# HoloNAV Technical Specifications

HoloNav is a solution for location-based AR with the HoloLens 2*.  This lightweight attachment enables your HoloLens 2* to be used in nearly any location by providing high-accuracy GPS and compass heading through a Bluetooth LE connection. In addition, it helps keep your HoloLens 2* cool with two ultra-quiet fans.

| PRODUCT INFO | | | |
|---|---|---|---|
| **DIMENSIONS** | **WEIGHT** | **POWER CONSUMPTION** | |
| **Height** 140 mm  **Width** 126.5 mm  **Depth** 61 mm | 276 g | 2+ Hours at room temperature | |
| **GPS** | **IMU** | **Cooling Fans** | **Battery** |
| **GNSS**: GPS, Galileo and GLONASS. **Accuracy**: 2.5m - horizontal position. **Update rate**: 10 Hz. Supports Differential GPS (D-GPS) data. | 9-DOF Absolute Orientation IMU. **Outputs fused sensor data** Quaternion (100Hz), Euler angles (100Hz), Rotation vector, Linear acceleration, Gravity, Heading. | **Fan Blade**: 7 Blades. **Bearing Type:** Brushless Dual Ball Bearing. **Rated Speed:** 6000PRM. **Airflow:** 7.32CFM. **Air Pressure**: 2.98mmH2O. **Noise:** 26.26dB. **Life Expectancy:** 50000h at 25-degree test. | Li-ion battery able to recharge 1000 times. Low self-discharge technology that makes it hold 75% power after 3 years of non-use. Protection: over-charged, over-discharged, over-voltage, over-current and short circuit. |

## Bluetooth LE Data Protocol

| DATA PROTOCOL (bytes) | CHECKSUM | FLAGS |
|---|---|---|
| HoloNav serializes the Latitude (8), Longitude (8), Altitude (8), GPS Speed (8), Sat Count (4), Bearing (4), Roll (4), Pitch (4), and Flags (1) into a binary format that is sent over BLE. A parity byte is computed to perform a checksum on the receiver. | Sum of all bytes received, this includes the parity byte, so all 50 bytes. | 4 flags stored in one byte. Defined Flags: 0(0x01): Reliable Compass, 1 (0x02): GPS Lock, 2 (0x04): GPS Ready, 3 (0x08): GPS Location Updated. |

## Visual Indicator

| LED Color | LED State | Meaning |
|---|---|---|
| Red | Steady | Power ON. GPS has no lock yet and IMU is connected but not calibrated yet |
| Yellow | Steady | GPS lock. Waiting for GPS to be more accurate and IMU to be reliable |
| Yellow | Blinking | GPS lock and ready, but IMU not reliable. IMU needs calibration |
| Blue | Steady | IMU ready and waiting for GPS lock |
| Blue | Blinking | Waiting for GPS to be more accurate |
| Green | Steady | All good |

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