# FMWF
# 16200-REN

## Low power Wi-Fi & BLE IoT Module

2.4 GHz ultra low power Wi-Fi & BLE module based on Renesas DA16200 and DA14531 supporting continous connection to Wi-Fi network.

## Description

FMWF **16200-REN** as Miromico's first low-power Wi-Fi IoT module enables devices and sensors to stay interconnected and communicate at high data rates in the worldwide 2.4 GHz radio band yet delivering year plus battery life. The highly integrated SoC with integrated 2.4 GHz 802.11n radio and ARM Cortex®-M4F processor runs the full OS and TCP/IP stack and supports OTA firmware updates.

The additional Bluetooth Low Energy interface allows for additional functionality such as local configuration and on-boarding of the device to a Wi-Fi network.

The module is suitable for high security IoT applications supporting WPA3, secure boot and debug and TLS for authentication and encryption.

## Features

- Renesas DA16200 SoC based low power Wi-Fi module
- Renesas DA14531 Bluetooth LE 5.1 SoC
- Bitrate up to 72 Mbps
- ARM Cortex®-M4F processor with 4Mbit external flash memory
- Integrated 2.4 GHz 802.11 n radio with 20 MHz channels and PA/LNA
- Security: WPA2/3, HTTPS with TLS/SSL
- Customer application on MCU
- Several years of battery lifetime
- Tiny FMLR footprint: 14 × 19.5 mm

## Applications

- Long range, high data rate IoT sensors
- Home automation, smart buildings

# Document Information

## About

| File name | Document type | Date | Revision |
|---|---|---|---|
| DS-FMWF-16200-REN | Datasheet | 2023-09-26 | 1.0 |

## Revision History

| Date | Release | Changes |
|---|---|---|
| 2023-09-26 | 1.0 | Initial revision |

# Table of Content

# Functional Description

The FMWF **16200-REN** Wi-Fi IoT module provides wireless connectivity to devices, systems and sensors communicating with high data rates at low power consumption. It features an integrated DA16200 SoC with integrated 2.4 GHz 802.11n radio and LNA/PA (TX power up to +20dBm). Its ARM Cortex®-M4F processor runs the full OS and TCP/IP stack, supports OTA firmware updates due to the external 4Mbit flash memory, and has sufficient resources to run user applications. The device is suitable for secure applications, featuring WPA3 and TLS for authentication and encryption at Wi-Fi and higher stack layers.

The add addintional Bluetooth Low Energer 5.1 capable DA14531 SoC provides BLE peripheral functionality. BLE can be used to implement additional features such as device configuration, management and beaconing.

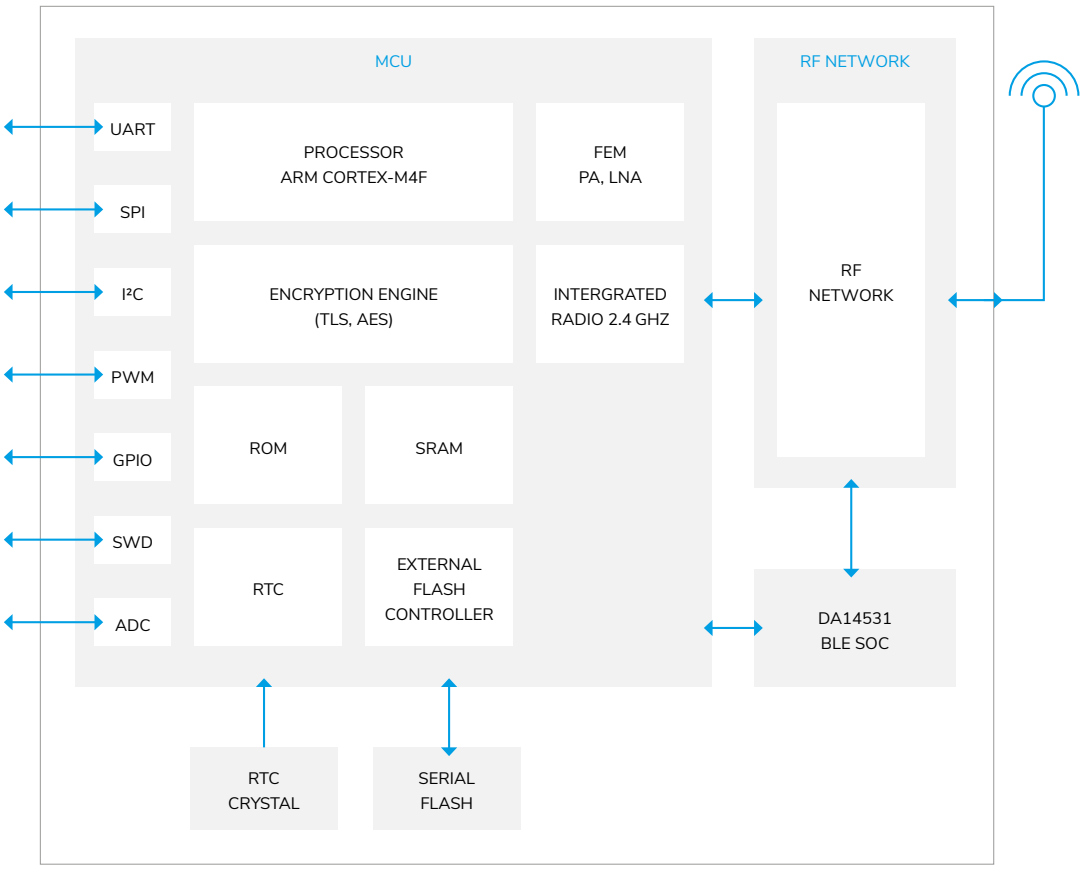


*Figure 1: Block diagram*

# Technical Specifications

## Core Components

| | |
|---|---|
| Wi-Fi SoC | Renesas DA16200 |
| Wi-Fi Radio | 2.4 GHz 802.11b/g/n, IEEE 802.11s Wi-Fi mesh |
| Wi-Fi SoC Core | ARM Cortex®-M4F |
| Bluetooth SoC | Renesas DA14531 |
| Bluetooth Radio | Bluetooth Low Energy 5.1 |
| Bluetooth SoC Core | ARM Cortex®-M0+ |
| On-board flash memory | 16 MB |

## Mechanical Specifications

| | |
|---|---|
| Weight | 1 g |
| Dimensions | 14.2 × 19.5 × 2 mm |

## Operating Conditions

| | |
|---|---|
| Temperature | 0 – 65 °C |
| Humidity | 0 – 95% RH, non-condensing |

## Absolute Maximum Ratings

| Parameter | Min | Max | Unit |
|---|---|---|---|
| Ext. supply voltage on all power pins ($V_{DD}$) | $V_{SS}$ | 3.6 | V |
| Input voltage on any pin | $V_{SS}$ | $V_{DD}$ | V |
| Storage temperature | -40 | +85 | °C |

⚠ WARNING!

Stressing the device beyond the «Absolute Maximum Ratings» may cause permanent damage.