



# MECHANICAL INTERFACE CONTROL DOCUMENT

SAGITTA STAR TRACKER

## Release information

	Name	Function	Signature	Date
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**Version Control**

Version	Author	Date	Change Log	Sections
1.0	T. Delabie	8/06/2020	Initial version	All
1.1	T. Delabie	1/03/2021	Split up ICD in parts	All
1.2	T. Delabie	18/04/2021	Added information on threaded holes	Mounting

**Applicable Documents**

ID	Document Title	Document Reference	Version
AD01			

**Reference Documents**

ID	Document Title	Document Reference	Version
RD01	Star Tracker CAD	SST_ARC_ENG_0006	1.0





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# 1 Introduction

This document describes the mechanical interfaces of the arcsec star tracker. The arcsec star tracker is a high accuracy, compact star tracker that fits within CubeSat dimensions, but is also suitable for larger satellites. It delivers arc-second range pointing knowledge with a minimal strain on the power, volume and mass budget.



Figure 1 arcsec Star Tracker

Figure 2 shows the star tracker reference frame.

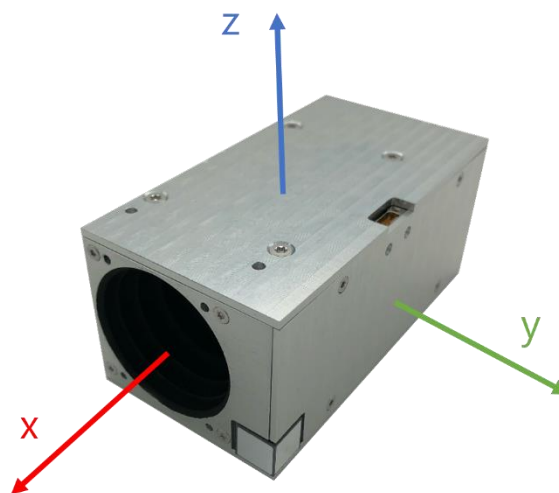


Figure 2 Star tracker reference frame





## 2 Mechanical Design

A STEP file of the star tracker is given in [RD1].

The outer dimensions of the star tracker are 44x50x95 mm<sup>3</sup>. This includes a baffle that gives the star tracker a sun exclusion half cone angle of 40 deg. The mass of the star tracker is 270g.

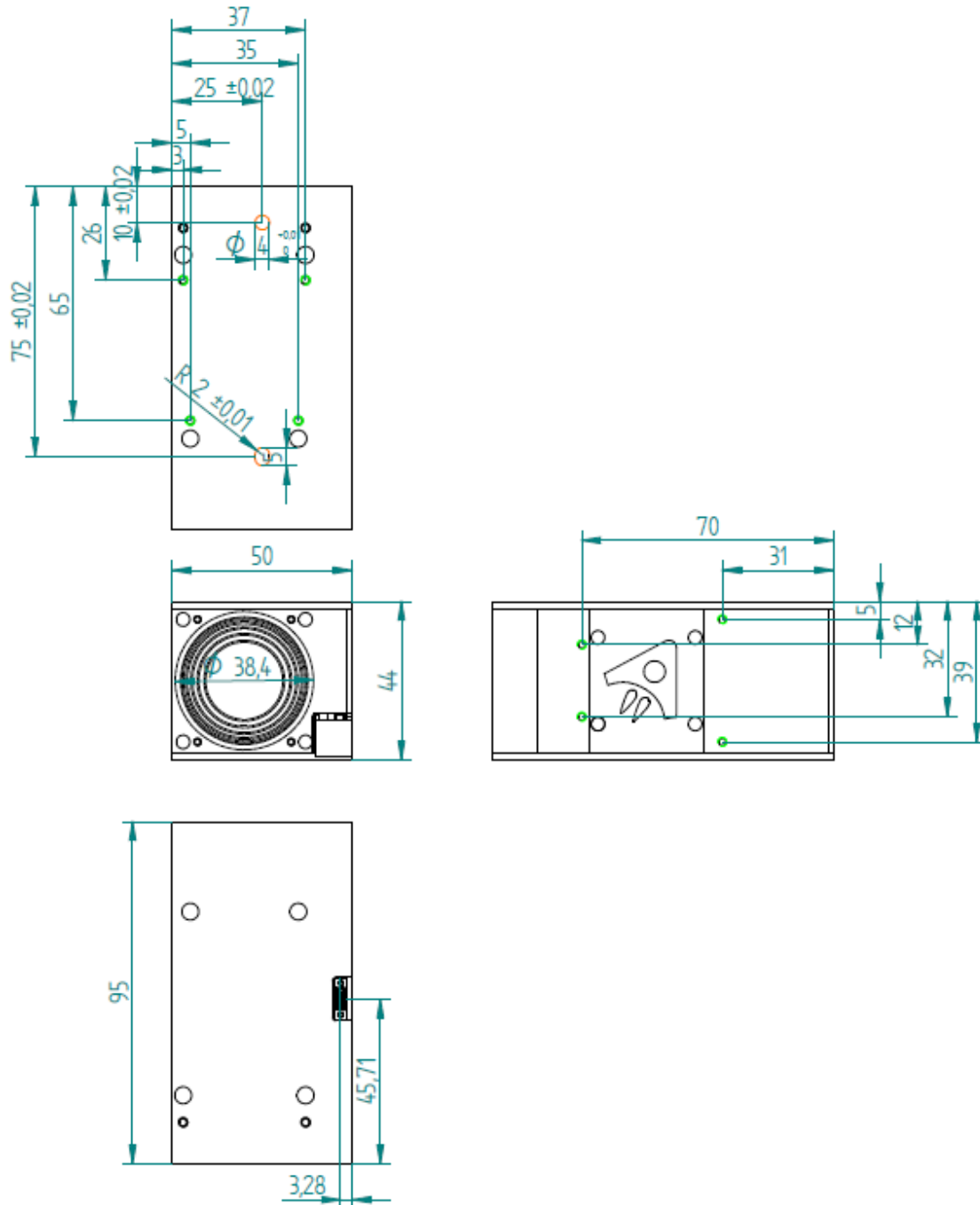


Figure 3 Star Tracker Technical Drawing





## 3 Mounting

The star tracker can be mounted in three different ways, the recommended mounting is **Bottom Mounting**. With this mounting option, there are two alignment holes (shown in orange in Figure 3) that can be used to align the star tracker with two alignment pins on the spacecraft platform.

### 3.1.1 Bottom Mounting

The recommended mounting of the star tracker is Bottom Mounting. The star tracker is mounted on a structure in the spacecraft using the four screw holes highlighted in blue in Figure 4 and shown in green at the top of Figure 3. The advantage of this mounting method is that two alignment holes are included (highlighted in green in Figure 4 and in orange in Figure 3), which can optionally interface with alignment pins on the spacecraft structure to reduce variation in mounting.

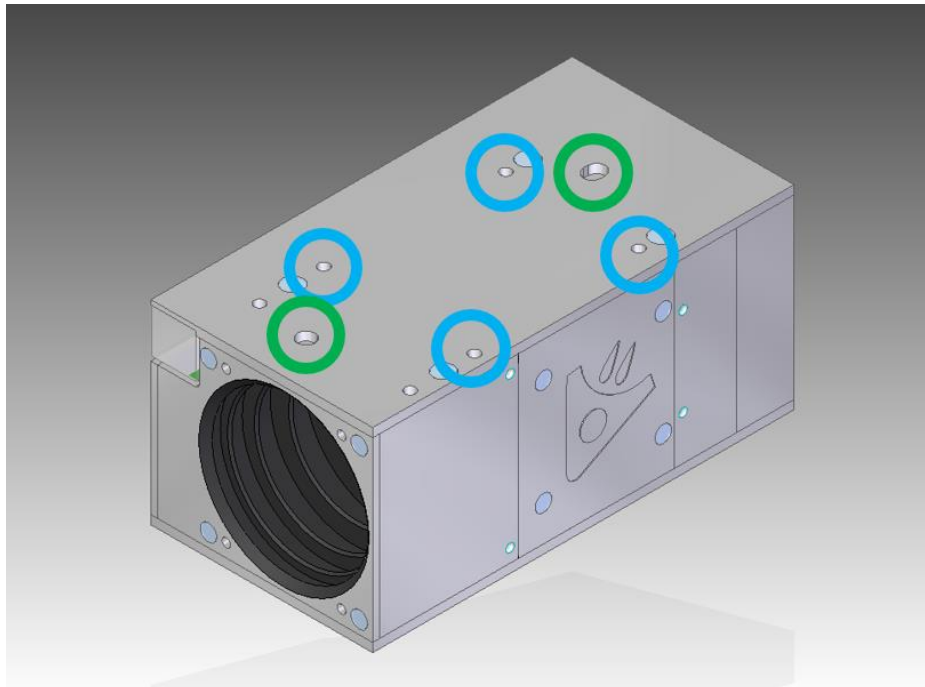
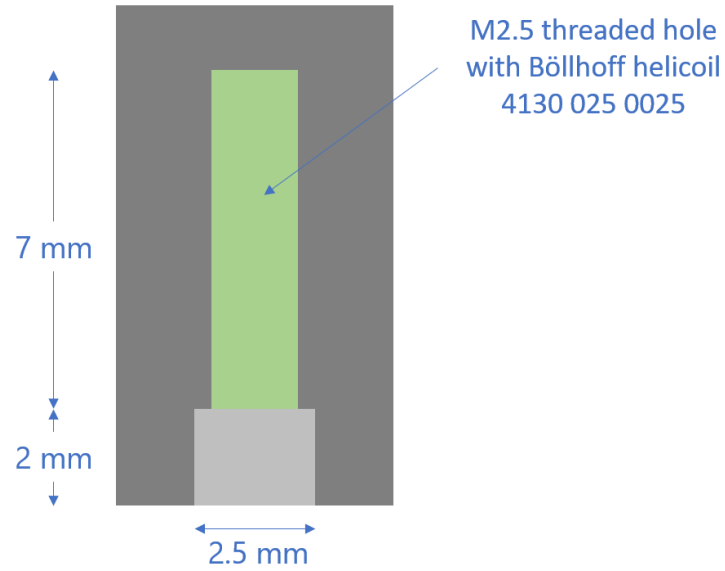


Figure 4 Bottom Mounting

The four screw holes are M2.5 with depth of 7mm and have Bölhoff 4130 025 0025 helicoils placed in them. Before the threaded hole starts, there is a 2 mm thick plate that the screw passes through without thread as shown in Figure 5.

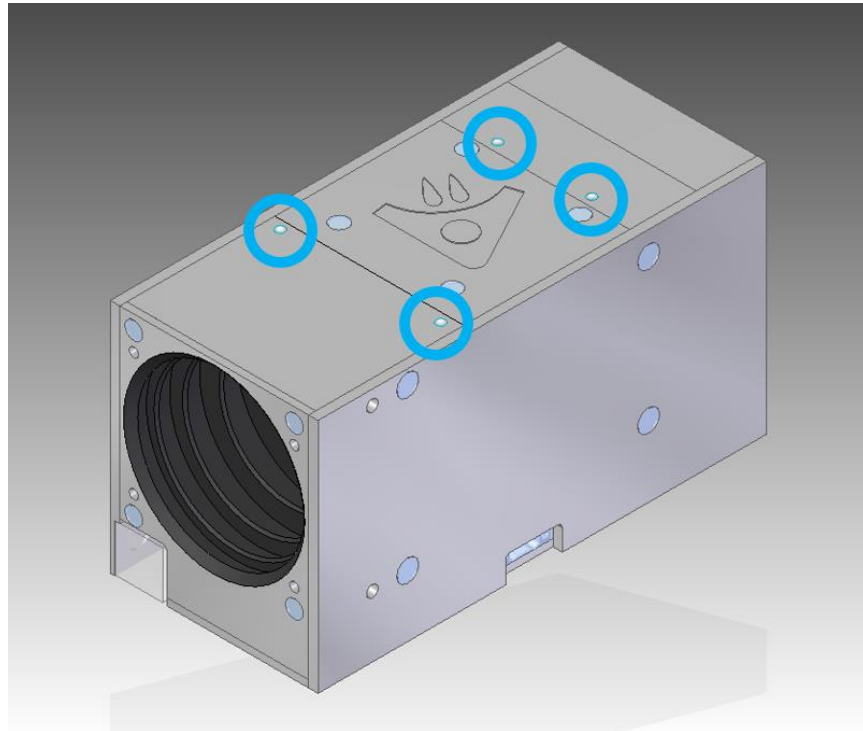




**Figure 5 Threaded hole bottom mounting**

### 3.1.2 Side Mounting

An alternative possibility (See Figure 6) is to mount the star tracker with 4 M2.5x8 Countersunk screws on the side. The location of these screw holes is shown in Figure 3 on the right side view.

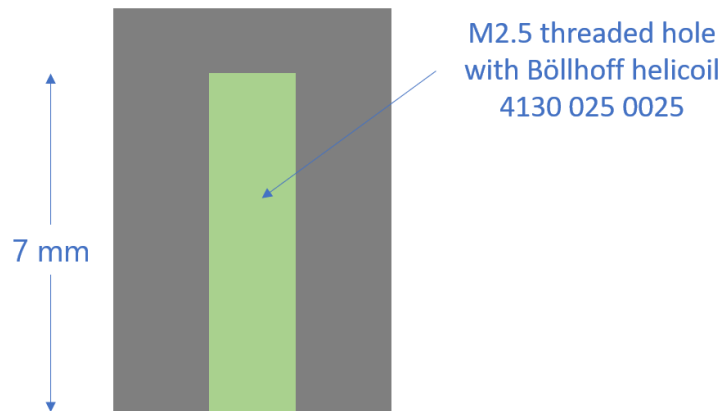


**Figure 6 Side Mounting**





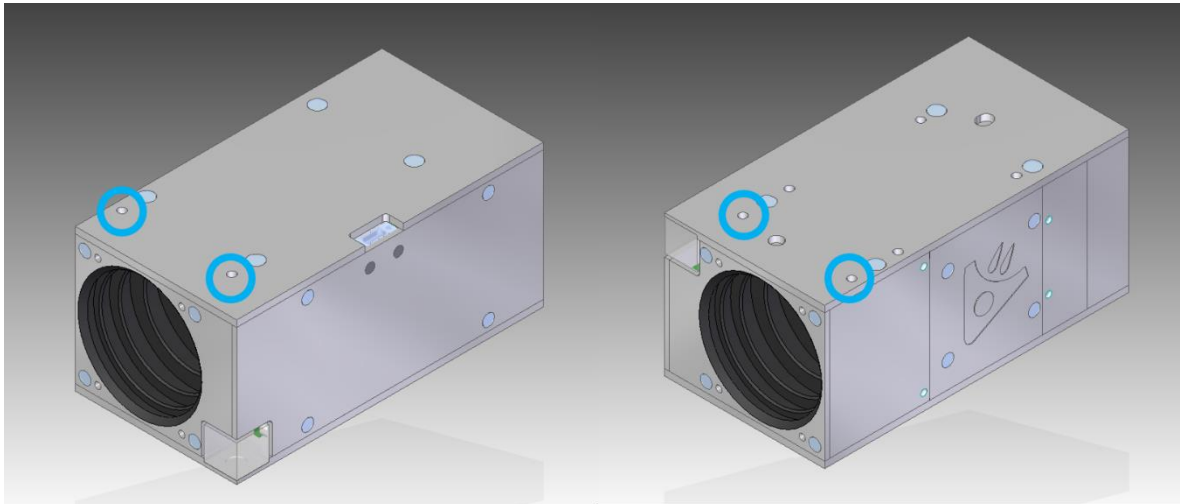
The four screw holes are M2.5 with depth of 7mm and have Böllhoff 4130 025 0025 helicoils placed in them as shown in Figure 7.



**Figure 7 Threaded hole side mounting**

### 3.1.3 Front Mounting

Finally, the star tracker can be mounted using 2 M2.5x8 Countersunk screws in the front of the Top Plate and 2 M2.5x8 Countersunk screws in the front of the Bottom Plate, as shown in Figure 8.



**Figure 8 Front Mounting**

The four screw holes are M2.5 with depth of 7mm and have Böllhoff 4130 025 0025 helicoils placed in them, similar to the threads of Bottom Mounting

