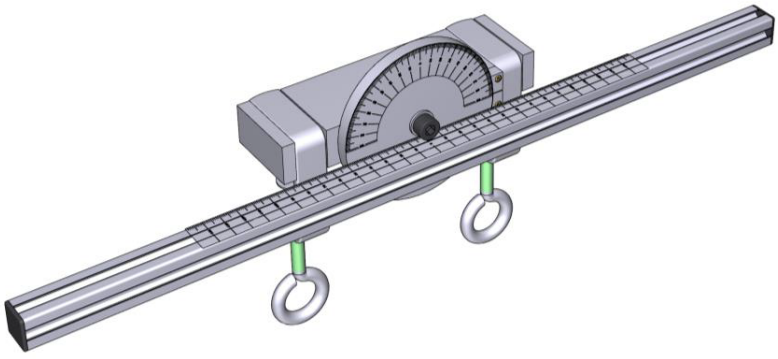
Rev.1 - Oct 15th, 2020

SP5609

Telescope Mechanics Assembling Instructions



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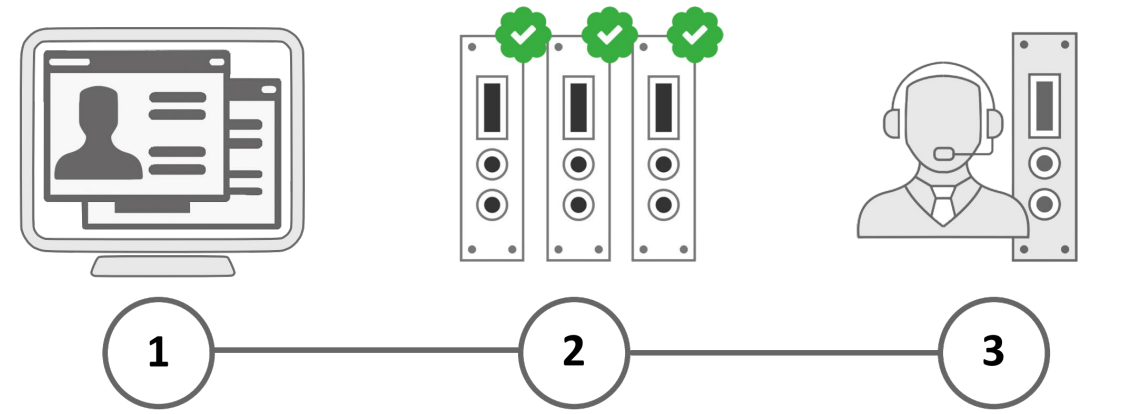

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Purpose of this Document

This document is a step by step for setting up the muon telescope. It can be built starting from the telescope Mechanics (SP5609) and by adding two Scintillating Tiles (SP5608) or two Detection Systems (SP5622).

Change Document Record

Date	Revision	Changes
26 November 2019	00	Preliminary release
15 October 2020	01	Modified Chap 2. Added Sec. “SP5622 – Detection System Assembling”

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List of Figures

1. System Content

The SP5609 Telescope Mechanics, shown in the picture below, is composed of :

- n°1 rotary axis with desk support [A];
- n°2 Clamp with screws [B];
- n°2 angle bracket kits [C], each one composed of n°1 angle brackets, n°2 T-slot nuts and n°2 hex socket cap screw bolt;
- n°4 TPC cross screws 4x25 [D];
- n°4 zinc coated washers [4mm] [E];
- n°4 zinc smooth washers [F];
- n°4 inox nuts [G];
- n° allen key (6mm) [H];
- n°2 square bracket kits [I], each one composed of n° 2 locking flanges, n°1 squared support, n°6 TPC cross screws 3X25 and n°12 TPC cross screws 3X12.

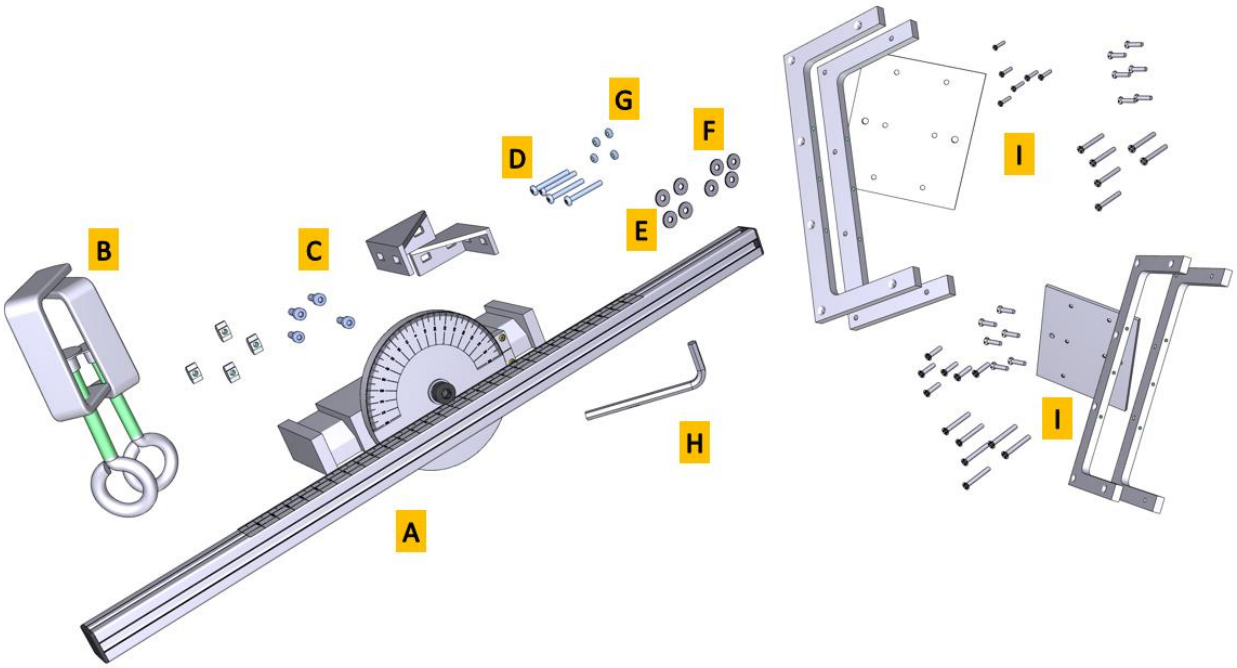


Fig. 1.1: SP5609 - Mechanics Telescope contents.

2. Assembling Instructions

The Muon Telescope can be built in two ways depending on the detection system, namely if it is based on the SP5608 - Scintillating tile or on the SP5622 - Detection System. The first section of the assembling instructions is referred to the system composed of two SP5609 Scintillating Tiles, while the second one is related to the system composed of two SP5622 Detection Systems
Please, identify the system in question and perform the related illustrated steps to assemble the muon telescope.

SP5608 Based Telescopic System

Required additional tools:

- n° 1 allen key (2.5mm);
- n°1 cross screwdriver.

SP5608 - Scintillating Tile Assembling

The first step is the Scintillating tiles assembling.

For each tile, you need to use:

- n°1 angle bracket kit [A];
- n°2 screws TPC 4X25 INOX CROSS DIN 7985 [B];
- n°2 zinc coated washers [4mm] [C];
- n°2 zinc smooth washers [D];
- n°2 inox nuts [E].

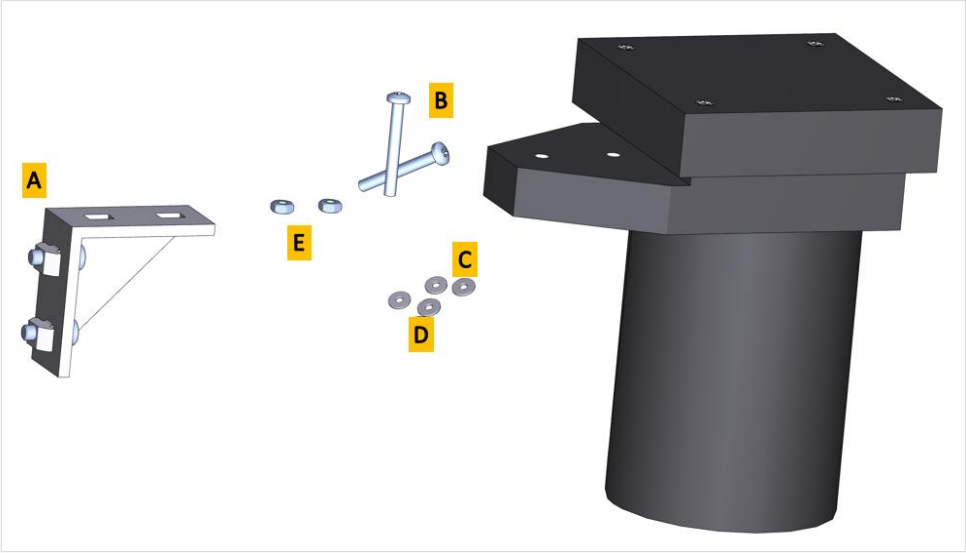
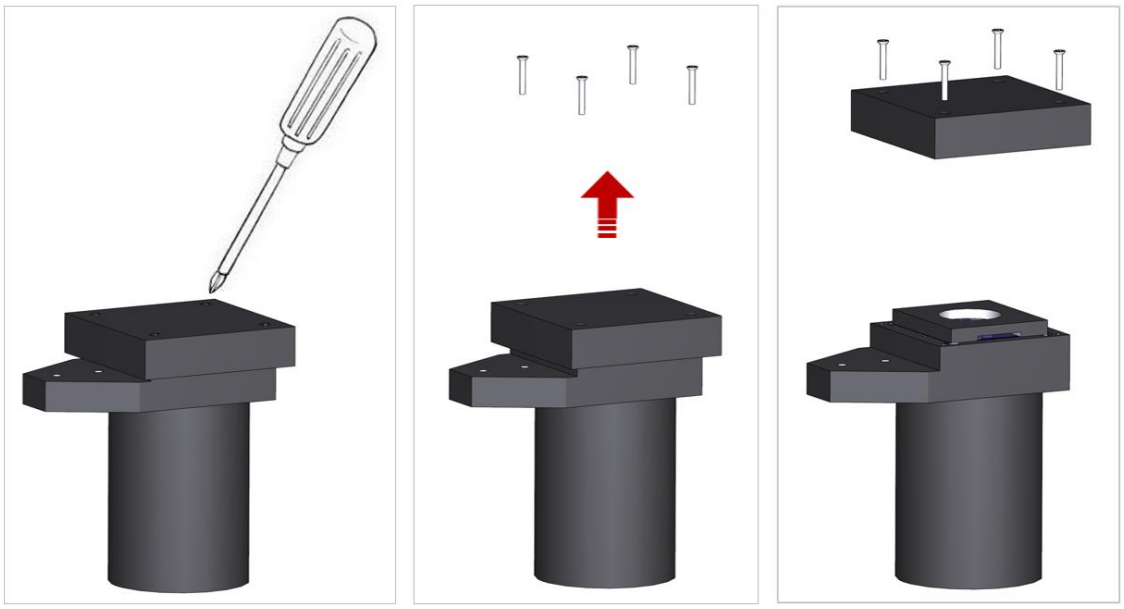


Fig. 2.1: Assembling tools for SP5608 – Scintillating tile.

Execute the following instructions:

- **Unscrew and remove the top cover of the Scintillating tile.**



- **Insert the two cross screws and plug the angle bracket.**

– **Fix the angle bracket to the Scintillating tile by using the zinc coated washers, the zinc smooth washers and the inox nuts. Please, take care to assemble everything as in the order previously indicated.**

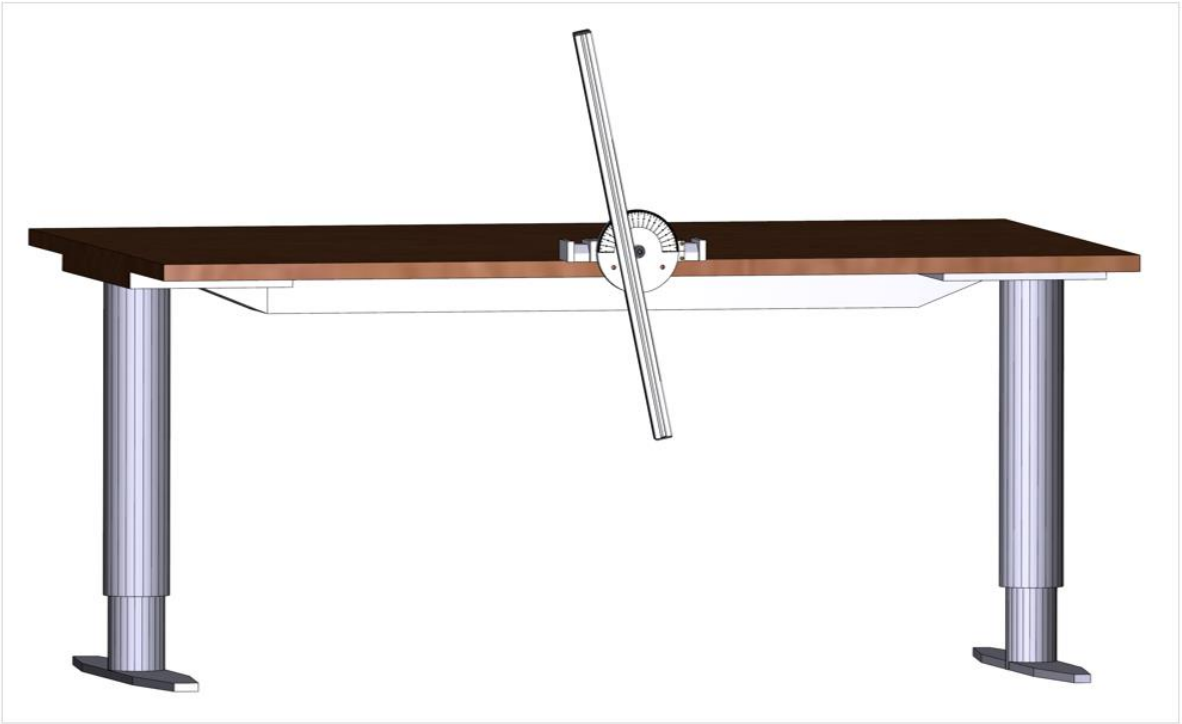
– **Close and screw the top cover of the Scintillating tile.**

- **Repeat the same assembling procedure with the second Scintillating tile.**

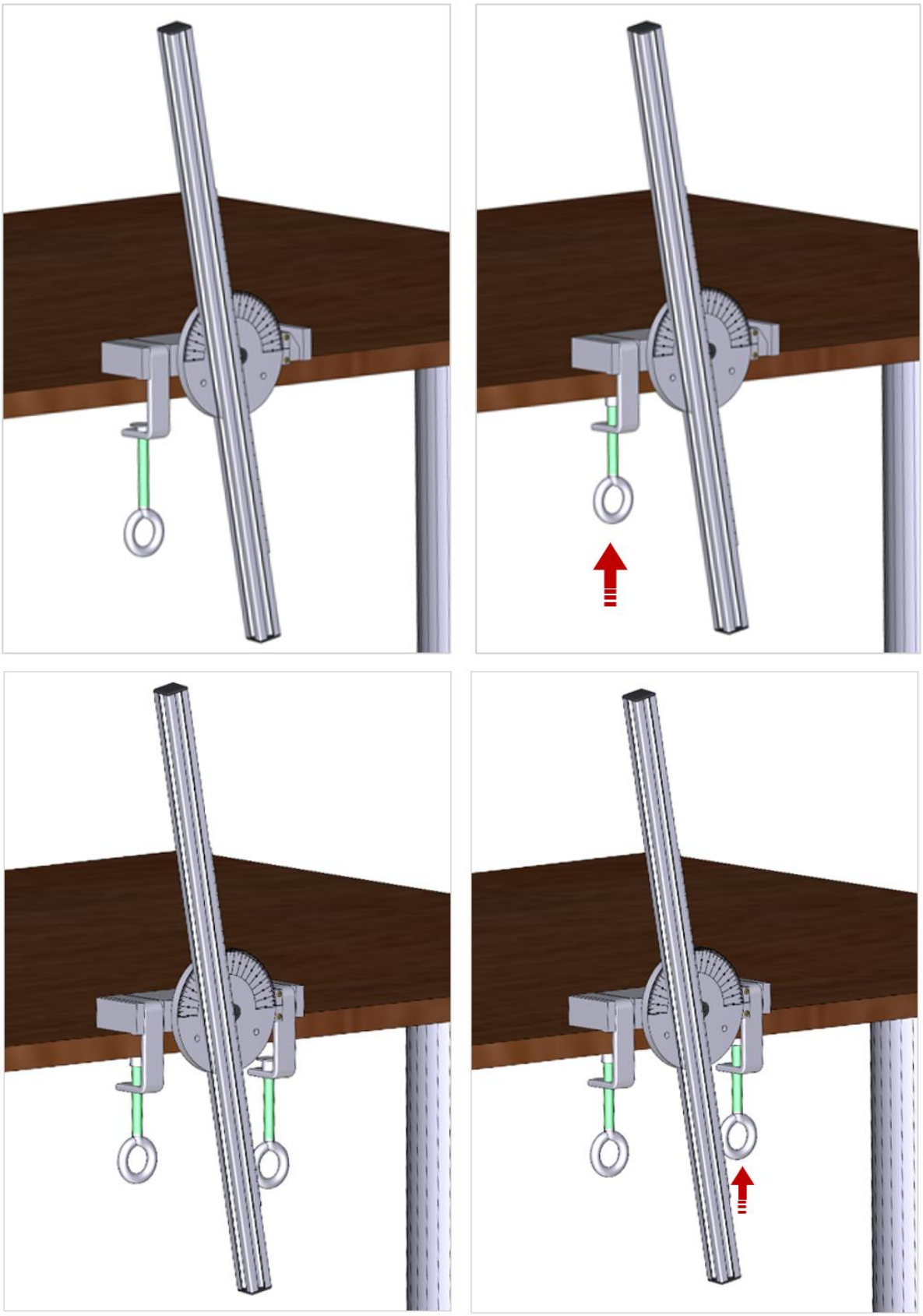
SP5609 – Telescope Mechanics Assembling

The second step is to put the Telescope Mechanics on your desk. The rotary axis and the two clamps are needed together with the big allen key (6mm).

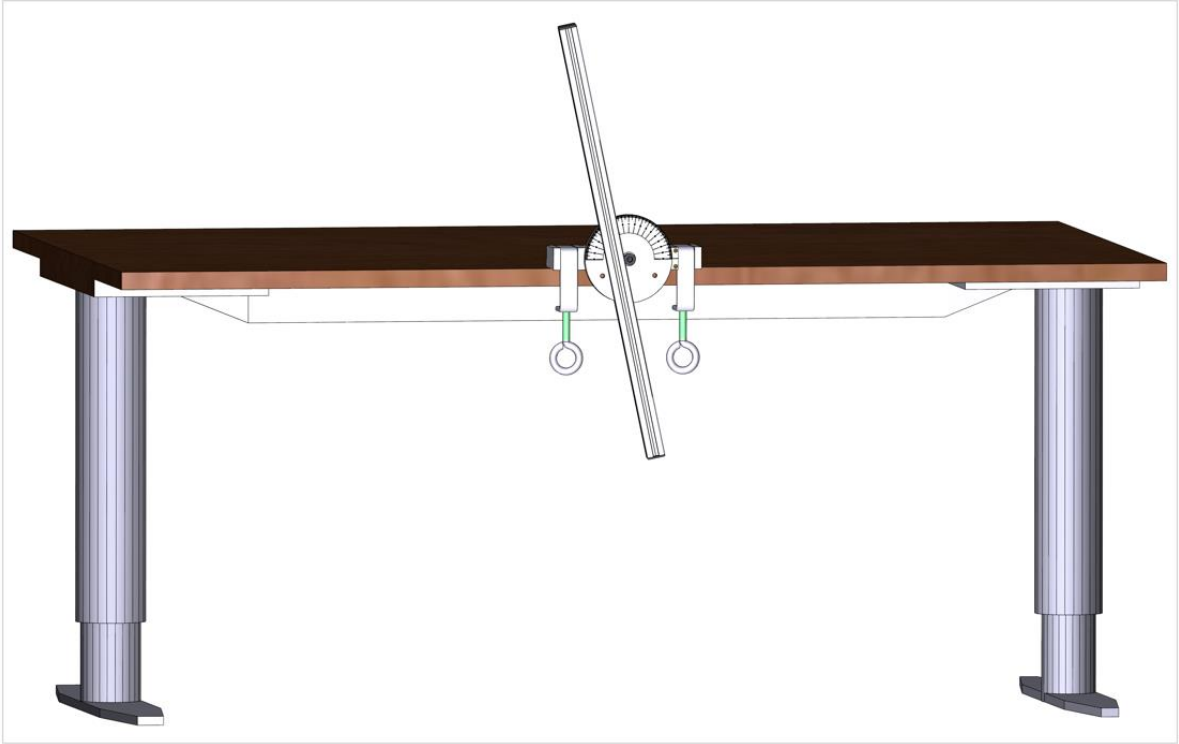
- **Arrange the rotary axis on the desk as shown in the picture below.**



– **Fix the axis on the desk by using the two clamps.**



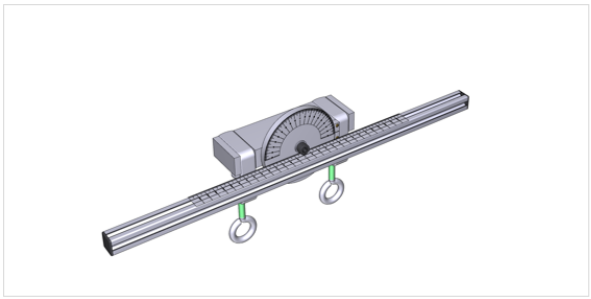
– **Use the big allen key to rotate and fix the axis position.**

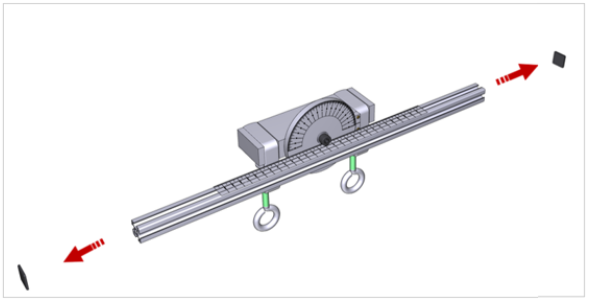


Muon Telescope Assembling

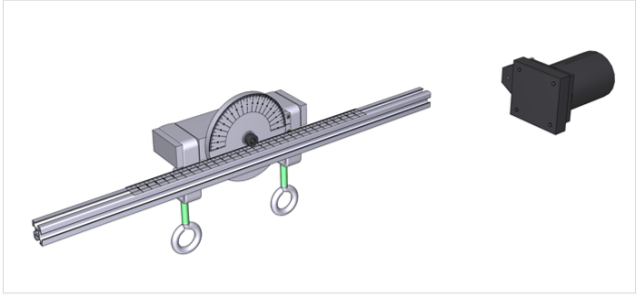
The third and last step is the fulfilment of the muon telescope. To add the scintillating tile to the rotary axis, you need a smaller allen key (2.5mm).

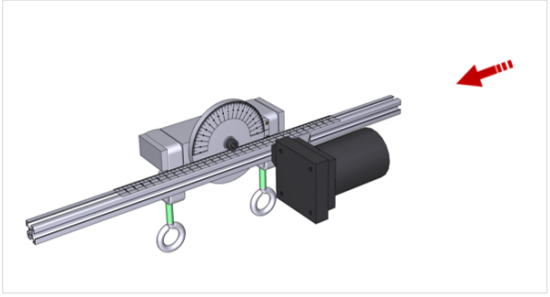
– **Remove the black caps from the rotary axis extremities.**



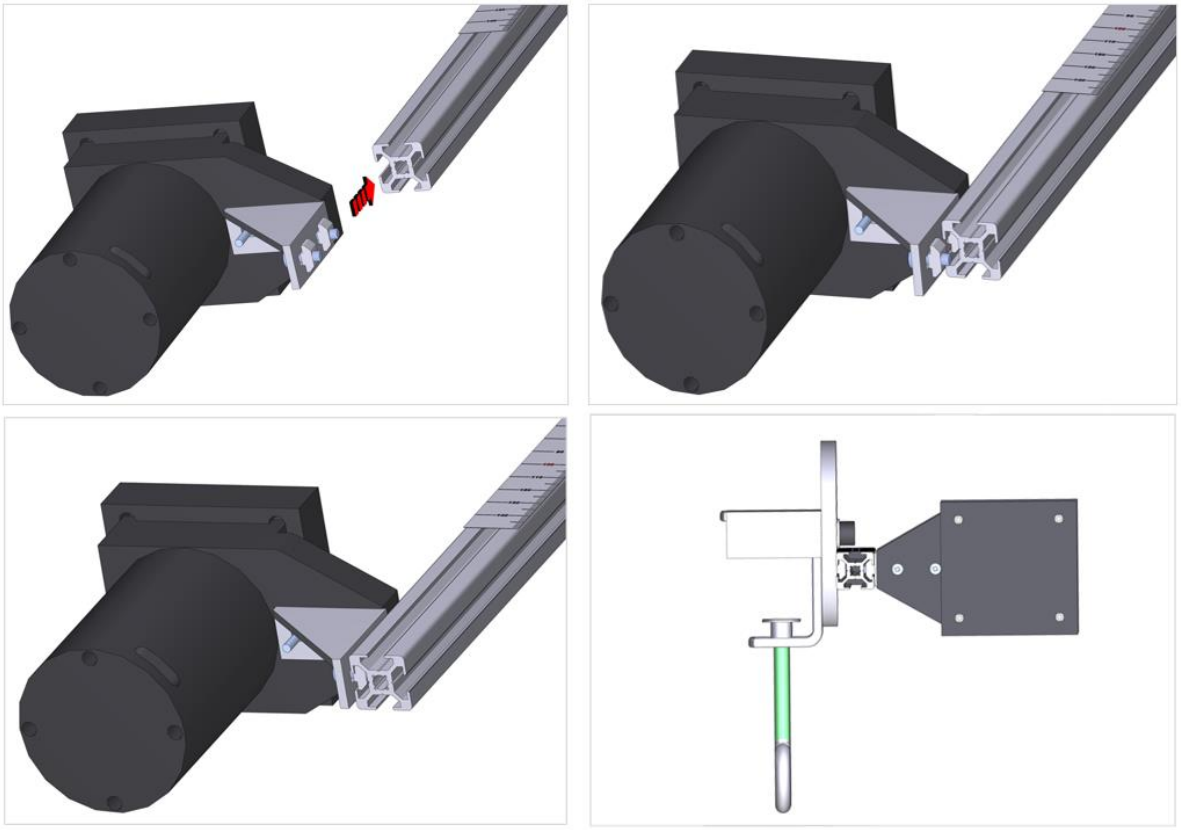


– **Arrange the Scintillating tiles as shown in the pictures.**

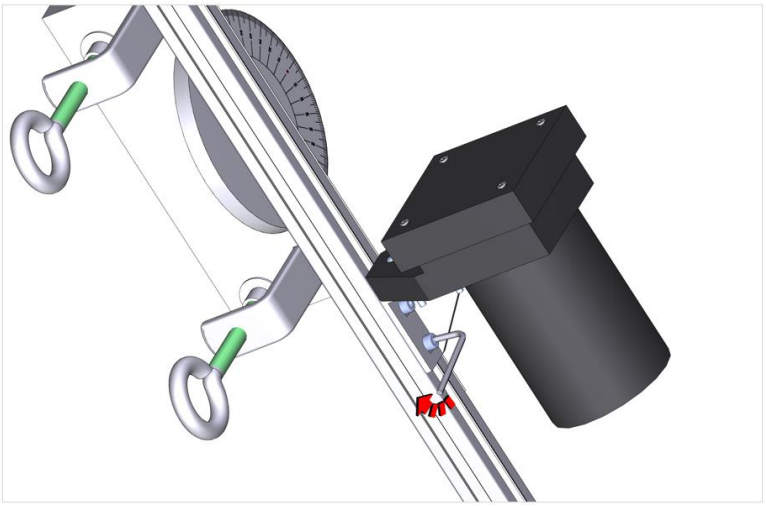




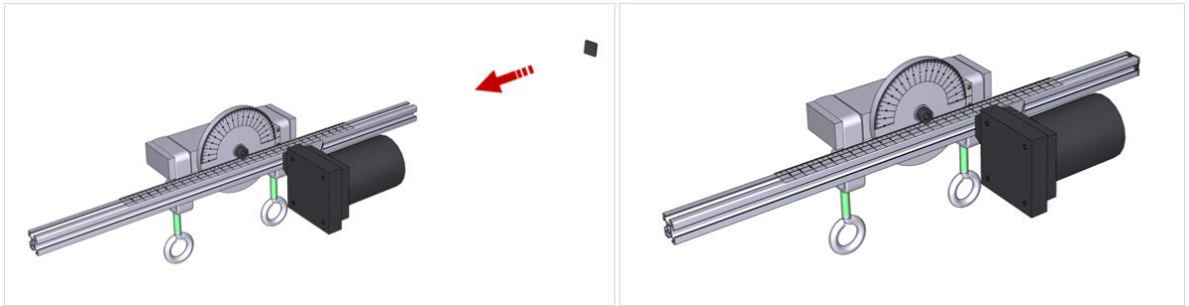
– **More in detail, the hex socket cap screw bolts must be inserted in the runner of the rotary axis, exactly.**



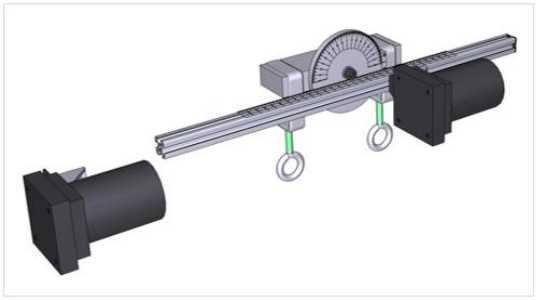
– **Fix the tiles position by using the small allen key [2.5mm].**

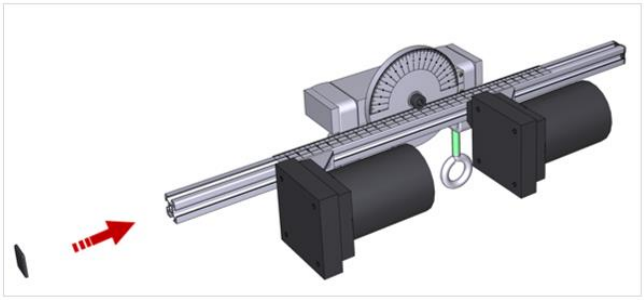


– **Put the black caps on the rotary axis extremities.**

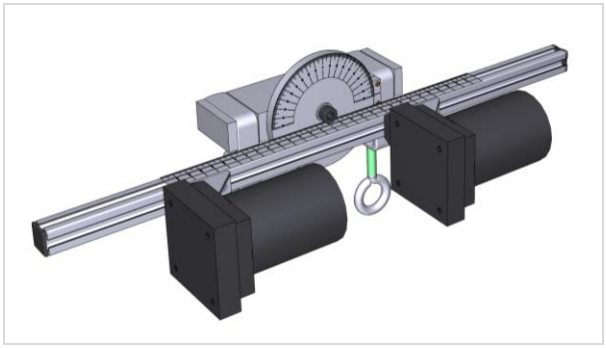


– **Repeat the same assembling procedure with the second Scintillating tile.**





– **The final result is the system equipped with both two SP5608 at a certain distance.**



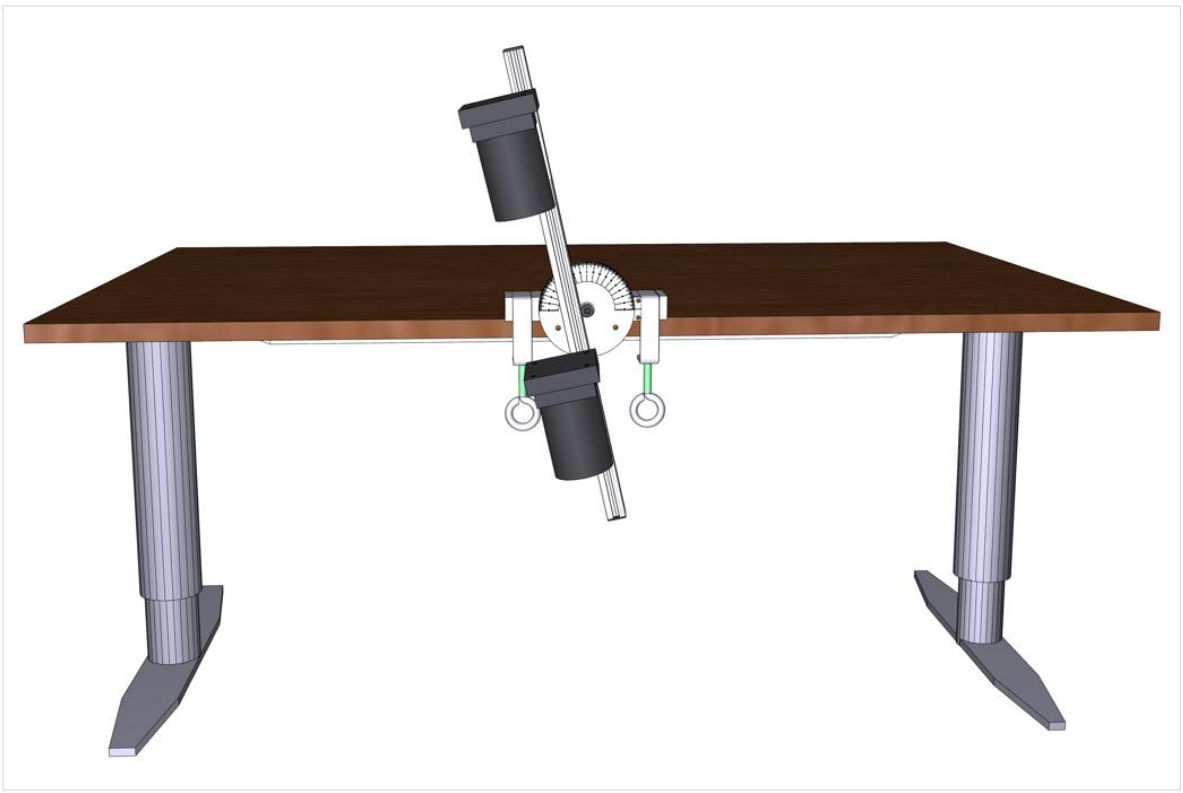


Fig. 2.2: Muons telescope (SP5608 based).

SP5622 Based Telescopic System

Required additional tools:

- n° 1 allen key (2.5mm);
- n° 1 cross screwdriver.

SP5622 – Detection System Assembling

The first step is the Detection System assembling.

For each detection system, you need to use:

- n° 2 locking flanges [A];
- n° 1 squared support [B];
- n° 6 TPC cross screws 3X25 [C];
- n° 12 TPC cross screws 3X12 [D];
- n°2 T-slot nuts [E];
- n°2 hex socket cap screw bolt [F].

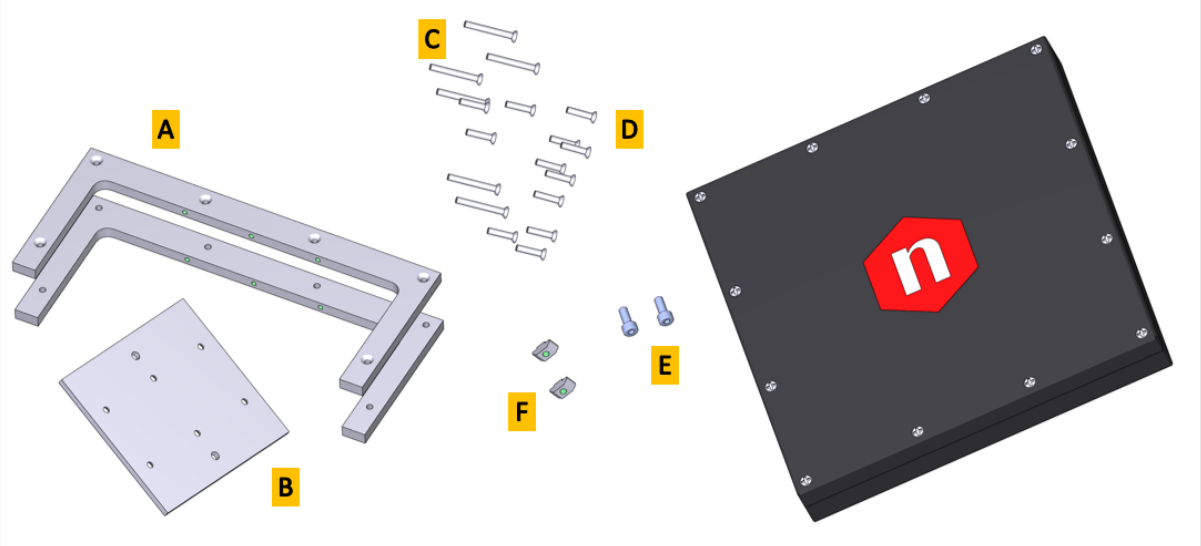
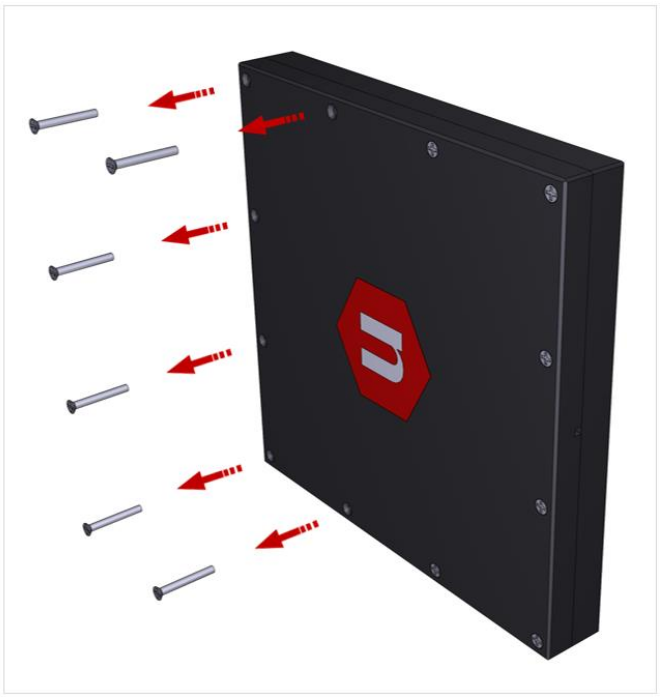


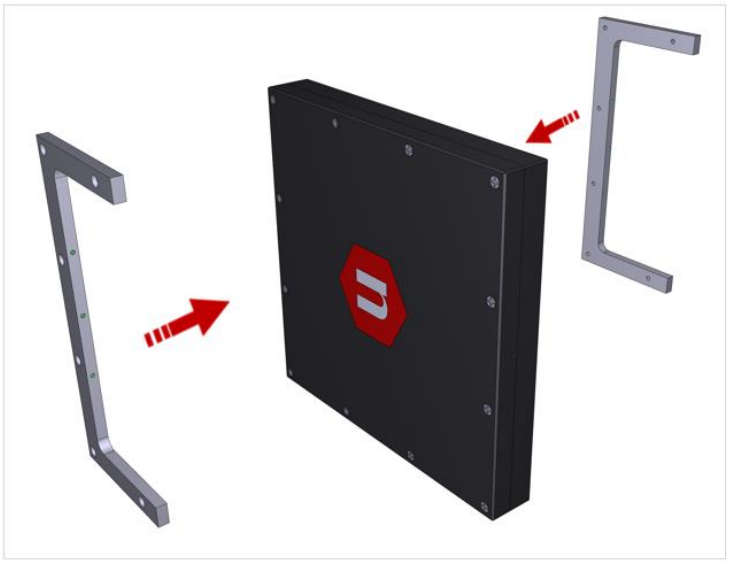
Fig. 2.3: Assembling tools for SP5622 – Detection System.

Execute the following instructions:

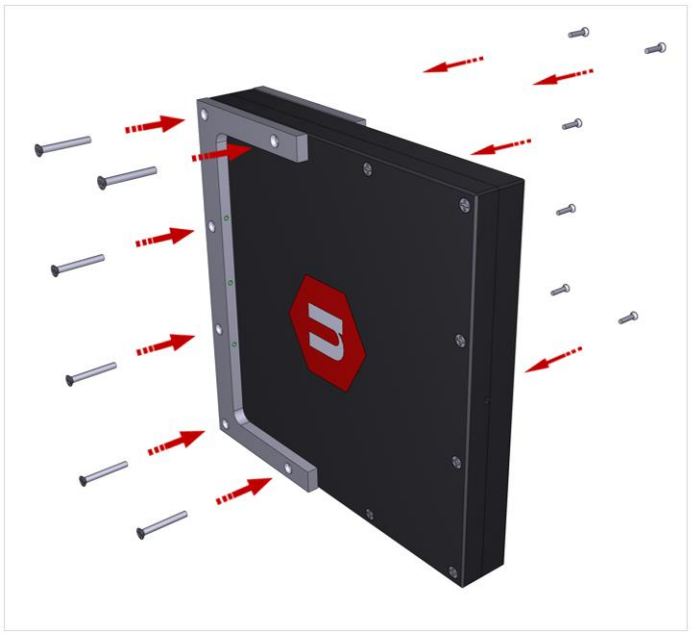
- **Unscrew the six adjacent screws as shown in the picture.**

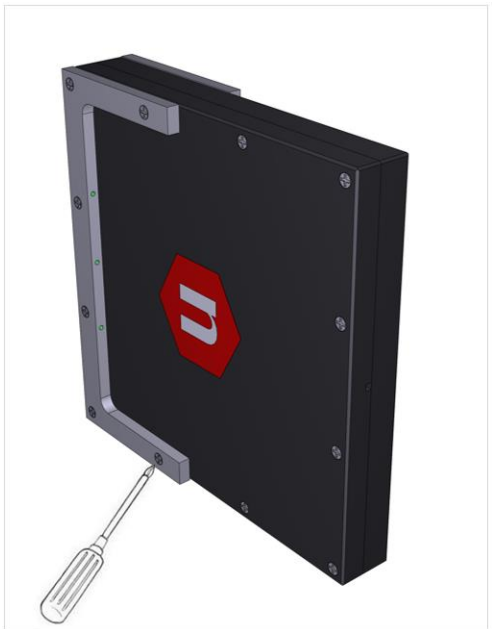


- **Put the locking flanges on the two system sides, in correspondence with the holes of the unscrewed screws.**

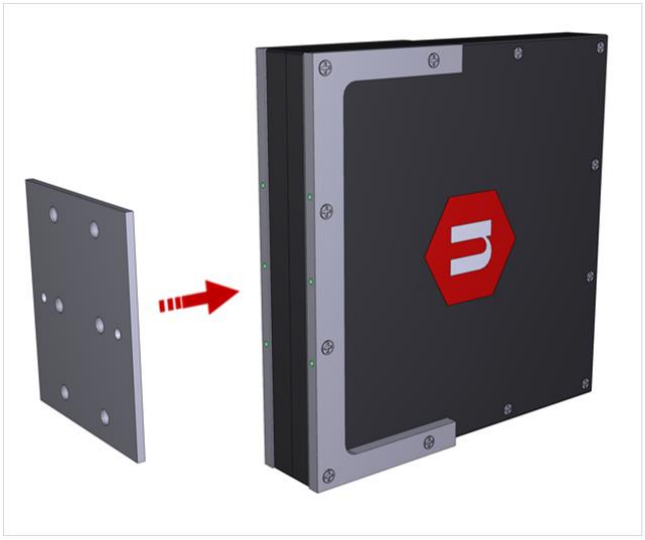


– **Insert and screw the six TPC cross screws 3X25 ("n" labelled side) and six cross screws 3X12, as shown in the picture.**

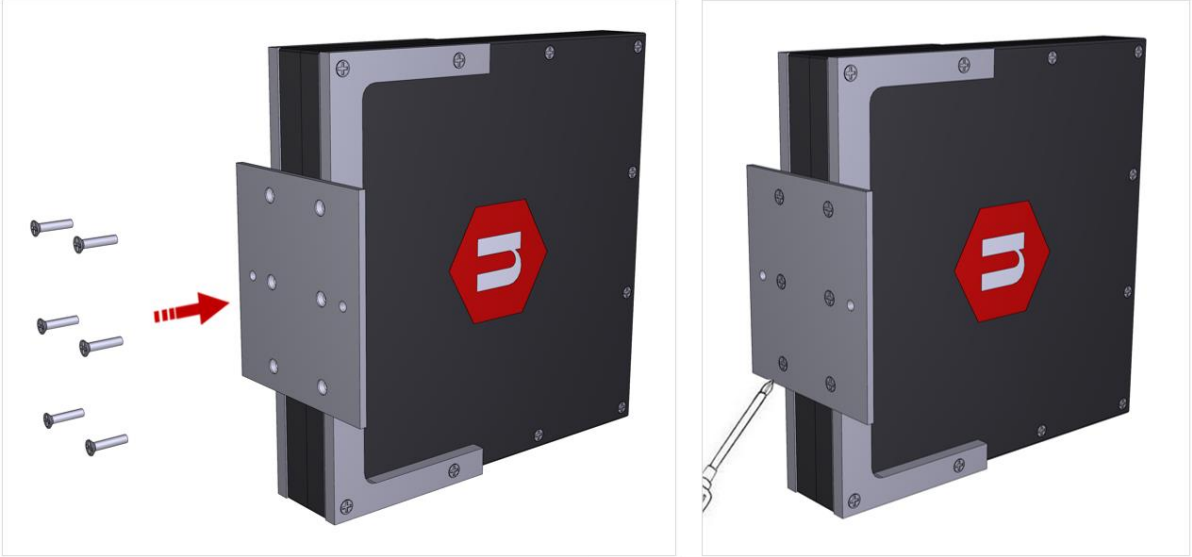




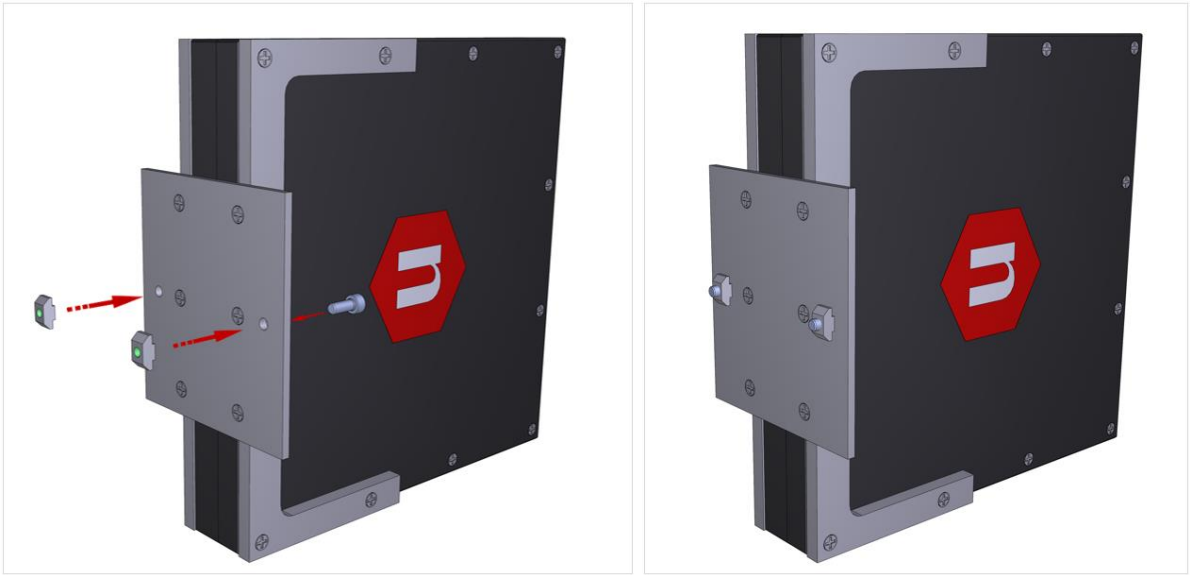
– **Put the squared support as shown in the pictures.**



– **Fix the squared support by using the remaining six cross screws 3X12, as shown in the picture.**



– **Use the two T-slot nuts and the two hex socket caps screws bolt coming from the angle bracket kit. The hex socket cap screws bolt employment is needed to plug the SP5622 to the rotary axis of the SP5609**

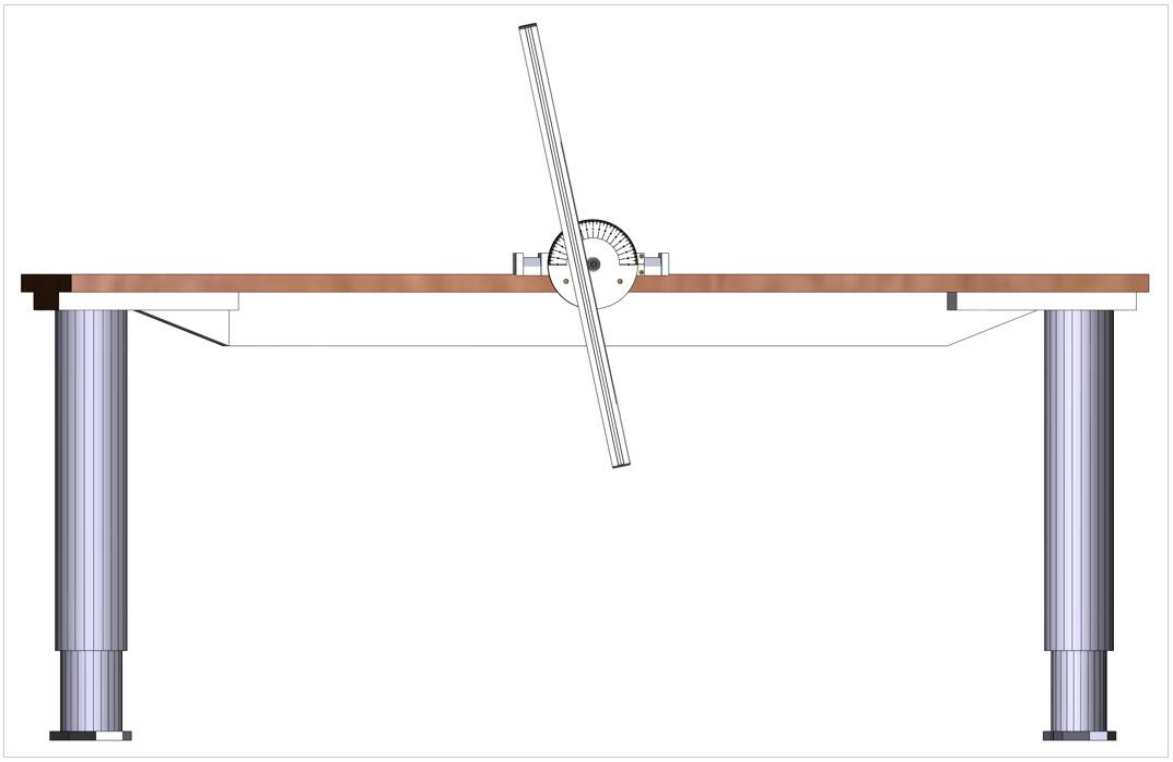


– **Repeat the same assembling procedure with the second Detection System.**

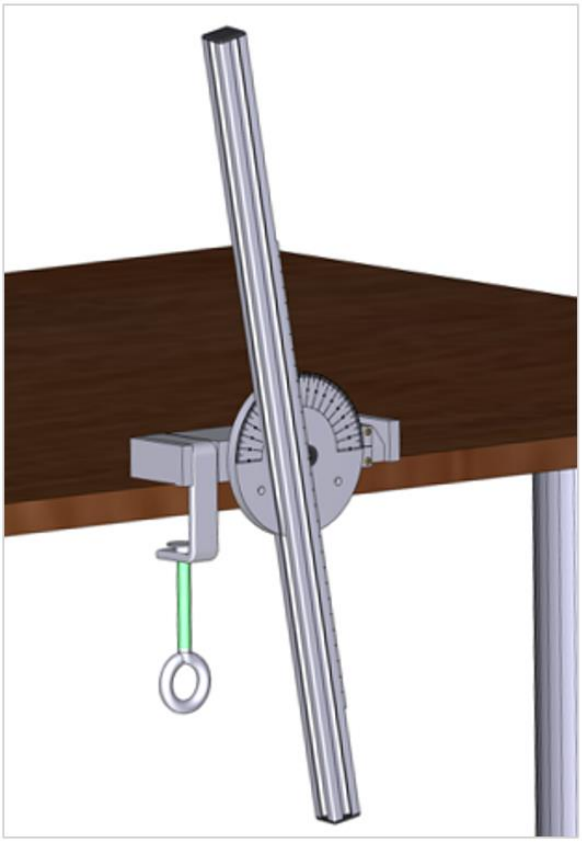
SP5609 – Telescope Mechanics Assembling

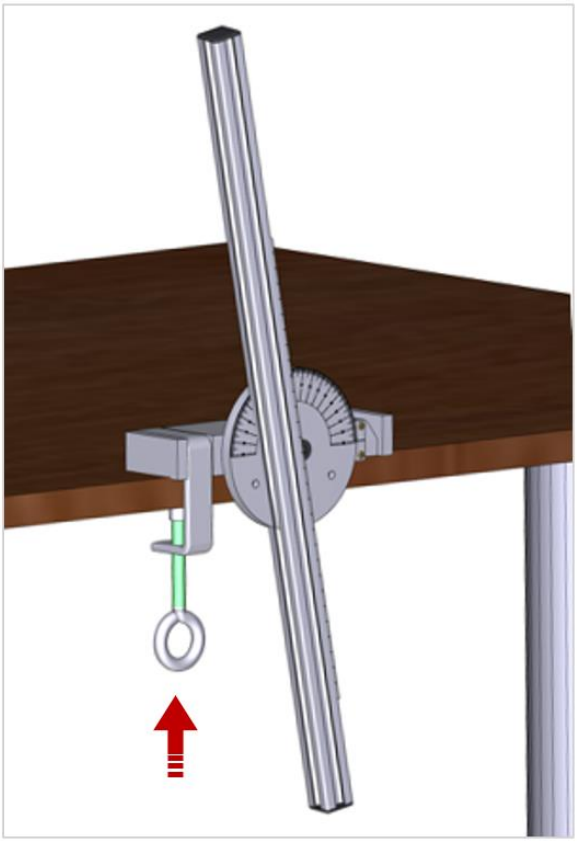
The second step is to put the Telescope Mechanics on your desk. The rotary axis and the two clamps are needed together with the big allen key (6mm).

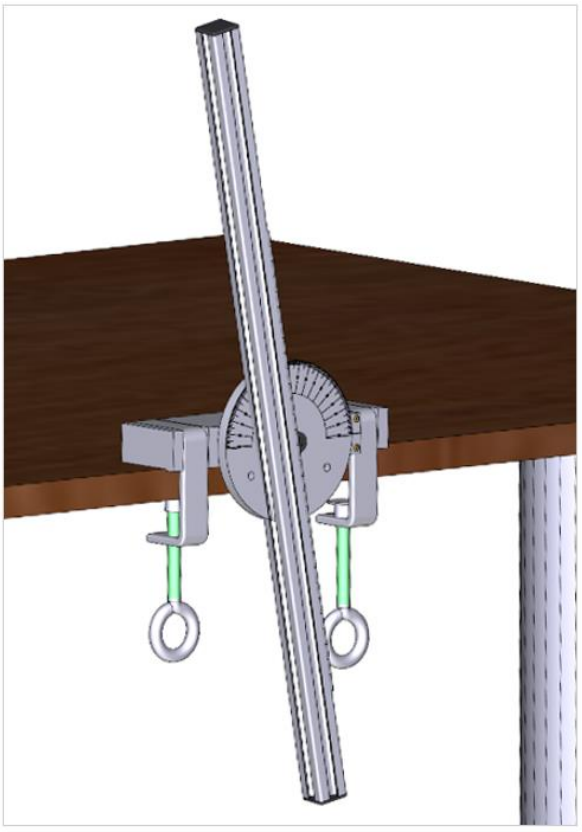
- **Arrange the rotary axis on the desk as shown in the picture below.**

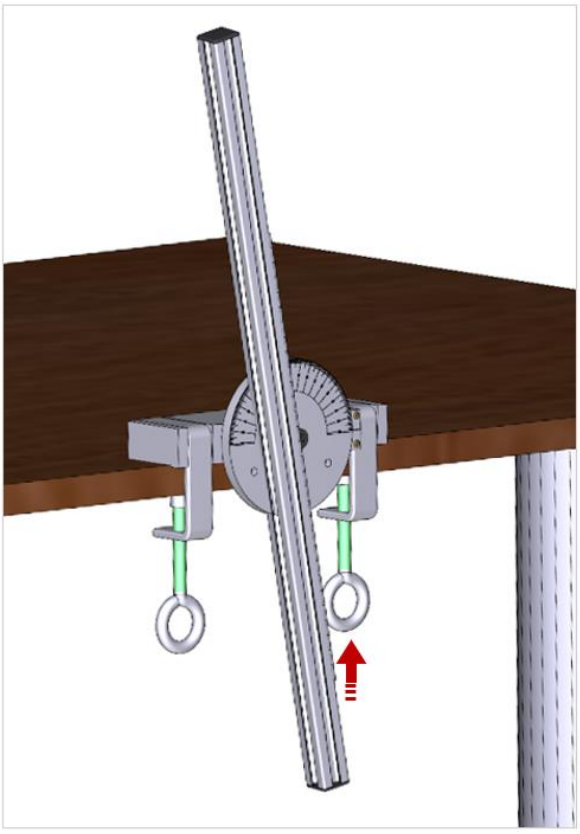


- **Fix the axis on the desk by using the clamps.**







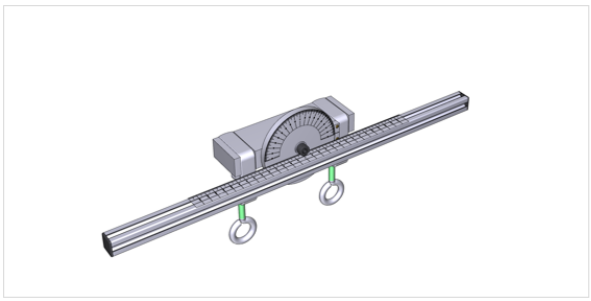
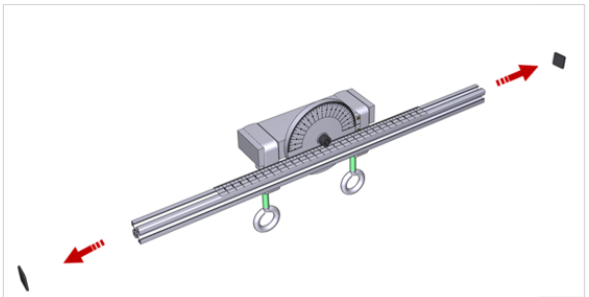


– **Use the big allen key to rotate and fix the axis position.**

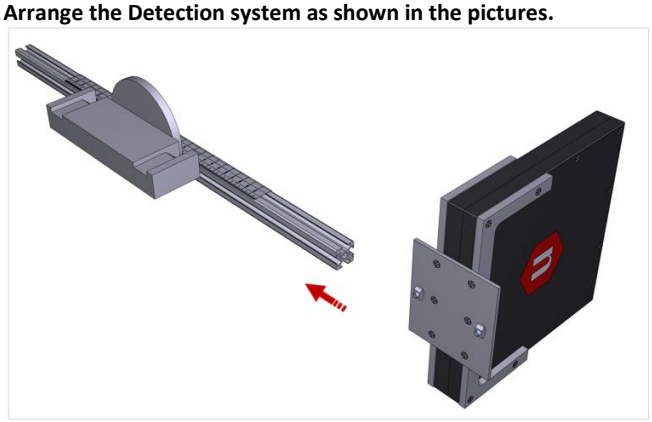
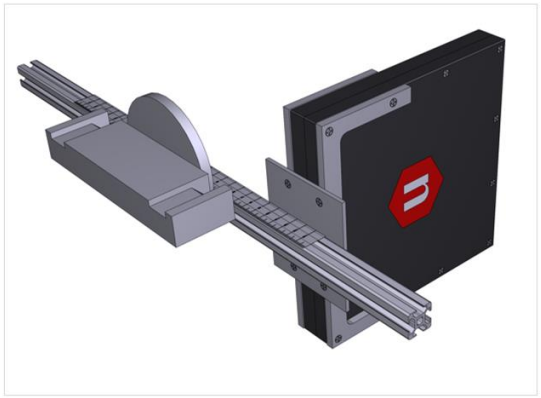
Muon Telescope Assembling

The third and last step is the fulfilment of the muon telescope. To add the detection systems to the rotary axis, you need a smaller allen key (2.5mm).

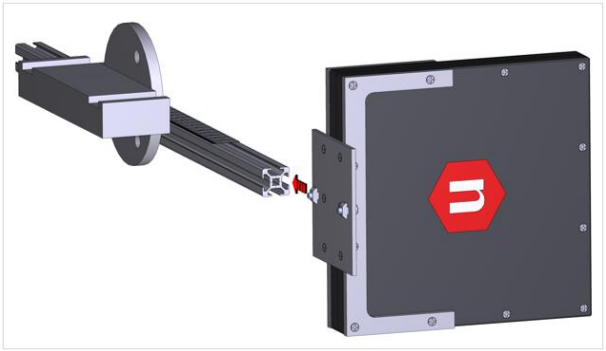
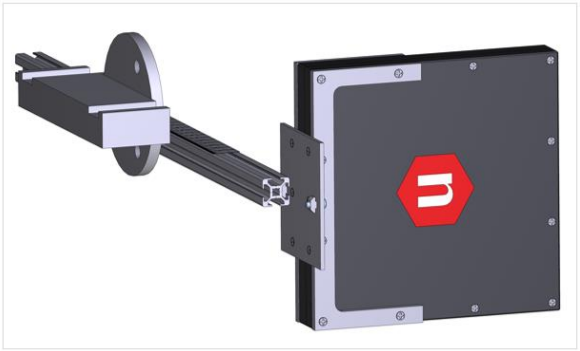
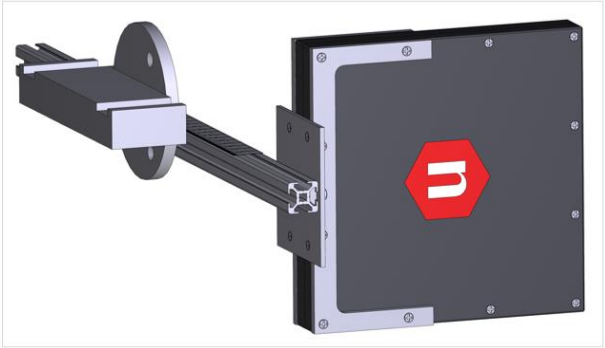
- **Remove the black caps from the rotary axis extremities.**

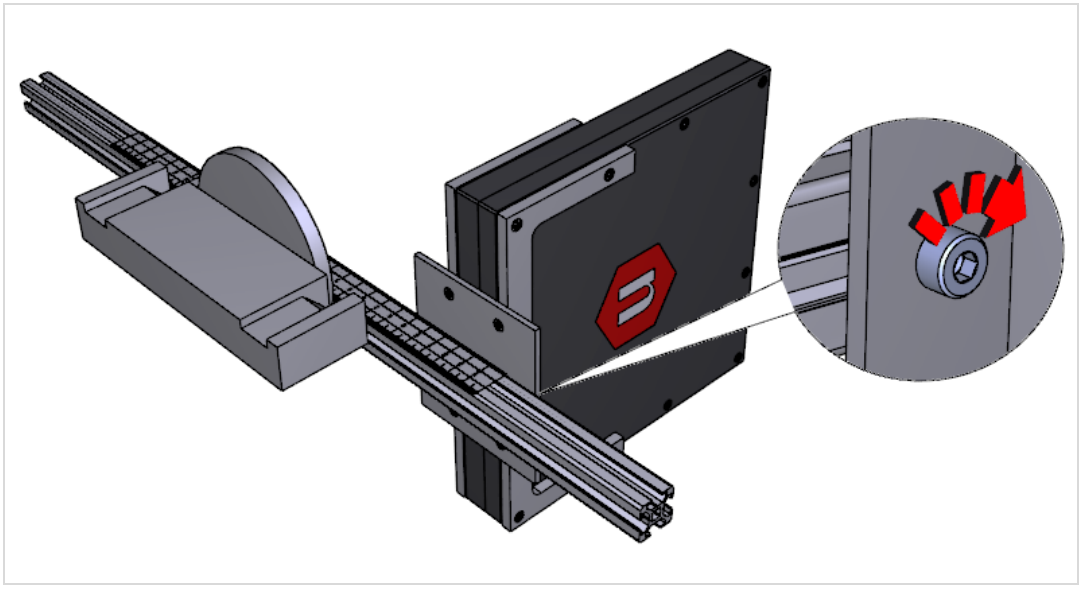
- **Arrange the Detection system as shown in the pictures.**

- **More in detail, the hex socket cap screw bolts must be inserted in the runner of the rotary axis, exactly.**

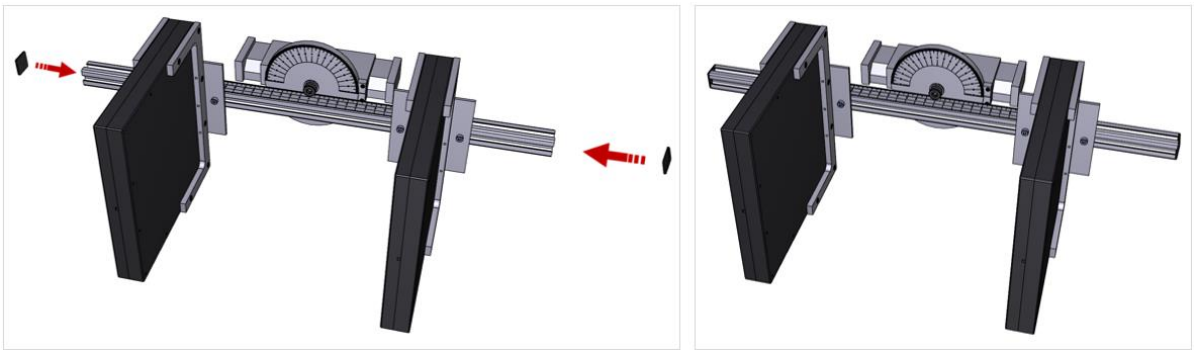




– **Fix the tiles position by using the small allen key (2.5mm).**

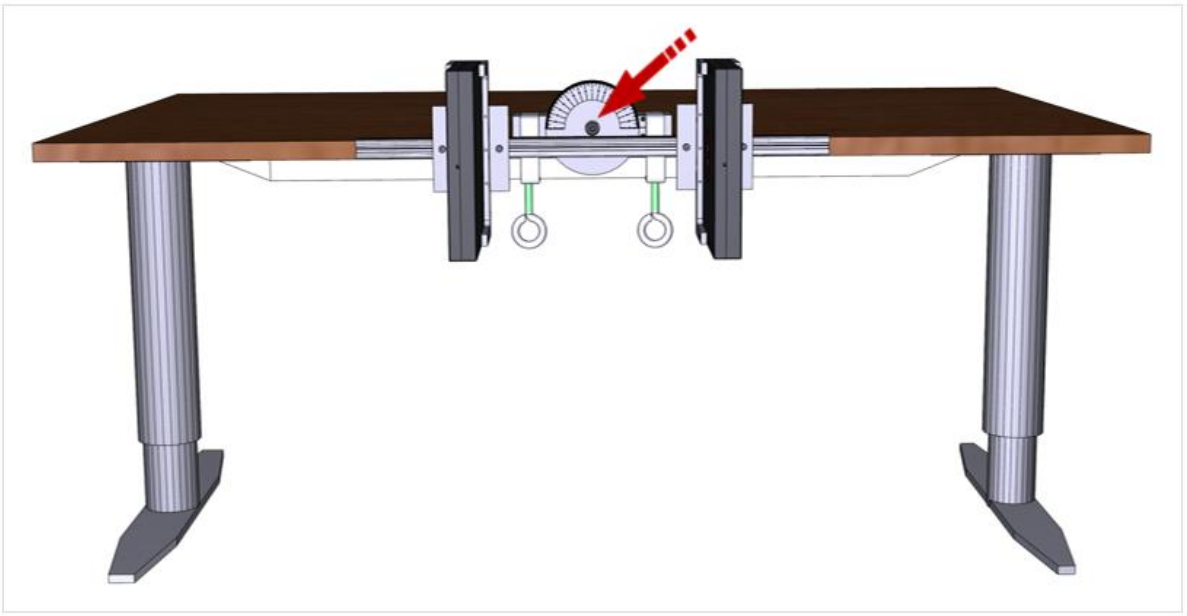


– **Repeat the same assembling procedure with the second Scintillating tile.**

– **Put the black caps on the rotary axis extremities.**



– **Use the big allen key (6mm) to rotate the whole system.**



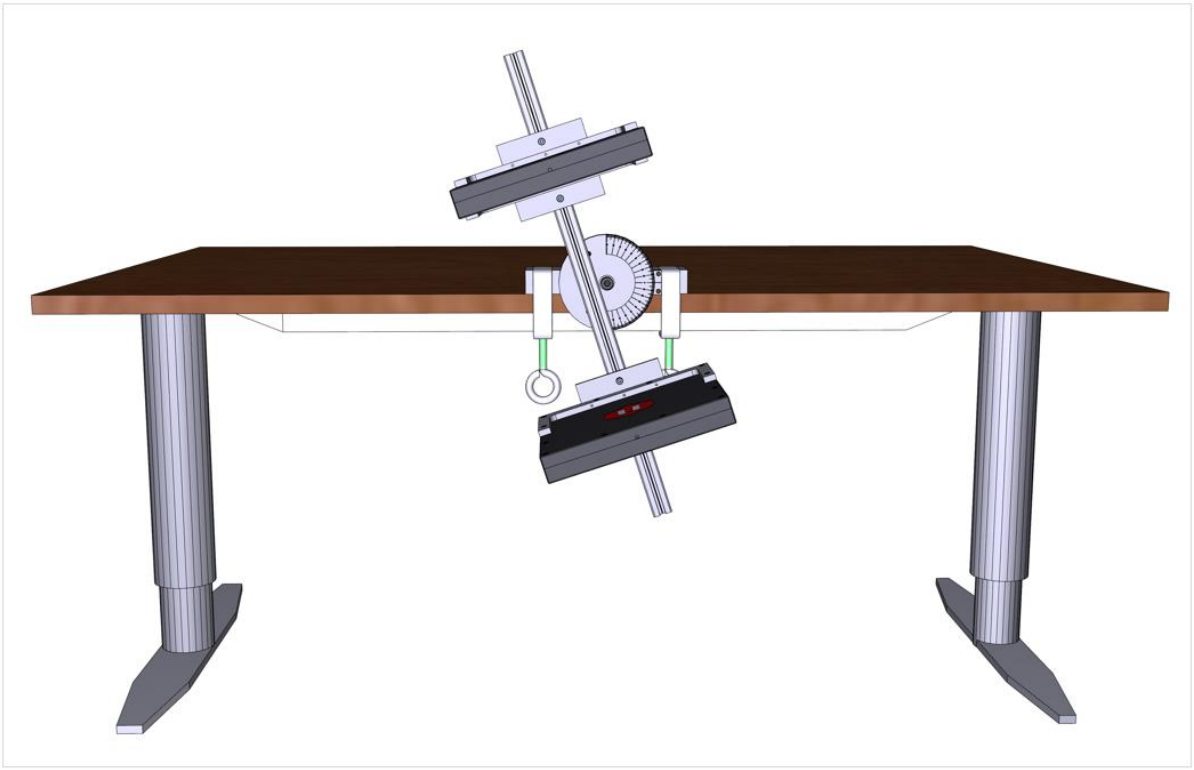


Fig. 2.4: Muons telescope (SP5622 based).

3. Technical Support

CAEN makes available the technical support of its specialists for request concerning the software and the hardware. Use the support form available at the following link:

https://www.caen.it/support-services/support-form/

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