW3) to select the next menu. The user will be prompted with:

Set DST

x OK →

Press OK (SW2) to enable / disable DST. The user will be prompted with:

DST: OFF DST time changes are not observed

x OK →

or

DST: OLD DST begins on first Sunday of April; ends last Sunday of October

x OK →

or

DST: NEW DST begins on second Sunday of March; ends first Sunday of November*

x OK →

Press the right arrow button (SW3) to select between OFF, OLD and NEW. The default value is "NEW". Once the correct value is selected, press OK to return to the Set DST menu. The user may press "x" (SW1) to exit program mode, or press the right arrow button (SW3) to program other functions.

*NOTE: Since the new DST changes don't take affect until 2007, a setting of **DST: NEW** will still use the old DST algorithms for years less than 2007.

C. PROGRAMMING THE TIMER EVENTS

Timer Events are programmed in Program Mode. If the TM-365 is in Run Mode (date and time displayed), the user must enter Program Mode by pressing and holding SW2 for three seconds.

The user will be prompted with:

Events

x OK →

Press OK (SW2) to select and program Timer Events. The timer has three modes: O = Off, N = Normal and P = Pulsed.

You will see:

Tmr 01 O

x OK →

Press the right arrow button (SW3) to select from Timer 01 through Timer 16. Once the correct timer is selected, press OK (SW2) to select the timer type.

The cursor will highlight the “O” (Off) character. Press the right arrow button to select between Off, Pulsed and Normal. Once the correct timer type has been selected, press OK (SW2).

NORMAL EVENTS

If N is selected, you will see **smtwtfs**. The letters represent the days of the week. A capital letter means the timer is active that day. A small letter means it is inactive that day.

1. Use the right arrow button (SW3) to move the cursor to the day you wish to change and the “^” button (SW1) to change from inactive to active. **Example:** sMTWTfS means the timer is active all days except Sunday and Saturday. **Note:** **The following common settings may be quickly recalled by pressing and holding SW1 for more than 2 seconds:**
 - smtwtf (no days selected)
 - sMTWTfS (weekdays selected)
 - SmtwtfS (weekend days selected)
 - SMTWTfS (all days selected)

These settings may be further modified once SW1 is released.

2. When you are satisfied with your selection, press OK (SW2).

3. You will see:

On 00:00

← OK →

Stealth Labs TM-365 Timer Module

To program the time at which the timer will be activated (relay changes state), use the left and right arrow buttons (SW1 and SW3). The hours are programmed first (0 – 23). Press OK (SW2) to select the minutes. Use the arrow buttons to select the correct minutes (0 – 59). When you are satisfied, press OK (SW2).

4. You will see:

Off00:00

← **OK** →

To program the time at which the timer will be de-activated (relay returns to normal state), use the left and right arrow buttons. As before, program the hours first, then press OK to select the minutes. When you are satisfied, press OK.

5. You will see:

Tmr 02 0

x **OK** →

Repeat the process to program the next timer event until all desired events have been programmed.

PULSED EVENTS

If **P** is selected, you will see **smtwtfs**. The letters represent the days of the week. A capital letter means the timer is active on that day. A small letter means it is inactive that day. Follow steps 1 and 2 above.

3. You will see:

PULSE 00

← **OK** →

To program the duration of the pulse, use the left and right arrow buttons to change the number of seconds. Permitted values are 1–60. When you are satisfied, press OK (SW2). Repeat the process to program the next timer event.

When all required timer events have been programmed, press “x” (SW1) to return to the main program menu. Press the right arrow button (SW3) to select other programming options, or press “x”, then OK to Exit Program Mode and return to Run Mode.

D. PROGRAMMING HOLIDAYS

A holiday is a day on which the relay will not be activated – regardless of timer setting. From the main program menu, press the right arrow button (SW3) until you see:

Holidays

x **OK** →

Press OK (SW2) to select the first holiday. You will see:

Hol.: 01

X 00/00→

Stealth Labs TM-365 Timer Module

Press the right arrow button (SW3) to select from Holiday 01 through 14. Press the middle button (SW2) to proceed to set the holiday month. The cursor will highlight the month digits. Use the left and right arrow buttons (SW1 and SW3) to select the desired month. When you are satisfied, press OK (SW2) to select the day. As before, use the arrow buttons to select the desired day. When you are satisfied, press the middle button (SW2). The next holiday will be displayed. When you have programmed all the desired holidays, press 'x' (SW1) to return to the main program menu.

DELETING HOLIDAYS

To delete a programmed holiday, simply change the month and day to **00/00** using the arrow buttons. When you are satisfied, press OK (SW2) to return to the main program menu.

Press the right arrow button (SW3) to select other programming options, or press "x", then OK to exit Program Mode and return to Run Mode.

E. OVERRIDING THE TIMER

The timer can be overridden by connecting a normally open switch to the terminals marked GND and OV IN. When this switch is closed, the relay will not energize, regardless of programmed events. If the relay is already energized when the switch is closed, it will de-energize.

K1 TOGGLE

The relay state may also be changed by pressing the K1 TOGGLE button. Pressing this button will toggle the relay state (if off, it will turn it on; if on, it will turn it off). The relay will remain in the new state until the next programmed timer event changes it or the K1 TOGGLE switch is pressed again.

F. DISPLAY OPTIONS IN RUN MODE

ALTERNATE DISPLAY MODE

By default, the LCD will display the date on line one (MM/DD/YY) and the time on line two (HH:MM:SS). An alternate display mode may be selected by pressing SW3. In alternate display mode, the time is displayed the same as before, but the date is displayed with a two-letter abbreviation for the day of week, and no year is displayed, i.e., **Mo 08/15** for Monday, August 15.

SAVED / ACTIVE EVENTS

To display the number of programmed events, press SW1. You will see:

**XX Saved
Events**

Where “XX” = the number of programmed timer events.

If the relay is energized (due to an active event), press SW1 to display the event number that is active. You will see:

**Event XX
Active**

Where “XX” = the number of the active event.

Note: The Active Events will also be automatically displayed when a new event is triggered. The Active Events will remain displayed for up to 5 seconds or until the pulse ends, whichever is shorter.

FIRMWARE VERSION

Press SW2 to display the firmware version of the TM-365. You will see:

**TM-365
REV X.XX**

Where “X.XX” = the current firmware version that is programmed in the TM-365 microcontroller. Note: Holding SW2 for greater than 3 seconds will place the TM-365 into Program Mode.

G. BATTERY TEST / LOW BATTERY OUTPUT

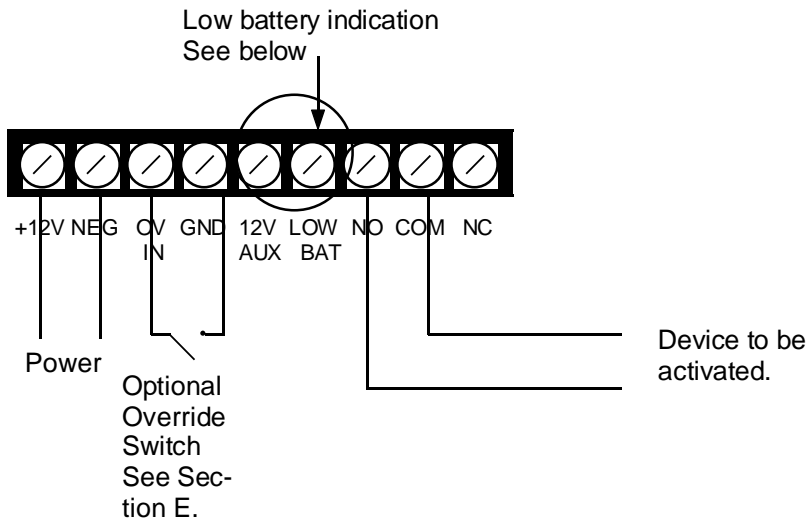
It is very important to keep a good 9V battery installed in the TM-365 Timer Module. The 9V battery allows the Real Time Clock / calendar to retain the correct settings at all times, as well as power the entire timer module for short durations during power failures.

A battery test is performed immediately upon power up of the timer module, and once an hour thereafter. If the battery voltage reads less than 8.2V in standby (12V DC power applied to power terminals), the LCD will display “LOW BATT” on line one of the readout. Also, the open collector output terminal labeled LOW BAT will pull low. The LOW BAT terminal is useful for triggering a warning buzzer, LED, relay or other low current device to alert the user of a low battery condition. The battery should be replaced as soon as possible with a fresh alkaline 9V cell. Note: Once a low battery is detected, a battery test is performed once a minute. Therefore, it may take up to one minute for a new battery to be detected and the low battery condition to be cleared.

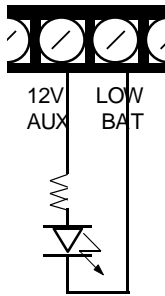
H. EVENT CHART

The chart on the next page may be used to keep a record of the events which are programmed and to check that there is no conflict between events. For example, the relay is programmed to energize at 09:00 and de-energize at 9:30. Clearly, you should not program another event to occur during this period.

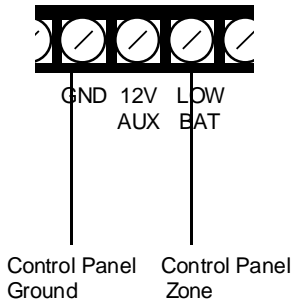
CONNECTION DIAGRAM



Low battery indication output is an open collector.
When battery is low, output drops to ground. Do
not exceed 50mA current draw.



LED indication
of low battery



Low battery output
connected to a
control panel zone.