



VERSION 1.0

Sentrax BLE Tag Guide



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Overview

This document provides a comprehensive guide to integrating Sentrax’s Real-Time Location System (RTLS) hardware with partner platforms. Our system offers multiple integration options, including REST APIs, a Positioning Engine with Connector/Docker Images, and MQTT. This guide will walk you through each option, providing the necessary details to facilitate seamless integration.

1. Introduction

This guide is intended to assist Sentrax partners in selecting appropriate BLE tags for various RTLS deployments. It provides technical details, selection criteria, and deployment considerations to ensure optimal system performance across use cases.

For support, contact support@sentrax.com or your dedicated account manager.

2. Tag Types Overview

2.1 Personnel Tags

- Badge tags (lanyard/wearable)
- Wristband tags (for healthcare, infant tracking)

2.2 Asset Tags

- Standard tags (machinery, tools)
- Compact tags (small devices, containers)
- Trolley/basket tags.

2.3 Special Tags

- Asset tags with Environmental sensors (temperature, humidity, pressure)
- Anchor Beacons (indoor positioning/fixed position)
- ATEX tags (sensitive environment tags)

TAG TYPE	USE CASE	MOUNTING	ENVIRONMENT
PERSONNEL	Staff, patients	Wearable	Indoor
ASSET (COMPACT)	Medical devices, tools	Adhesive	Indoor
ASSET (STANDARD)	Industrial machinery	Screw mount, Adhesive	Mixed
ANCHOR BEACONS	Indoor navigation, safety	Adhesive, Screw Mount	Mixed

3. Sentrax Tag Ecosystem

3.1 Native Tags

- Designed and tested in-house
- Supports SBeacon, iBeacon, and Eddystone (UID & TLM)
- Full compatibility with SBeacon, SDM, and Solix platform/API config.

3.2 Certified Third-Party Tags

- Provided by our registered partner vendors (e.g., Moko, EM Microelectronics)
- Must support Sentrax firmware and SBeacon if used in AoA deployments

4. Understanding Sentrax's BLE tags and SBeacon

4.1 Sentrax BLE Tags and Operating Protocols

Sentrax offers a proprietary range of BLE tags, along with support for third-party BLE tags supplied by certified partners. These third-party tags are fully compatible with Sentrax's infrastructure through the integration of our proprietary **SBeacon protocol**.

Sentrax BLE tags broadcast Bluetooth signals using a combination of advertising formats, including **SBeacon, iBeacon, and Eddystone (UID & TLM)**. Each advertising packet type serves specific use cases:

SBeacon: Sentrax's proprietary protocol is designed for high-precision tracking, advanced tag management, and AoA (Angle of Arrival) compatibility. SBeacon packets carry additional metadata required for deterministic localization and device management over the Solix platform.

iBeacon: A widely supported protocol suitable for proximity-based or medium-accuracy tracking scenarios. It is not suitable for AoA-based positioning due to its limited signal structure.

Eddystone UID/TLM: Typically used for telemetry or broadcast identity in non-AoA scenarios.

Sentrax gateways and scanners are equipped to interpret all the above advertising formats. However, operational capabilities vary depending on the protocol used.

4.2 SBeacon and Its Role in AoA Positioning

SBeacon is essential for AoA-based deployments. It provides directionality data and includes extended attributes that allow gateways to perform high-resolution angle-based localization. AoA tags must meet specific hardware requirements—such as synchronized antenna arrays—which are fulfilled by both Sentrax's native tags and approved partner tags.

While most tags by default to broadcast iBeacon, SBeacon is mandatory for any deployment requiring AoA tracking. Tags not equipped with SBeacon will transmit iBeacon and will be limited to lower-accuracy RSSI-based tracking.

4.3 Compatibility with RSSI-based Systems

For RSSI-based tracking systems, any off-the-shelf BLE tag broadcasting iBeacon is generally supported. These tags can be used for proximity detection and trilateration-based positioning with medium accuracy. However, tags that do not run Sentrax's firmware will lack native support for remote configuration and management via the Sentrax Device Manager (SDM) and Solix API, which may impact maintainability, diagnostics, and scalability.

5. BLE Tag Protocol Comparison Table

Protocol	Used For	AoA Support	RSSI Support	Telemetry	Tag Management (SDM/Solix)	Remarks
SBeacon	High-precision positioning	✓	✓	✓	✓ Full	Required for AoA
iBeacon	Proximity detection	✗	✓	✗	✗ Limited*	Good for basic tracking
Eddystone UID	Broadcast identity	✗	✓	✗	✗ Limited*	Used in signage/asset discovery
Eddystone TLM	Sensor data (temp, batt)	✗	✓	✓	✗ Limited*	Optional sensor layer

Comparison of supported BLE advertisement formats across different tracking capabilities.

**Tag management is available only with Sentrax-certified tags.*

Deployment Modes and Tag Compatibility

Deployment Type	Required Protocol	Compatible Tag Type	Accuracy	Notes
AoA-based Tracking	SBeacon	Sentrax / Certified Partner AoA Tags	High (sub-meter)	Requires directional antenna gateways
RSSI + Trilateration	iBeacon / SBeacon	Any BLE tag	Medium (3–5m**)	Works with all BLE tags
Presence/Proximity	iBeacon / UID	Any BLE tag	Low (Zone-level)	Entry-level use cases

Tag selection matrix based on deployment type and accuracy requirements.

***Typical trilateration accuracy is half of the distance between the scanners.*

6. Tag Selection Criteria

6.1 Technical Parameters

- BLE protocol support (SBeacon, iBeacon, Eddystone)
- Advertising interval (default: 100–10000ms)
- Battery capacity and estimated life
- Form factor and material
- Environmental resistance (IP67, ATEX, etc.)

6.2 Use Case Fit

- Required positioning accuracy (high / medium/zone)
- Installation environment (metallic, dusty, wet)
- Tag reusability (replaceable battery, disposable, or rechargeable)

6.3 Management & Configuration

- Compatibility with Sentrax Device Manager (SDM)
- OTA update capability
- Remote configuration support via Solix API

7. Deployment Scenarios

7.1 AoA-Based Tracking

- High-accuracy requirement (<1m)
- SBeacon-enabled tags mandatory
- Compatible with ZENIX LON series Angle of Arrival gateways

7.2 RSSI-Based Tracking

- Medium to zone-level accuracy
- iBeacon and/or SBeacon supported
- Works with any off-the-shelf BLE tag (limited management support)

7.3 Hybrid Deployments

- Use of AoA in high-precision zones (e.g., ICU, loading bays)
- RSSI in general areas (e.g., hallways, warehouses)
- Recommended AoA tags.

8. Tag Provisioning & Management

8.1 Tag Lifecycle Management

- Tag sleep mode activation/deactivation
- Battery monitoring
- Tag retirement and re-provisioning

8.2 Bulk Provisioning Options

- SDM Bulk Add via CSV
- Solix Management platform and/or API remote configuration and management

FAQs / Troubleshooting

Q: My tag is not visible in Solix.

- Check if it's broadcasting via the SDM application
- Ensure the tag is powered and within range
- Confirm tag is registered and active in the Solix Platform

Q: Accuracy is lower than expected.

- Check for interference or obstruction
- Ensure the tag is transmitting SBeacon for AoA
- Validate antenna orientation and gateway placement

Q: Can I use any BLE tag?

- **For RSSI:** Yes, if broadcasting iBeacon
- **For AoA:** No, must support SBeacon and hardware spec

Appendix

Glossary

AoA: Angle of Arrival

RSSI: Received Signal Strength Indicator

SDM: Sentrax Device Manager

SBeacon: Sentrax proprietary BLE packet

Solix: Sentrax RTLS management platform and middleware

Regulatory Compliance

CE, FCC, RoHS compliant tag recommendations

Partner Tag Certification Request and Technical Queries

Contact: info@sentrax.com or sales@sentrax.com

Disclaimer:

This guide is intended for informational purposes only. If in doubt at any stage of the installation or operation of the locator/gateway always consult Sentrax's authorized dealer, distributor, or get in touch directly with Sentrax GmbH.

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