

# SolarMonitor

## Windows, Linux & Mac

V 01.02.05



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## Introduction

SolarMonitor is an application interfacing a home-made, or commercially available Airylab, Solar Scintillation Seeing Monitor<sup>i</sup> It allows to monitor Solar seeing conditions in real-time on Windows, Linux or Mac computers. The app can be used stand-alone or together with at plug-in for FireCapture<sup>ii</sup> capturing software. Capturing can be configured in such a way, that only images are saved when seeing is good. (Highly reducing the volume of the capture file, and also reducing post-processing time)

The software is “freeware” and licensed under the GNU General Public License v3.0<sup>1</sup> and can be downloaded from <https://github.com/paul-db/SolarMonitor/releases>

Source code is available<sup>iii</sup> for compilation on other platforms.

The program comes completely **without** warranty.

## Installation

Download the relevant installation file for your platform:

Windows 10: `win-SolarMonitor.zip`

Linux: `Linux-SolarMonitor.tar.gz`

Mac: `Mac-SolarMonitor.zip`

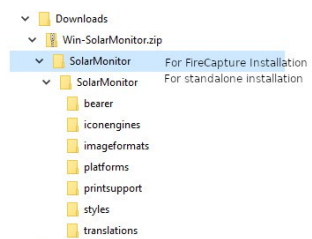
### Win10 Installation

Open the downloaded zip file by double clicking on it.

**FireCapture plug-in:** drag the first SolarMonitor folder in FireCapture plug-in location:

64bit FireCapture: **Firecapture Install Dir**\plugins\x64

32bit FireCapture: **Firecapture Install Dir**\plugins\x86



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<sup>1</sup> GNU General Public License v3.0

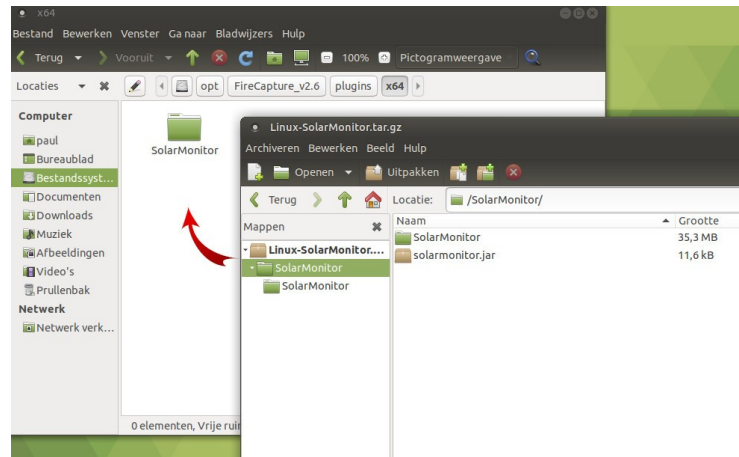
Permissions of this strong copyleft license are conditioned on making available complete source code of licensed works and modifications, which include larger works using a licensed work, under the same license. Copyright and license notices must be preserved. Contributors provide an express grant of patent rights. ([Full License](#))

**Stand-alone:** drag the second SolarMonitor folder to where you want to install it on your local disc. (e.g.: C:\Program Files\ or your users home folder)

## Linux Installation

Open the downloaded tar.gz file by double clicking on it.

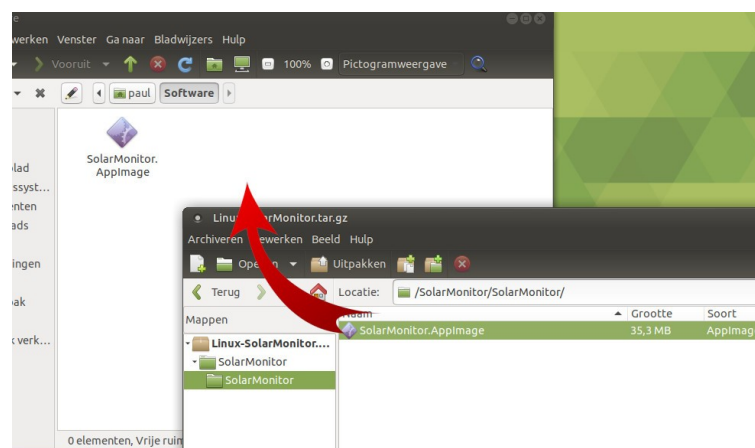
**FireCapture plug-in:** drag the first SolarMonitor folder in FireCapture plug-in location:



Normal FireCapture installation path is `/opt/FireCapture_v2.6`

The Solar monitor folder must be copied to the `plugins/x64` subfolder.

**Stand-alone:** from the second SolarMonitor folder drag the SolarMonitor.Appimage file to a folder where you want to install the app on your system.



If needed, make the SolarMonitor.Appimage file executable.

From a terminal window: change (cd) to the folder where you copied the SolarMonitor.Appimage file and issue the following command:

```
chmod 550 SolarMonitor.Appimage
```

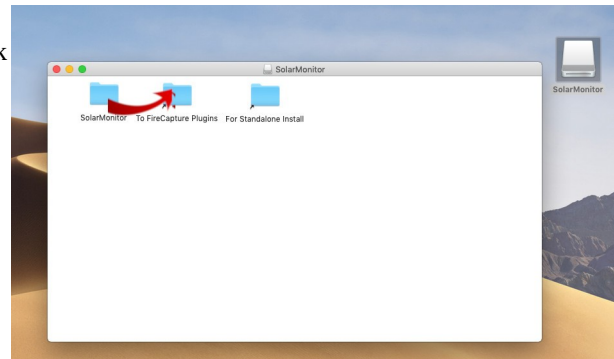
## Mac Installation

Open the downloaded zip file by double clicking on it and click on the SolarMonitor.dmg file to mount it.

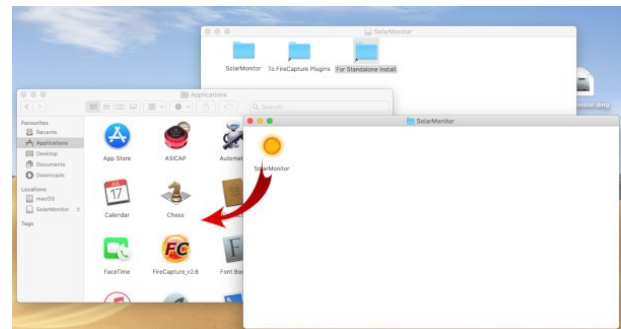
Open the newly mounted SolarMonitor file which will show a folder window containing 3 items:

- Link to the FireCapture plugin folders
- Link to the SolarMonitor App
- The SolarMonitor Folder

FireCapture plug-in: Drop the SolarMonitor Folder on the To FireCapture Plugins folder.



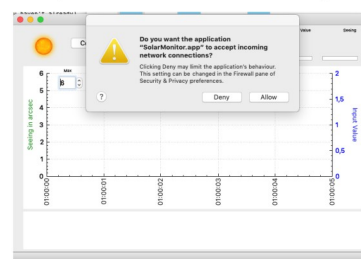
**Stand-alone:** for a stand-alone installation, open the *For Standalone Install* folder, then drag the **SolarMonitor** Icon to the *Applications* folder.



## General installation remarks



1. SolarMonitor connection works as a TCP server.  
When first running the program a firewall warning might be shown, asking to allow incoming connections. Connection **should be allowed** for the program to work correctly.
2. On **Windows** you might get a warning that you are trying to run a program from an unknown publisher. Well ... you have to trust it (and me) or not use it.
3. On **Mac** systems: same as for FireCapture is true. You need to allow to run apps from anywhere in GateKeeper. On how to see <http://osxdaily.com/2016/09/27/allow-apps-from-anywhere-macos-gatekeeper/>  
(sudo spctl --master-disable)

This is **freeware**, hopefully useful to someone, but I am not paying \$99/year for an Apple developer ID.



# Program Usage

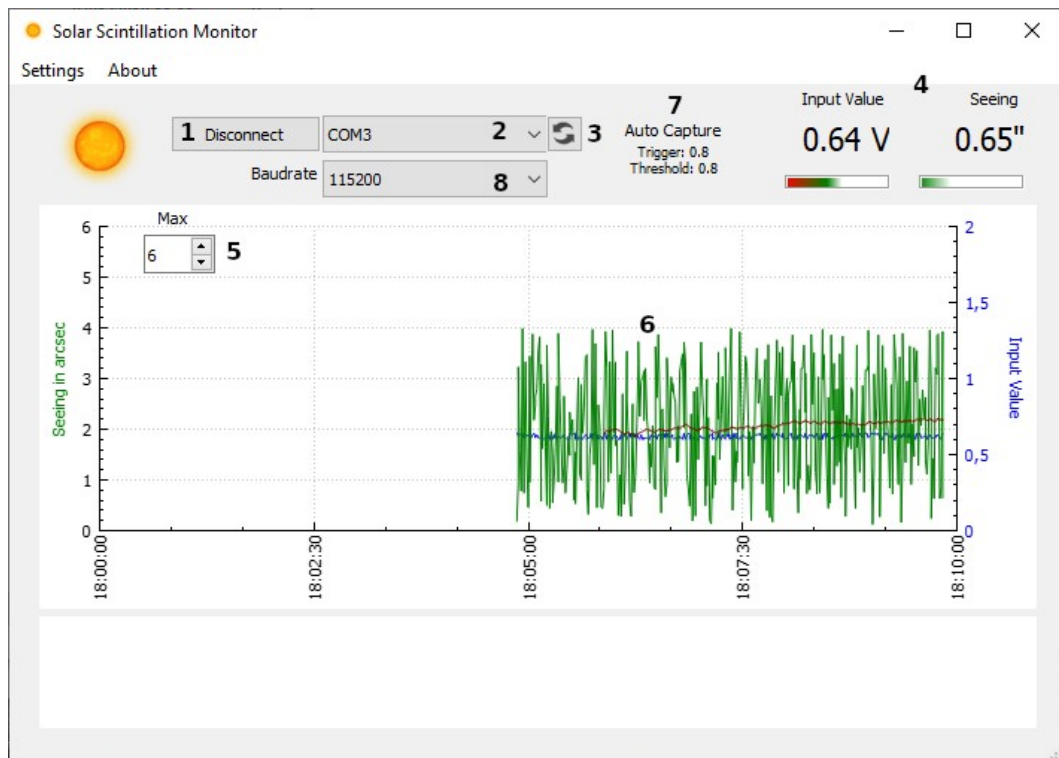
## Stand-alone usage

Start the program by double clicking on the  or  icon. This will be found in the folder where you installed SolarMonitor.

If you installed it as a FireCapture plugin, you can still run it as a stand-alone program.

Located in **<FireCapture\_Folder>/plugins/x64/solarmonitor/solarmonitor**.

(On the Mac you will need to use “Show PackageContents” to see FireCapture folder structure.)



1. Connects or Disconnects from the selected device
2. Contains a drop-down list of available devices on the system. Make sure you select the correct *comport/tty-device*. For testing purposes there is a *simulator* device which generates random input- and seeing values.
3. Input value and seeing value indicator. The *Solar Scintillation Seeing Device* should be tuned so that input value is between 0.5 and 1.0 – When levels are acceptable to bar indicators will show green, growing to red for non-acceptable values.
4. Graphic scale change. Seeing scale can be adjusted for max values from 4 to 10.
5. Graphic area showing the measured samples from the connected device.  
**Green:** seeing value (left scale)  
**Blue:** input value (right scale)  
**Red:** seeing 1 minute moving average

6. Trigger indicators for the FireCapture plug-in. These can be changed from the settings option
7. Baud Rate of the serial port connecting to the *Solar Scintillation Seeing Device*.

The horizontal time scale is your computer's local time.

## Integration with FireCapture

The screenshots show the FireCapture v2.6.08 software interface. The top screenshot shows the 'PreProcessing & Plugins' window with a table of filters and plugins. The bottom screenshot shows the same window with the 'SolarMonitor v-1.6' plugin selected and highlighted in yellow. Red arrows and numbers 1, 2, and 3 indicate the steps to select the plugin and connect it.

ON / OFF	Visible	Filter / Plugin	Description
<input checked="" type="checkbox"/>		Contrast	This prefilter will apply a contrast function for each frame. ...
<input checked="" type="checkbox"/>		Live-Stacking	Stack frames before capture Using this filter you can live-st...
<input checked="" type="checkbox"/>		Average	Average frames before capture With this filter you can aver...
<input checked="" type="checkbox"/>		Mosaic-Helper	Helper for taking lunar mosaics It will overlay the last captu...
<input checked="" type="checkbox"/>		Color-Saturation	This prefilter will apply a color saturation function to each fr...
<input checked="" type="checkbox"/>		Bright Object	Capture objects exceeding a pre-defined brightness level ...
<input checked="" type="checkbox"/>		Moving Object (daytime)	Capture moving objects only (daytime-mode) This filter is i...
<input checked="" type="checkbox"/>		Moving Object (night)	Capture moving objects only (night-mode) This filter works...
<input checked="" type="checkbox"/>		Planetary mask	Apply different sort of masks and zero out all pixels values ...
<input checked="" type="checkbox"/>		SolarMonitor v-1.6	Solar Seeing Monitor

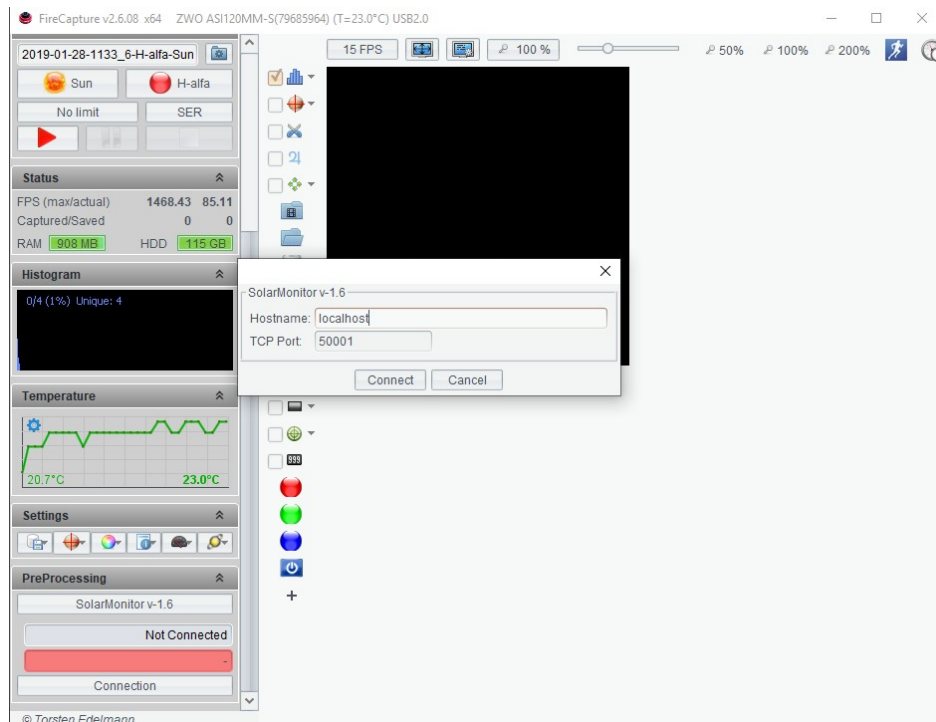
1. Select the 'PreProcessing' dropdown menu.

2. Select the 'SolarMonitor v-1.6' plugin.

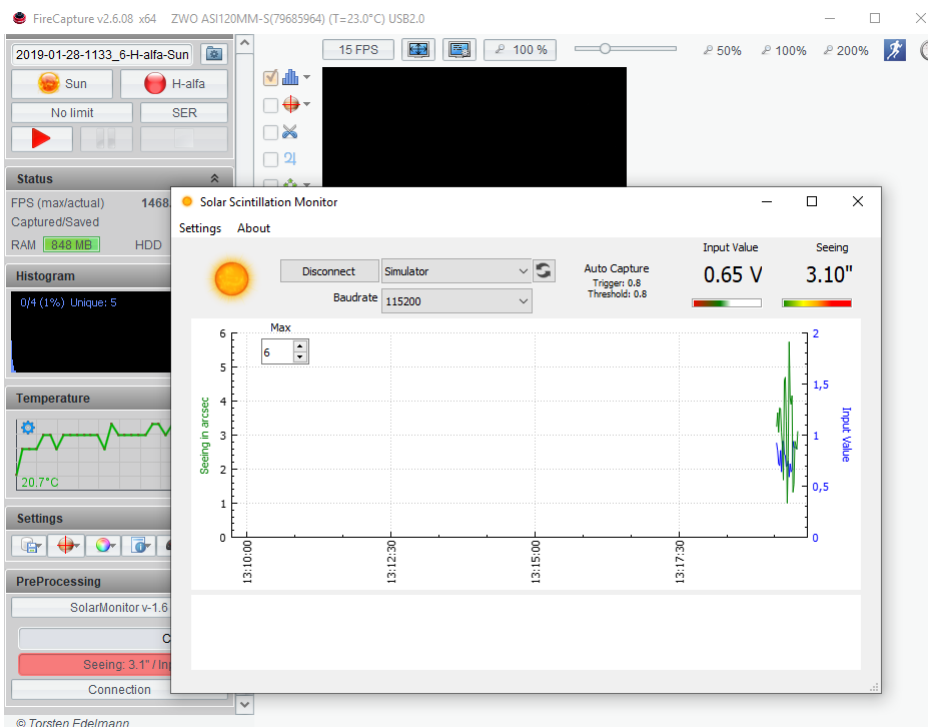
3. Click the 'Connection' button.

Start FireCapture and enable the plug-in clicking on the current preprocessor (1) and change the plug-in to the “ON” state (2)

Then configure and start the plunging by pressing the “Connection” Button”

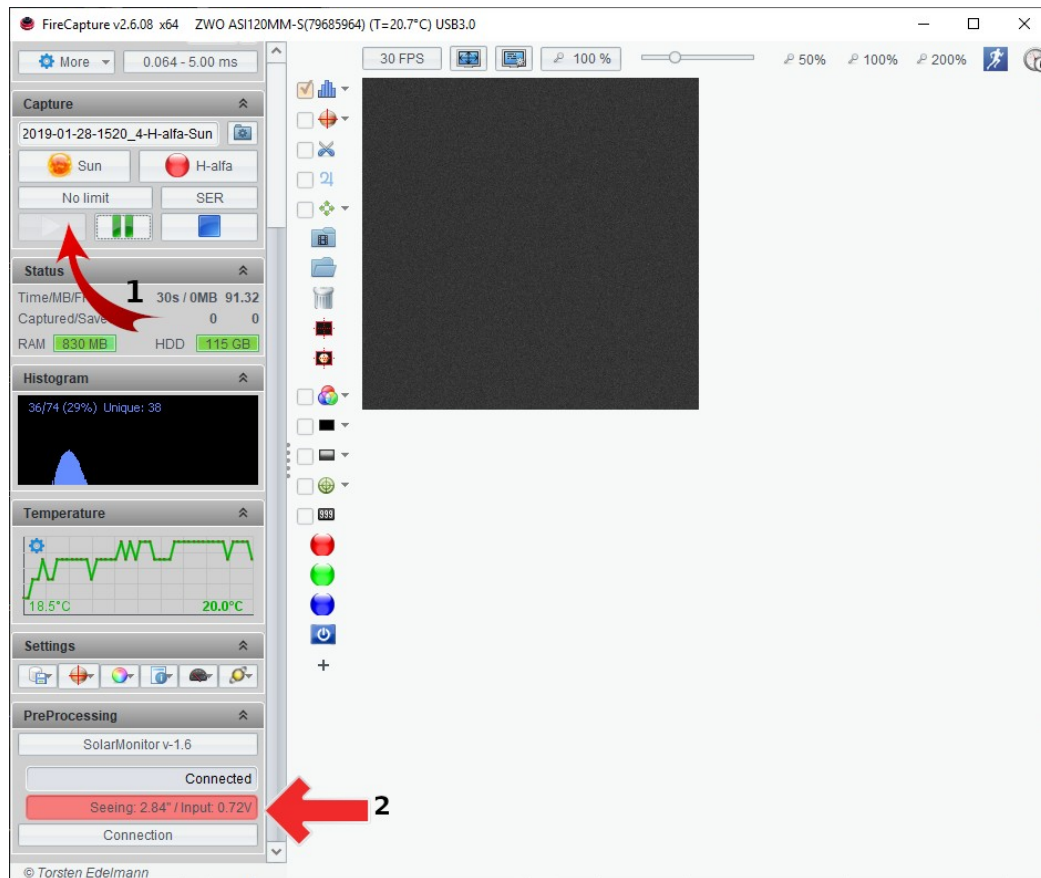


If needed (but not advised) change the hostname and TCP port. SolarMonitor runs as a tcp server, and can be run on a different computer. In that case change hostname to the computer’s hostname or IP address. If SolarMonitor was configured to run on a different TCP port, then that should be configured here to the same port number. In normal situations, no changes are required here.

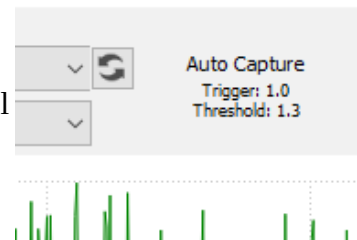


You are now ready to start capturing.

Start the recording with the “*Start Recording*” button in FireCapture (1)



Recording will be started, but no images are saved in the capture file, when seeing conditions (2) are outside the AutoCapture settings in SolarMonitor. When seeing gets better than the trigger value, images will be released until seeing gets worse than threshold value. When images are released, the plug-in status window will turn green. Both numbers can be configured in the SolarMonitor program in the settings menu.

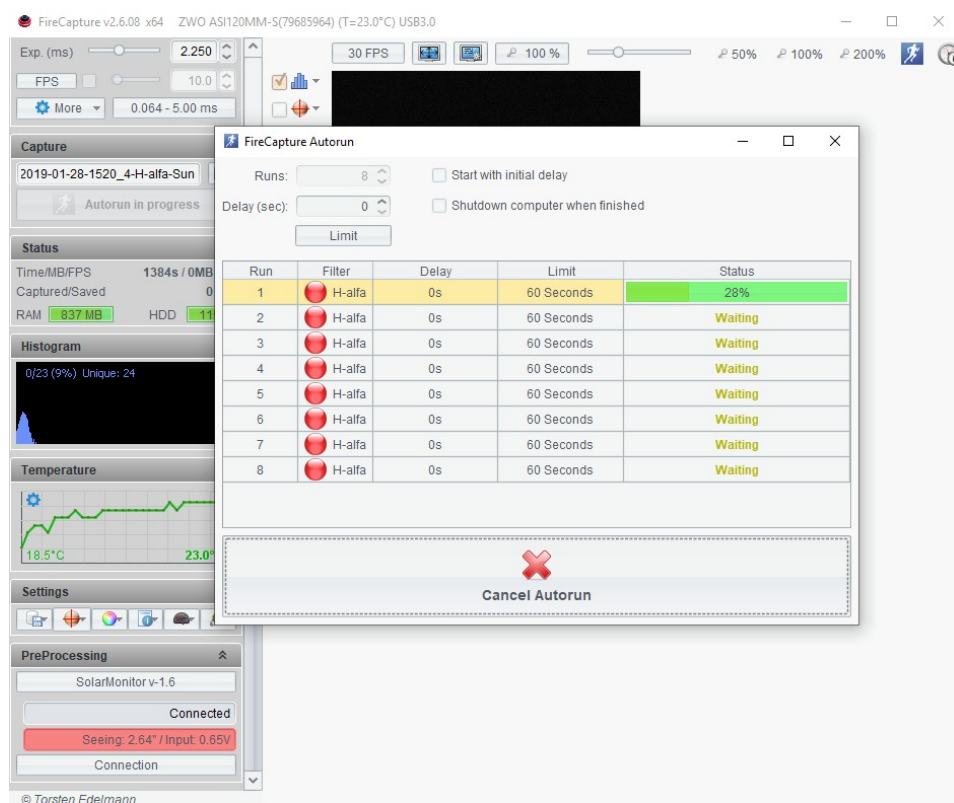


The recording file will be saved when FireCapture recording is stopped by using the “*Stop Recording*” button, or limit (time or frames) has been reached.

For multiple captures, the FireCapture “*Autorun*” feature can be used.









- i See <https://www.ecu.edu/cs-cas/physics/upload/An-Inexpensive-Solar-Scintillation-Seeing-Monitor-Circuit-with-Arduino-Interface-final2.pdf> for more information on building your own device. Commercial models are available from AiryLab <https://airylab.com/category/solar-telescopes/ssm/>
- ii FireCapture (astro image capture software) by Torsten Edelmann is available at <http://www.firecapture.de/>
- iii Source code is on GitHub at <https://github.com/paul-db/SolarMonitor>