WBM-XC6P-SC
Manual

Revision History

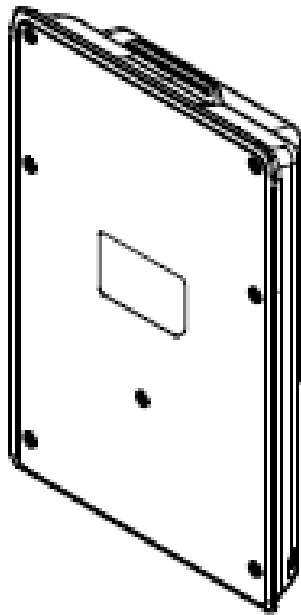| Revision	Date	Author	Remark
1.0	Dec. 27th, 2023	B. Yoo	Initial revision
1.1	Sep. 7th, 2024	W. Lee	Update & add content
1.2	Jan. 20th, 2025	R. Jung	Update & add content

Table

1. Introduction

The Wiliot Bridge combines the functionalities of Wiliot bridge and Smartcase Extended Battery Pack.

Wiliot bridges perform three main functions: energizing IoT Pixels, receiving and filtering their packets, and sending these packets to gateways. It runs specialized Wiliot firmware, featuring a Sub-1 GHz antenna for energizing Pixels and a 2.4 GHz antenna for retransmitting Bluetooth packets. Designed for optimal Wiliot deployments, it supports asset tracking, inventory management, temperature sensing, and proximity applications. It seamlessly integrates with the Wiliot ecosystem, ensuring precise data flow and signal accuracy, and is compatible with various Wiliot Pixels, including Dual Band, Single Band, and Battery Assisted versions.

RF Exposure Statement

The device complies with RF specifications when the device used at 0cm from your body. The device is in compliance with the SAR requirements

2. System Specification

2.1   Physical

- Size: 90mm x 12mm x 38mm (without Smartcase)
- Weight: 147g (without Smartcase)
- Locking knob: 2ea

2.2   Electrical

- Battery: Lithium-Ion (3.85V DC, 3950mAh)
- Charging: Type-C USB Connector

2.3   Interface

- LED: 4(Green, Red, Orange)
- Button: 1
- Radio: BLE 5.2 & LoRA Sub 1G
- USB Port: Type-C
- Pogo Contact: 2 (from Cradle)

2.4   User Environment

- IP Rating: IP54
- Drop: 1.5m
- Operating: 0℃ ~ 45℃ (Charging), -5℃ ~ 60℃ (Discharging), -20℃ ~ -5℃ (Slow Discharging)
- Storage: -20℃ ~ 45℃ (With in 3 months)
- Humidity: 5% ~ 95%, Non-condensing

3. H/W Specification

3.1 Input Power

The input power specifications of the XCover6Pro-SCWILIOT are as follows.

Number	Item
3.1.1	USB-C Port Input Power: 5V/2A *2

3.2 BLE (Bluetooth® Low Energy) 5.2 Specification

Number	Item
3.3.1	Function: Retransmit Wiliot Pixel packets, calibrate nearby Wiliot Pixels
3.3.2	Frequency Range: 2.402 - 2.481 GHz
3.3.3	Tx Max. output Power:+20dBm
3.3.4	Antenna Polarization Type: Mixed Linear
3.3.5	Antenna Gain: < 5dBi (Peak)
3.3.6	Impedance: 50Ω (RF I/O)
3.3.7	DC Power: 3.85V Battery
3.3.8	Broadcast Packet: Standard Bluetooth Low Energy Packet (PDU), payload: Wiliot Ephemeral ID (WEID)
3.3.9	Security: AES-128, encryption and authentication
3.3.10	Pixel Calibration Beacons: 3 BLE advertisements every 90ms (default)
3.3.11	Default Echo Pacing Interval: 15 s (configurable)

3.3 LoRA (FSK/CSS) Sub-1G Specification

Number	Item
3.3.1	Function: Energize nearby Wiliot Pixels
3.3.2	Frequency Range: 902-920 MHz
3.3.3	Tx Max. outpurt Power：+27dBm
3.3.4	Antenna Polarization Type: Mixed Linear
3.3.5	Antenna Gain: 2.4dBi (Peak)
3.3.6	Impedance: 50Ω (RF I/O)
3.3.7	DC Power: 3.85V Battery

3.4   Button

The button is for indicating battery status and entering bootloader for firmware upgrade.

3.5   LEDs

The left two LEDs are assigned to KOAMTAC battery and right two LEDs are assigned to Wiliot bridge. All four LEDs are dual colors (RED and Green).

3.6   USB connector

This USB connector is for charging KOAMTAC battery and battery firmware upgrade.

4.   Button Operation

4.1   Display Battery Status

Pressing the button will display the remaining battery capacity. Please see 5.1 Battery status for detailed battery level status.

4.2   Firmware upgrade

Pressing the button for 10 seconds, the battery firmware will enter into bootloader mode and ready to upgrade firmware. It will return to the application if no firmware upgrade action is started for 10 seconds.

During bootloader, the left two LEDs will blink with green/red on every 500ms cycle.

5. LED Operation

After power up or entering bootloader for firmware upgrade,

- The left two LEDs (LED1/LED2) will blink with red/green colors with 500ms cycle.
- The right two LEDs (LED3/LED4) will display orange color.

After 10 seconds later,

- The LED1/LED2 show battery status.
- The LED3/LED4 show Wiliot Bridge status.

5.1 Battery status

Battery Level	Charging		Discharging	
	LED1	LED2	LED1	LED2
Low Battery (< 10%)	Orange blinking	Off	Red solid	Off
< 25%			Green blinking	Off
< 50%	Orange solid	Off	Green solid	Off
< 75%	Orange solid	Orange blinking	Green solid	Green blinking
< 100%	Orange solid	Orange solid	Green solid	Green solid
Full Charged	Green solid	Green solid		

5.2 Wiliot Bridge status

Status	LED3	LED4
Advertising & NUS Mode *1	N/A	Green solid
Energizing	Red solid	N/A
Packet Echoing *2	N/A	Green blinking

*1. Advertising (right after start-up) shows Green LED for 30 seconds and NUS mode (connecting the Wiliot Bridge through UART) keeps Green LED until disconnection.

*2. The number of blinks for Packet echoing is determined according to several conditions.

6. Battery Firmware Upgrade

To upgrade the battery firmware upgrade, follow below step.

1. Remove phone from bridge.

2. Remove USB cable from USB connector.

3. Press the button for 10 seconds.

4. Confirm the left two LEDs are blinking on every 500ms.

5. Plug USB cable from Windows PC.

6. Confirm the left two LEDs blinking cycle is changed to fast(100ms).

7. Run the firmware upgrade program on the windows PC and follow instructions of the application.

7. Regulatory Information

7.1 RF Exposure Statement

The device complies with RF specifications when the device used at 0cm from your body. The device is in compliance with the SAR requirements.

7.2 FCC Information

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 or more 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

The device must not be co-located or operating in conjunction with any other antenna or transmitter

The RF transmitter on this device has not been tested for FCC compliance for those conditions where client transmitters are also in operation.