metirionic
WIRELESS DISTANCE MEASUREMENT

MARS Demo Kit DMK-215

- Evaluation of MARS (Metirionic Advanced Ranging Stack) under real environmental conditions even in complex indoor environments with walls.
- For wireless distance and angle measurements.
- Based on Microchip AT86RF215.
- Potential applications: Complementing existing IoT systems to achieve the highest functional safety according to EN ISO 13849-1.
- Exact wireless measurements with different methods (1-way or 2-way measurements, basic ranging, ranging with diversity, angle measurements).
- The MARS system can also be implemented on other platforms and in existing applications.
- Typical end-user applications include collision avoidance, keyless entry, access control, geo fencing, tracking of individuals, pets or animals, follow-me functions for any kind of vehicles, swarm control of sensor nodes, theft protection, real-time location, indoor and outdoor positioning.

The DMK-215 Demo Kit is a plug-and-play kit that allows to gain experience with Metirionic's ranging technology.

With the Demo Kit you get a demonstration platform on which the performance of the patented ranging technology can be tested under real environmental conditions. MARS adds ranging functionality to IEEE 802.15.4-based wireless personal area networks (WPAN).
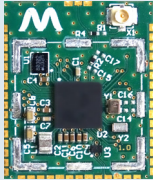
The IEEE 802.15.4 standard is the base for other network protocols, such as ZigBee, ISA100.11a, WirelessHART, 6LoWPAN and others.

MARS is also transfereable to Bluetooth® LE and other communication stacks and, it can be easily integrated in other platforms like AT86RF233, DA1469X, nRF5340.
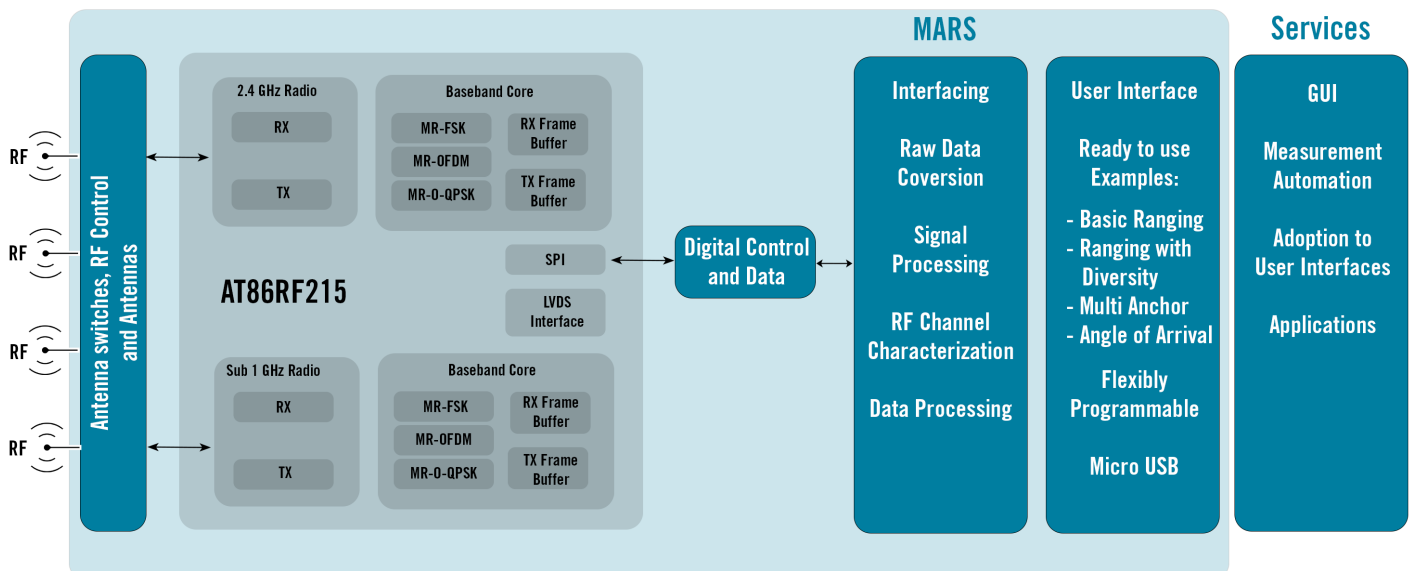
Key Features

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Ranging	Accuracy: ~ 7-50 cm (depending on environment) Range: > 1000 m (with supplied antennas, depending on environment) Update rate: up to 10 measurements/s
Angle of Arrival	Segment Indication Typical angle resolution (depending on antenna position): ± 3° @60° viewing angle ± 10° @180° viewing angle
Data Communication	According to IEEE 802.15.4 standard Modulation: O-QPSK Data rates from 6.25 kb/s to 1000 kb/s
Frequency Range	2400-2483.5MHz worldwide ISM band Phase difference measurement on multiple frequencies Optional raw data recording

Engineering Services

MARS Implementation Example (20x25 mm) inkl. BLE	Field tests and measurements, indoor and outdoor in various environments Hardware design reviews Proof of concept (POC) review Porting to customer specific platform Integration in existing data and communication stacks Integration in controller platforms, i.e. IEEE and Bluetooth® LE
General services	Feasibility Studies Data analysis and consulting

Software Development

Custom software development	GUI (grafical user interface) Automatic measurements Generic measurement and control applications Dynamic data correction Communication and analysis solutions
Software development	Python C/C++/C# (Embedded software development)
Software maintanance and support	Data Analysis
Example of GUI Optional on request, with NDA	
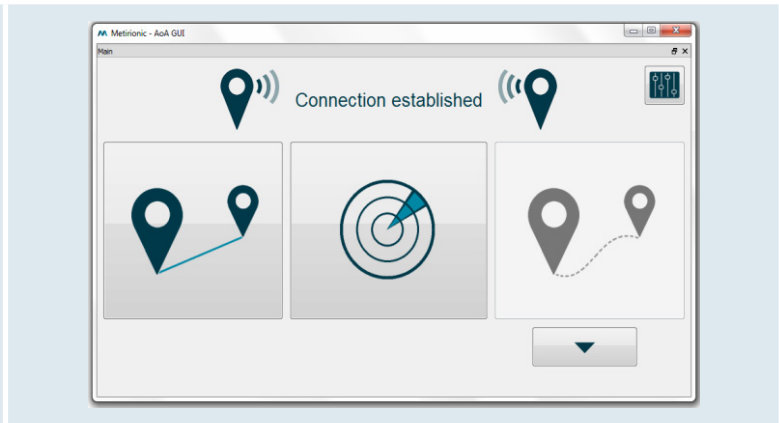
Content

2 sensor nodes (initiator and reflector)
5 antennas (3 for initiator: 2 top, one right outside, 2 for reflector: 1 top left, 1 right outside)
2 USB cables (connection and communication interface for initiator, power supply for reflector)
2 tripods
1 Micro SD card with USB drivers, firmware and software

System Requirements

PC with Linux or Windows operating system, PYTHON development environment (not included in kit)

Ordering Information and Lead Time

DMK-215	MARS Demo kit for wireless distance and angle measurements, based on Microchip AT86RF215	4 weeks
SERVICES	MARS engineering services, software development on demand	R&D project