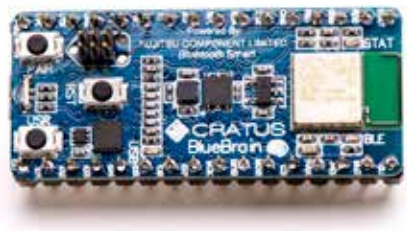
FUJITSU Component Wireless Sensor Module BlueBrain™

Overview

The BlueBrain integrates hardware and software to create a development platform that allows designers to easily create a wireless monitoring and data collection system via bluetooth. BlueBrain features a powerful CORTEX-M4 microcontroller from STMicroelectronics and a *Bluetooth*® Smart wireless module from Fujitsu Components as the cornerstone functional components. The system is capable of detecting motion and temperature events as well as installation orientation via on board sensors, and is highly configurable to allow users and system designers to collect, view and monitor data on any *Bluetooth* Smart device such as a smartphone or a tablet at anytime by the mobile application (available for distribution). It also has an onboard real time clock, configurable ADC channels and GPIOs. Basic IOS and Android app is included to serve as foundational building blocks for application development.



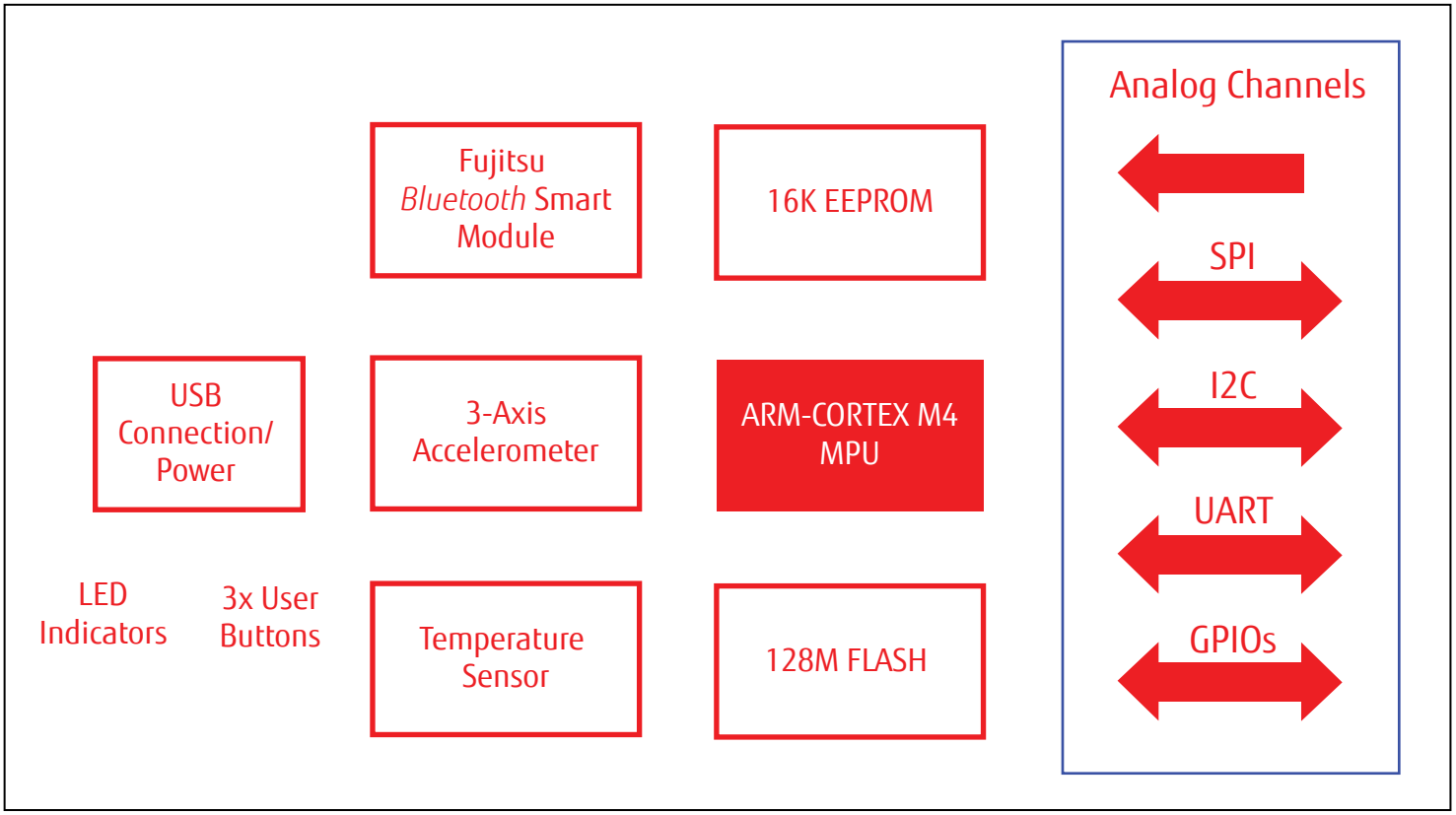
Whether the BlueBrain is used to monitor the health of machinery, collect data from a sensor or for telemetry purposes, it is easy to bring-up and have included interfaces and peripherals to cut down on development time. The on board interfaces which connect BlueBrain to the physical and the rest of the digital world are I2C, SPI, UART and USB.

BlueBrain is designed and developed in partnership with CRATUS Technology. www.cratustech.com

Features

- STM32F415RGT6 - ARM Cortex-M4 Main Controller
- MBH7BLZ07 - Fujitsu Components *Bluetooth* Smart Module With Cortex-M0 Controller
- Flash (S25FL128SAGNFI001) 128Mb
- EEprom (24C16) 16Kb
- On Board Sensors:
  - STMicro LIS2DH12 - 3-Axis Accelerometer
  - Silicon Labs Si7050 - Temperature Sensor
- Interfaces
  - USB
  - SPI
  - I2C
  - UART
- Mobile Application for *Bluetooth* application
- Optional RTX Real Time Operating System on Main Controller (Contact CRATUS)
- Development Board available with 3V & 5V I2C, CAN, 8X GPIO, UART, USB, SPI and Analog Interfaces

■ Block Diagram



■ Hardware Details

Absolute Maximum Ratings

Maximum Input Voltage	3.6V
Typical Operating Voltage	3.3V
Minimum Operating Voltage	2.7V

Electrical Specifications

- General Specifications

Processor	STM32F415RGT6 ARM CORTEX-M4
Memory	1MB Flash , 192K X 8
Converter	2 X 12 Bit D/A, 3 X 12 Bit A/D

- MEMS Motion Sensor

# of Axis	3 Axis sensing
Programmable Acceleration Detection Range	+/-2g, +/-4g, +/-8g, +/-16g
Orientation Detection Resolution	1 Degree

- On-Board Temperature Sensor

Temperature Measurement Range	-40°C to +125°C
Accuracy	+/- 1.0°C (max.)
Resolution	14 bits
Interface	I2C up to 400KHz

- On-Board Flash Memory for Data Storage

128Mb Storage
100K program/erase cycles endurance
20 year data retention

- On-Board Secure EEPROM

16Kb Storage
Hardware write protection
1 Million program/erase cycles endurance
10 year data retention

- On-Board Indicators

1X RGB LED
1X GREEN LED
1X BLUE LED

- On-Board Interface

1X Switch	Reset
1X Switch	*Bluetooth* Smart Pairing
1X Switch	User

■ Electrical Characteristics & Recommended Operating Conditions

Parameter	Minimum	Maximum	Notes
BLUEBRAIN INTERFACE CHARACTERISTICS			
SPI INTERFACE			
FSCK	-	42MHz	Master Mode, SPI1, 2.7V<VDD<3.6V
1/tc(SCK)	-	21MHz	-
Data input setup time	6.5ns	-	Master mode
Data input hold time	2.5ns	-	Master mode
Data output valid time	-	2.5ns	Master mode (after enable edge), SPI1, 2.7V<VDD<3.6V
Data output hold time	0ns	-	Master mode (after edge enable)
I2C INTERFACE			
Main clock output	256 x 8K	256xFs(1)	(1) Sampling frequency
Clock frequency	-	64XFs	Master data: 32bits
WS valid time	0ns	6ns	Master mode
WS hold time	0ns	-	Master mode
Data input setup time	7.5ns	-	Master receiver
Data input hold time	0ns	-	Master receiver
Data output valid time	-	20ns	Master transmitter (after enable edge)
Data output hold time	2.5ns	-	Master transmitter (after enable edge)
ANALOG DIGITAL INPUTS (ADC)			
Conversion time (including sampling time)	0.50us	16.40us	fADC=30MHz, 12 bit resolution
Sampling rate (fADC=30MHz, at ts=3ADC cycles)		2MSPS	12 Bit single ADC

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