MECHANICAL INTERFACE CONTROL DOCUMENT

TWINKLE STAR TRACKER

Release information

	Name	Function	Signature	Date
Author	T. Delabie	CEO		14/09/2021
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Version Control

Version	Author	Date	Change Log	Sections
1.0	T. Delabie	06/09/2021	Initial version	All
1.1	T. Delabie	14/09/2021	Update CAD and technical drawing with 4 mounting holes instead of 6	2, 3

Applicable Documents

ID	Document Title	Document Reference	Version
AD01			

Reference Documents

ID	Document Title	Document Reference	Version
RD01	Twinkle External.stp	TWK-ARC-1001b	1.0

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1 Introduction

This document describes the mechanical interfaces of the Twinkle star tracker. The Twinkle star tracker is a high accuracy, extremely 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 shows the star tracker reference frame.

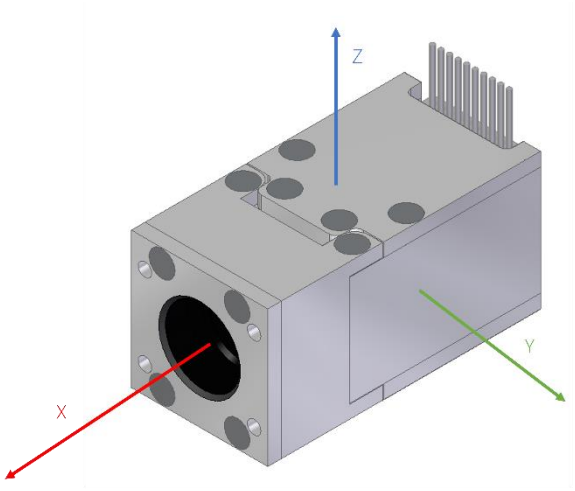

Figure 1 Star tracker reference frame

2 Mechanical Design

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

The outer dimensions of the star tracker are 40x20x20 mm^3, with the connector protruding from the back plate. This includes a baffle that gives the star tracker a sun exclusion half cone angle of 60 deg.

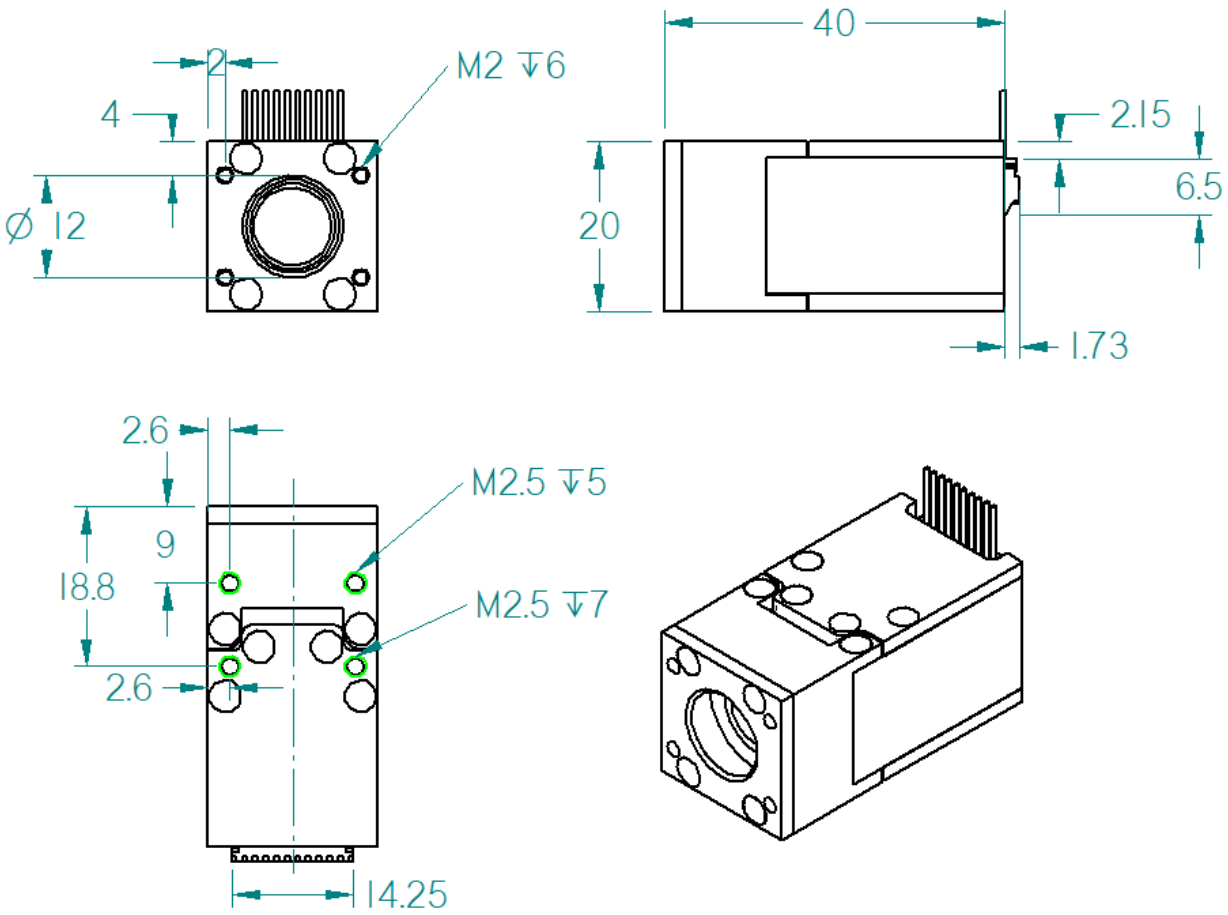

Figure 2 Star Tracker Technical Drawing

3 Mounting

The star tracker can be mounted on the bottom plate. The star tracker is mounted on a structure in the spacecraft using the four screw holes highlighted in green at the top of Figure 2.

Two of the 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. The other two screw holes are M2.5 with depth 5mm and have Bölhoff 4130 025 0025 helicoils placed in them.

4 Field of view and Sun exclusion

The unobstructed field of view is 20 deg (full cone).
The Sun exclusion angle is 60 deg (half cone). There should be no shiny (not black coated) spacecraft elements within a 70 deg half cone angle of the star tracker line of sight.