Model 483x Outdoor Environment Sensors

The Models 4831 and 4832 are compact, attractive, programmable outdoor environmental sensors for use with LoRaWAN® technology or Sigfox networks.

Based on the Murata CMWX1ZZABZ-078, and designed to be compatible with the Adafruit Feather family of development boards and accessories, these sensors are greats platform for LPWAN investigation and deployment.

The modules sense temperature, humidity, and light, then transmit to your application, powered from two AAA cells.

No programming is needed; but if you want to program, the complete Arduino-based software package is available as a starting point from GitHub.

Because of the embedded FRAM, these modules can fully meet the requirement of LoRaWAN 1.1, without worrying about EEPROM wear out or wear-leveling, both for ABP and OTAA.

USB provisioning allows you to load network keys without updating the firmware.

Features

- STM32L082 CPU (Cortex M0+, 32 MHz, 192K flash, 20K RAM)
- Semtech SX1276 LoRa radio
- LoRaWAN 1.1 865, 915MHz - up to 0.5 mile with external antenna
- High Quality RF engineering
- Certified for US and EU
- Industrial quality sensors measure accurately.
- 8KB FRAM for LoRaWAN provisioning info and frame counters
- 1MB SPI Flash for bulk data storage, FUOTA firmware storage, etc.
- Boost converter for powering from disposable batteries such as 2xAAA cells or from USB
- Provisions for screw terminals for pulse, analog or digital I/O
- Ready for firmware update over the air (FUOTA)
- The Model 4831 uses the MCCI Catena 4618, with an SHT31 with a PTFE membrane for weather protection. The Model 4832 uses the MCCI Catena 4818 M201, with a high-accuracy SHT35 sensor (also with a PTFE membrane).

Typical Applications

- Home and building automation efficiency studies.
- Urban heat island studies.
- Outdoor microclimate studies.

Long-Range Wireless Communication

These sensors get up to half-mile range in urban environments without site planning, complex RF engineering, or a SIM card. They use special encrypted protocols and simple, secure gateways that can be placed anywhere, typically outside the corporate firewall. One gateway can handle up to 10,000 devices; if noise or congestion limits capacity, it's easy to add another gateway - the devices automatically take advantage of all the gateways in range. The radio technology is optimized for *things*, not *phones*; this allows for great service at a very modest price.

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The long-range communication modules in the Model 4831-4832 are based on the MCCI Catena 4618 modules. MCCI provides a full Arduino board-support package and libraries allow rapid customization by system integrators, including an open-source LoRaWAN stack. ST Micro tools may also be used.

These modules work well with and are tested with The Things Network (an open-source, user-owned IoT network based on LoRaWAN); but can be used with any LoRaWAN-compatible network, including offerings from Actility, Helium, ChirpStack.io, machineQ, myDevices, MultiTech, Senet, SenRa, Tata, and others.

The modules also can be configured for Sigfox networks.

Software and hardware are open-source and readily available on https://github.com/mcci-catena.

General features

LoRaWAN module	Murata CMWX1ZZABZ-078 (STM32L082 + SX1276)
Frequency range	868MHz to 1020MHz
Supported band plan	EU868, US915, AU-915, AS923, KR-920, IN865.
Antenna	Integrated whip antenna (U.FL connection)
External ICs	8K FRAM, 1MB Flash
Communication interfaces	SPI, I2C, UART, USB
GPIO	Digital I/O: 19; Analog I/O: 5

Electrical Characteristics

Power source	Disposable Batteries
Operating voltage	2.4V to 3.6V
Battery type	Primary (2xAAA Lithium recommended)
Battery connector	JST-PA (3 position, 2.00mm pitch, center position not used)
Battery life	2 years (depending on the application and how often data is transmitted)
Sleep current	20uA
Operating temperature	-40°C to 85°C

Sensor Specifications

Sensors	SHT31 or SHT35 (Temperature/ Humidity); Si1133 (Light)
Temperature accuracy (at worst case)	Model 4831: SHT31: ± 0.4 °C (-40..90°C) Model 4832: SHT35: ± 0.3°C (-40..90°C)
Humidity accuracy	Model 4831: SHT31: ±2% typ, ±3.5% max, 0..100% RH @ 25 °C Model 4832: SHT35: ±1.5% typ, ±3% max, 0..100% RH @ 25 °C
Recommended Humidity Range	0..100%
Light measurement	Illuminance W/m²

Mechanical Specifications

Enclosure Type	Outdoor (Weatherproof casing)
Dimension	3.7” x 4” x 7”
Weight	9.6 oz (272 g)

More Information

Please contact MCCI at sales@mcci.com, Twitter @MCCI, website http://www.mcci.com.