PRODUCT BRIEF

Intel® RealSense™ Tracking Camera T265

Quality Tracking Tiny Device

New class of self-contained visual inertial odometry tracking solution for robotics, drones and more

Give your robot or drone a sense of its place in the world with the Intel RealSense Tracking Camera T265.

Simultaneous Localization and Mapping

The Intel RealSense Tracking Camera T265 is designed to provide high quality, low latency Simultaneous Localization and Mapping (SLAM) in one self-contained, low power package.

What is SLAM?

SLAM, or Simultaneous Localization and Mapping is a method to solve how a device constructs or updates a map of an unknown environment while simultaneously keeping track of its own location within that environment.

There are many SLAM technologies, but one popular approach due to its efficiency and accuracy uses one or more cameras and Inertial Measurement Units (IMU), incorporating the data from these different sensors together for Visual Inertial Odometry. This type of more efficient and accurate SLAM is often referred to as V-SLAM .

Intel RealSense Tracking Camera T265 is a new class of self-contained device for V-SLAM, with all position calculations performed on the device at extremely low power.

Simple and Versatile Prototyping

For developers working on a robotics, drone or augmented reality system, SLAM can be challenging to implement; requiring significant time and resources in order to add valuable environmental understanding. With the T265, developers can now have precise and robust tracking that has been extensively tested.

This self-contained tracking system is designed for simple integration. There is no need to re-design your board, simply plug in the provided USB cable and start immediately streaming pose data. The T265 also features an easy mounting solution, with standard mounting sockets on the rear of the camera.

Platform Independent Solution

At launch, the T265 will include support for Windows and Ubuntu. The Host API library is open source, and since the FW that runs inside T265 is independent of host platform, the performance of T265 is also host independent. With the on-board Intel® Movidius™ Myriad ™ 2 handling all of the tracking algorithms, there are no requirements to use host-based compute. This means that the T265 caneasily be run on an Android-based phone, a Raspberry Pi or whatever platform you desire*.

Precision Tracking

The T265 has been extensively tested and validated for performance[1], providing under 1% closed loop drift under intended use conditions. It also offers sub-6ms latency between the start of movement and reflection of the movement in the pose, which means the T265 offers latency low enough for even highly-sensitive applications such as Augmented and Virtual Reality. Despite this accuracy, the T265 doesn't require a lot of power, operating at an incredible 1.5W or less.

Go Anywhere

While well-lit environments are preferable, T265 performs well at light levels as low as 15 lux, and, depending on the exact structure of the light, can sometimes continue to work at even lower light levels[2].

The camera will work both indoors and outdoors. An ideal operating space for the T265 has a reasonable number of fixed, distinct visual features in view. In environments where crowds, or many moving, near-field objects are expected, it's possible to point the camera upwards, where it can use features on ceilings to navigate.

Part of the Family

While there are many use cases for a stand-alone T265, it is definitely a part of the Intel RealSense Technology family, and has been designed to work flawlessly along-side our other devices. The T265 features an infrared cut filter over the lenses, allowing it to ignore the projected patterns from our D400 series depth cameras. This means that developers can utilize both devices together with ease for advanced applications such as occupancy mapping or collision avoidance and navigation in locations where GPS data isn't available.

INTEL® REALSENSE™ TRACKING CAMERA T265 FEATURES AT A GLANCE

FEATURES	Benefits
Proprietary V-SLAM	High precision Visual Inertial Odometry Simultaneous Localization and Mapping algorithms
Intel® Movidius™ Myriad™ 2.0 VPU	Visual Processing Unit optimized to run V-SLAM at low power
Two Fisheye lenses with combined 163 ±5° FOV	The camera includes two OV9282 imagers with fisheye lenses for a combined, close to hemispherical 163° field of view for robost tracking even with fast motion
BMI055 IMU	The Inertial Measurement Unit, allows for accurate measurement of rotation and acceleration of the device, to feed into the V-SLAM algorithms
USB 3.1 Gen 1 Micro-B	USB 2.0 and USB 3.1 Gen1 supported for pure pose data, or a combination of pose and images. Connection on the camera is Micro-B.
108 x 24.5 x 12.5 mm	Small form factor designed to mount on any device with ease
2 x M3 0.5mm post mounting sockets	Securely attach the camera to your device with these standard mounting points on the rear of the camera

[1] Under 1% drift observed in repeated testing in multiple use cases and environments. AR/VR use cases were tested with the T265 mounted on the head in indoor living and office areas with typical indoor lighting including sunlight entering the room. Wheeled robot use cases tested with wheel odometer data integrated, again in indoor office and home environments.

[2] Sufficient visibility of static tracked visual features is required, the device will not work in smoke, fog, or other conditions where the camera is unable to observe visual reference points. Performance will vary based on use case and environment, the system will attempt to detect and report reduced tracking precision.

CONTACT

If you have additional questions about this technology or how it would benefit you, our FRAMOS imaging experts are available to answer any questions. We can be reached at: info@framos.com