

# VISO SYSTEMS LabTemp

## User Manual

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*Congratulations on purchasing your new Viso Systems product. Before using this product, please read our Safety Information.*

*This manual contains all the feature operating information and troubleshooting necessary to install and operate your new Viso Systems product. Please review this manual thoroughly to ensure proper installation and operation.*

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# Introduction

The special Viso accessory “LabTemp” is a hub with one internal and 3 external standard temperature probes. The LabTemp makes it possible to conform with ambient temperature control requirement of CIE standard S 025/E:2015.

The hub is attached to the goniometer with strong permanent magnets.

LabTemp captures temperature data on any Viso BaseSpion and LabSpion while measuring light. It saves temperature results with the light measurement file.

No extra software and no extra power supply is needed.

Easily connect the LabTemp by daisy chaining the LabTemp and the c-plane motor - power and data by Ethernet cable. If you have more than one LabTemp, just daisy chain together (cable in sequence).

Live temperature measurement results are displayed in the software and can be exported in various formats.

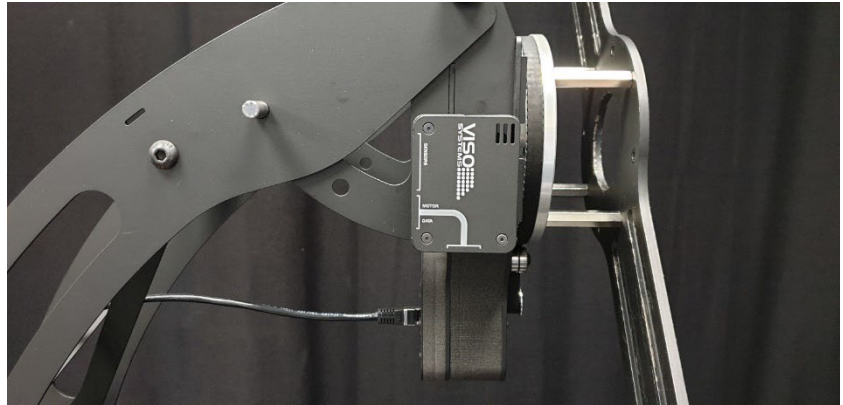
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# LabTemp Installation Procedure<sup>1</sup>

## Hardware setup

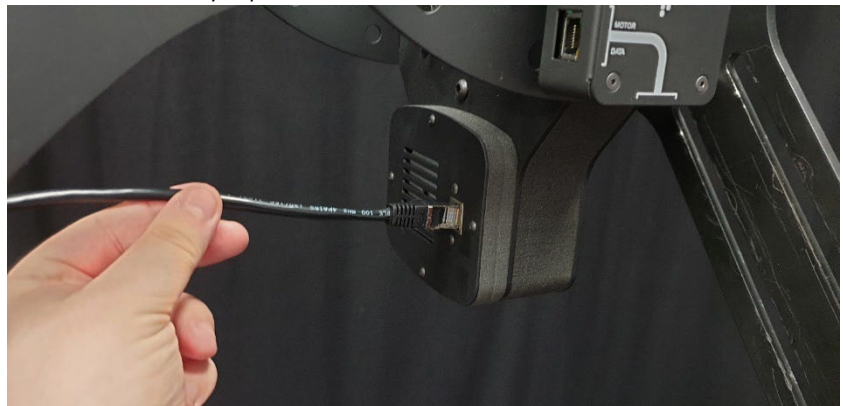
The following images show LabTemp installation on a LabSpion light measurement system. The procedure is the same on BaseSpion

**Step 1:** Place the LabTemp unit on the desired measurement equipment using the magnets on the back.



Note: If the internal high precision sensor is to be used to test compliance with the S 025 standard the vents in the corner of the LabTemp unit should be placed at the same height as light measurements are being performed.

**Step 2:** Disconnect the C-Plane motor Ethernet cable from the C-Plane motor. The other end should stay in place in the mainboard.



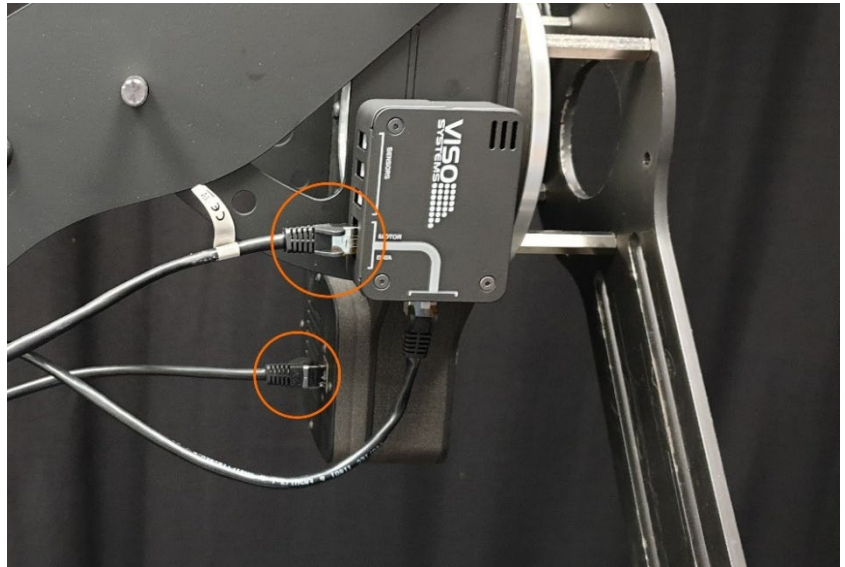
<sup>1</sup> Note: Owners of LabSpion and BaseSpion built before March 2021 need to make some mainboard modifications that are described step by step later in this manual.

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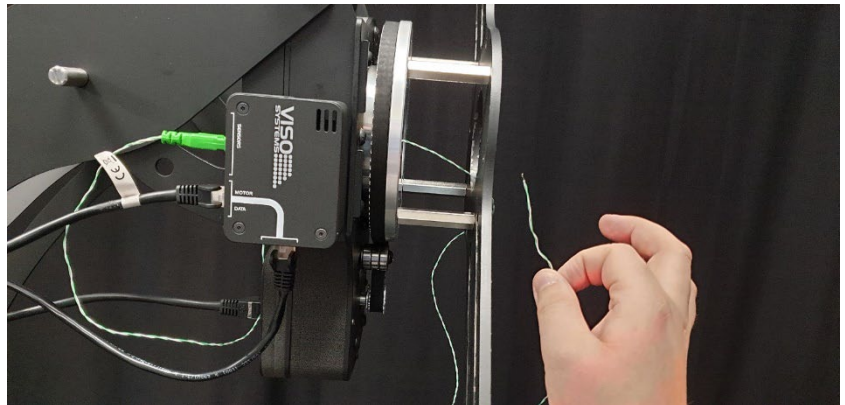
**Step 3:** Connect the C-Plane motor cable into either one of the LabTemp data connectors.



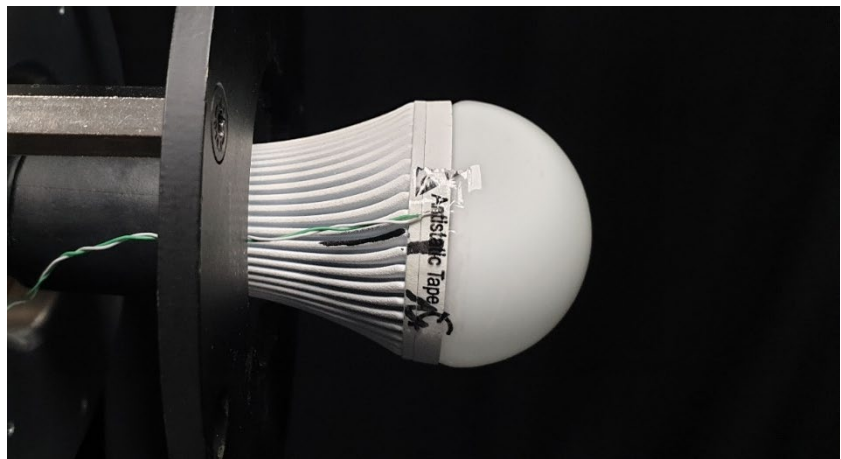
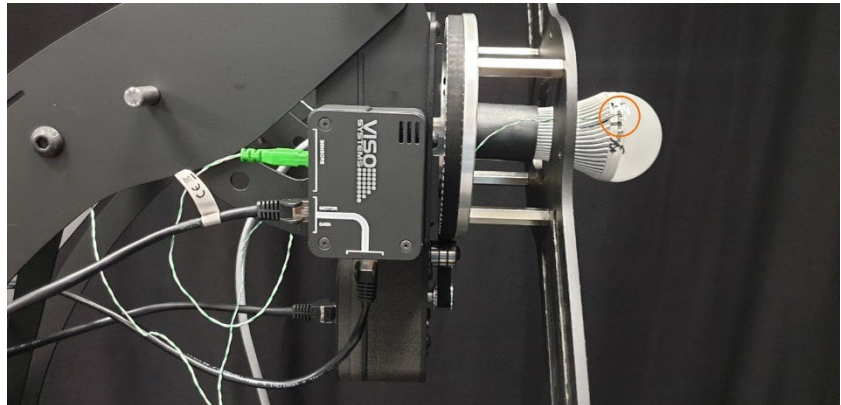
**Step 4:** Connect the short cable included with the LabTemp into remaining LabTemp data connector and the C-Plane motor of the measurement equipment.



**Step 5:** If needed connect any of the external temperature probes to the LabTemp and feed the probe wires through the cable hole on the measurement equipment used.



**Step 6:** Affix the external temperature probe tips to the DUT using heat resistant tape.



OBS: For higher temperatures Kapton tape can be used if other tape types tend to peel off or the adhesive tends to break down.

**Step 7:** LabTemp Hardware setup is complete.

## Attaching k-type probes

When attaching K-type thermocouples to a surface for accurate temperature measurement, consider these best practices:

### Choosing the Right Probe Type

3 basic probes are included, but several other k-type probes exist:

- Exposed junction thermocouples for fast response but sensitive to air currents.
- Surface probes with a flat tip for better contact.
- Magnet-backed probes for ferromagnetic surfaces.
- Adhesive-backed thermocouples for long-term attachment.



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## Attachment Methods

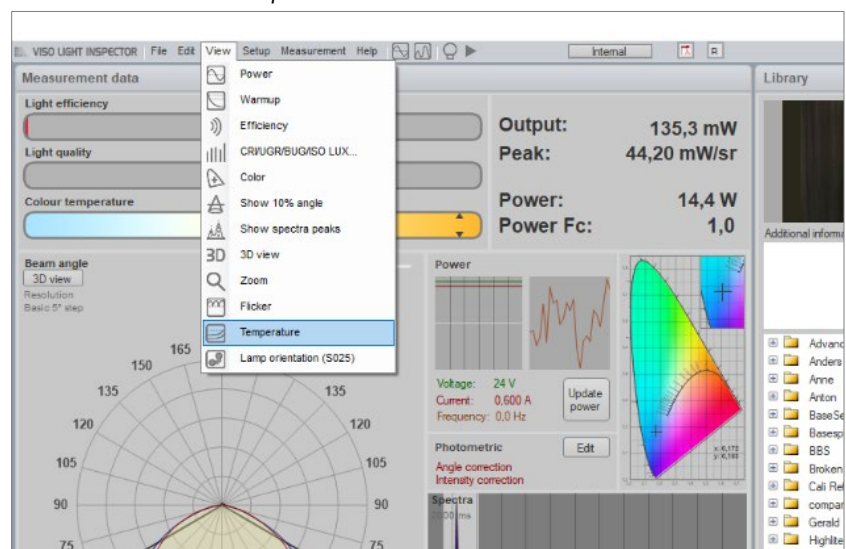
- Thermal Conductive Adhesive or Tape
- Kapton tape (polyimide): High-temperature resistant, good thermal contact.
- Aluminum or copper tape: Improves thermal conduction to the probe.
- Thermally conductive epoxy: Permanent and robust but harder to remove.
- Mechanical Clamping
- Spring-loaded clamps: Maintain consistent pressure.
- Screws and brackets: If the surface allows drilling.
- High-Temperature Methods
- Ceramic cement: Withstands extreme temperatures but is permanent.
- Spot welding (for metal surfaces): Ensures excellent contact but is irreversible.

## Considerations for Accuracy

- Minimize air gaps by pressing the thermocouple firmly against the surface.
- Use thermal grease to improve heat transfer if applicable.
- Avoid placing the probe in direct airflow unless measuring air temperature.
- Keep the probe wires insulated to avoid electrical interference.

# Software Setup and Measurements

**Step 1:** Open the Viso LightInspector software and go the temperature measurement section under *View* → *Temperature*.

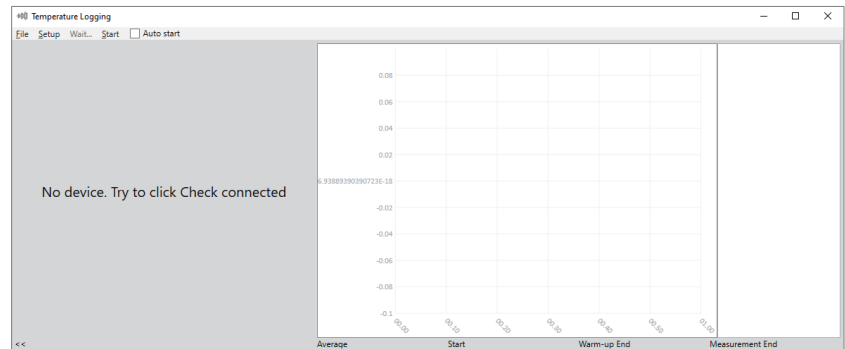


**Step 2:** If no LabTemp units are connected you will be prompted to connect them

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and have to press “Check connected” for the software to find the LabTemp units.

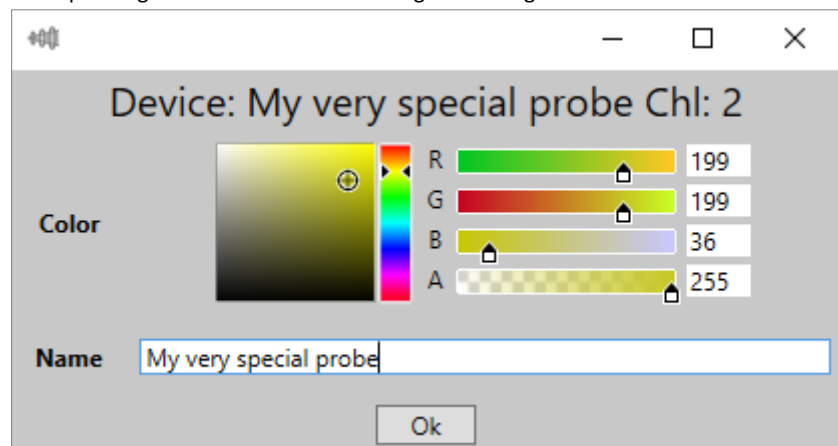


**Step 3:** Once the LabTemp Units have been detected they will show up in the panel on the left of the temperature measurement window.



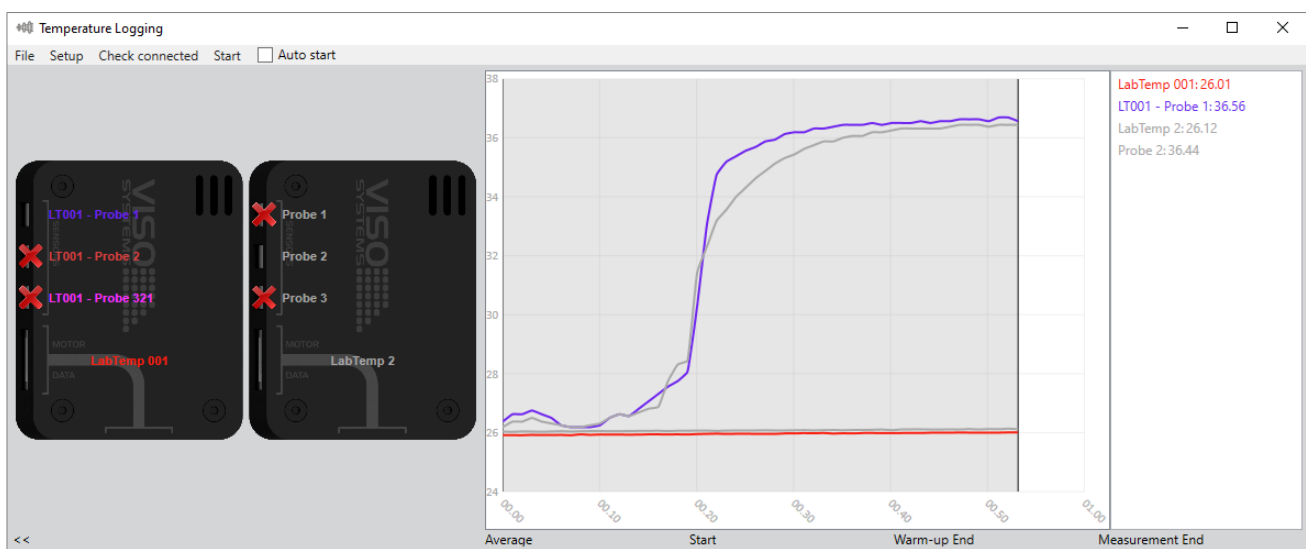
OBS: If external sensors are needed, they will need to be connected to the unit before pressing the “Check connected” button. Otherwise, another press of the “Check connected” button is required for them to be detected.

**Step 4:** If needed the internal and external sensors can be named and given a color in order to increase readability of the graphs. This can be done by clicking the corresponding text on a sensor and editing the settings.



**Step 5:** Once all sensors have been connected, configured and detected, a measurement can be started either manually (Start) or automatically alongside with normal light measurements (Auto start). Data will be shown on the graph in the middle of the temperature window and a legend will be shown on the right side of the window. Start, Stop and End of warm up period will automatically be displayed on the graph during measurement.

**Posterior changes:** If you want to change the representation color or name of a probe, you can always do this by right-clicking the probe name and entering your changes. Remember to save you measurement file to keep these changes.



**Step 6:** Your setup is now complete.

At Viso Systems, we design, develop and manufacture OEM- and customer-specific goniophotometer solutions. Our mission is to support customers with powerful, yet easy-to-use control and measurement solutions. Products are developed and manufactured in Copenhagen, Denmark.

# Mainboard Modifications

## LabSpion Modifications

**Note:** Disregard this chapter if you own a LabSpion built after March 2021.

**Step 1:** Unplug the LabSpion and disconnect it from all other equipment.

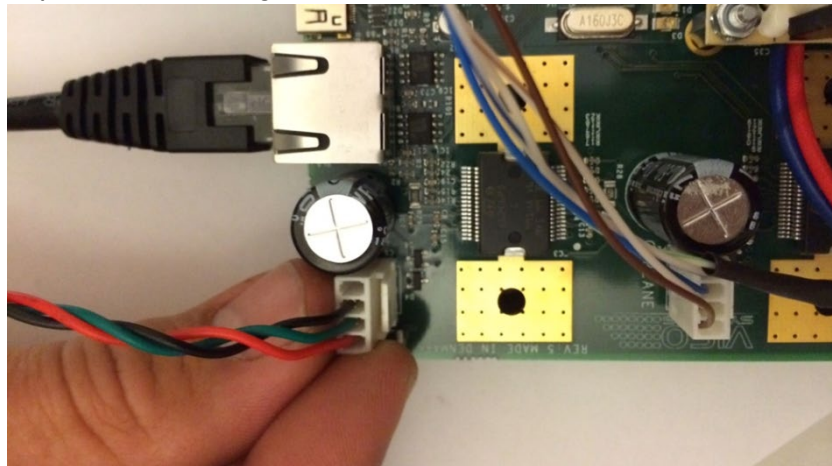
**Step 2:** Undo the 3 screws on the top of the Mainboard panel.



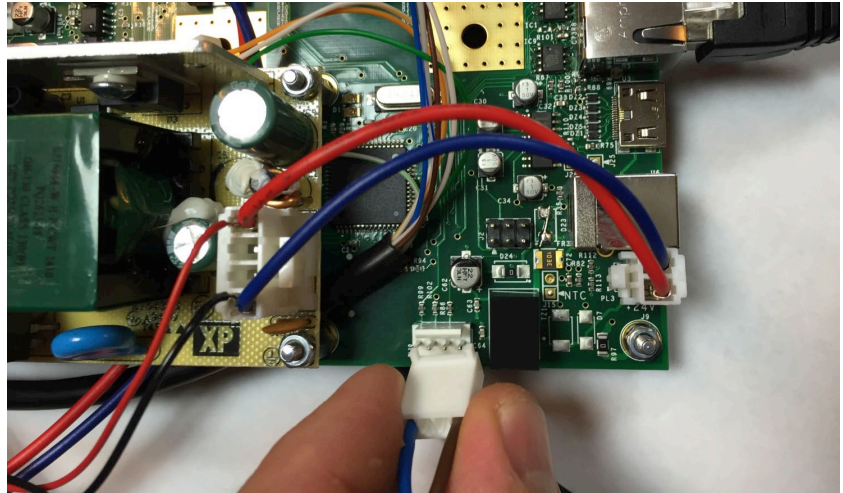
**Step 3:** Slide the Mainboard panel out making sure not to damage any internal cables.



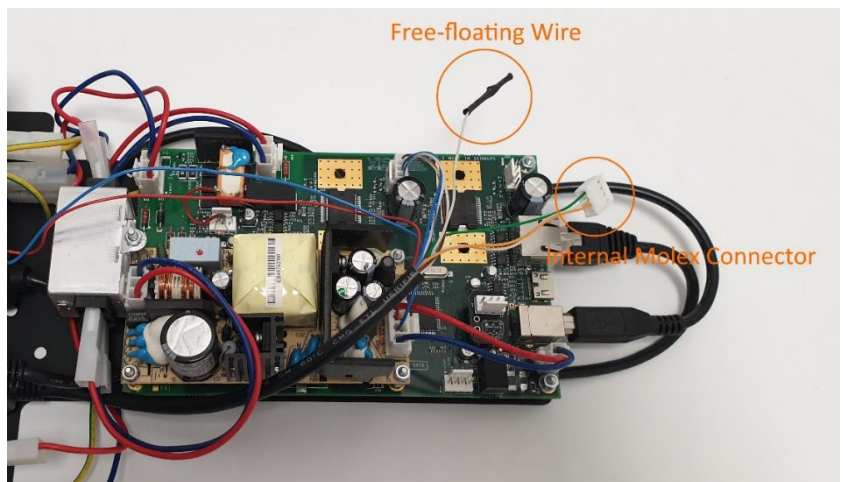
**Step 4:** Remove the main goniometer motor cable.



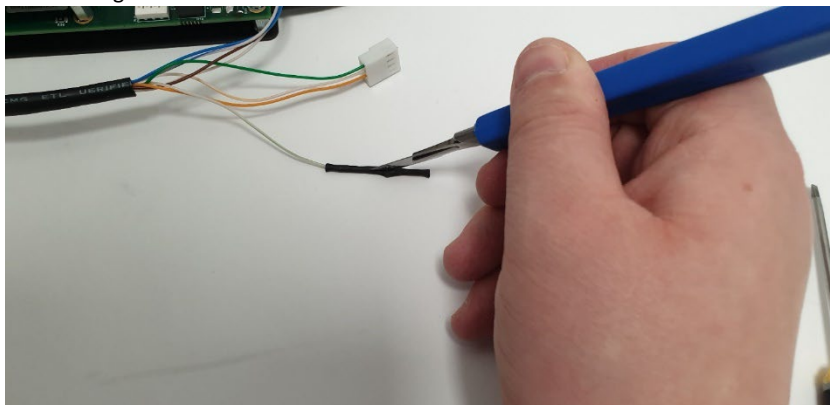
**Step 5:** Remove the rotation lock for the base.



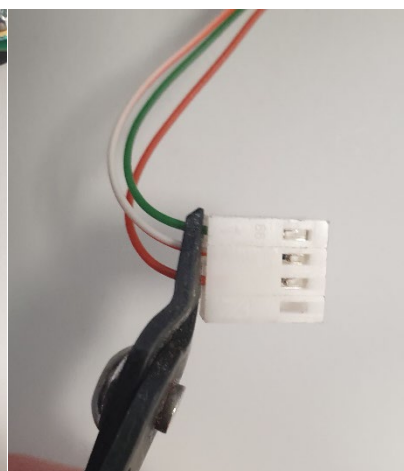
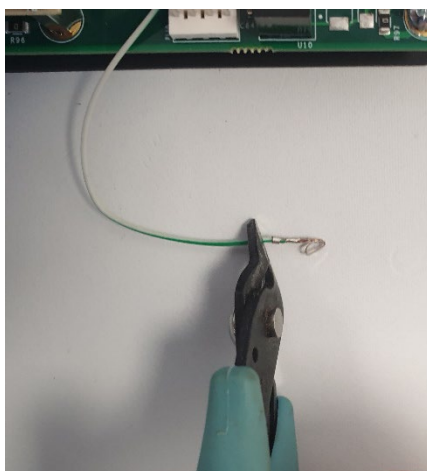
**Step 6:** Locate the free internal Molex connector connected to the C-Plane motor connector.



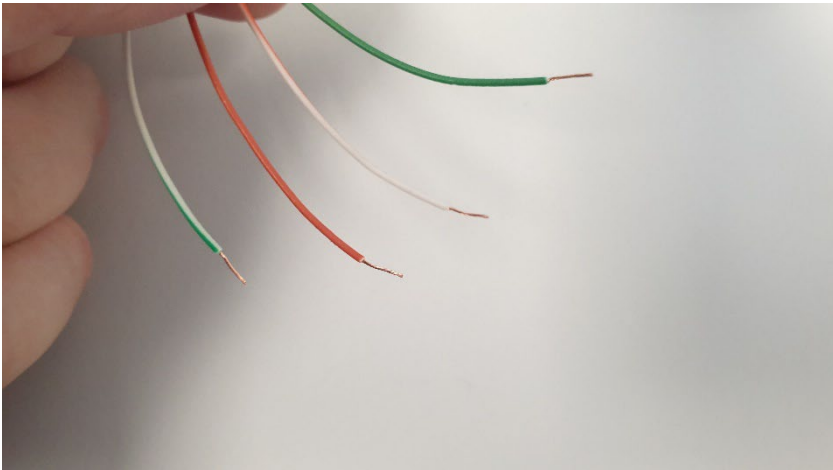
**Step 7:** Carefully use a knife to free the single free-floating terminal from the surrounding heat shrink.



**Step 8:** Cut the free-floating wire and the wires going to the internal Molex connector.



**Step 9:** Strip 5mm of insulation from each wire and twist the conductors together. This is to avoid stray conductors accidentally shorting between the terminals after insertion.



OBS: For stripping the wires either the 24 AWG setting on a wire stripper can be used or a wire snipper with some patience and a steady hand.

**Step 10:** Insert the wires into the screw terminal according to table 1 and tighten the screw.

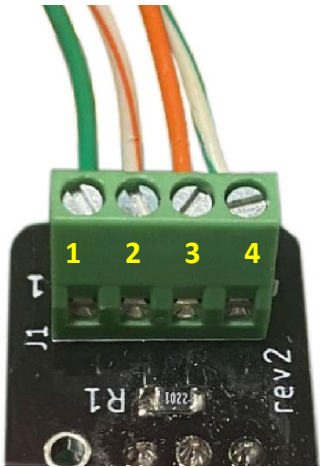
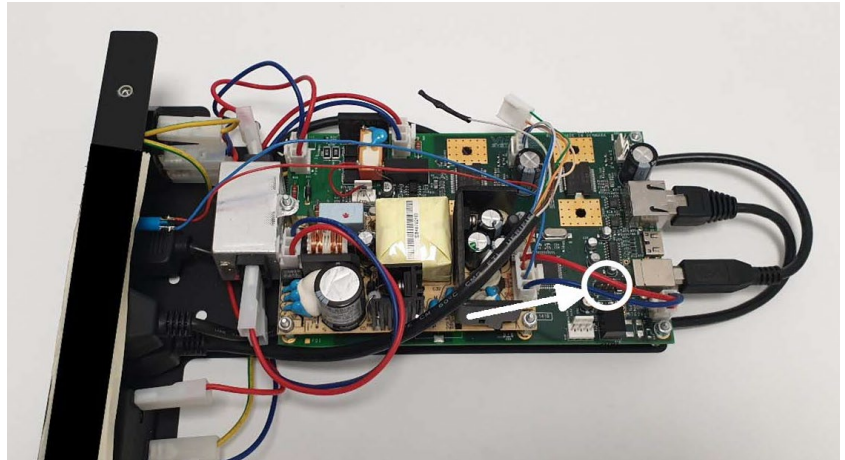


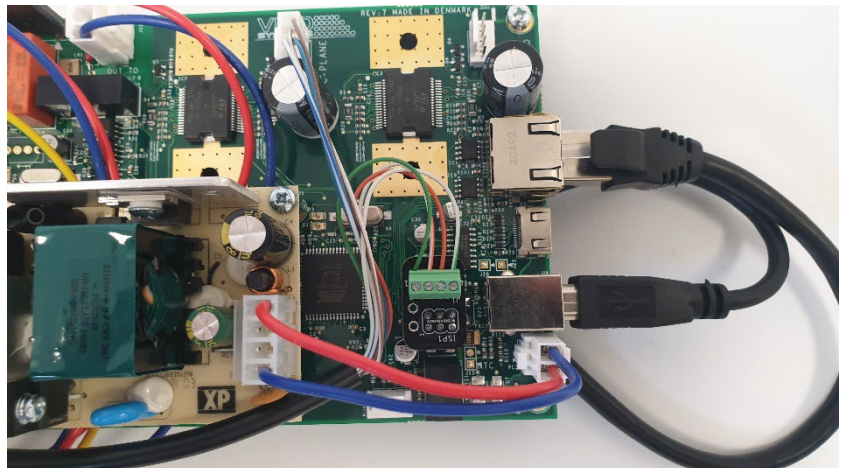
Table 1	4	3	2	1
Terminal slot number				
Cable Type 1	White & Green	Orange	White & Orange	Green



**Step 11:** Locate the 6 pin J2 pinheader on the Mainboard.



**Step 12:** Plug in the Mainboard to screw terminal adapter with the screw terminal facing the center of the Mainboard.



**Step 13:** Plug in the main goniometer motor wire and the rotation lock wire that was removed in step 4 and 5.

**Step 14:** Put the LabSpion Mainboard panel back into the LabSpion again making sure not to damage any of the internal cables.

**Step 15:** Screw in the screws on the top of the Mainboard panel.

**Step 16:** LabSpion modification is complete.

## BaseSpion Modifications

Note: Disregard this chapter if you own a BaseSpion built after March 2021.

**Step 1:** Unplug the BaseSpion and disconnect it from all other equipment.

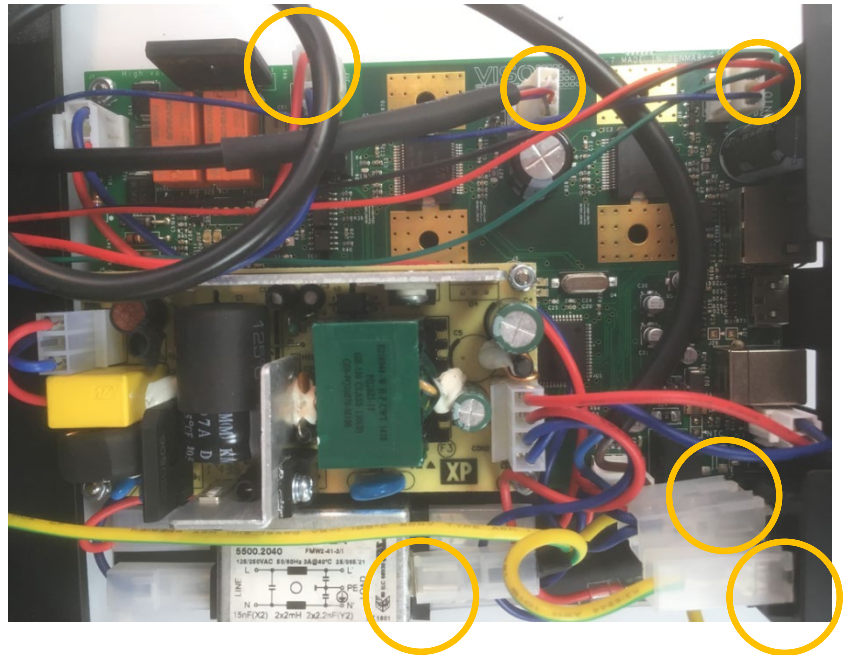
**Step 2:** Undo the 2 screws on the top of the Mainboard panel.



**Step 3:** Slide the Mainboard panel out making sure not to damage any internal cables.



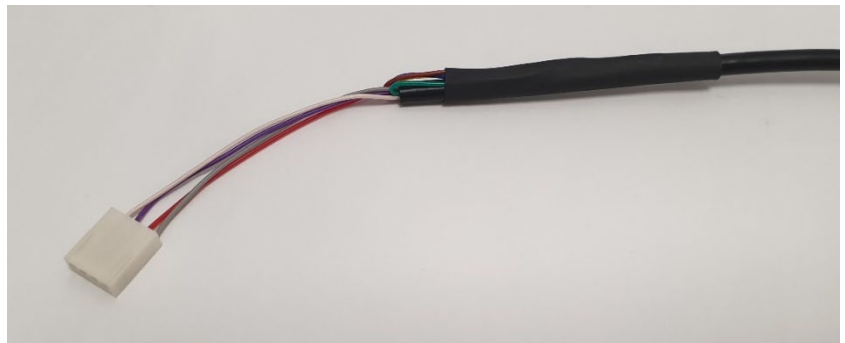
**Step 4:** Remove the 3 Molex connectors and the yellow grounding cable with 3 connectors.



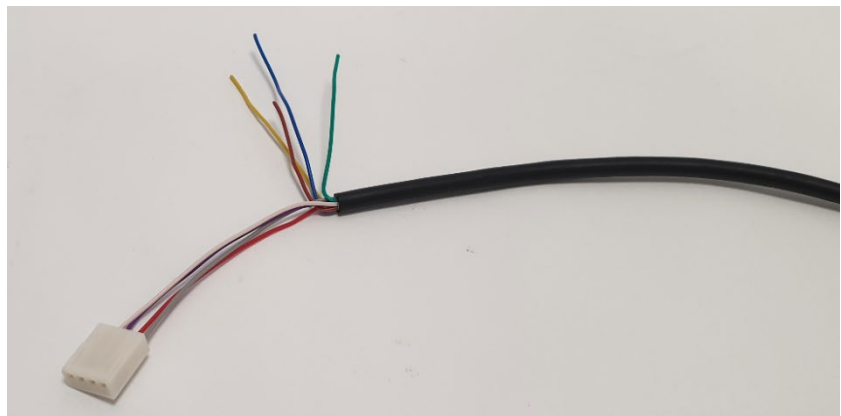
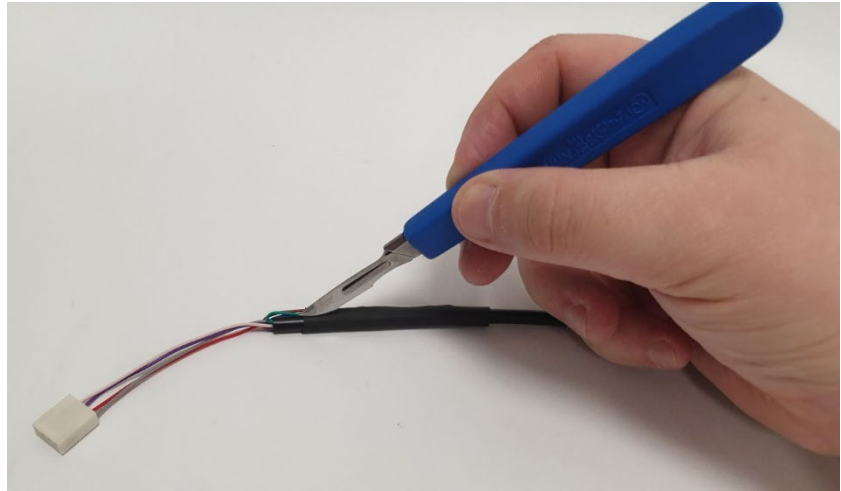
**Step 5:** Remove the rotation lock for the base.



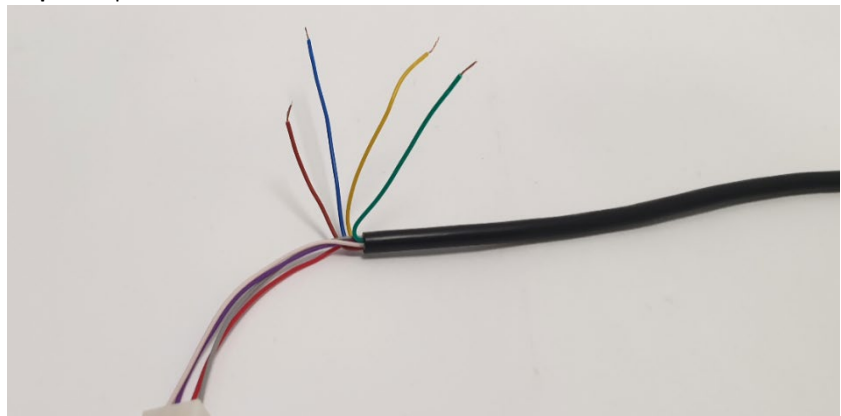
**Step 6:** Locate the heat shrink covered internal Wires on the internal C-Plane motor cable.



**Step 7:** Carefully use a knife to free the wires from the surrounding heat shrink.



**Step 8:** Strip the wires clean from insulation. About 5mm of clear wire is needed.



OBS: For stripping the wires either the 24 AWG setting on a wire stripper can be used or a wire snipper with some patience and a steady hand.

**Step 9:** Insert the wires into the screw terminal and use a screwdriver to lock the wires in place. The wires should be placed in the terminal in the order specified in Table 2 according to the colors of the internal wires.

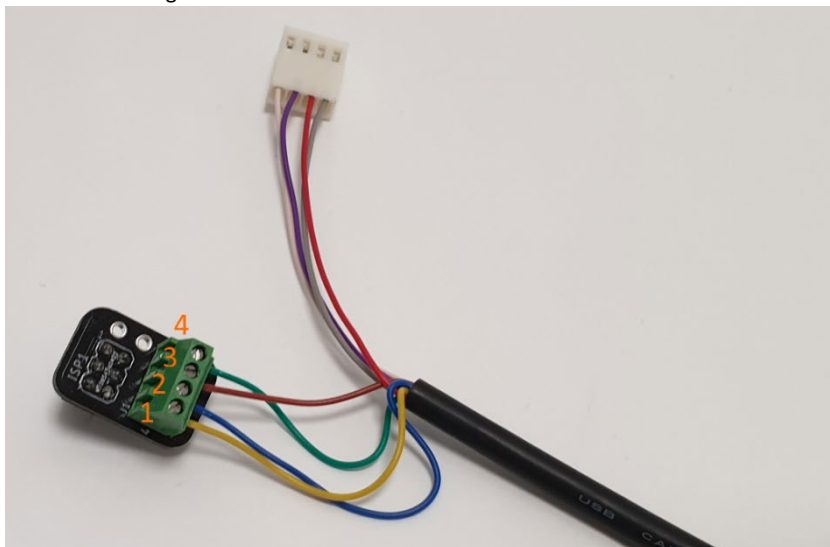
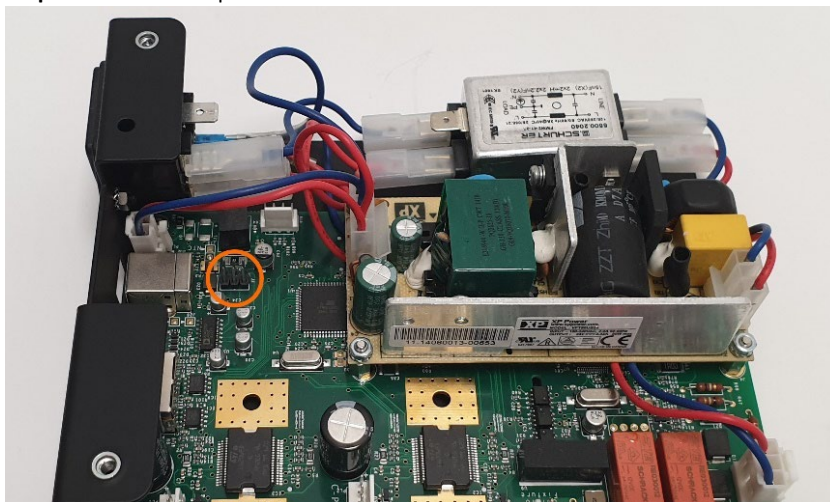


Table 2

**Terminal slot number**

	1	2	3	4
Cable Type 1	Yellow	Blue	Brown	Green
Cable Type 2	White & Green	Orange	White & Orange	Green

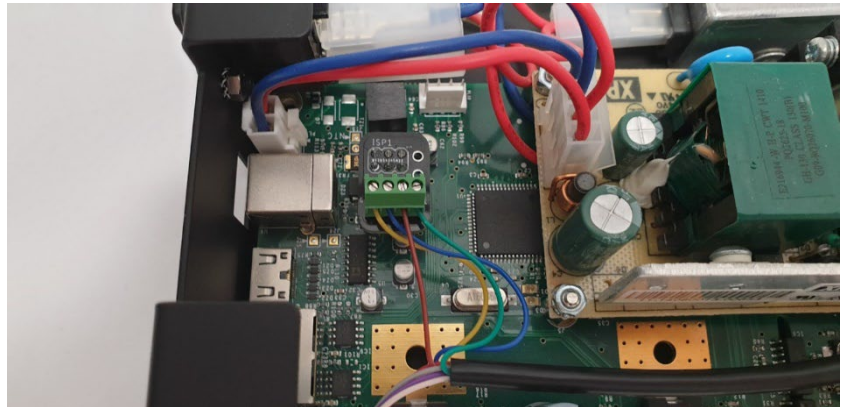
**Step 10:** Locate the 6 pin J2 header on the Mainboard.





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**Step 11:** Place the included Mainboard to screw terminal adapter with the screw terminal facing the center of the Mainboard.



**Step 12:** Plug in the main goniometer motor wire and the rotation lock wire that was removed in step 4 and 5.

**Step 13:** Put the BaseSpion Mainboard panel back into the LabSpion again making sure not to damage any of the internal cables.

**Step 14:** Screw in the 2 screws on the top of the Mainboard panel.

**Step 15:** BaseSpion modification is complete.

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## Technical Specifications

Power and data	Via Ethernet RJ45
Dimensions, L*W*H	76.3mm * 58mm * 32mm
Materials	Powder coated steel housing
Weight	Device 200 g + sensors and 0.5 m Ethernet cable
Number of sensors Internal	1 pcs, external 3 pcs
Temperature range of sensors	Internal -40 to 128 °C, external -210 to 1800 °C
Accuracy of sensors	Internal $\pm 0.25$ °C, external $\pm 0.15\%$
Precision of sensors	0.01 °C
Update Frequency	5Sa/s