

# UrsaLeo UltraLite Gateway

UL-NXP1S2R2, Version 1.5

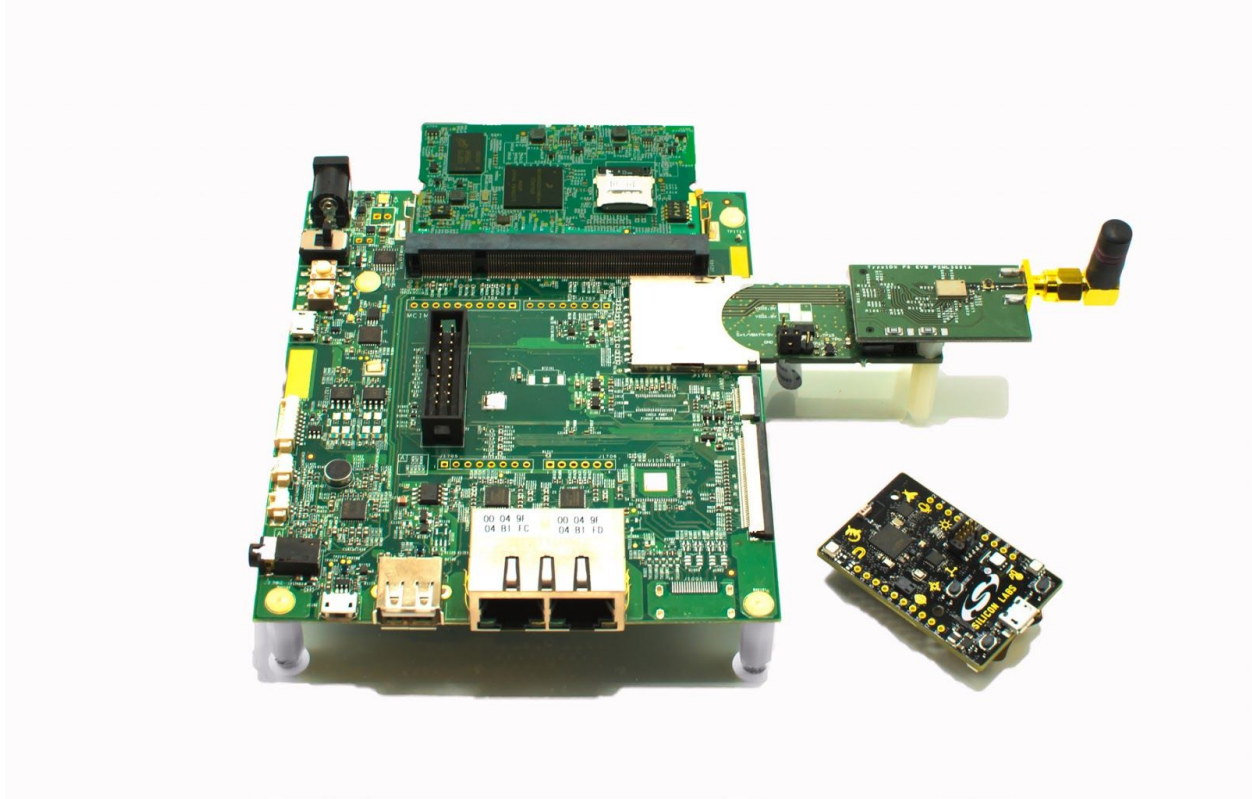
The UrsaLeo UltraLite IoT Evaluation Kit is designed to serve as a starting point for connecting sensors to UrsaLeo's 3D modeling demo. When assembled and powered on, data from nine different environmental and motion sensors is immediately sent to and presented on a photorealistic model you can specify using our Getting Started page.

## Kit contents

- UrsaLeo Gateway - based on NXP iMX6UL Evaluation Kit with additional debug LED's
- Silicon Labs Thunderboard Sense 2 sensor board
- Murata WiFi / BLE combo development board
- 16GB microSD card preconfigured with Yocto Linux and UrsaLeo Gateway demonstration application

## Getting started

The Evaluation Kit and demo are easy to assemble - follow instructions at [www.ursaleo.com/gettingstarted](http://www.ursaleo.com/gettingstarted)



## Overview

Once you've gone through all instructions on Getting Started, the Gateway software will start sending sensor data for display, processing and triggering actions. The sensor board can be powered using a USB cable (recommended) connected to the Gateway or from a coin cell battery. Note: power consumption of the Silicon Labs TB2 means a coin cell will only last one or two days. Once powered on, the Gateway will boot and connect to the sensor board using Bluetooth Low Energy and begin transmitting data to the specified 3D model through the wired or wireless internet connection.

## Wired Ethernet

Connect an Ethernet cable to either ethernet ports - only DHCP is supported at this time. Both hot and cold plug is supported. Also - please note if WiFi AND wired Ethernet are connected at the same time, unpredictable behavior can result. At power-on, the Gateway will retrieve the time/date, establish a connection to Google Cloud and begin sampling the sensors and transmitting data. Readings will start appearing in the UrsaLeo Cloud Console a few seconds later.

## Wifi Access

The Gateway supports WiFi Protected Access (WPA) and WiFi Protected Access II (WPA2) 802.11 wireless authentication and encryption standards. Detailed instructions for configuring wireless access is available [www.ursaleo.com/gettingstarted](http://www.ursaleo.com/gettingstarted). Only wired or wireless access is supported. Once configured the Gateway automatically establishes a connection to the cloud and begins sampling the sensors and transmitting data. Readings will start appearing in the specified 3D model a few seconds later.

## LED debug

UrsaLeo provides an LED debug board that can be used to indicate the status of the Gateway. The following LED conditions are available

- LED 1 on - system clock has updated time/date from NTP server
- LED 2 on - data is being received from the Thunderboard
- LED 3 on - MQTT link is established with Google Cloud
- LED 4,5,6 are reserved for future use or for developers
- All LEDs off - clean shutdown, power can safely be removed

## Thunderboard reset

The Thunderboard stops advertising after 30 seconds (before the Gateway finishes booting for example). It is good practice to press the small black reset button on the TB2 after boot-up and at regular intervals.

## Gateway specifications (NXP i.MX6 UltraLite Evaluation Kit)

- i.MX 6UltraLite applications processor with 696 MHz ARM Cortex-A7 core
- 4 GB DDR3L SDRAM 400 MHz
- 256 MB QSPI NOR Flash
- eMMC (unpopulated) / NAND flash (unpopulated)
- MicroSD connector / SD connector
- LCD expansion port connector
- USB OTG connector / USB Host connector
- 3.5 mm audio stereo headphone jack
- Board-mounted microphone
- L/R speaker connectors

- Two 10/100 Mbit/s Ethernet connectors
- CAN bus connector
- Sensors including:
  - Three-axis accelerometer
  - Digital compass
  - Gyroscope (unpopulated)
- JTAG 20-pin 2.54 mm connector
- Debug port for ARM Cortex-A7 core
- Bluetooth connector

## Sensor specifications (Silicon Labs Thunderboard Sense 2)

- Relative Humidity and Temperature Sensor Si7021
- UV and Ambient Light Sensor Si1133
- Pressure Sensor BMP280
- Indoor Air Quality and Gas Sensor CCS811
- 6-axis Inertial Sensor ICM-20648
- Digital Microphone ICS-43434
- High brightness LEDs
- Hall-effect Sensor Si7210

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