Indoor positioning technologies comparison table

www.marvelmind.com

Technology	Accuracy	Location update rate	Applications	Other pros and cons	Cost
Ultrasound (Marvelmind)	±2cm	Up to 40Hz	- Autonomous robots - Autonomous drones - Forklifts, vehicles - People tracking - Cranes - Boats	The most accurate IPS. High acoustic noise may interfere.	100-200 USD per beacon. Stationary beacons have the same cost.
UWB	10-30cm	Up to 200Hz	- Autonomous robots - Autonomous drones - Forklifts, vehicles - People tracking - Cranes - Boats	Nearly all UWB vendors use the same chipset from Decawave (Qorvo) – the same risks and the same specs	100-300 USD per tag. Anchors – more expensive.
BLE / Bluetooth	- 2-5m - ~1m with BLE AoA	1Hz typ.	Tracking of people with cell phones and apps installed. Not designed for industrial applications, though widely used due to lower costs than UWB.	Very low power consumption for anchors – up 1-2 years on one battery. Poor accuracy due to RSSI-based technology.	5-20 USD per anchor. Industrial variants can be significantly more expensive.
WiFi	~5-15m	1Hz typ.	- People - Vehicles	If existing WiFi infrastructure can be reused, there is no need to install additional anchors or tags. The big question is whether the existing WiFi access points support the RTLS functionality	Low, if existing WiFi is reused. High, if new WiFi access points are required.
LIDAR	Up to mm-level	~8Hz	- Robots and AGVs - Too heavy, costly, and power-hungry for other industrial applications	- Can be mm-level accurate	10-10k USD per LIDAR depending on specs
Optical	Depends on distance: cm-dm level	Up to 100Hz	- VR/AR applications - Robots, AGVs - Drones	Multiple subvariants: - QR codes - Stargazers - Optical flow - Motion capture	From ~10 USD for cameras for basic systems to 100+kUSD for expensive motion capture
IR	Depends on distance: cm-dm level	Up to 100Hz	- People - Assets - Robots - Drones	High requirements for the line of sight. It can be interfered with by other IR sources.	Can be low – depends on the implementation
RFID / active RFID	Not a real IPS. Gate-based positioning	No real-time tracking. Event-based location updates	- People tracking gate-based - Assets tracking with scanners, robots, or drones	Gate-based tracking. More accurate location data may come from autonomous robots or drones with RFID scanners onboard/	Very low cost for tags. 10 – 300 USD for scanners.
Odometry	mm- to dm-level – depends on distance	Up to 100Hz	- Robots - AGVs	- Accumulate errors over distance - Must be used with other systems in the sensors fusion scheme	Depends on implementation – from very low to high.
Inertial	mm- to tens of meters and more. Depends on time	Up to 400Hz	- People - Robots - Drones	It doesn't work as a standalone system because, due physics of the technology, the location drift becomes ~meters in a few seconds (for MEMS)	1-5 USD for basic MEMS. 1-500k USD for laser-based gyroscopes.