

STARS4ALL

STARS4ALL FOUNDATION

TESS-W maintenance notes

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1. Introduction

The TESS-W photometer is designed to be monitoring the sky brightness. The enclosure should resist the outdoor conditions and to prevent the water to enter inside. The clear glass window of TESS-W is glued to the TESS-W plastic box and assures that the enclosure is water-tight to protect the electronics. The original design is a plastic box with a glass window on top. The light enters through the window that point to the vertical, i.e. the zenith. There is another small window that belongs to the infrared sensor that measures sky temperature to estimate cloudiness.

2. Detected problems

a. Detached glass window problem

Some TESS-W photometers have lost their glass window. At this time, we know that part of the problem is due to thermal expansion of the plastic box, and mainly to the glue used for the first units. After losing the window, the water comes inside the enclosure and the electronics is spoiled.

b. Cracked plastic enclosure

An additional problem detected recently was the difference in the plastic box quality. Although the boxes were ordered to the same producer, some of the boxes have 2mm thick tops while the first ones were 3 mm thick. The plastic quality seems also to be different from different batches.

Unfortunately, this faulty can only be detected after outdoor exposure during some time. While the first TESS-W units (including the prototypes) have been resisting the weather for 6 years, other photometers show defects in the enclosure after a time. Some photometers as stars273 are showing a crack on the box top from the window to the IR sensor.



Figure 1. TESS-W stars273 in Malta showing a significant crack on the box top and loss of the window.

3. Maintenance

We are working to improve the enclosure for new TESS-W photometers with a more reliable plastic box and aluminum boxes for very hard weather conditions.

In the meantime, for those photometers that are sending data at this moment we recommend the users these actions to mitigate the reported problems

- a) Visually inspection of your photometer.
In case that some defects are detected, please send us a picture.
- b) Strengthen the cover of the boxes of these photometers by adding an aluminum foil sheet (read below).
- c) Clean the IR sensor.
This sensor has no glass window and the rain is not enough to clean the entrance.

Protection with aluminum tape.

An easy and strong protection for already installed photometers which are in good condition is an adhesive aluminum tape of 75 mm width. It is easier to find adhesive aluminum tape of 50 mm width. You can also use it. It is important not to cover the entire box. The aluminum should not cover the bottom of the box to allow the wifi connection. We expect some loss of wifi signal. The next images show the system in different steps of setting in place. Please ask us for a precut tape if you need it.

The circular opening for the window should be larger than the light entrance and partially cover the glass window to extra fastening of the glass window.

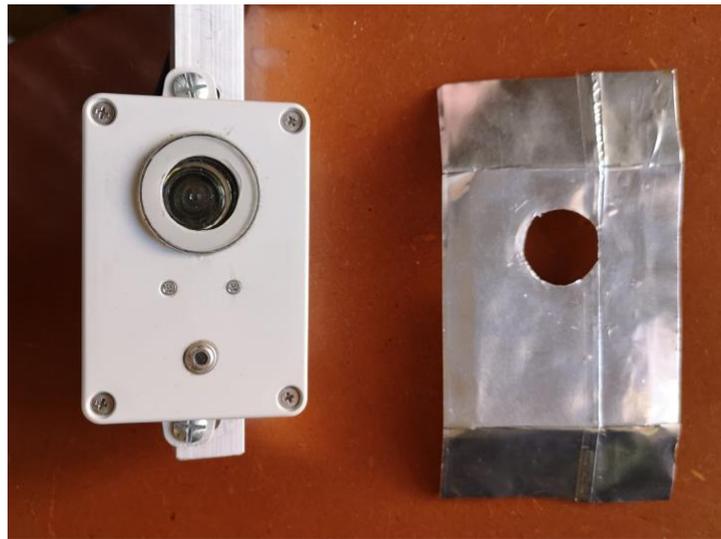


Figure 2. TESS-W photometer and the aluminum tape before placing on top of the cover.



Figure 3. Different steps of the process and final result.



Figure 4. More pictures of the process.