

MitraStar



Quick Start Guide

MIO-6706
Development Kit

DRAFT

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Chapter 1

Introduction

1.1 MIO-6706 Overview

The Wi-SUN (Wireless Smart Ubiquitous Network) Module Development Kit lets you try out the MIO-6706 Wi-SUN Module.

The MIO-6706 is a Wi-SUN Module designed to be integrated with IoT sensors and gateways for data transfer. The Wi-SUN network technology follows IEEE 802.15.4g/e and supports most available sub-GHz frequencies. The Wi-SUN solution provides the advantages of long range applications, low power, higher speed, hybrid mesh, and cost effectiveness. It provides open-standards based secure, interoperable communications for large scale IoT, Smart Utility, and Smart City networks.

Chapter 2

The Development Kit

2.1 The Dimensions

The fixture board PCB size is 55 x 40 mm. The IO board PCB size is 75 x 70 mm.

2.2 Connecting the Boards and Powering Up

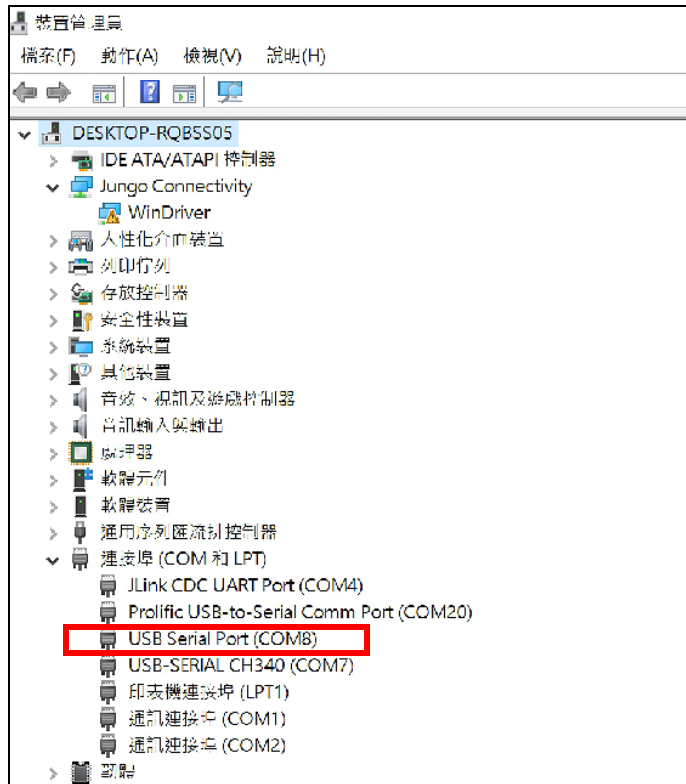
- 1 Connect the fixture board and the IO board. Connect the included antenna to the IO board's antenna connector.
- 2 Connect the Micro-USB port of the Development Kit to the included Micro-USB adapter.
- 3 Connect the adapter to a proper power source to power up the Development Kit.

2.3 Connecting to a Computer and Starting Up

Follow the steps below to connect the Development Kit to a computer and start it up.

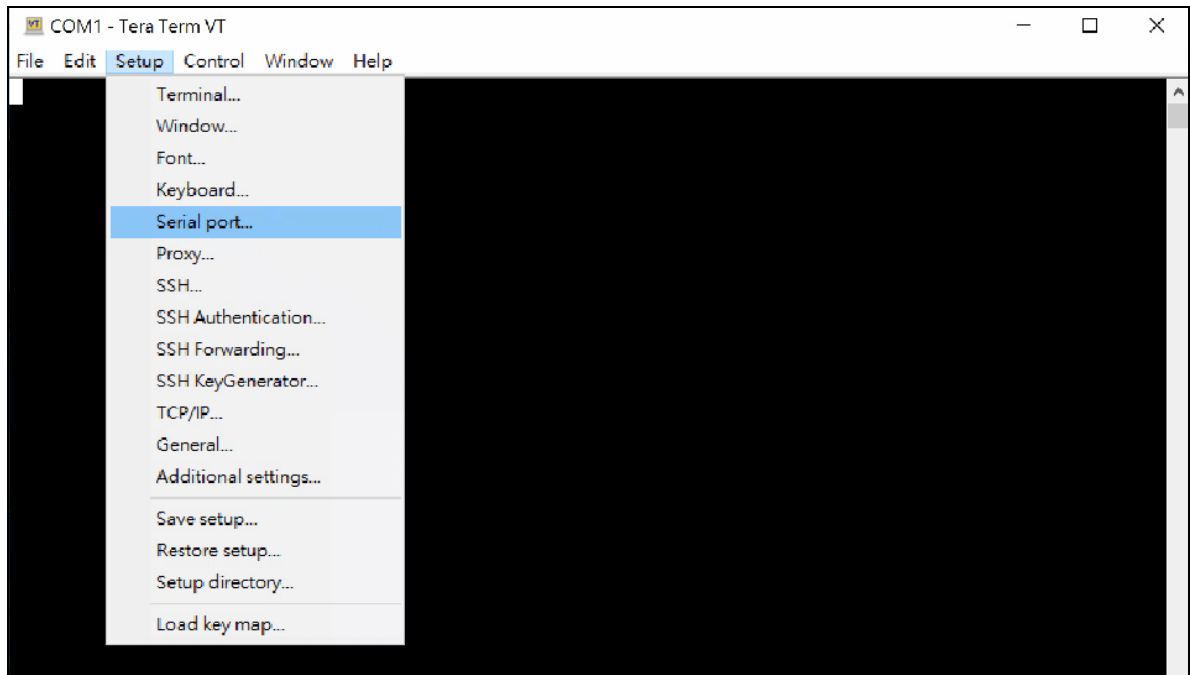
- 1 Power up the Development Kit by following the steps in [Section 2.2 on page 4](#).
- 2 Connect the 4-pin UART port of the Development Kit to your computer's USB port with an RS232 cable. Make sure the computer is powered on.
- 3 You can access the Development Kit via various command tools in Linux and Windows environments. The following example uses Windows 10 and Tera Term.
- 4 In Windows, open **Device Manager** and check for a new COM port. **COM8** is used in this example.

Figure 1 New COM Port



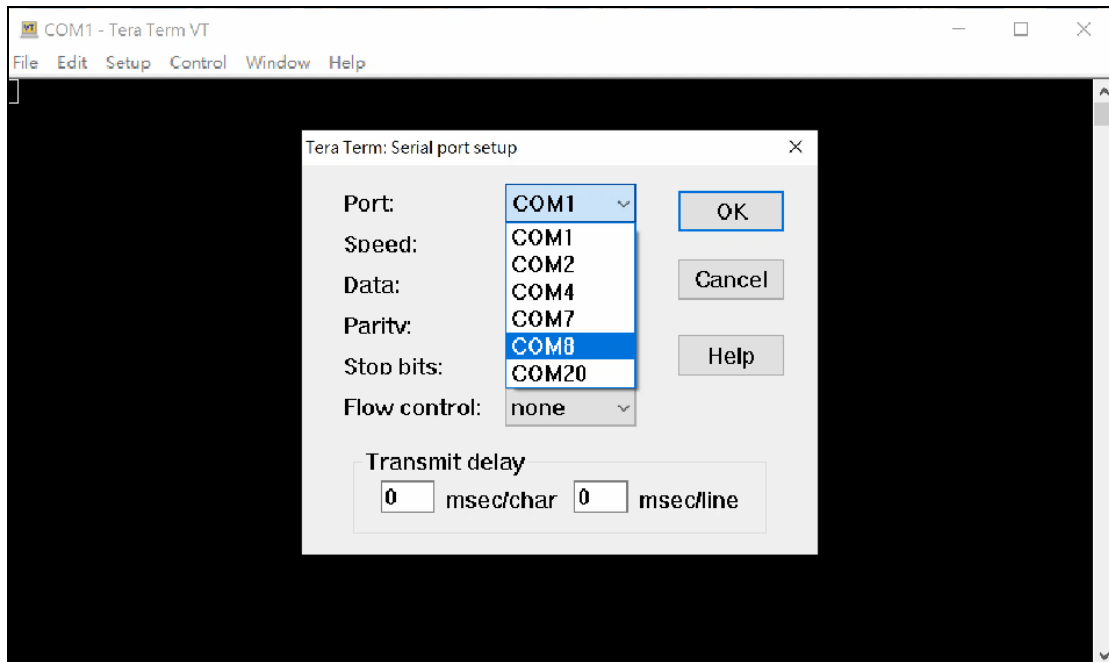
- 5 Open Tera Term and click **Setup > Serial port....**

Figure 2 Tera Term: Setup > Serial port...



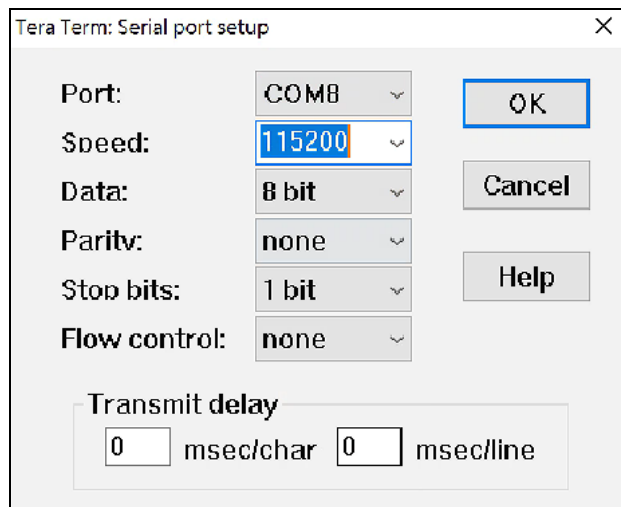
- 6 Select the new COM port in the **Port** field.

Figure 3 Select Port

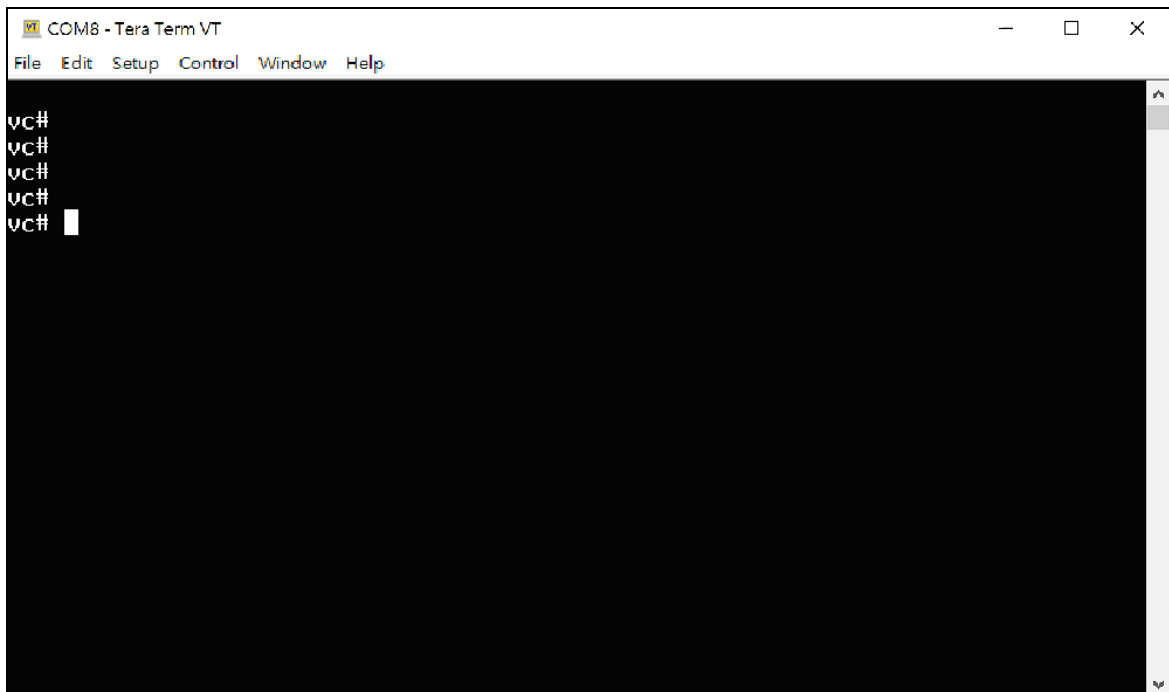


- 7 Set the baud rate in the **Speed** field to **115200**. Click **OK** to save the settings.

Figure 4 Set Speed



- 8 The following screen appears. You can now start using commands for the Development Kit.

Figure 5 Setup Complete

2.4 Other Information

Table 1 Other Information

1	Environmental Requirements	<ul style="list-style-type: none"> • Operating Temp: -20°C~+70°C • Storage Temp: -30°C~+85°C • Operating Humidity: 10% to 90% Non-Condensing • Storage Humidity: 10% to 95% Non-Condensing
2	Other Requirements	<ul style="list-style-type: none"> • Timer function • Heat resistance and fireproofing

2.5 Regulations/Certifications

Regulations (draft report only)

Table 2 Regulations/Certifications

COUNTRY/ REGION	CERTIFICATION	STANDARD	FREQUENCY BAND	BOM
U.S.A.	FCC	FCC Part 15C §15.247	902 - 928 MHz	902 - 928 MHz
Taiwan	NCC	LP0002 §5.8	Taiwan, Asia Regions	920 - 925 MHz

Wi-SUN Module Specifications

3.1 Wi-SUN Module PCB Size

The Wi-SUN PCB size is 18 x 32 mm.

3.2 Specifications

Table 3 Wi-SUN Module Specifications

Frequency Band	FCC: 902~928 MHz, NCC: 920~925MHz
Maximum Power Consumption	400 mW
Link Rate	Maximum is 300 kbps Also support 50 kbps, 100 kbps, 150 kbps
TX	FCC maximum peak conducted output power: 18.95 dBm at 50 kbps 18.96 dBm at 100 kbps 19.02 dBm at 150 kbps 18.99 dBm at 300 kbps NCC maximum peak conducted output power: 18.98 dBm at 50 kbps 18.92 dBm at 100 kbps 11.28 dBm at 150 kbps 8.37 dBm at 300 kbps
RX	Sensitivity in Wi-SUN mode: -98 dBm at 50 kbps -96 dBm at 100 kbps -94 dBm at 150 kbps -91 dBm at 300 kbps
Antenna	Defined by customer

3.3 Other Information

Table 4 Other Information

1	Environmental Requirements	<ul style="list-style-type: none"> Operating Temp: -20°C~+70°C Storage Temp: -30°C~+85°C Operating Humidity: 10% to 90% Non-Condensing Storage Humidity: 10% to 95% Non-Condensing
2	Other Requirements	<ul style="list-style-type: none"> Timer function Heat resistance and fireproofing

3.4 Power Tree

The IO board provides +3.3V power to the system.

3.5 GPIO for Sub-1G TX/RX Switching

Figure 6 Truth Table

VC	RF1	RF2
HIGH	RX	OFF
LOW	OFF	TX

3.6 Regulation/Certifications

Regulations (EVT Test only, no certificate)

Table 5 Regulations

CERTIFICATION	STANDARD
FCC	FCC Part 15C § 15.247
NCC	LP0002 §5.8.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

IMPORTANT NOTE:

This module is intended for OEM integrator. This module is only FCC authorized for the specific rule parts listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Additional testing and certification may be necessary when multiple modules are used.

LABEL OF THE END PRODUCT:


The final end product must be labeled in a visible area with the following "Contains TX FCC ID: ZMY-MIO6706".

Antenna information

Antenna (1)				
No.	Manufacturer	Model No.	Antenna Type	Antenna Gain
1	HongBo	290-10540	PCB Antenna	-0.43 dBi
Antenna (2)				
No.	Manufacturer	Model No.	Antenna Type	Antenna Gain
1	HongBo	56-001-000023Z	PCB Antenna	-0.85 dBi

National Communications Commission (NCC)

「取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。」。

「本模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求平台廠商於平台上標示「本產品內含射頻模組  CCXXxxLPyyyZzW」。

Antenna information

Antenna (1)				
No.	Manufacturer	Model No.	Antenna Type	Antenna Gain
1	HongBo	290-10540	PCB Antenna	-2.05 dBi
Antenna (2)				
No.	Manufacturer	Model No.	Antenna Type	Antenna Gain
1	HongBo	56-001-000023Z	PCB Antenna	-1.01 dBi