

TELUS LTE-M IoT Starter Kit

The TELUS LTE-M IoT Starter Kit enables designers to rapidly prototype cellular connected IoT devices utilizing TELUS' low-power wide-area network. The modular design kit includes all the elements required to collect sensor data, connect to the TELUS LTE-M network, and utilize cloud services from Microsoft Azure for the management, storage, and analytics of a connected IoT solution.

The kit features a versatile three board IoT solution:

- NUCLEO-L496ZG Development Board from STMicroelectronics is the host board on which user application software is developed.
- STMicroelectronics' X-NUCLEO-IKS01A2 Motion and Environmental Sensor Shield
- Avnet's proven Quectel BG96 module-based LTE Cellular Shield.

The NUCLEO-L496ZG microcontroller board is fitted with an STM32L496ZG microcontroller, clocked at 80 MHz, with 1MB Flash memory, 320 KB RAM (for development flexibility), up to 115 GPIOs, an on-board ST-LINK/V2-1 debugger/programmer, and multiple expansion interfaces (USB OTG host interface, Arduino™ Uno V3 compatible expansion headers and ST Morpho headers), and is supported by comprehensive STM32 free software libraries and examples

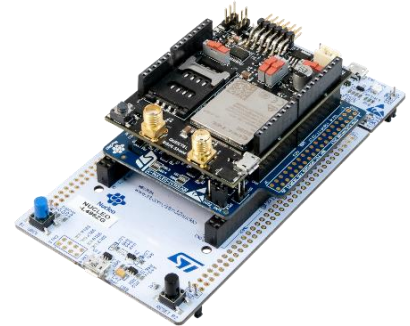
The X-NUCLEO-IKS01A2 sensor shield includes 3D Accelerometer, 3D Magnetometer, 3D Gyroscope, MEMS Pressure sensor plus relative humidity and temperature sensor. Additional 3rd-party sensor shields are also available through Avnet or Element14 for customized prototyping.

The 4G LTE-M cellular shield is built around the Quectel LTE BG96 Cat.M1/NB1 & EGPRS module with added support for GPS. A 2FF SIM connector accommodates the TELUS Starter SIM that is included in the kit for connecting to the internet via TELUS' virtual dedicated IoT network.

Development of your embedded application software is enabled through the user-friendly Arm® Mbed online IDE, but migration to other software development tools is also supported, including Keil®, IAR™ and GCC-based IDEs. The advanced debugging features within IDEs such as Keil, further mitigates the schedule and cost risks faced by developers and helps ensure your new product gets to market as quickly as possible.

Accelerated development with Microsoft Azure IoT is enabled via reference design expertise included within this starter kit. From device management, to device security, to data storage, analytics and visualization, with a specialized set of cloud services specifically engineered for massively scalable IoT applications. Additionally, leverage the flexibility and pre-configured architectures and design patterns for Azure IoT solutions to significantly accelerate solution development and prototyping.

Cloud application services from additional service providers is also available.



Example Applications

Industry & Agriculture

- Gas detector
- Soil PG tester
- Optical sensor
- Machinery alarm system
- Irrigation controller
- Elevator

Consumer Market

- Asset tracking
- Asset Monitoring
- Person / Pet Tracking

Public Utilities

- Water / Gas meter
- Parking system
- Fire hydrant
- Smoke alarm
- Trash cans
- Street lighting

FEATURES

NUCLEO-L496ZG Development Board

- STM32 microcontroller with LQFP144 package
 - 115 GPIOs
- On-board ST-LINK/V2-1 debugger/programmer interface via USB or SWD connector
 - Mode switch allows use as standalone ST-LINK/V2-1 debugger/programmer
- USB OTG interface for user applications
- 1 MB FLASH memory and 320 KB SRAM
- Flexible board power supply
 - USB V_{BUS} or external source (3.3 V, 5 V, 7-12 V)
 - Power measurement access point
- Three User LEDs and Five Status LEDs
- Two push button switches:
 - USER and RESET
- USB enumeration of three different interfaces
 - Virtual Com port
 - Mass storage
 - Debug port
- Comprehensive free software libraries and examples available with STM32Cube MCU package
- Support of a wide choice of software development IDEs including IARTM, Keil®, GCC-based IDEs, Arm® Mbed

TELUS IoT LTE-M Starter Pack

- TELUS Tri-Cut (2FF/3FF/4FF) Starter SIM
- 150 MB Data, 150 SMS messages, valid for up to 6 months
- Access to TELUS LTE-M network in Canada.

Access package for Microsoft Azure IoT

- \$250 credits for any Azure service for 30 days
- 12 months of 25+ popular services

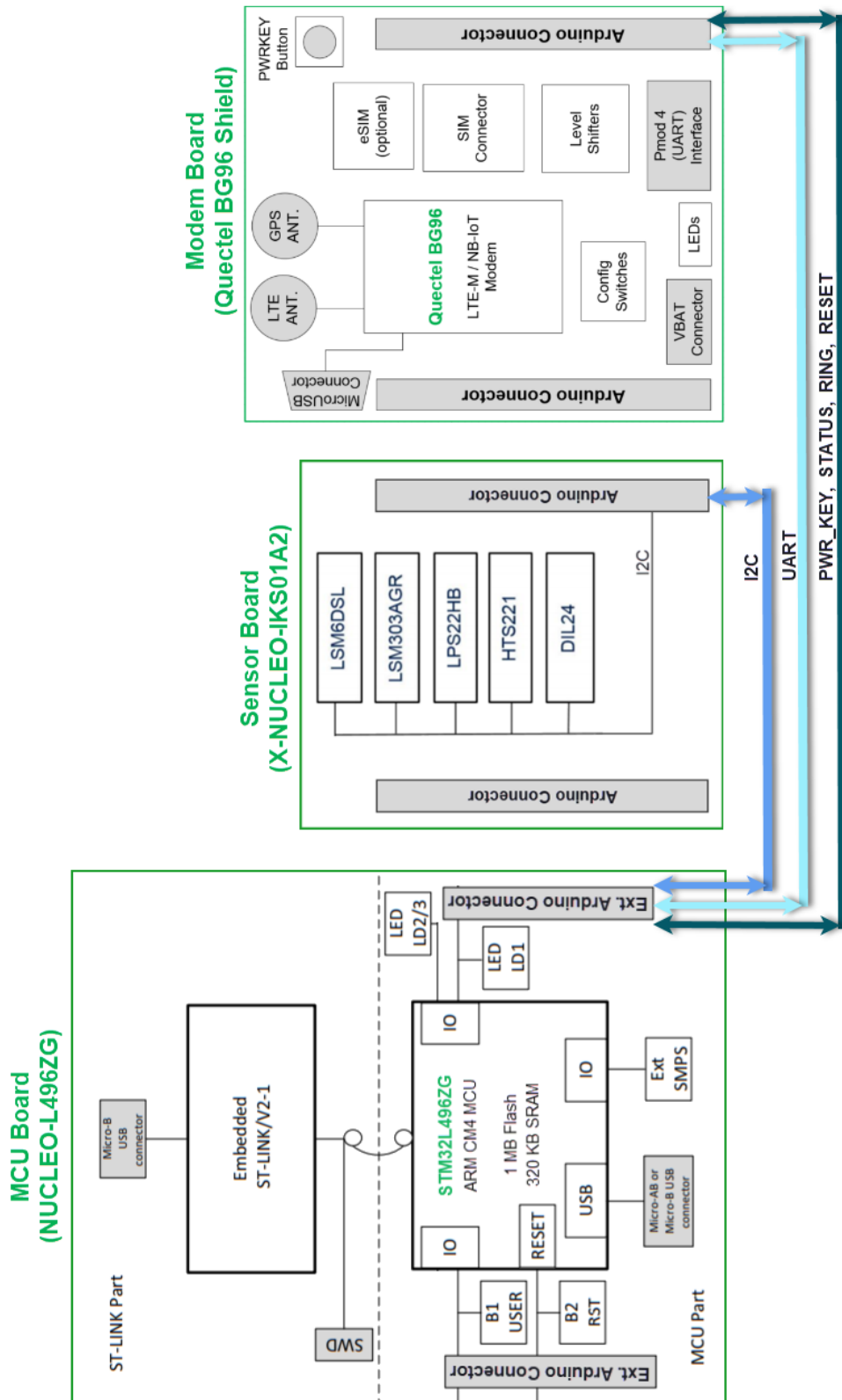
Cellular Modem and GPS Shield

- Module – Quectel LPWA Module BG96
- Multi Modes: Cat.M1, Cat.NB1, EGPRS
- Global bands
 - Cat M1/NB1: B1 B2 B3 B4 B5 B8 B12 B13 B18 B19 B20 B26 B28 B39 (B39 for Cat M1 only)
 - EGPRS: 850/900/1800/1900 MHz
- Low Power Consumption
 - Approx. 10 uA in PSM mode
- Optional GNSS
 - GPS, GLONASS, BeiDou/Compass, Galileo, QZSS
- Connectors
 - SIM holder
 - Arduino pinout
 - Pmod
- GSMA Standard based eUICC enabled

X-NUCLEO-IKS01A2 sensor shield

- 3D MEMS accelerometer ($\pm 2/\pm 4/\pm 8/\pm 16$ g)
- 3D gyroscope ($\pm 125/\pm 245/\pm 500/\pm 1000/\pm 2000$ dps)
- 3D MEMS magnetometer (± 50 gauss)
- MEMS pressure sensor, 260-1260 hPa absolute digital output barometer
- Capacitive digital relative humidity and temperature sensor
- Expansion socket for additional sensors

SYSTEM LEVEL BLOCK DIAGRAM



To purchase this kit, visit <http://avnet.me/telus1-iot>