



# DATASHEET

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Structure 1U

## STRUCTURE 1U – DATASHEET

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# STRUCTURE 1U

## DATASHEET

This user manual details the applications, features and operation of EnduroSat's **Structure 1U** product. **Structure 1U** is an acronym for **Structure 1 Unit**.

Please read carefully the manual before unpacking the elements to ensure safe and proper use.



Figure 1 – EnduroSat's Structure 1U

## 1 CHANGE LOG

Date	Version	Note
05/04/2017	Rev 1	
24/04/2017	Rev 1.1	Extended standoff configuration added, 1.5U configuration moved to the dedicated datasheet
22/11/2017	Rev 1.2	Minor changes text and drawings
20/04/2018	Rev 1.3	Minor changes text and drawings
17/10/2018	Rev 1.4	Old version removed, minor text changes
16/11/2018	Rev 1.5	Technical writing enhancements

### 2 OVERVIEW

EnduroSat's **Structures** have a minimalistic design and are easy to assemble. They also provide a physically safe environment for the customer's payload and subsystems during all phases of the mission (e.g. launch phase). These qualities ensure stable operation of the CubeSat.

Our **Structure** products comply with the CubeSat standard and are compatible with a wide range of CubeSat subsystem producers. They also come with kill switches and 2 separation springs already integrated.

A full campaign of tests at qualification level were performed on the Qualification Engineering Model of EnduroSat's **Structure** products following ESA standard ECSS-E-ST-10-03C and NASA standard GEVS: GSFC-STD-7000A.

### 3 HIGHLIGHTED FEATURES

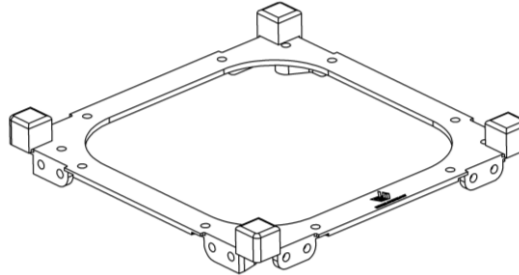
- Dimensions 1U: 100x100x113.5 mm
- Material: Aluminum 6061 or 6082
- One/two kill switches option
- Two separation springs
- Customizable design
- Custom nuts
- Weight 1U\*: 98 g

\*including bolts, 2 kill switches and 2 separation springs

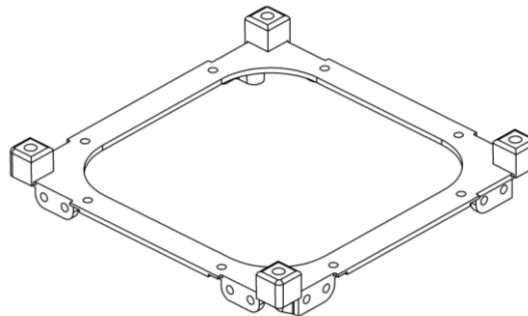
## 4 ELEMENTS

EnduroSat's **Structure** products are designed to be modular and are made up of 3 types of elements (top, bottom, and legs). This design approach allows the top and bottom elements to be used for different form factors. For instance, a **1U Structure** can be converted to a **1.5U Structure** by changing only the leg elements.

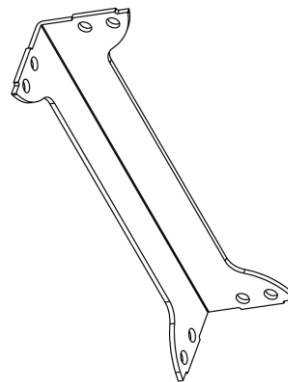
1 x Top Element  
(Z+)



1 x Bottom Element  
(Z-)



4 x Leg 1U Element



## 5 MECHANICAL DRAWING

The following drawings show the main dimension of **Structure 1U**. All dimensions are in mm.

A STEP file can be provided upon request.

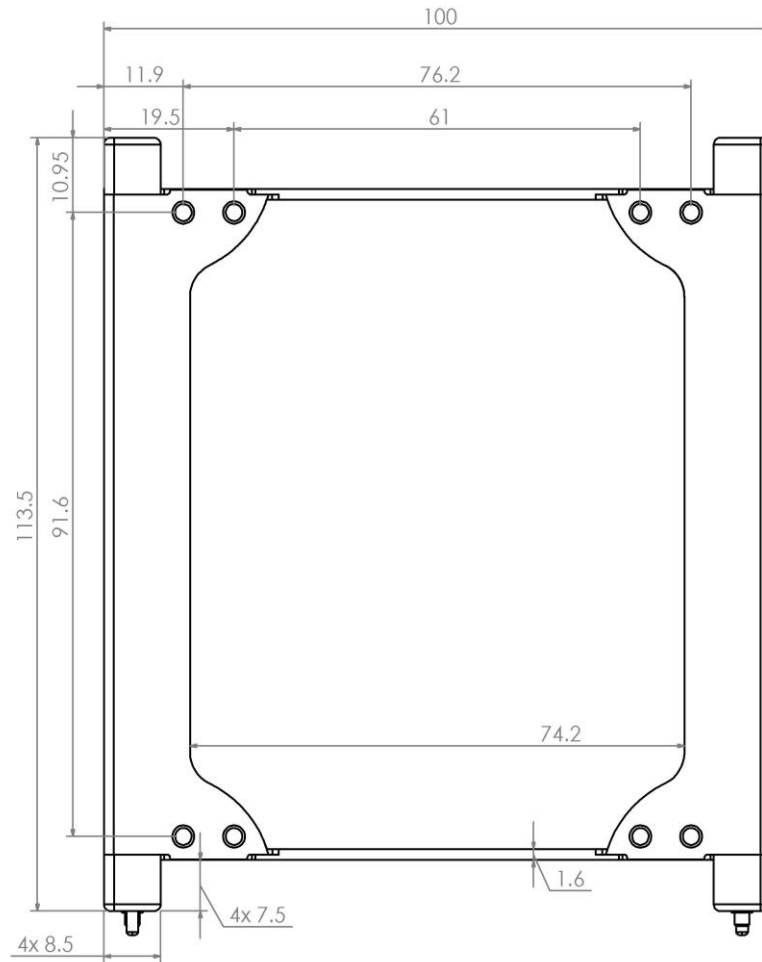


Figure 2: Structure 1U – Side View

# STRUCTURE 1U – DATASHEET

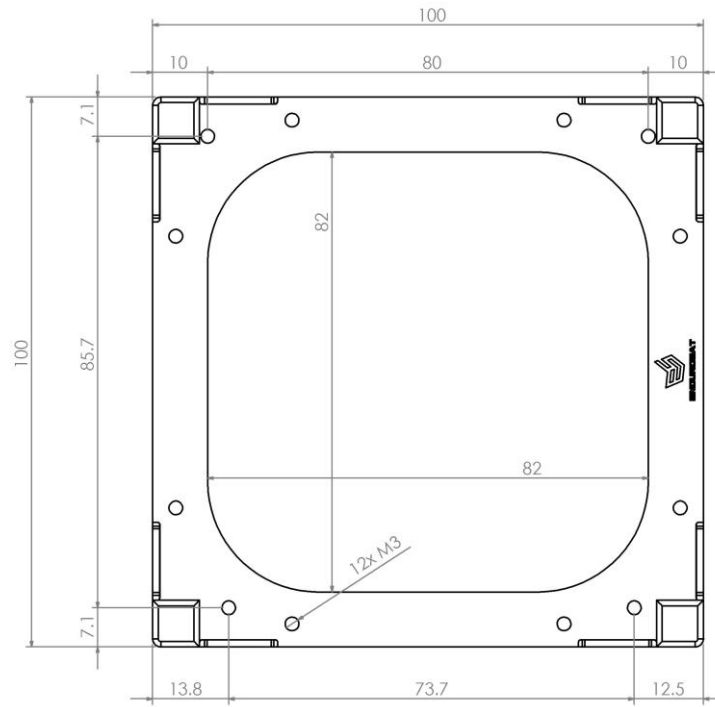


Figure 3: Structure 1U – Top View (Z+)

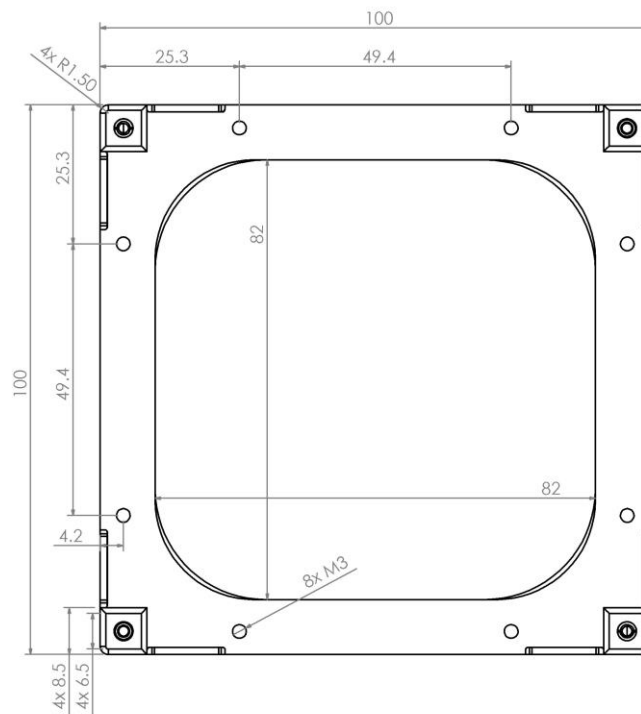


Figure 4: Structure 1U – Bottom View (Z-)

The dimensional tolerances for an assembled **Structure 1U** comply with the CubeSat Design Specification ( $\pm 0.1$ mm in all three axis).

### 6 MATERIALS

All the elements of EnduroSat's **Structures** are made of Aluminum 6061-T651 or Aluminum 6082-T6, pearl finished and hard anodized (25-30  $\mu$ m).

### 7 INCLUDED IN THE SHIPMENT

EnduroSat provides along with the **Structure**:

- Torx - DIN965/ISO 7046-1 -A2- M3 – Length: 5 mm
- Torx - DIN965/ISO 7046-1 -A2- M3 – Length: 8 mm

Recommended torque for mounting solar panels onto the structure is 0.8 Nm

### 8 MECHANICAL AND ENVIRONMENTAL TEST

A full campaign of tests at qualification level was performed on the qualification engineering model. Qualification test levels and duration follow the ESA standard ECSS-E-ST-10-03C and GEVS: GSFC-STD-7000A. Tests performed:

- Thermal Cycling
- Thermal Vacuum
- Random Vibration
- Sine Vibration
- Shock Test

Space qualification campaign link: <https://www.endurosat.com/space-qualification/>



## 9 HANDLING AND STORAGE

Particular attention shall be paid to the avoidance of damage to the elements of the **Structure** during handling, storage and preservation. The handling of the **Structure** should be performed in compliance with the following instructions:

- Handle using PVC, latex, cotton (lint free) or nylon gloves.
- The environment where structure module will be handled shall meet the requirements for a class environment 100,000, free of contaminants such as dust, oil, grease, fumes and smoke from any source.
- Store in such a manner as to preclude stress and prevent damage.
- To prevent deterioration, the **Structure** must be stored in a controlled environment (i.e. the temperature and humidity levels shall be maintained in the proper ranges):
  - Ideal storage temperature range: 15°C to 27°C
  - Ideal storage humidity range: 30% to 60% relative humidity (RH)