Metirionic develops software solutions for distance and angle measurement based on Bluetooth® 6.0 Channel Sounding, UWB, and IEEE 802.15.4. We also design and implement IoT and RTLS (Real-Time Location Systems) solutions, while focusing on the integration of our proprietary MARS software.

MARS OVERVIEW

- Metirionic Advanced Ranging Stack (MARS) is a highly configurable middleware designed for precise distance estimation and Angle of Arrival (AoA) detection using Bluetooth® Low Energy (BLE)
- MARS Pathfinder algorithm is the core module for distance estimation

KEY CAPABILITIES

- Supports the specification 6.0 for Bluetooth® Channel Sounding (CS) for accurate proximity and navigation applications
- Integrates with various hardware platforms, ensuring wide applicability across multiple products

WHY PARTNER WITH METIRIONIC?

INDUSTRY-PROVEN TECHNOLOGY

MARS has been successfully integrated into several products already available on the market, demonstrating its reliability and effectiveness across different applications.

HIGH ACCURACY AND PRECISION

MARS offers highly accurate distance and Angle of Arrival (AoA) estimations, even in complex RF environments. This precision is achieved through advanced algorithms, multi-antenna support, and filtering support.

FLEXIBLE AND SCALABLE SOLUTIONS

MARS is designed with modularity and configurability in mind, allowing it to be tailored to a wide range of signal processing needs and hardware platforms. This flexibility ensures optimal performance across various environments.

COMPREHENSIVE TESTING AND VALIDATION

MARS undergoes rigorous testing, including unit testing, continuous integration/continuous testing (CI/CT), and environmental testing in both anechoic chambers and real-world indoor and outdoor settings. This thorough validation process delivers robust and reliable performance.

WE KNOW THE DISTANCE!

MARS

METIRIONIC ADVANCED RANGING STACK

Software License

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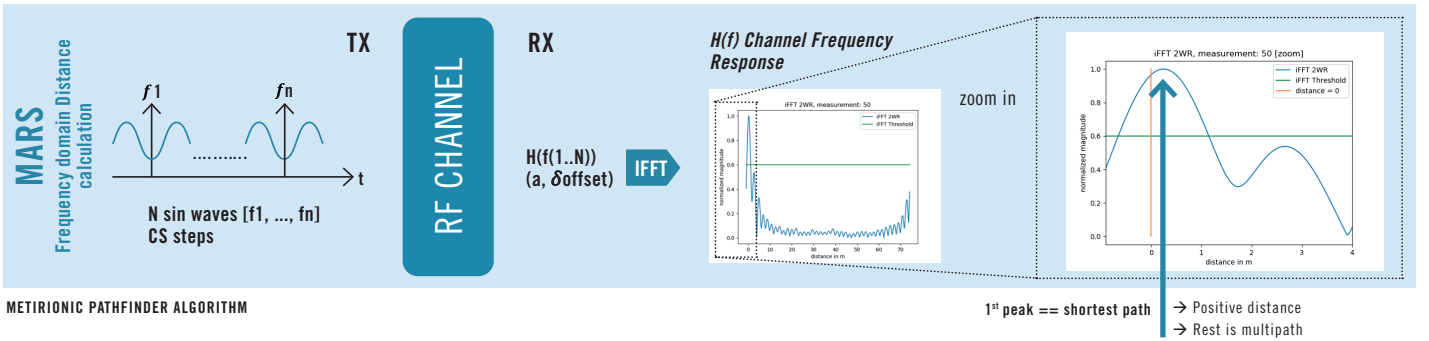
metirionic
WIRELESS DISTANCE MEASUREMENT

MARS

PRECISE DISTANCE MEASUREMENT AND LOCALIZATION IN INDUSTRIAL APPLICATIONS



METIRIONIC PATHFINDER ALGORITHM

MARS METIRIONIC ADVANCED RANGING STACK Application

This high-accuracy distance measurement technology is applicable in indoor environments, outdoor venues, and over long ranges, facilitating digital key solutions for automotive, building, and other secure access applications. Additionally, this technology enhances 'Find My Device' applications, Real-Time Location Services (RTLS), proximity detection services, safety and asset tracking, and a variety of other emerging applications.

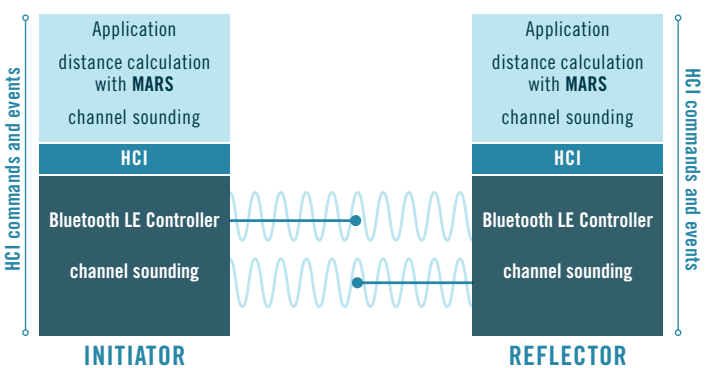
MARS Pathfinder-Algorithmus Key Features and Capabilities

The MARS Pathfinder algorithm is the innovative core of the Metirionic Advanced Ranging Stack (MARS). This technology models the propagation of radio waves to accurately distinguish the direct signal path from the various multipath reflections that can occur in complex environments.

The result? Unmatched accuracy in distance estimation with minimal computational effort. It has been proven in industrial applications, meets the MISRA standard, and is subject to Continuous Integration (CI) and Continuous Testing (CT). Additionally, the source code is available, offering flexibility and adaptability for integration into diverse systems.

MARS integration with Bluetooth® Protocol Stack for Channel Sounding

The new Bluetooth Channel Sounding feature does not provide direct distance data but instead offers PCT (Phase Correction Term) data that contains In-Phase (I/Q) values. These raw data must be further processed by application developers and Bluetooth integrators to derive accurate distance measurements. The Metirionic MARS algorithm plays a crucial role in this process. This algorithm is designed to precisely process the PCT data and calculate exact distances. By combining Channel Sounding with MARS, developers can create a customized solution for their applications that fully leverages the power of Bluetooth technology and enables reliable distance measurement.



FACTS

- **Up to 10cm accuracy in outdoor environment possible**
- **Reliable in difficult indoor environments**
- **Distinguishes between direct signals and reflections**

Precise Indoor Positioning with Bluetooth® Channel Sounding

Metirionic's **MARS 2.0** provides a cutting-edge solution for accurate indoor distance measurement and positioning using Bluetooth Channel Sounding technology. Designed to deliver reliable results, **MARS 2.0** enables precise distance and Angle of Arrival (AoA) measurements, making it ideal for a wide range of applications such as secure access, RTLS, and proximity detection.

MARS 2.0 is a complete overhaul of its predecessor, **MARS 1.0**. It offers enhanced flexibility and easier integration across different hardware platforms. By processing Bluetooth Channel Sounding data directly, **MARS 2.0** removes the need for complex, custom algorithms, allowing developers to implement advanced positioning capabilities with ease. This new version ensures greater scalability and improved performance, especially in environments requiring high precision.

Metirionic extensively tested **MARS 2.0** in outdoor and challenging indoor environments. The outdoor measurements achieved an accuracy of up to 10 cm. Measurements in real-world indoor environments with prefabricated steel concrete slabs, using Metirionic's Cable Car Tester, demonstrated impressive accuracy in both static and dynamic tests, with error margins consistently below 1 meter. These results highlight **MARS 2.0**'s ability to maintain performance even in difficult conditions, such as environments with signal interference and reflections.

MARS 2.0 streamlines the implementation of Bluetooth LE-based distance measurement and positioning, offering developers a powerful tool for high-precision applications. Its adaptability and proven performance make it suitable for use in industrial, automotive, and consumer electronics.