

The MCCI Catena® 4470 Modbus Node for LoRaWAN® technology is a powerful open-source IoT device that integrates Modbus control with [The Things Network](#). Based on the [Adafruit Feather M0](#) system, the Catena 4470 is a ready-to-use platform for Modbus-oriented LoRaWAN 1.0 and 1.1 wireless IoT applications.

Designed to be compatible with the [Adafruit Feather](#) family of development boards and accessories, the Catena 4470 is a great platform for LoRaWAN investigation and deployment.

Lightweight and small, in addition to its Modbus interface, the 4470 needs no external components to measure and send temperature, pressure, humidity, and lux, powered from USB or a rechargeable Lithium-Polymer battery.

If LoRaWAN connectivity is not needed, Catena 4470 can also be used to add Modbus and sensing to any member of the Adafruit Feather system.

As a Modbus controller, the Catena 4470 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 4470 can bridge an existing Modbus controller to the LoRaWAN network, and to the integrated sensors.

Although it's available in several variants, the recommended base configuration consists of:

1. The Adafruit Feather M0 board. Features:

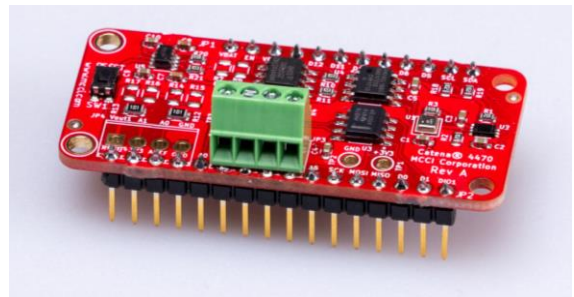
- ARM Cortex M0 CPU at 48 MHz
- 256 kilobytes of flash program memory
- 32 kilobytes of static RAM
- 900 MHz LoRa® radio from Hope RF
- USB port for charging and programming
- Compatible with a wide range of Adafruit Feather Wings
- Battery charging circuit for LiPo batteries
- Fifteen I/O pins with a variety of supported protocols
- RoHS Compliant; FCC Certificates on file

2. The Catena 4470 sensor wing, including:

- RS-485 transceiver for connecting to Modbus, with 120-ohm termination;
- Screw terminals (on the assembled models) for connecting to the Modbus field wiring, and for connecting to additional external sensors.
- Processor-controlled power switches for the RS485 transceiver and the external sensors.
- A Bosch BME-280 sensor, measuring temperature, humidity, and barometric pressure;
- A lux sensor, measuring from 0 to 65,536 lux of ambient light;
- 2 kbytes of ferro-electric RAM (FRAM) for non-volatile storage of network parameters, session keys, and application data (fully meeting requirements of LoRaWAN 1.1);
- One megabyte of SPI flash, for use for staging firmware-over-the-air and local data storage;
- ROHS Compliant

3. A whip antenna. (A U.FL to SMA adapter can optionally be used.)

4. A 350 mAh Lithium Polymer ("LiPo") battery.



Software

MCCI provides a full Arduino board-support package and libraries to allow rapid prototyping and experimenting, including an open-source LoRaWAN stack that supports the EU868, US915, AS923, AU921, KR920 and IN866 regional plans. Adafruit tools and PlatformIO may also be used.

Variants



Several variants are available as standard products.

The BASE, M101 and M102 variants are all complete units. They vary only in the population of the resistor option field. The M101 is configured for use in electric power monitoring applications. The M102 is configured for use with external sensors for smart agriculture applications. The BASE unit leaves the resistor field and screw terminals unpopulated to allow users to make their own adaptations.

The DIY-KIT variant is sold unassembled, but gives the most flexibility for use and deployment.

The DIY-FACTORY variant is the DIY-KIT assembled and tested.

The WING-ONLY variant is the Catena 4470 wing without the CPU board, and without headers. It is great for experimenters who want to breadboard more complex solutions.

Complete Systems

MCCI offers a variety of standard and custom complete systems based on the Catena 4470. Shown to the right is an apartment power monitoring system for a research project. The Catena 4470 controls two Modbus power meters; an external antenna is mounted on top of the box. MCCI designed the system, delivered the components for fifteen system to the electrical panel contractor, documented the installation, and provided automated test software. The project takes advantage of the flash on the Catena 4470 to download firmware over the air, so that the researchers can update the software without requiring access to the apartments.

Network Compatibility

The Catena 4470 works well with and is tested with [The Things Network](#) (an open-source, user-owned IoT network based on LoRaWAN); but can be used with any LoRaWAN-compatible network such as MachineQ by Comcast.

Both hardware and software are open source and available on [GitHub](#).



Price and Availability

The price of the Catena 4470 varies based on options and quantity order. It is available now. Current pricing may be found on MCCI's online store, <https://mcci.io/Catena4470>. For more information, please contact MCCI at sales@mcci.com, Twitter [@MCCI](#), <http://www.mcci.com>.