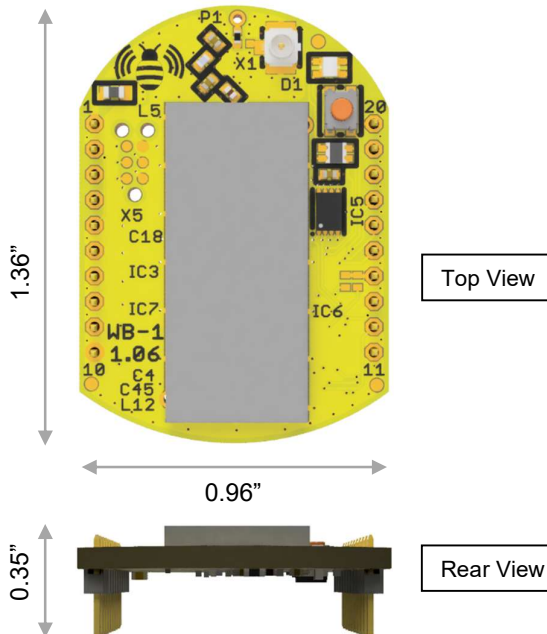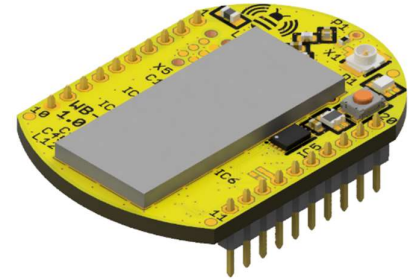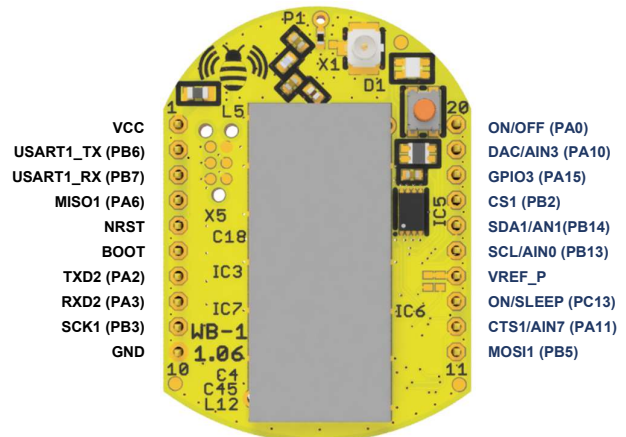# WillowBee

Industrial LoRaWAN Wireless Module

WillowBee is an industrial wireless microcontroller module that is designed for LoRaWAN sensor end-node designs and embedded applications that need LoRaWAN communications. WillowBee uses the popular STM32WL Cortex-M4 microcontroller from ST Micro.This microcontroller combines a computer unit and a LoRaWAN radio on a single chip.

WillowBee is pin compatible with other popular wireless devices. WillowBee is fully backed by a 3-year warranty, technical support and application assistance from BiPOM Electronics, Inc.

1.36"

0.96"

Top View

0.35"

Rear View

Microcontroller Features:

- Built-in LoRaWAN 1.1.0 Stack
- Ultra Low Power
- Suitable for battery operation
- User programmable
- Configurable power output
- Maximum output power: 22 dBm
- Frequency Bands: US915 /AS915/ AU915/ EU868/CN779/EU433/KR920/IN865/RU86 (Supported but not officially certified in all regions)
- 64 KB of RAM and 256 KB of Flash available to user applications

WillowBee Specifications:

- Pin compatible with popular modules
- u.FL Connector
- RF Shield
- Dual Power option: Battery or DC Power
- Temperature Range: -40°C to +85°C
- Dimensions 1.36" x 0.96" x 0.36" (34.54 mm x 24.38 mm x 9.14 mm)
- 2 LED's and 1 Button
- 32-Mbit Serial Flash
- Configurable 15 I/O Pins
- Drivers for ADC/IO/DAC/SPI/UART/I2C interfaces
- Part number: WB-L-1

VCC — ON/OFF (PA0)
USART1_TX (PB6) — DAC/AIN3 (PA10)
USART1_RX (PB7) — GPIO3 (PA15)
MISO1 (PA6) — CS1 (PB2)
NRST — SDA1/AIN1(PB14)
BOOT — SCL/AIN0 (PB13)
TXD2 (PA2) — VREF_P
RXD2 (PA3) — ON/SLEEP (PC13)
SCK1 (PB3) — CTS1/AIN7 (PA11)
GND — MOSI1 (PB5)

WiPOM

Wireless Point of Monitoring

WiPOM is a software application package that adds sophisticated data logging, remote terminal, and PLC-like capabilities to the WillowBee sensor board. WiPOM can run on STM32WL family of processors, WiPOM handles all aspects of Industrial IoT applications development, including I/O management, tags, alarms, events, SMS/email handling, MODBUS master and slave capability, modem detection, and management and Cloud portal support. WiPOM runs directly on WillowBee sensor board. Coupled with the WiPOM Client running on a Windows PC or on a web server, programming the WillowBee sensor board is reduced to a series of configuration selections to build a complete IoT system. WiPOM takes software out of the equation for faster time to market. Creating remote monitoring and control systems and sensors has not been easier.

WillowBee Development Board

Windows PC

Serial, USB or over the air

WiPOM Firmware running on board

WiPOM Client running on Windows PC or a web browser (local or remote)