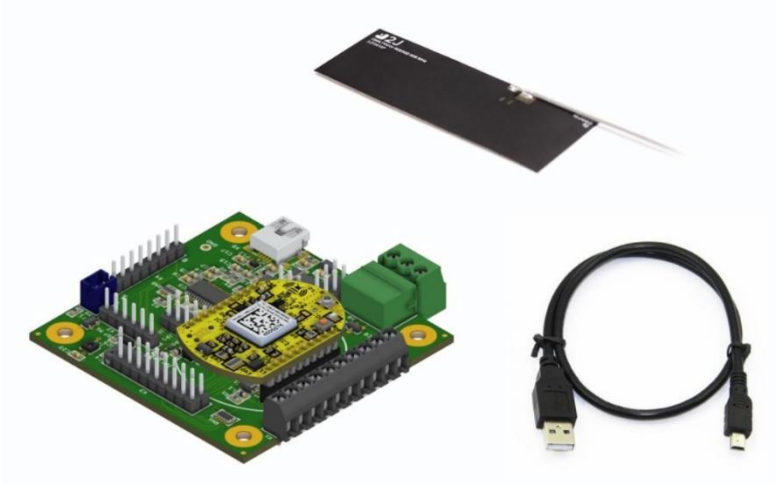
EKIT-WB-L-MAXI

Quick Start Guide

Date: 23 August 2025

Document Revision: 1.02E



www.bipom.com

Overview

Thank you for your purchase of the EKIT-WB-L-MAXI.

EKIT-WB-L-MAXI is an engineering kit based on the MINI-MAX/WB-1 board and WillowBee module. The MINI-MAX/WB-1 board is a versatile carrier board that can be used for evaluation, demonstration and deployment of WillowBee wireless module products.

WillowBee is an industrial wireless microcontroller module that is designed for LoRaWAN and CAT-M1/NB-IoT sensor end-node designs and embedded applications that need wireless communications. Programs are downloaded into the MINI-MAX/WB-1 board with a Windows PC through the USB port or JTAG port.

This document describes how to quickly get started with EKIT-WB-L-MAXI and includes the following steps:

- Requirements
- Hardware Setup
- Software Installation
- Configuring Communications
- Opening Projects
- Downloading Programs
- Creating Projects

Requirements

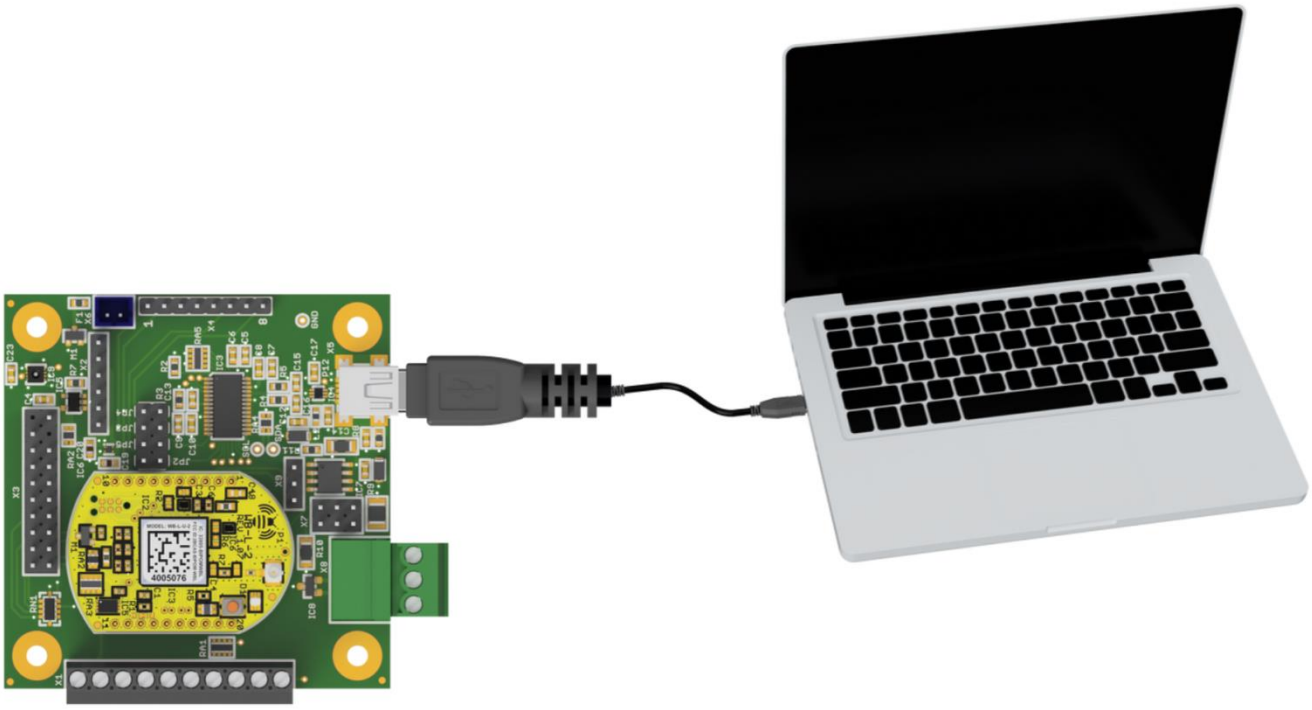
- EKIT-WB-L-MAXI kit that includes the MINI-MAX/WB-1 board, WillowBee module, antenna and mini USB cable for the connection with PC.
- A Windows PC that is required to run BiPOM's **WillowBee Development System** (free download from BiPOM website).

Hardware Setup

1. Place the MINI-MAX/WB-1 board on a clean, non-conductive surface.

2. WillowBee module is already installed on MINI-MAX/WB-1 board from the factory.

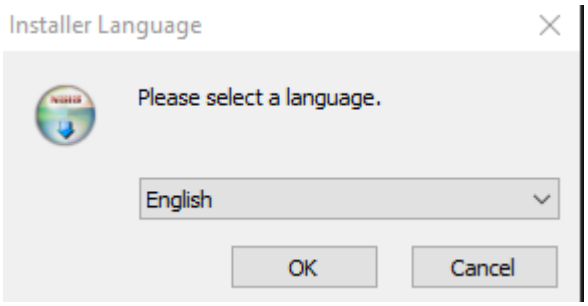
3. Connect the MINI-MAX/WB-1 board to the PC with the mini-USB cable. This powers the kit and enables program download.



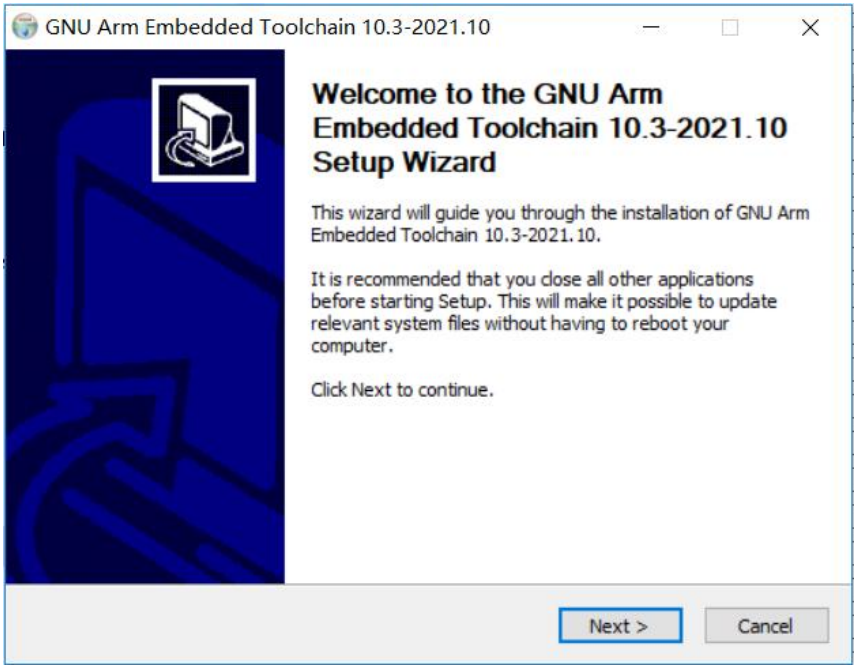
Software Installation

First install the GNU compiler tools. Download and run **GNU ARM Embedded Toolchain 10.3** from **www.bipom.com/wb_down.php**

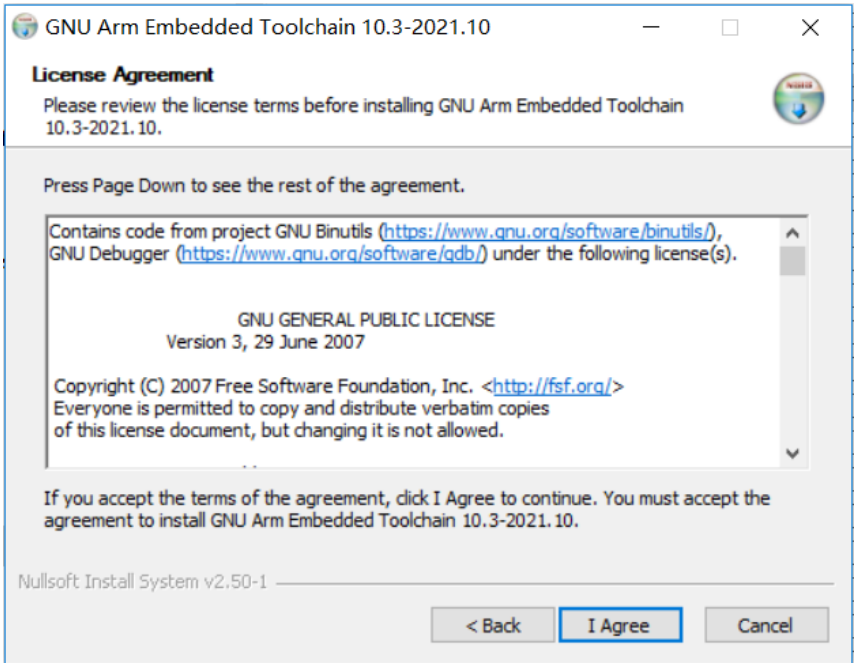
Choose language and click OK:



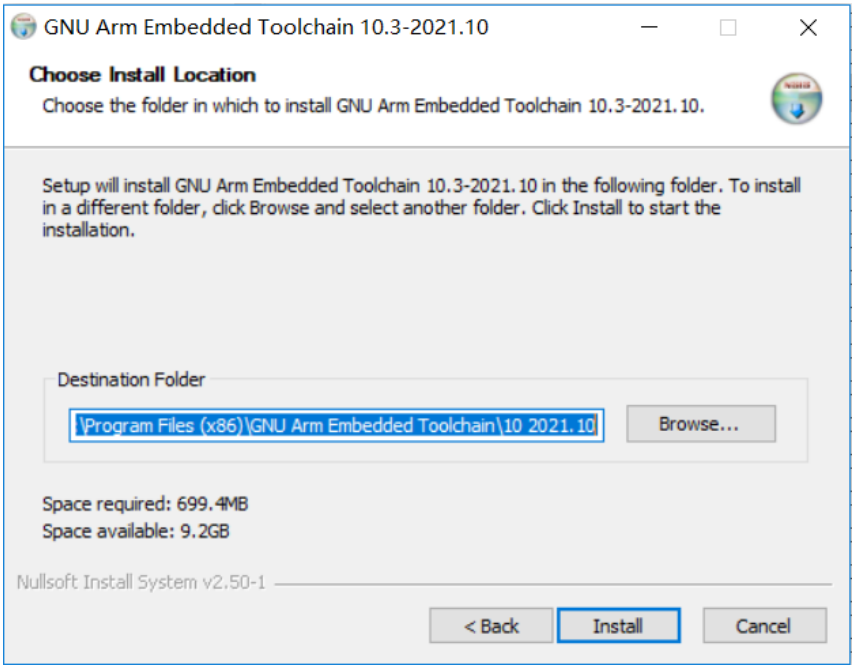
Click Next on the welcome screen



Read the license agreement and click “I Agree”.



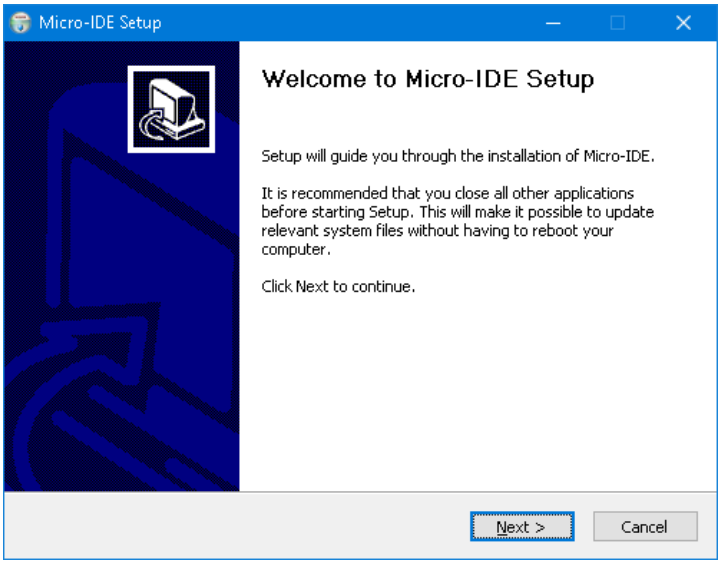
Keep default installation path and click Install:



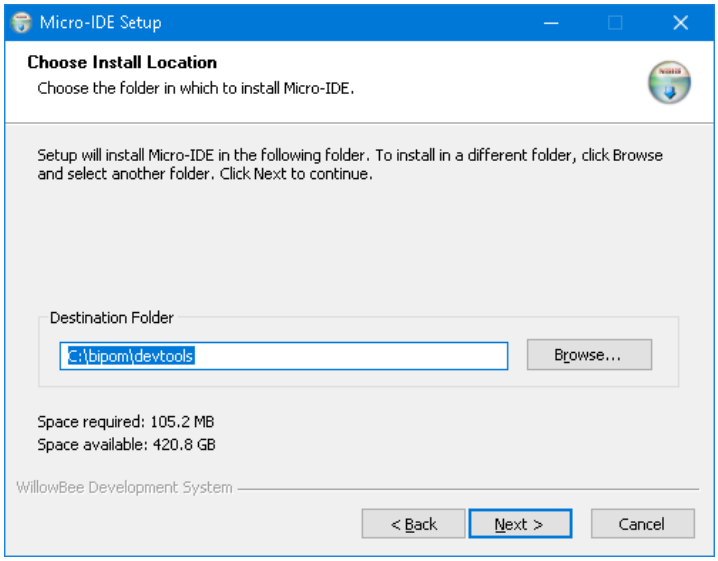
Once GNU Compiler is installed, download WillowBee Development System (wb_devsys.exe) from

www.bipom.com/wb_down.php

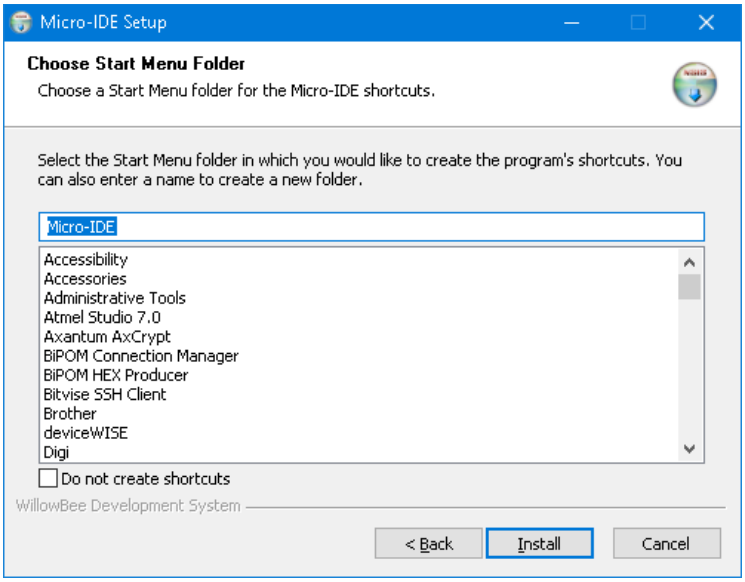
Run **wb_devsys.exe**. A welcome screen will appear.



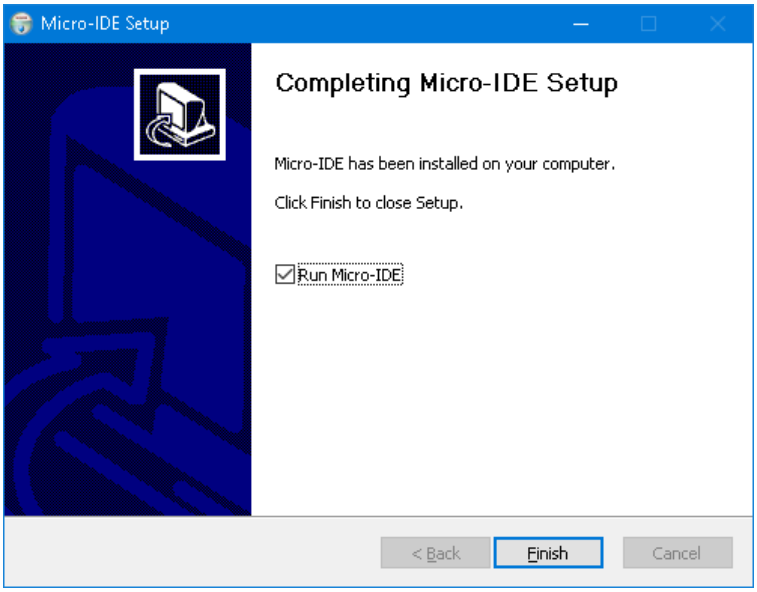
Click Next and keep the Install Location as it is in the next window.



Now click Install to start installation process.

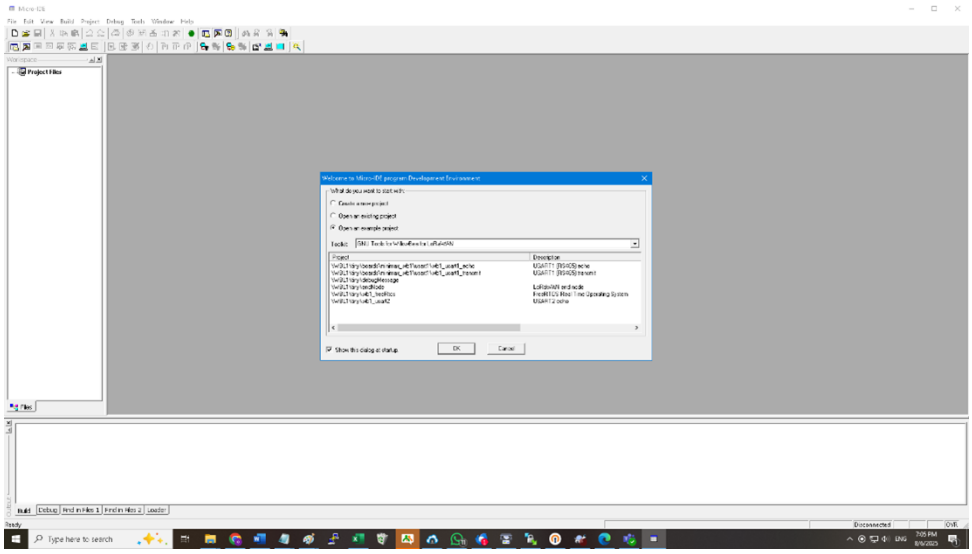


After installation is complete, click Finish:



Micro-IDE will start and show the splash screen (unless the “Run Micro-IDE" option is unchecked).

Above is WillowBee Development System splash window. Following is the startup page.



At this point, software setup is complete and the computer is ready to download projects to the kit.

Configuring Communications

After starting Micro-IDE, configure the correct COM port and communications parameters:

1. Select **Tools->Options** from the Micro-IDE menu.

2. Under Terminal and Loader tabs, make sure COM Port is selected as the port that you connect EKIT-WB-L-MAXI. For example, if the MINI-MAX/WB-1 board appears as COM4, select COM4 under Terminal and Loader tabs. Make sure that the Terminal and Loader options are as follows:

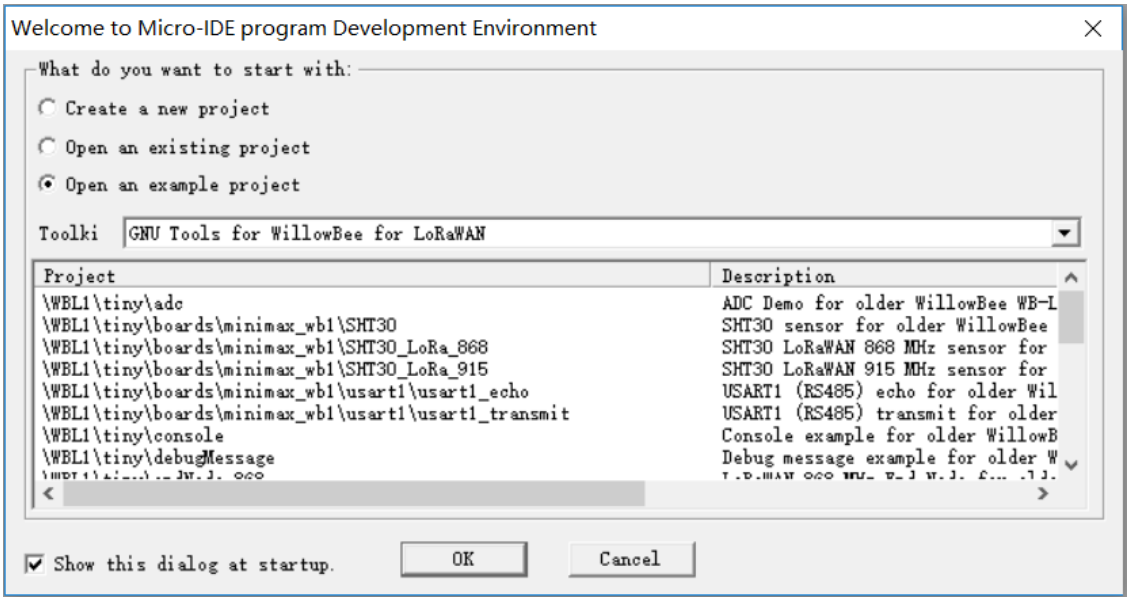
Setting	Terminal Tab	Loader Tab
Baud Rate	115200	115200
Data Bits	8	8
Stop Bits	1	1
Parity	None	Even
Echo	Off	Off

3. Open the **Terminal** window by selecting **Terminal** under **View** menu. A blank terminal screen will appear on the right side of the Micro-IDE window. (Terminal screen can be resized as needed by selecting the left edge of the terminal window with the left mouse button and dragging to the right).

4. Select **Tools->Terminal->Connect**. This will connect the terminal to the MINI-MAX/WB-1 board.

Opening Projects

When Micro-IDE starts, a welcome screen will appear. If not, use **Projects->Open Example Project** option. In that screen select **Open an example project** and the relevant toolkit, either “GNU Tools for WillowBee for LoRaWAN” or “GNU Tools for WillowBee for LTE-M/NB-IoT”. Example projects listed, select one and click OK:



Downloading Programs

Build and download programs to the WillowBee on the MINI-MAX/WB-1 board by following the steps below:

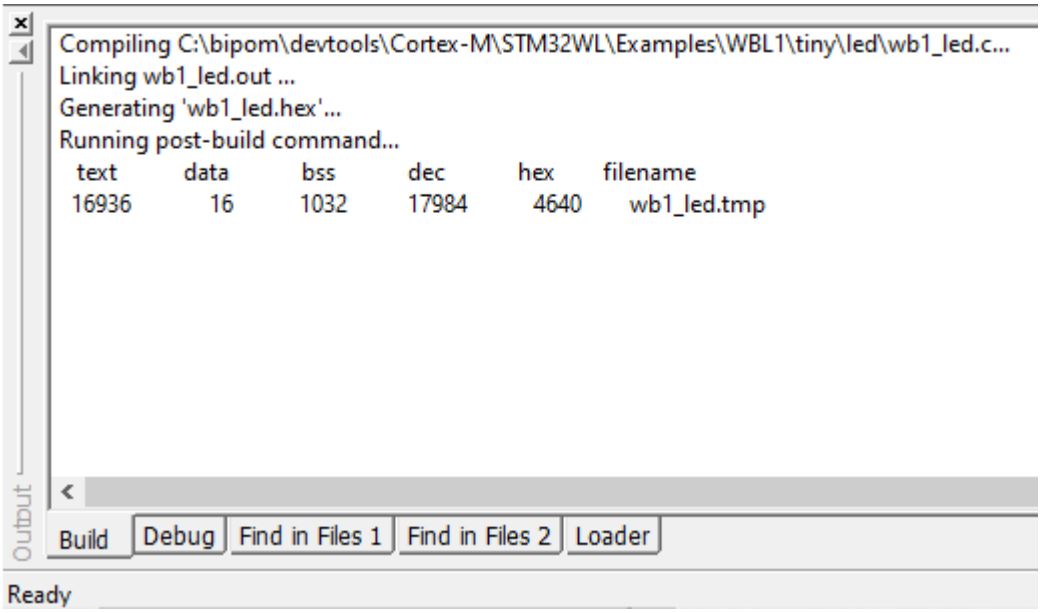
1. Make sure the MINI-MAX/WB-1 board is connected to the PC as described in the Hardware Setup section.

2. Open an example project as described in **Opening Projects** section.

3. Configure communications as described in Configuring Communications section.

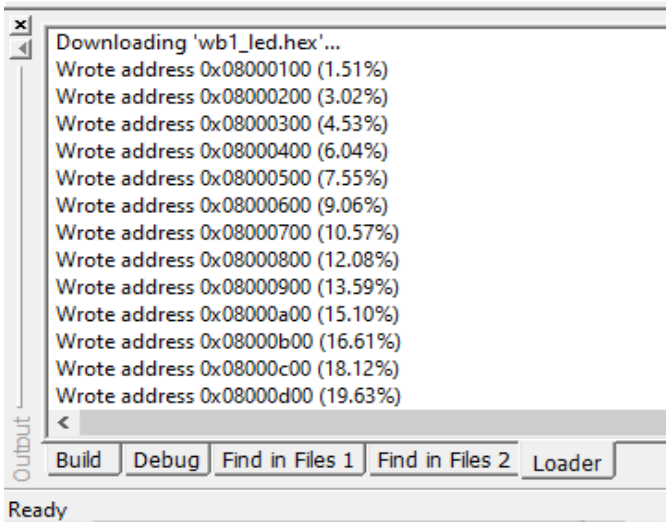
4. Click the **Build** button on the main toolbar. This will build the example project you opened and create a **.hex** output file:

If the project builds successfully, a message indicating no errors appears on the **Output Window**:



5. Download the program file to WillowBee on the MINI-MAX/WB-1 board by selecting **Download** under **Build** menu:

If all goes well, download progress should be shown on the **Output Window**:



After the program has been successfully downloaded, it can be started using the **Mode** button on the main toolbar:

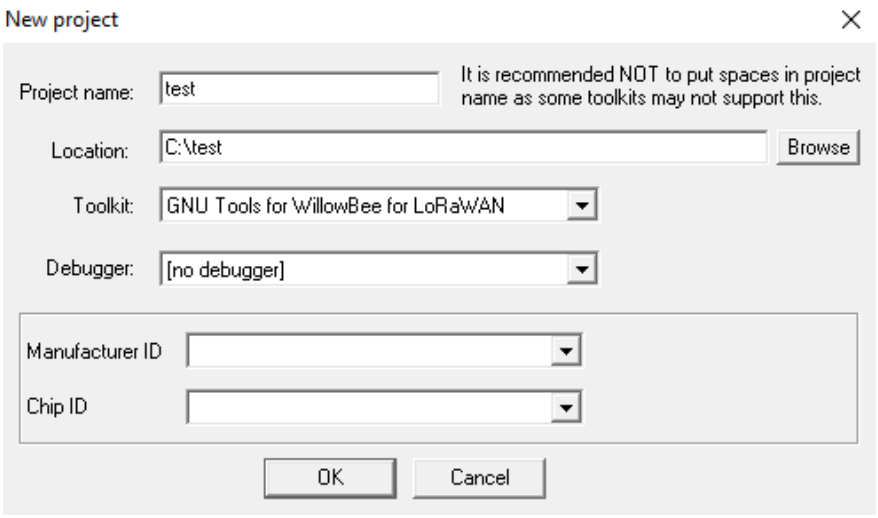
The Mode button puts WillowBee into **Run** or **Program** mode. In **Run** mode, the micro-controller is executing the program in its memory. In **Program** mode, the micro-controller is in Reset state, so no programs are running. In **Program** mode, micro-controller's flash memory can be changed, and a new program can be downloaded.

The Mode button is Red in **Program** mode and Green in **Run** mode. Following a download, the **Mode** button will be Red. Click the Mode button to switch to **Run** mode. The program that you just downloaded starts executing.

Congratulations! You have built and executed your first program on WillowBee.

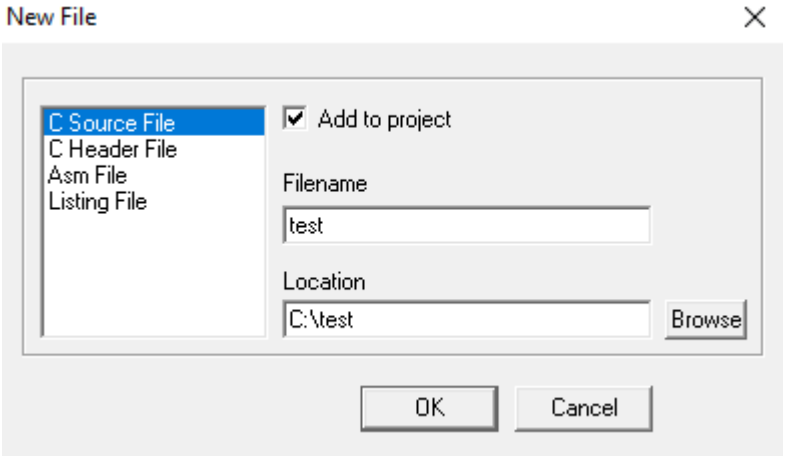
Creating Projects

To create your own project, select **Project** menu and select **New Project**. This will display the **New Project** dialog:



Enter the name of the new project and its location (this example uses **test** as the project name and **c:\test** as the project location). Select the toolkit and Click OK; the new project named test will be created in **c:\test**.

To add a C source file to the project, first create the C source file. Select **File** menu and New. **New File** dialog will appear:



Enter the name of the C source file (for example, test) and its location (**c:\test**). The file type is C Source File. Check the Add to project box so **test.c** will be automatically added to test project.

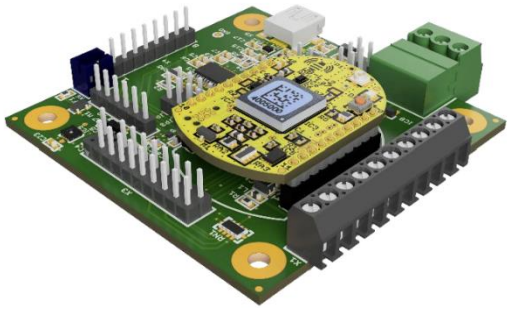
Click OK. A blank C source file (**test.c**) will be created:

You can now write code, build, download and run your code by following the steps described previously.

Appendix A: MINI-MAX/WB-1 Board

MINI-MAX/WB-1 board is a compatible development and deployment board for WillowBee. With powerful capabilities and seamless integration, the MINI-MAX/WB-1 board is the perfect choice for developers looking to create cutting-edge IoT applications. MINI-MAX/WB-1 board enables rapid sensor development.

MINI-MAX/WB-1 board is fully backed by a 3-year warranty, technical support and application assistance from BiPOM Electronics, Inc.



Features

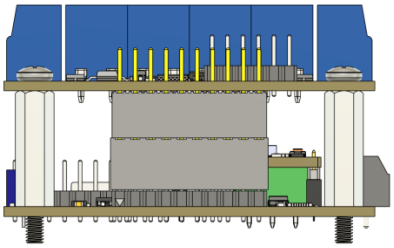
- Compatible with both LoRaWAN and LTE-M1/NB-IoT WillowBee modules
- Expansion connector for easy access to WillowBee
- Communication Method: USB and RS485
- Type B Mini high-retention USB connector
- USB approved for industrial environments
- FTDI chip to convert USB to serial port
- External power or 5 Volts on USB
- 3.3V Regulator for WillowBee
- Connector for optional 3.6V battery
- 4x Analog inputs, 12-bit resolution, screw terminal
- 1x Digital output, open drain
- 1x Digital input, dry contact
- Expansion bus interface to low-cost peripheral boards
- 4 mounting holes
- Temperature range: -40°C to +85°C
- Dimensions: 2.35" (59.7mm) x 2.40" (61mm)
- Supported by popular development packages
- Micro-IDE integrates GCC Compiler and Downloader for WillowBee
- Keil uVision and ST Micro Cube support
- Command line downloader for any 3rd party development tool
- Examples for all major build environments
- Various LoRa sensor projects
- Libraries and drivers for a variety of sensor components and IC’s.
- Generic UART, I2C, SPI, 1-wire, analog and digital I/O drivers
- Open-source examples
- Warranty Period: 3 years

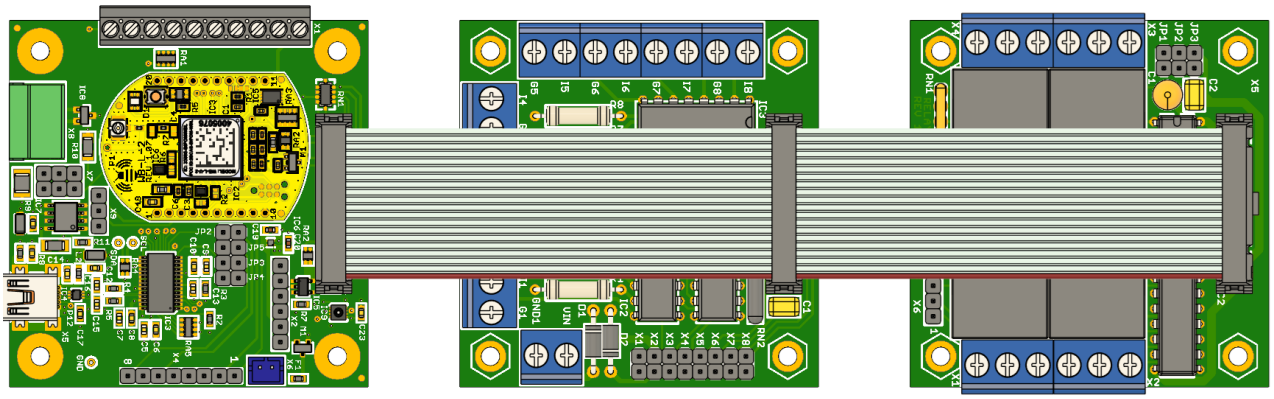
Appendix B: Peripherals

MINI-MAX/WB-1 board can be connected to a wide variety of low-cost peripheral boards to enhance its functionality. Some options are:

- Prototyping Board (**BRD-MMP-PROTO-1**, **BRD-MMP-TERMINAL-1**)
- Training Board (**BRD-MMP-TB-1**)
- Digital Input/Output Expander Board (**BRD-MMP-DIO-1**, **DLPB-1**)
- 12-bit Analog-To-Digital Converter Board (**BRD-MMP-DAQ-128**, **BRD-MMP-DAQ-127**, **BRD-MMP-DAQ-2543-DA1**, **BRD-MMP-DAQ-2543-LOOP-8**)
- Relay peripheral boards (**BRD-MMP-RELAY-2**, **BRD-MMP-RELAY-4**, **BRD-MMP-RELAY-4REED**)
- Real Time Clock boards with a Multimedia Card socket (**BRD-MMP-RTC-1**, **BRD-MMP-MMC-RTC-1**)
- A peripheral board with LED/OLED displays with decimal point (**LED-1**, **OLED-1**)
- Analog input Interface Board (**ATB-5CL**, **ATB-5PHI**)
- Temperature/Humidity Sensor Interface Board (**BRD-MMP-T-1-1820**, **BRD-MMP-TH-1-SHT**)
- Opto-isolator Board (**BRD-MMP-OPTO-8-DC**, **OPTO-9**)
- Thermocouple amplifier Board (**BRD-MMP-TC-1**, **BRD-MMP-TC-4**)
- Digital to Analog Converter board (**BRD-MMP-DAC-8**)
- Wireless module Interface Board (**CB-1**, **BRD-MMP-SW-1**, **BRD-MMP-SW-1-X**)
- RS232/485 Converter Board (**BRD-RS232-TTL-1**, **BRD-MMP-UART-2RS232**)
- Stepper motor control Board (**BRD-MMP-MOTOR-1B**, **BRD-MMP-MOTOR-2**)
- High current driver Board (**BRD-MMP-HCD-4**)
- Arduino Adapter Board (**Duino-Adapter-MMP**)
- GPS module Board (**BRD-MMP-GPS-2**)
- Additional MINI-MAX/WB-1 boards

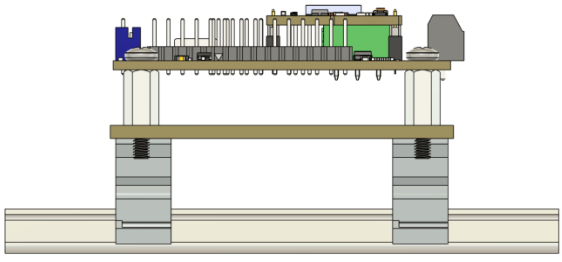
Peripheral boards can either be stacked on top of MINI-MAX/WB-1 board using stand-offs or connected in a chain configuration using flat ribbon cable. First diagram below shows how MINI-MAX/WB-1 board can be connected to a peripheral board in a stacked fashion. Second diagram shows the chain connection.

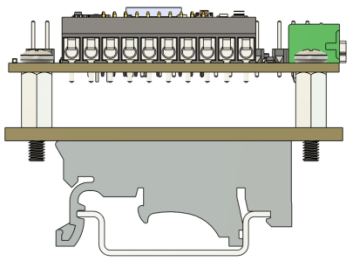


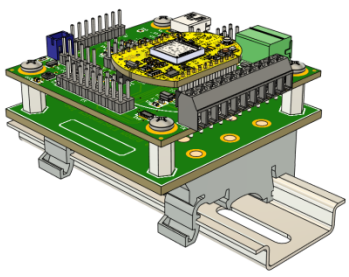


More details on BiPOM Peripheral boards are available from **www.bipom.com/periph_cat/us/44/0.html**

MINI-MAX/WB-1 board and its peripheral boards can also be mounted on a DIN rail mount using BiPOM's **BRD-MMP-DIN-1** adapter board as shown below:







Appendix C: Troubleshooting

⚠ If you encounter problems while setting up or using the EKIT-WB-L-MAXI, check the following:

• MINI-MAX/WB-1 board COM port not detected by Micro-IDE:
  - Ensure the USB cable is firmly connected.
  - Check Windows Device Manager for COM port visibility.
  - Install or reinstall FTDI drivers if necessary.

• Build errors when compiling projects:
  - Ensure GCC ARM toolchain is installed.
  - Verify project paths do not contain spaces.

• Download fails or times out:
  - Confirm COM port settings (Baud **115200**, Parity **Even** in Loader tab).

• Program does not run after download:
  - Check Mode button status (Green = **Run** mode).
  - Re-download program if necessary.

💡 If issues persist, contact BiPOM technical support at **tech@bipom.com**