Catena® 4801 RS485 LoRaWAN® Technology Node
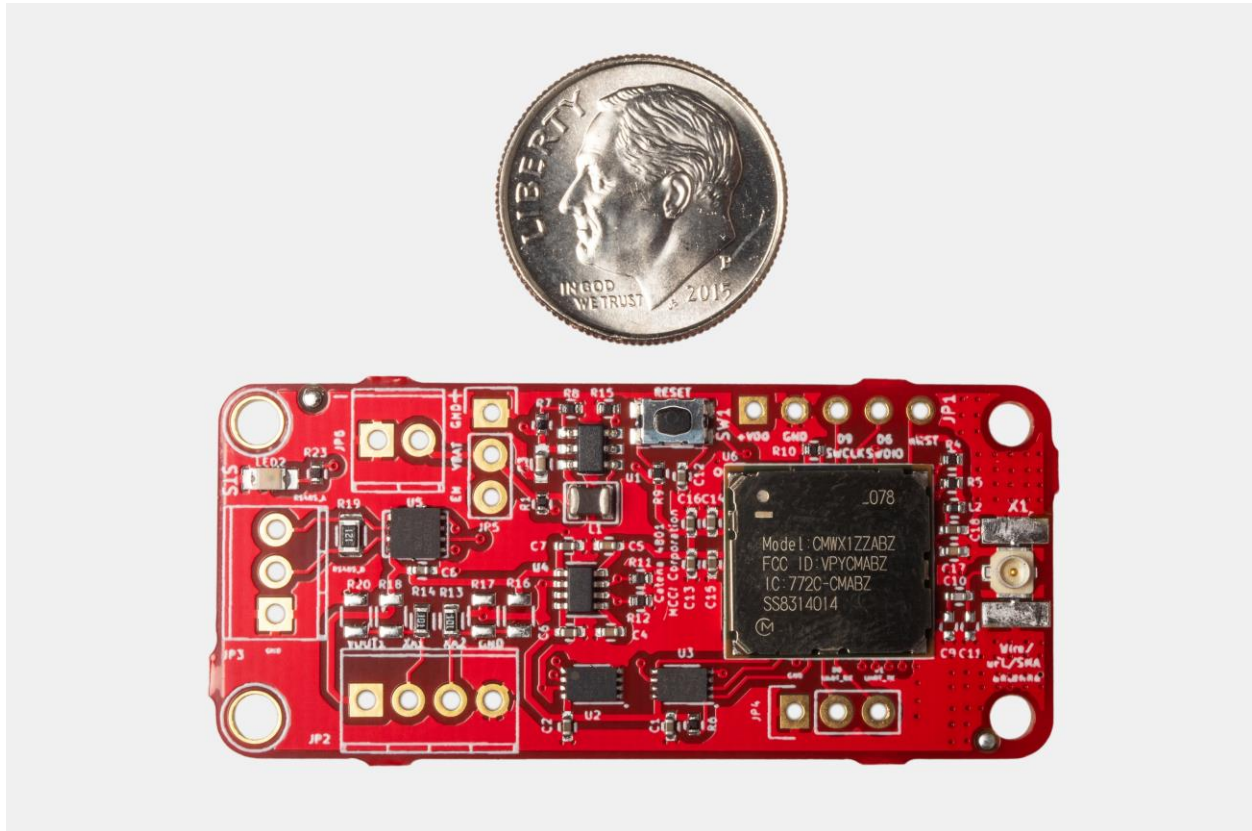
The MCCI Catena® 4801 RS485 Node for LoRaWAN® technology and Sigfox networks is a complete single-board IoT device with RS485 control and GPIO for projects using LoRaWAN networks for remote sensing and control.


Based on the Murata CMWX1ZZABZ-078, the Catena 4801 is a great platform for RS485/Modbus based LoRaWAN investigation and deployment. It works well with The Things Network, myDevices, or any LoRaWAN 1.0 through 1.1 network in the 865 to 923 MHz range. It also works with Sigfox networks worldwide.

As a Modbus controller, the Catena 4801 can control a large number of Modbus devices and communicate results via the LoRaWAN network, limited only by system memory and polling rate. As a Modbus device, the Catena 4801 can bridge an existing Modbus controller to the LoRaWAN network.

Local GPIO pins can be used for status or high-precision pulse counting, via optional terminal block. Software controlled power to the external devices protects the battery and node operation from external faults.
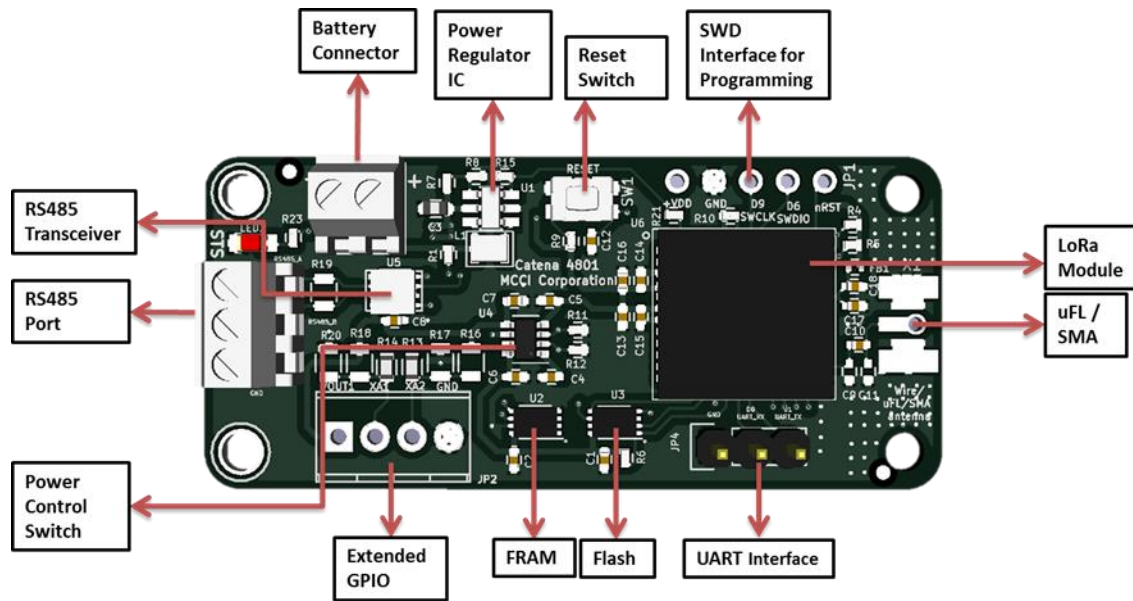
Specifications and Features

Murata LoRaWAN module

- Semtech SX1276 LoRa® and GPFSK radio
- STM32L082 CPU (Cortex M0+, 32 MHz, 192K flash, 20K RAM)
- High quality RF engineering
- Certified for US and EU
- Compatible with IN866, AS923, AU915, KR920 regions
- Sigfox also supported

Additional Hardware Features

- RS-485 transceiver for connecting to Modbus or M-bus.
- Screw terminals (on the assembled models) for connecting to the Modbus or M-bus field wiring, and for connecting to additional external sensors.
- Processor-controlled power switches for the RS485 transceiver, the external sensors, FRAM and Flash ICs
- 2K bytes FRAM for LoRaWAN provisioning info and frame counters -- power can be removed completely without requiring a new join to the network, and without losing uplink and downlink count values (required for LoRaWAN 1.1)
- 1M byte SPI Flash for bulk data storage, future FUOTA firmware storage, etc.
- Switchable boost converter for powering from disposable batteries (such as 2x AAA cells) – input range 1.8V to 3.3V. Processor can disable boost converter when regulated 3.3V is not required, for additional power savings.
- Standby current < 10 µA.
- SWD for download and debug.
- UART port for provisioning and logging.
- Provisions for screw terminals for pulse, analog or digital I/O

- Whip, U.FL, or SMA antenna. U.FL is standard.
- Battery termination: rising cage screw terminals, 20 to 30 AWG.
- Size: 0.9" by 2.0".
- Open-source hardware and software (https://github.com/mcci-catena).
- Operating temperature -20 to 85 degrees C.

Additional Software Features from MCCI

- MCCI-supported open-source Arduino-LMIC LoRaWAN MAC passes EU, US, AS, KR and IN LoRaWAN pre-certification tests using RedwoodComm RWC5020A tester.
- Full Arduino board-support package.
- Libraries to allow rapid prototyping and experimenting, including Modbus and Mbus protocol libraries.
- Support for ST-LINK V2 debugging.

The Catena 4801 works well with and is tested with several networks, including The Things Network (an open-source, user-owned IoT network based on LoRaWAN), myDevices, machineQ, SenRa, and Tata Communications; but can be used with any LoRaWAN-compatible network. Software is available from GitHub at https://github.com/mcci-catena/. Support is also available for Sigfox.

Available for online purchase at https://mcci.com/lorawan/products/catena-4801/.

A variety of completed products are also available from MCCI based on the 4801.

For more information, contact MCCI at sales@mcci.com.