RN4020 Bluetooth® Low Energy Module

Fully-Certified Bluetooth Version 4.1 Module

Summary

The RN4020 is a Bluetooth® Smart module for designers who want to easily add low-power regulatory approved wireless capability to their products. As with Microchip's other "RN" Bluetooth modules, the RN4020 provides a turnkey solution with a complete software stack, and RF components on board. The RN4020 includes an onboard antenna and is interfaced and configured via a simple ASCII command interface over UART.

The module supports all standard Bluetooth SIG profiles, and Microchip's Low-Energy Data Profile (MLDP) for custom serial data transfer. Developers can also use scripting to set the RN4020 up for standalone operation where any one of the analog or digital I/Os can be monitored and the values can be transmitted over wireless without the use of a host MCU or processor. This makes the RN4020 an excellent solution for low-power sensors and accessories. The compact 11.5 × 19.5 × 2.5 mm size, enables ease of integration.

As a complete solution interfaced over UART, the RN4020 is a true drop-in solution that is easy to use and easy to prototype, significantly reducing time to market and the expense of regulatory certifications.

With 7 dBm transmit power, the RN4020 achieves a range of 100 meters*, and with a deep sleep mode of less than 1 µA, designs can be powered from a single coin cell battery.

*Dependent on specific application environment.

Features

- Fully certified Bluetooth version 4.1 module
- On-board embedded Bluetooth low energy stack
- Simple ASCII command interface over UART
- Multiple IOs for control and status
- Secure AES128 encryption
- GAP, GATT, SM, L2CAP and integrated public profiles
- Create custom services using command API
- Data streaming with Microchip's Low Energy Data Profile (MLDP)
- Scripting for standalone module operation with analog and digital data collection
- 7 dBm transmit power for 100m+ range*
- Field upgradeable via the UART interface or over the air
- Software-configurable role as peripheral or central, client or server
- Compact form factor, 11.5 × 19.5 × 2.5 mm
- Low-power modes
- UART interface, GPIO, ADC
- 64 KB internal serial Flash
- Castellated SMT pads for easy and reliable PCB mounting
- Environmentally friendly, RoHS compliant
- Bluetooth SIG and worldwide regulatory certification

Applications

- Wireless pulse sensors
- Proximity sensor applications
- Clinical applications
- Consumer appliances/home automation
- Smart watches/activity trackers
- Mobile device accessories
- Industrial control

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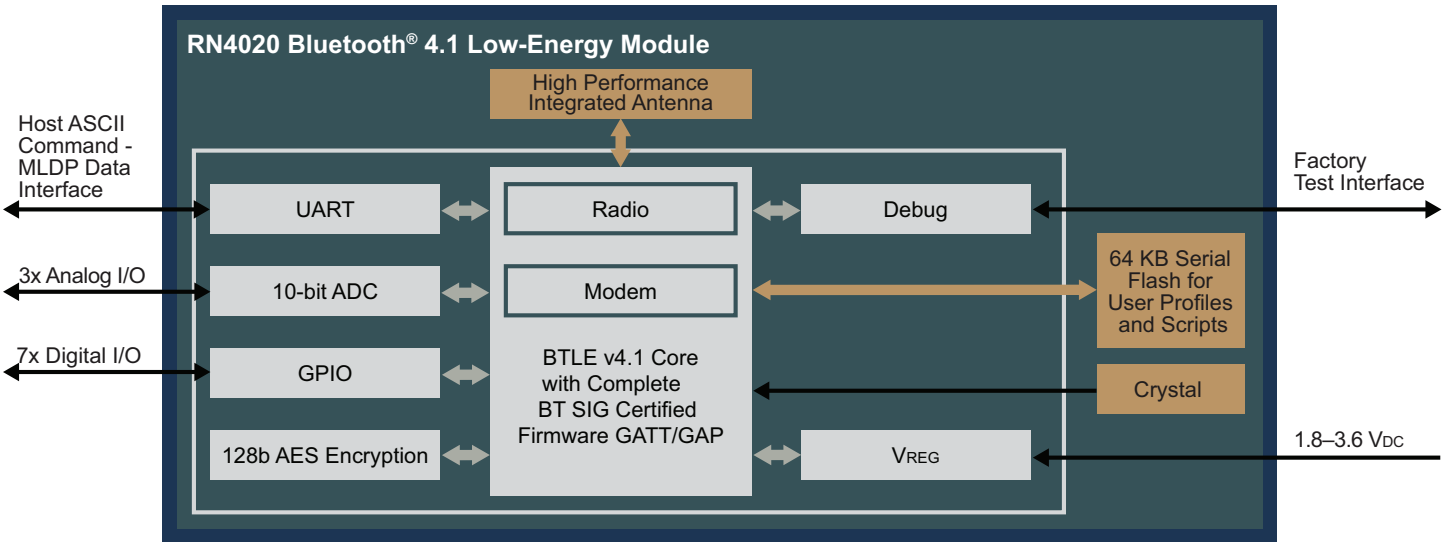
Block Diagram



Ordering Information

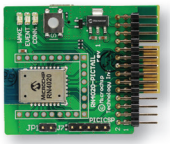
Part Number	Description
RN4020-V/RM	Bluetooth® 4.1 Class 2 surface mount low-energy module with on-board PCB trace antenna
RN-4020-PICTAIL	Evaluation kit for the RN4020 Bluetooth low-energy module. Includes evaluation board with USB interface and mini USB cable

Specifications	
Standard	Bluetooth® 4.1
Profiles	GATT, GAP, SM, L2CAP
Frequency	2.4–2.48 GHz
Maximum Data Rate	1 Mbps
Interface	UART, PIO, AIO, SPI
Operation Range	100 meters*
Sensitivity	–92.5 dBm
RF TX Power	+7 dBm
Antenna	PCB Trace

*Dependent on specific application environment.

Development Tools

RN4020 PICtail™/PICtail Plus Daughter Board (RN-4020-PICTAIL)



The RN4020 PICtail/PICtail Plus Daughter Board is a single board with the RN4020 paired with a PIC18 microcontroller. It has a convenient USB interface for plug-and-play capability. It also has PICtail, PICtail Plus and PICkit™ 3 interfaces for development within the Microchip ecosystem. The board has all module pins exposed for UART and additional connectivity, including on-board connection and status LEDs.

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Microchip Technology Inc. · 2355 W. Chandler Blvd. · Chandler, AZ 85224-6199

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DS70005184A