

iLight series TC-1 Timeclock Programming Guide

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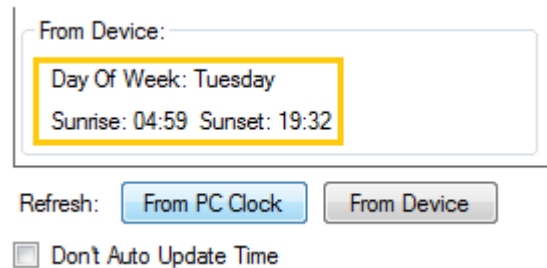
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1. Introduction

A TC-1 Astro Timeclock allows for up to 255 events to be added to an iLight system. Each event is programmed to perform one of the available actions, for example, selecting a scene, starting a sequence, enabling/disabling physical devices. Each event is configured to occur at a specific frequency and time.

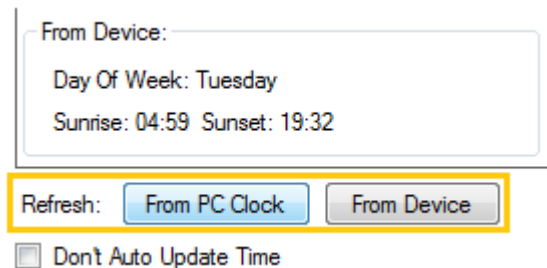
2. Setting the Time and Date

The time and date is visible in the Time/Date tab. Click on the From Device button to retrieve the current date and time setting from the TC-1. The sunrise and sunset time for the current date is also displayed.



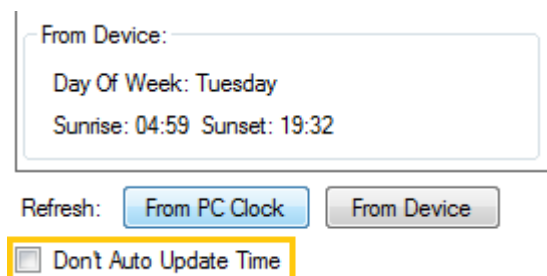
The screenshot shows a web interface for setting the time and date. A box labeled 'From Device:' contains the text 'Day Of Week: Tuesday' and 'Sunrise: 04:59 Sunset: 19:32'. Below this box are two buttons: 'From PC Clock' and 'From Device'. The 'From Device' button is highlighted with a yellow border. Below the buttons is a checkbox labeled 'Don't Auto Update Time' which is currently unchecked.

The time can be manually entered or set using that of the computer by selecting Use PC Time. Whenever date / time is updated make sure to click the Apply button to save this to the TC-1.



The screenshot shows the same web interface as above. The 'From Device' button is now greyed out, and the 'From PC Clock' button is highlighted with a yellow border. The 'Don't Auto Update Time' checkbox remains unchecked.

When manually entering a time, ticking the 'Don't Update Time' box will pause the current time from progressing, allowing you to enter the desired time.



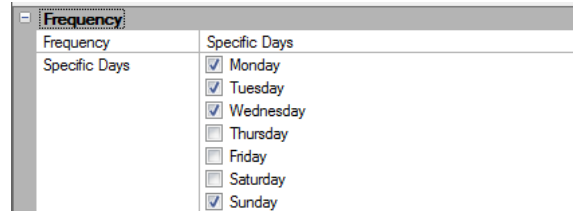
The screenshot shows the same web interface. The 'From Device' button is now highlighted with a yellow border. The 'Don't Auto Update Time' checkbox is now checked and highlighted with a yellow border. The 'From PC Clock' button is greyed out.

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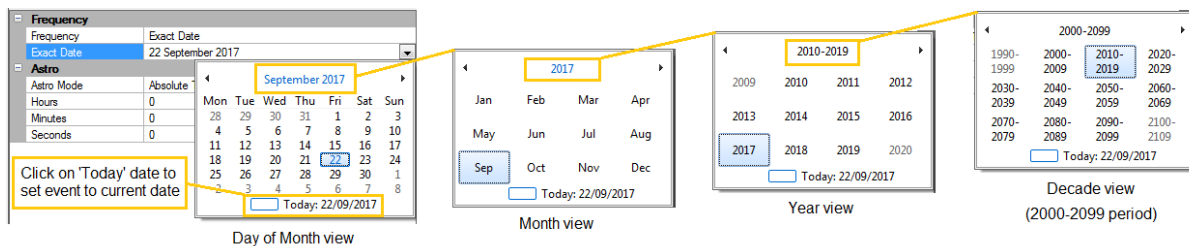
3. Event Frequency Options

Daily – event occurs every day (no exceptions).

Specific days – event occurs only on selected days of the week.



Exact date – event occurs only on a selected calendar date (one-off event)

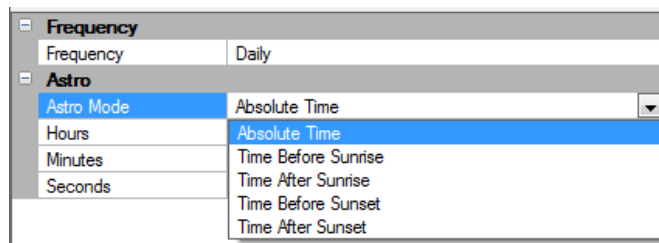


4. Event Timing Options

Absolute Time – event occurs at a specific time, e.g. 14:30:00. Times are input in 24h format (HH:MM:SS).

Astronomic – event occurs relative to pre-calculated sunrise/sunset times:

- Before Sunrise
- After Sunrise
- Before Sunset
- After Sunset



Times delay is input in HH:MM:SS format. For example, to make an event occur half an hour before sunset, choose the option 'Before Sunset'; and set the delay time to 00:30:00.

To make an event occur at the same time as sunrise/sunset, choose from either of the two sunrise/sunset options and set the delay time to 00:00:00.

The maximum delay time for any Astronomic event is 23:59:59 (23hours, 59minutes, and 59 seconds).

Astronomic events track the pre-calculated times for sunrise and sunset. This is determined by an algorithm saved in the TC-1. This means that the actual time that an Astronomic event occurs is adjusted slightly every day as daytime hours increase and decrease during the course of the annual cycle.

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5. Location Options

For the sunrise/sunset times to be correct, it is essential to specify the correct location (by longitude and latitude). To help with setting this up a list of countries are provided, and once selected there are some major cities listed to choose from.

The screenshot shows the 'Location / Time' tab with the 'Select From List' radio button selected. Under 'Pre-Defined Location', the 'Country' dropdown is set to 'UNITED KINGDOM', 'State / Province' is empty, and 'City' is set to 'London'.

If a location is not shown in the list, or if greater accuracy of a location is required, it is also possible to enter the longitude and latitude coordinates manually.

The screenshot shows the 'Location / Time' tab with the 'Manual Coordinates' radio button selected. Under 'Coordinates', the Latitude is set to 51° 31' North and the Longitude is set to 0° 6' West.

6. Daylight Saving Options

Some countries have Daylight Saving Time for a period of the year. This can be set to occur automatically, based on pre-calculated dates, set manually by entering the dates that the changeover will occur, or disabled if this is not applicable to the location.

NOTE: Manual date entry is for the upcoming annual cycle only and will require adjustment for the next year if the dates vary.

7. Using More than 32 Events

In the Events tab, click on the 'Add Events' button to make the next 32 events visible. When a system is utilising more than 32 events it is important to remember to load these additional events next time they need to be programmed as the number of events visible when a TC-1 is loaded is always 32.

The screenshot shows the 'Events' tab with the 'Add Events' button highlighted. Below it is a table of events:

	Time	Action
<input checked="" type="checkbox"/> 1	Mon Tue Wed Thu Fri at 07:00	[A12] Re
<input type="checkbox"/> 2	Mon Tue Wed Thu Fri at 23:00	[A12] Re
<input checked="" type="checkbox"/> 3	Daily at 30m before sunset	[A20] Ex

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8. Reset Message for Astro Events

When using any Astronomic events, it is necessary to add a daily event that sends a reset command to the TC-1. This is a Send CAN Message action to occur daily.

CAN Message

NOTE: All values in hex

CAN ID	03D4
Data Length	4
Data 0	TC-1 Segment ID <i>(in hex)</i>
Data 1	TC-1 Node ID <i>(in hex)</i>
Data 2	34
Data 3	0

The use of this reset message will prevent utilising any of the sequence storage within the TC-1 where pause/resume actions are used. The reset message will place any paused sequences in the TC-1 back to line 0, which means they will start at line 1 on the next resume command. Make sure to write any such sequences in another device elsewhere on the system.

9. Enabling and Disabling Timeclock Events

The tick box on the left side of the event in the list denotes whether this event is enabled (ticked) or disabled (unticked).

	Time	Action
<input checked="" type="checkbox"/>	1 Mon Tue Wed Thu Fri at 07:00	[A12] Reception: [S1] Scene 1 Fade 1m
<input type="checkbox"/>	2 Mon Tue Wed Thu Fri at 23:00	[A12] Reception: [S2] Scene 2 Fade 1m
<input checked="" type="checkbox"/>	3 Daily at 30m before sunset	[A20] External Lighting: [S1] Scene 1 Fade 0
<input checked="" type="checkbox"/>	4 Daily at 30m after sunrise	[A12] Reception: [S0] Off Fade 0
<input type="checkbox"/>	5 Daily at 00:00	No Action
<input type="checkbox"/>	6 Daily at 00:00	No Action
<input type="checkbox"/>	7 Daily at 00:00	No Action

*NOTE: To see the current status of events you must **Reload** the TC-1 into the software, as the tick box is not automatically updated in real-time.*

The action type 'Event Enable/Disable' can be assigned to an event and is useful for some scenarios where the TC-1 needs to self-manage which events are active for certain periods or days of the week.

The 'Count' parameter associated with this action allows for multiple consecutive events to be enabled or disabled without the need to add individual actions. 'Count 0' and 'Count 1' are in fact the same. They include only the event specified in this action. Count 2 will add the next consecutive event (two events included). Count 3 will add the next consecutive event (3 events included, and so on.

To make best use of this option, try to program events that will be enabled/disabled simultaneously to be consecutive in the events list.

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10. Enabling and Disabling Timeclock Events from Other Devices

It is possible to manage which events are enabled ('active') or disabled ('inactive') by using inputs from elsewhere on the system to enable and disable events. For example, a button on a control panel or touchscreen can be used to disable one or multiple events for special occasions, avoiding the normal events from interfering with the setup.

There are two important aspects to remember when introducing this functionality:

1. The Enable Event and Disable Event actions are only able to be carried out by the TC-1 internally. It is not possible to send this command directly from a remote device. Instead, a sequence must be written in the TC-1 containing the Enable/Disable Event actions. This sequence can then be started by any number of remote devices.

Example

```
001 50ms Enable Event 1
002 50ms Stop Sequence 1
003 50ms Disable Event 1
```

2. Visual feedback / flag of some kind must be provided so that the operator is aware of whether the target event(s) are in their Enabled or Disabled state. The best way to do this is by using scene commands in a 'dummy Area'. A dummy Area is defined as one that does not have any association to physical outputs therefore only existing in the system for the purpose of displaying the status of a desired function. Scene commands are used because they generate visual feedback on devices, such as button LED illumination of Control Panels, or button graphic 'highlighting' on touchscreens. Being virtual type messages, they are not directly targeted to any single device which allows for them to flag the status of a function across the system on multiple devices simultaneously.

To make this work for Event control, scene selection messages are added to the enable / disable sequence and one of these scene commands is then programmed to the press action of the Control Panel, or highlight image on a touchscreen. The scene used on the press action will dictate whether the LED is lit for the Enable or Disable state.

```
001 50ms Enable Event 1
002 50ms [A200] Event Status: [S1] Scene 1 Fade 3.0s
003 50ms Stop Sequence 1
004 50ms Disable Event 1
005 50ms [A200] Event Status: [S0] Off Fade 3.0s
```

Examples

Classic' Control Panel – two button control

Event Enable

- Set the Press Action of the button to Select Scene 1 in this dummy Area.
- Set the Release Action to 'Start Sequence 1 @ line 1 in the TC-1'.

Event Disable

- Set the Press Action of the button to Select Scene 0 in this dummy Area.
- Set the Release Action to 'Start Sequence 1 @ line 4 in the TC-1'.

The button depicting the current event enable/disable status will be lit. The other will turn off. This will also be the case if the sequence in the TC-1 has been run by another device.

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Classic' Control Panel – single button control (toggle)

Write the following sequence in the Control Panel:

- A1) Start Sequence 1 (in another device =TC-1) at line 1
 - A2) Pause Sequence
 - A3) Start Sequence 1 (in another device =TC-1) at line 4
- Set the Press Action of the button to Select Scene 1 in this dummy Area.
 - Set the Release Action to Start Sequence 1 @ line 0 in this device.

The button will be lit only when the 'enabled' section of the sequence in the TC-1 has been run. This will also be the case if the sequence in the TC-1 has been run by another device.

TSC30 Touchscreen

The same principle used on a Control Panel applies to the TSC30 touchscreen, only this time the Highlight Action parameter must be set to display a graphic to show status of the event control.

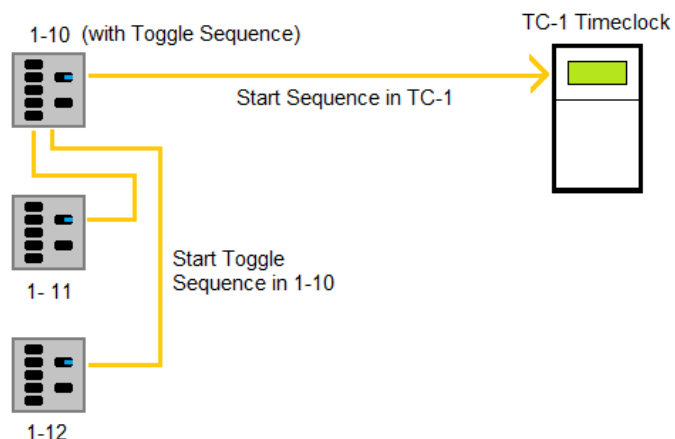
- Set the Highlight Action to 'Use Press Action'.
- Set the Press Action option to Select Scene 1 for the dummy Area so that the button graphic will flag the status (become highlighted).
- Set the Release Action for the designated button as per the Release Actions of the Control Panel example, depending on the operation style (two button or single button toggle).

Smartphone App Configuration

- The Primary Action parameter must be set to Select Scene 1 for the dummy Area so that the button graphic will flag the status (become highlighted).
- Set the Secondary Action for the designated button as per the Release Actions of the Control Panel example, depending on the operation style (two button or single button toggle).

11. Event Enable/Disable Toggle Control from Multiple Devices

When using the toggle control method for enabling /disabling events you should only write one instance of the toggle sequence (see Control Panel – single button control (toggle)). Additional device that need to toggle the event status should have their Start Sequence actions directed to the same sequence location. If you have multiple copies of the toggle sequence around the system all being started by individual device, they will not be synchronised making the flagging on other devices incorrect. Use one toggle sequence and all devices displaying the event status will follow.



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12. Advanced Programming Scenario

Programming a 'no-later than' Action (conditional events)

Consider this scenario: a restaurant with an outdoor seating area want to make sure that the external lighting is turned on 30min before sunset. However, they have an operational requirement that the external lighting will, at any time throughout the year, turn on no later than 8pm. At 9.30pm every day the external lighting is to be turned off for close of business.

- The first clear requirement will be to program an 'astronomical' event that turns the external lighting on 15minutes before sunset, daily.
- The second clear requirement is to program an 'absolute time' event to turn the external lighting off at 9.30pm, daily.

However, in this area of the world it is possible for the sunset time to be as late as 10pm. If we only use the two events above, there will be a period of the year when the external lighting will not turn on until after 8pm (potentially as late as 9:45pm).

Consideration must also be made to the time which the lights turn off. For the majority of the year the lights will turn off at 9.30pm without issue. However, for the period of the year when the sunset time is beyond 9.45pm, the 'lights on 15 minutes before sunset' event will result in the lights to turning after the event to turn them off has already occurred. This would leave the lights on overnight or require manual intervention.

To avoid both issues there needs to be some interaction between events to manage which ones will operate.

A solution is as follows:

- Event 1: Daily at 15 minutes before sunset – Select Scene 'External Lights On'
- Event 2: Daily at 8pm – Start Sequence 1 @ Line 1 in TC-1

Sequence 1

- A1) Select Scene 'External Lights On'
- A2) Event Disable – Event 1 (Count 0)

- Event 3: Daily at 9:30pm – Select Scene 'External Lights Off'
- Event 4: Daily at 11pm – Event Enable – Event 1 (Count 0)

How this works...

Event 1 is set to turn the lights on 15 minutes before sunset.

Event 2 repeats the command to turn the lights on for when Event 1 has not occurred by 8pm. In addition to this action, Event 1 is then disabled so it cannot occur after 8pm. The reason for this is to prevent it turning the lights back on after 9.30pm closure, for that period of the year where sunset is between 9.45pm and 10pm (since Event 1 would occur between 9.30pm and 9.45pm).

Event 3 turns the lights of at 9.30pm.

Event 4 is added to reset the scenario by re-enabling Event 1. This ensures that the timed programs are always active for when there will be no conflict between Event 1 and Event 3.