mo-sys
VisionMax

Optical Camera Tracking System
Accessory for StarTracker Max

Version 1

What comes with it?

1. Vision sensor

Shown is the DS80

2. V-Lock mounting kit (screws included)

3. USB cable

What is it?

The VisionMax is an add-on tracker that allows the StarTracker Max to carry on tracking when it loses sight of the stars. It's primarily designed for environments such as tracking inside a car or underneath lighting silks, outdoors – anywhere where it is unfeasible to stick stars.

The VisionMax tracker uses vSLAM to track features in the environment, and ST Max fuses its pose data in seamlessly and automatically when it loses sight of the stars, then gradually returns to star tracking when stars are found again. The VisionMax still needs to initialize tracking from the stars.

The process is transparent to the user. There is no additional calibration, operation, or homing required.

This maintains the robustness and accuracy of tracking from stars where possible, with the ability to compromise in areas where it is unfeasible to add stars.

The tracker is mounted with a v-lock so can be quickly mounted for only the shots that need it.

When the tracker is attached and enabled, it works transparently - the user does not have to do any extra steps other than begin tracking with stars (to find its absolute position); the StarTracker Max handles the operation of and data fusion from the tracker, and the interface with lenses and the virtual set remains exactly the same.

The trackers the ST Max interfaces to to provide the vision tracking are currently the Intel T265* and Xvisio DS80.

These have their own cameras and proprietary visual SLAM algorithms running onboard, tracking whatever features look distinctive in the environment, and handle the image processing, tracking and processing by themselves, giving the pose of the tracker to the StarTracker to further process.

However, this means that unlike when tracking stars, we do not control any of their settings nor monitor what or how well they are tracking.

Even when fused with the StarTracker's gyro, they may drift or jitter depending on the environment, and performance across environments may vary.
In general, such visual SLAM systems tend to track well in environments which include the following characteristics:
• consistent lighting
• good texture
• a mostly static scene

They may drift or jitter slightly in environments including:
• plain environments (not enough features to track)
• lots of movement, for instance people and/or LED walls
• sudden lighting changes (features may significantly change appearance)

We recommend pre-trying the VisionMax in the intended environment to gain experience of the performance and behaviour.

*We only supply the DS80 as the T265 is discontinued – T265 only shown for compatibility.

mo-sys
CAMERA MOTION EXPERTS

How to mount it

1. The StarTracker Max sensor unit has two mounting screw holes on the front and back face already present. Screw the V-Lock plate into the holes. Depending on your needs you can either mount it pointing forwards or backwards (for offsets see page 5)
2. Usually, you would point it forwards but backwards is an option, for instance to point backwards away from an LED wall.
3. Screw the Vision sensor plate of the mounting bracket to the Vision sensor
4. The narrow screw holes are for the DS80 and the wider holes are for the T265.
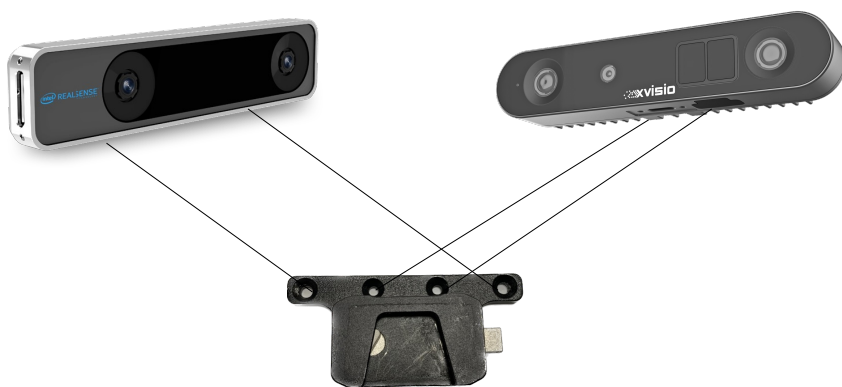
5. Attach the plate to the V-Lock

6. Plug in USB cable. Plug one end into Vision sensor and the other end into USB hub in your StarTracker or directly into the StarTracker if there is no need for USB hub.

mo-sys
CAMERA MOTION EXPERTS

How to operate it

1. If you are using the browser UI go to VisionMax (Vision Tracker) tab. Select your device from the Type dropdown.

2. Press Enable button. After a few seconds you will get a green tick if the tracker was enabled successfully.
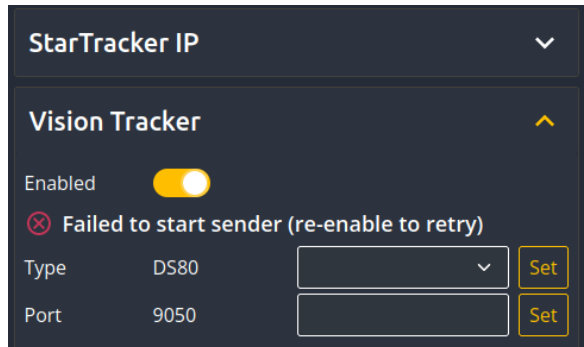
3. During normal tracking if the device symbol is green the VisionMax is ready standing by to take over.

4. Device Status Symbol:

   Grey: If it is grey, it's not enabled.

   Green: The device is ready to be used.

   Red: If it's red there is a problem and the VisionMax is not ready to track. Then you need to check cables are plugged in and try to reenable it. It can also be red if the StarTracker hasn't started tracking with Optical good. Maybe the map isn't loaded, or the system hasn't found it's place in the map yet. The VisionMax needs to know where the system is, to take over tracking.

5. When you take it off make sure to disable it in the UI.

6. The equivalent page for the local StarTracker UI is in Stars -> Advanced.
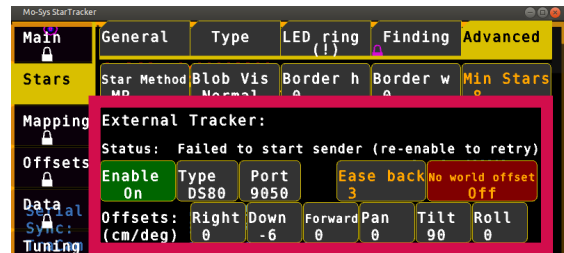
7. Operation is seamless. If optical is lost or the status is searching, don't worry, if the VisionMax symbol is green it will keep tracking.

8. The Ease Back setting is the number of seconds for the transition from vision tracking back to star tracking. This is to avoid a jump, if the VisionMax position drifted. We recommend 3 seconds. But feel free to play with it.

9. The port is 9050 by default. You shouldn't need to change it unless for some reason you are already receiving data on that port.

Note: The StarTracker does not monitor the quality of the pose coming from the VisionMax tracker. We recommend trying out the intended shot (with the same environment and lighting) beforehand to check that the VisionMax tracking output is sufficiently accurate and jitter-free for the shot.

Offsets

T265 front mounting

T265 back mounting

Note: DS80 offsets are still under revision. All offsets given are subject to change as we refine them.

January 2024

For more information
sales@mo-sys.com | www.mo-sys.com