# Control Programming LLC

Release Notes

# CPLLC Sun Position

Version 5.00 · November 9, 2026

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|---|---|
| **Product** | CPLLC Sun Position (Crestron Home extension) |
| **Version** | 5.00 |
| **Release date** | November 9, 2026 |
| **Where to find it** | Drivers › Date-Time › Control Programming LLC › Sun |
| **Requires** | Crestron Home OS 4.12 or later; no internet access or account needed (the sun is worked out on the processor) |
| **Licensing** | A Sun Position license key (cpllc.net/product/sun-position) or a CPLLC site license key (cpllc.net/product/site-license), entered in the extension's Enter License Key, or a site license key once in the CPLLC License Manager |

## Overview

The CPLLC Sun Position runs Crestron Home events from the sun, so shades, lights and anything else a sequence controls can follow it through the day: at dawn, sunrise, solar noon, sunset and dusk; when the sun climbs above or sinks below an elevation the installer chooses; and when the sun comes onto or goes off a window wall, given as a range of compass directions and the lowest elevation that counts. Close the west shades when the afternoon sun reaches them and open them again when it has gone; raise the east shades once the sun is 10° up. The sun is worked out on the processor from the house's latitude and longitude with NOAA's solar formulas, so no internet connection or account is needed. The tile shows the next event and its time, and its page lists all of today's.

## Capabilities

| Capability | What it does |
|---|---|
| **Sun times** | Dawn, Sunrise, Solar Noon, Sunset and Dusk events every day. Sunrise and Sunset can each run up to 120 minutes earlier or later; Dawn and Dusk can be civil, nautical or astronomical twilight. |

| Capability | What it does |
|---|---|
| **Elevations** | Up to six elevations, each with its own name: an Above event as the sun climbs past it in the morning and a Below event as it sinks past it in the evening. An elevation below the horizon (down to -18°) works too. |
| **Window walls** | Up to eight windows, each with its own name: a Sun On event when the sun comes into its range of compass directions and between its lowest and highest elevations, and a Sun Off event when it leaves the range, sinks below the lowest or climbs above the highest. A range may wrap past north (300° to 30°). |
| **Exact times** | Every event runs at its moment, to the second, from a schedule worked out a minute after each midnight; nothing is polled. |
| **The tile** | The sun by day and the moon by night, with the next event and its time. |
| **Today's page** | Each of today's events with its time, in order. |
| **Sequence actions** | Enable or disable the tile. A disabled tile shows Disabled and runs no events. |
| **Home and room screens** | The tile can be shown in its room, on the Home screen, or both. |
| **Live changes** | Installer options take effect as soon as OK is pressed in Setup, with no reload; debug output turns on and off while the processor runs. |

## What's New in 5.00

- Rebuilt on the Crestron Home SDK V2 and the CPLLC 5.0 shared libraries, replacing Sun Position for Crestron Home OS3.
- Up to eight window walls, each with its own Sun On and Sun Off events, in place of OS3's single Sun in Position event: Window 1 with OS3's Minimum and Maximum Azimuth and Altitude does what Sun in Position did.
- Dawn, Sunrise, Solar Noon, Sunset and Dusk events, with Sunrise and Sunset offsets and civil, nautical or astronomical twilight; Sunrise and Sunset take the place of OS3's Sun is Above Horizon and Sun is Below Horizon.
- Up to six elevations, each with Above and Below events.
- Events run at their exact moment, worked out for the day, instead of when a position update every few minutes (OS3's Minutes between Update) noticed them.
- The tile shows the next event, and its page lists today's.
- Its own license key, or a CPLLC site license key, licenses the extension by itself, so the CPLLC License Manager is no longer required; it is still the convenient place to enter a site license key once for every CPLLC driver.

## Installing

Version 5.00 replaces Sun Position for Crestron Home OS3, which was built on Crestron's original extension SDK: its options and events don't carry over. Add the new version, enter the latitude and longitude, put OS3's azimuth

and altitude range in Window 1, and move the sequences: Sun in Position to the window's Sun On, Sun is Above Horizon to Sunrise and Sun is Below Horizon to Sunset.

Add it from Drivers › Date-Time › Control Programming LLC › Sun, enter its license key (or leave it blank on a site with a CPLLC site license) and the house's latitude and longitude, then fill in an Elevation or Window box for each angle or window wall the shades should follow. Then add sequences to its events under its name in Customize Actions & Events.

A window's directions are compass bearings of the sun as seen from inside, looking out: 90° is east, 180° south, 270° west. A wall facing south-west sees the sun from about 135° to 315°; narrow the range for a window set back under an overhang or shaded by a neighbor, raise the lowest elevation where trees or buildings block a low sun, and set the highest where an overhang or a porch roof shades a high one. Sites such as suncalc.org show the sun's direction and elevation at the house for any time of day.

## Installer Options

| Option | Description |
|---|---|
| **Obtain License Key** | Opens CPLLC.net, where license keys and site licenses can be purchased. |
| **Enter License Key** | The Sun Position license key. Leave blank when the site has a CPLLC site license. |
| **Show on Home Screen** | Shows the tile on the Home screen (default off). |
| **Show in Room Screen** | Shows the tile in its room (default on). |
| **Latitude** | The house's latitude in decimal degrees, north positive, such as 35.970. |
| **Longitude** | The house's longitude in decimal degrees, east positive, so west is negative, such as -85.060. |
| **Dawn and Dusk** | How far below the horizon the sun is at Dawn and Dusk: Civil (6°, the default, light enough to see outside), Nautical (12°) or Astronomical (18°, full dark). |
| **Sunrise Offset** | Minutes to move the Sunrise event, -120 to 120: negative is before sunrise, positive after (default 0). |
| **Sunset Offset** | Minutes to move the Sunset event, -120 to 120: negative is before sunset, positive after (default 0). |
| **Elevation 1 – 6** | name\|degrees: the event name and the elevation in degrees above the horizon, -18 to 90, as the sun is seen (refraction included, as suncalc.org shows it) (e.g. Morning Sun\|10). Each box filled in adds its Above and Below events; a blank one adds none, and so does one that isn't valid. |

| Option | Description |
|---|---|
| **Window 1 – 8** | name\|from\|to\|lowest\|highest: the event name, the compass directions the sun comes on and goes off at (0 to 360, clockwise from north), and the lowest and highest elevations that count, in degrees, blank for 0 and 90 (e.g. West Windows\|200\|340\|5\|45). Each box filled in adds its Sun On and Sun Off events; a blank one adds none, and so does one that isn't valid. |

A latitude or longitude that isn't valid is reported on its option in Setup. An Elevation or Window entry that isn't valid (a missing name, a letter where a number goes, a number out of range, a lowest elevation not below the highest) is not reported: it adds no events, and every other entry works as usual. After pressing OK, check that each entry's events are listed under the Sun in Customize Actions & Events; one that is missing means its entry needs correcting. Sunrise and sunset are when the sun's upper edge crosses the horizon, as the U.S. Naval Observatory and NOAA give them.

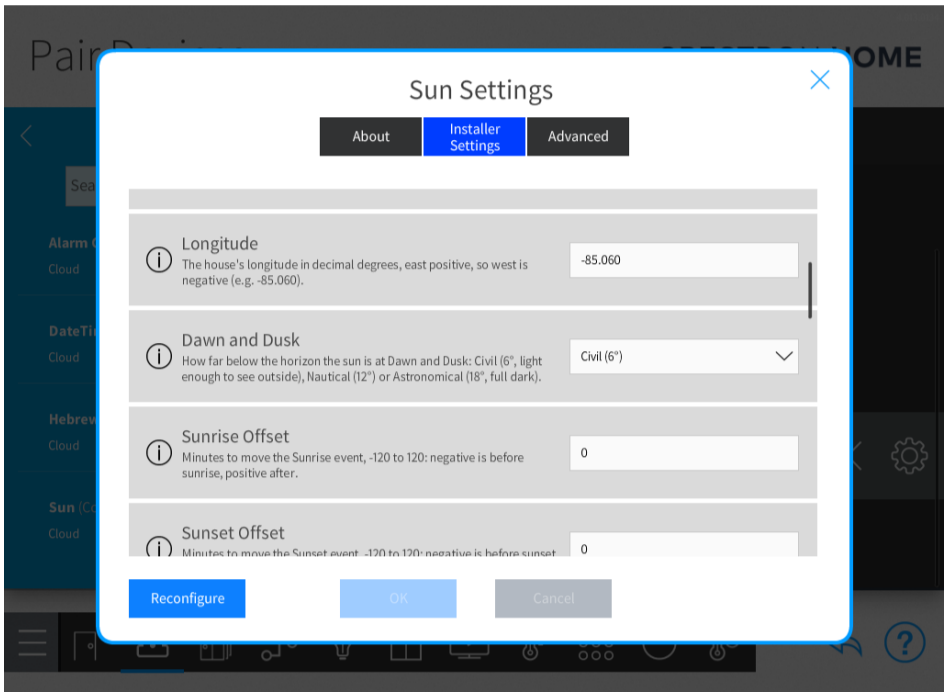
## Setting It Up, Step by Step

The Sun Position does nothing by itself: it raises events, and the sequences put on them in Setup do the work. Setting it up is three parts: tell it where the house is, describe the angles and windows the shades should follow, and put a sequence on each event in use. The example is a house whose west windows get the afternoon glare.

| Step | What to do |
|---|---|
| **1. Add the Sun Position** | Drivers › Date-Time › Control Programming LLC › Sun, into any room, with a name such as Sun (it controls nothing in its room; the room only decides where its tile shows, and its events are found under that room in Setup). |
| **2. Where the house is** | Latitude and Longitude, in decimal degrees: right-click the house in Google Maps and the first line of the menu is latitude, longitude (35.970, -85.060). West of Greenwich the longitude is negative. Check that the processor's time zone is the house's: every event runs on its clock. |
| **3. Dawn, dusk and offsets** | Leave Dawn and Dusk at Civil unless the lights should wait for real darkness. Use Sunrise Offset or Sunset Offset to move those two events: -30 on Sunset closes the shades half an hour before sunset. |
| **4. A window wall** | Window 1: West Windows\|200\|340\|5\|45 (see Finding a Window's Numbers). The box adds West Windows Sun On and West Windows Sun Off. |
| **5. An elevation, if wanted** | Elevation 1: Morning Sun\|10 adds Morning Sun Above (the sun is 10° up, clear of the trees) and Morning Sun Below (it has sunk to 10° in the evening). |
| **6. Check today's page** | Press OK. The tile shows the next event and its time; touch it in the app to see all of today's, with the window's Sun On and Sun Off times. They should match what suncalc.org shows for the house today. |

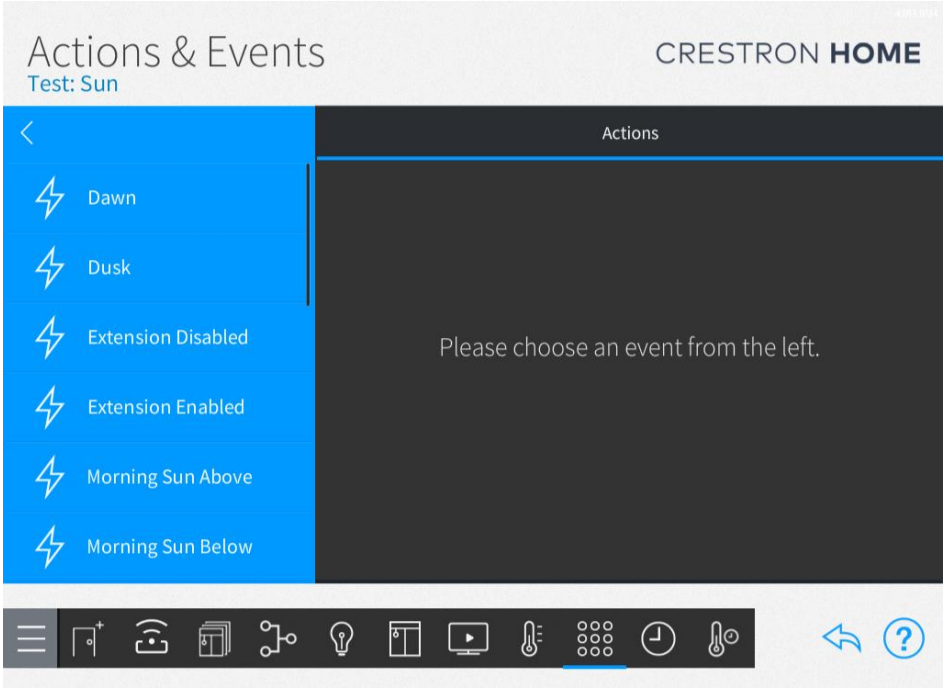
| Step | What to do |
|---|---|
| **7. Put sequences on the events** | Setup › Customize Actions & Events › the room › the Sun (by the name given it in step 1): West Windows Sun On › Mode Sequence › the room › the west shades › Close (or a shade scene). West Windows Sun Off › Mode Sequence › Open. Every Elevation and Window box filled in has its two events here; a box whose events are missing has an entry that isn't valid: correct it in the installer options. |
| **8. Leave it to run** | The events run every day at the day's times, which follow the seasons by themselves. Nothing else needs setting. |

Steps 2 to 5: the installer options, with Dawn and Dusk as a drop-down.



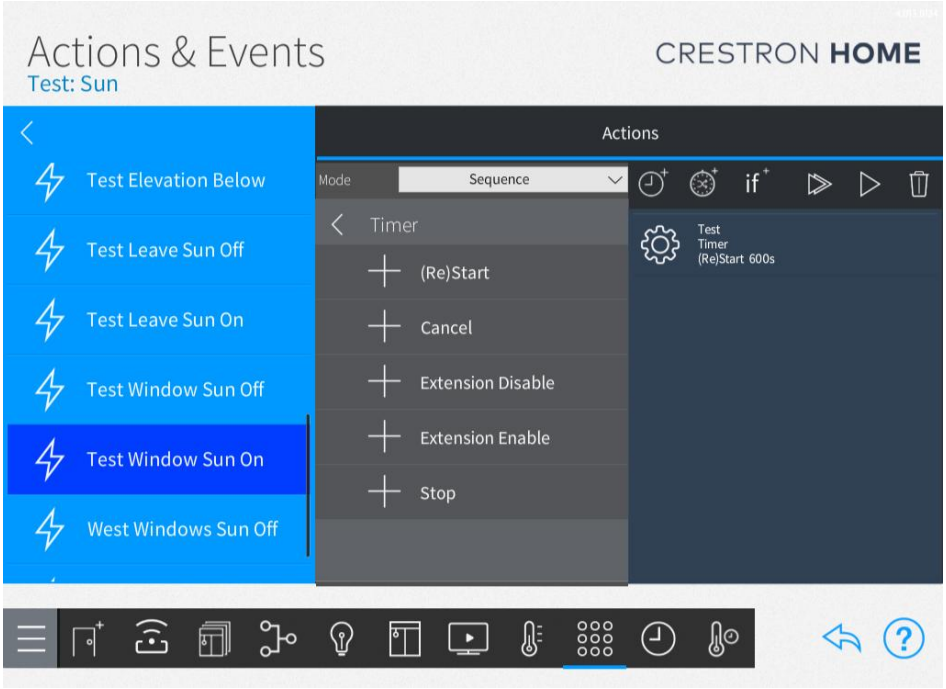

*The Sun Position's installer options*

Step 7: every box filled in adds its own events, under the Sun in Customize Actions & Events.




*The Sun Position's events*

A sequence on one of them: here Test Window Sun On starts a timer; on a real window it closes the shades.




*A sequence on a window's Sun On event*

## Finding a Window's Numbers

A Window box is name|from|to|lowest|highest. From and to are the compass directions of the sun, in degrees clockwise from north (90° east, 180° south, 270° west), between which it shines on the glass; lowest and highest are the elevations above the horizon between which it gets in. Lowest and highest may be left out (0° and 90°).

| Number | How to find it |
|---|---|
| **Which way the wall faces** | Stand at the window looking straight out and read a phone's compass app, or draw a line out from the wall on Google Maps. A west wall faces about 270°. |
| **From and to** | A flat window sees the sun across 90° either side of the way it faces: a west wall from 180° to 360°. Narrow it where the window is set deep or side walls, a wing of the house or a neighbor's house shade it: stand at the window and read the compass toward the furthest point the sun can be seen at on each side. |
| **Lowest** | The elevation the sun has to climb above to clear trees, hills or buildings: 5° to 15° for most houses, more for a tree line close by. Below it the window is shaded, so no Sun On. |
| **Highest** | Where a roof overhang, a porch or an awning starts shading the glass, so a high summer sun gives no glare: 40° to 60° for a deep overhang; leave it out where nothing shades the window. |
| **Checking them** | suncalc.org shows the sun's direction and elevation at the house at any time on any day: set the date and drag the time to the moment the sun hits the glass and the moment it leaves, and read both from it. |

Examples: a south-west patio door under a porch roof, Patio|135|315|0|40; east bedroom windows behind trees, Bedroom East|45|160|12; a skylight, Skylight|0|360|30 (any direction, but only once the sun is high enough to shine down it). A range may wrap past north: a north-west window seen in summer evenings, NW Window|280|20.

## More Ways to Use It

| Situation | Set-up |
|---|---|
| **Afternoon glare on west windows** | Window West|200|340|5|45: Sun On closes the west shades, Sun Off opens them again. |
| **Keep the morning sun out of a bedroom** | Window Bedroom East|45|160|5: Sun On closes the bedroom shades; open them with a scene when the house gets up. |
| **Open the shades once it is light** | Elevation Morning Sun|5: Morning Sun Above opens the living room shades; Sunset closes them. |
| **Outdoor and porch lights** | Dusk turns them on, Dawn turns them off; or Sunset with an offset of 15 for a little later. |

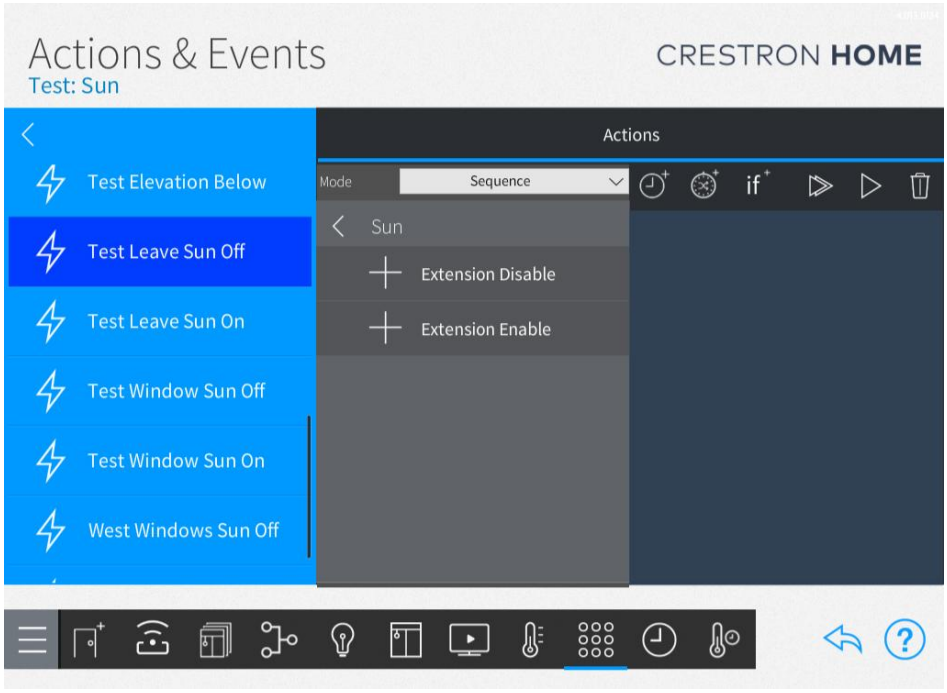
| Situation | Set-up |
|---|---|
| **Privacy at night** | Sunset with an offset of -15 closes the street-side shades before the rooms are lit. |
| **Summer heat** | Solar Noon closes the south shades in the hottest part of the day, and an Elevation Evening\|20 Below opens them again. Put Extension Disable and Extension Enable on scheduled events to use it only from May to September. |
| **Away or a party** | Extension Disable from a scene stops every Sun event while the house wants the shades as they are; Extension Enable puts it back. |
| **Several walls** | One Window box per wall, up to eight, each with its own shades on its own events. |

Each event runs once, at its moment. A shade opened by hand stays open until the next event: the Sun Position doesn't fight the people in the house.

## Sequences

The Sun Position adds these actions to Crestron Home sequences.

| Action | Description |
|---|---|
| **Extension Enable / Extension Disable** | Enables or disables the tile. A disabled tile shows Disabled and runs no events. |




*The Sun Position's actions, in an event's Sequence*

The Sun Position reports these events, under its name in Customize Actions & Events. The elevation and window events are named by the installer: an Elevation box named Morning Sun adds Morning Sun Above and Morning Sun Below.

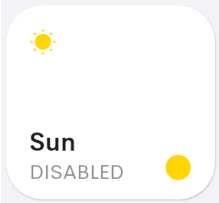
| Event | Description |
|---|---|
| **Dawn** | The sun is 6°, 12° or 18° below the horizon in the morning, as Dawn and Dusk sets. |
| **Sunrise** | Sunrise, moved by the Sunrise Offset. |
| **Solar Noon** | The sun is highest, due south (due north south of the equator). |
| **Sunset** | Sunset, moved by the Sunset Offset. |
| **Dusk** | The sun is 6°, 12° or 18° below the horizon in the evening, as Dawn and Dusk sets. |
| **<Elevation> Above** | The sun climbs past the elevation in the morning. |
| **<Elevation> Below** | The sun sinks past the elevation in the evening. |
| **<Window> Sun On** | The sun comes into the window's range of directions, between its lowest and highest elevations. |
| **<Window> Sun Off** | The sun leaves the window's range of directions, sinks below its lowest elevation or climbs above its highest. |
| **Extension Enabled / Extension Disabled** | The tile was enabled or disabled. |

## End-User Experience

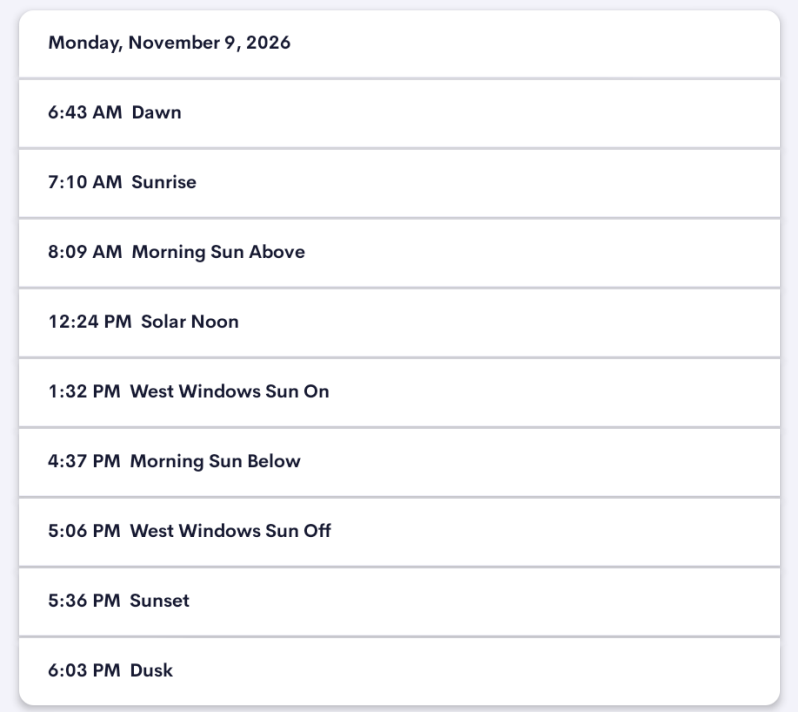
The tile shows a sun by day and a moon by night, with the next event and its time beneath it (Sunset 4:38 PM), and No more events today after the last. Touching it opens today's page, titled with the date, which lists each of today's events with its time, in order.




*Next event*




*Disabled*




*Today's page*

Without a valid license key or a CPLLC site license, the tile runs for a two-hour grace period after it starts; then it shows License Expired with an alert icon, and no events run. Entering a valid key, or adding a site license, clears it without a restart.

## Known Limitations

- An Elevation or Window entry that isn't valid adds no events, with no message in Setup: check that its events are listed in Customize Actions & Events. Setup can't check a box that holds several values, so the extension leaves a bad one out rather than stop the others.
- Events run at the processor's clock, so its time and time zone must be the house's. An event the clock was set past is not run late.
- A day on which the sun never reaches an elevation (a high one in winter, or a low one near the poles) has no Above or Below event for it, and a window the sun never reaches has no Sun On.
- Sun On and Sun Off follow the sun's direction and elevation only: they don't know about clouds, trees or neighboring buildings, beyond what the range and the elevations leave out.
- After the processor restarts or the extension reloads, events run from then on; one that came while it was down is not run late, so a window the sun came onto then has no Sun On until the next day.

## Test Environment

Crestron Home 4.013.0134 on a DIN-AP4-R, set up with Crestron Home Setup and checked in the Crestron Home app 4.13.0 on Android, on November 9, 2026, at the lab's location (35.970, -85.060) with the processor on Eastern time. The day's times matched NOAA's solar calculator to the minute: dawn 6:43 AM, sunrise 7:10 AM, solar noon 12:24 PM, sunset 5:36 PM and dusk 6:03 PM; a West Windows window (200° to 340°, 5° to 45°) came on at 1:32 PM and went off at 5:06 PM. Window and elevation boxes set a few minutes ahead fired to the second and ran their sequences; an event that came while the extension was disabled ran nothing. Changing the options rebuilt the day at once with no reload, and Nautical moved Dawn and Dusk about 31 minutes out. A reload while a window was on raised nothing; the clock set forward past the day's events skipped them, the day rolled over at 12:01 AM, and the clock set back rebuilt the day. Version 5.00.014 was then checked the same way: an elevation fires as the sun is seen at it, as NOAA gives it (Morning Sun, 10°, at 8:09:20 AM and 4:38:20 PM), and a Window entry that wasn't valid added no events while every other entry ran, after a reload as well.

## Version History

| Date | Version | Changes |
|---|---|---|
| 2026-11-09 | 5.00 | Initial release |
| 2023-04-18 | 2.00 | Sun Position for Crestron Home OS3: one azimuth and altitude range (Sun in Position), Sun is Above / Below Horizon |

## Support

> **CPLLC Site License**
> A CPLLC site license is one key per processor, entered in the License Manager, that licenses every CPLLC extension and platform on that processor, current and future, so no product needs a key of its own. See the Site License page. Customers who already own CPLLC license keys can upgrade to a site license on the CPLLC website for the difference.

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|---|---|
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| **Product page** | https://cpllc.net/product/sun-position/ |

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