

NeoEyes NE-CM03 WiFi-HaLow Module

User Manual

Xiamen CamThink Technology Co., Ltd.

1.Introduction

The NeoEyes NE-CM03 is a high-performance, low-power wireless communication module based on the IEEE 802.11ah (WiFi HaLow) standard. Operating in the sub-1 GHz frequency band, it is specifically designed to provide long-range, robust connectivity with excellent wall-penetration capabilities, making it an ideal solution for Internet of Things (IoT) applications such as long-range video surveillance, smart agriculture, industrial sensors, and smart city infrastructure.

2.Key Features

- **WiFi HaLow (802.11ah) Compliance:** Enables long-range and low-power wireless connectivity.
- **Low Power Consumption:** Optimized for battery-operated IoT devices.
- **Long Range:** Capable of covering distances up to 1 kilometer and beyond (line-of-sight).
- **Robust Connectivity:** Excellent performance in challenging environments with obstacles.
- **Multiple Bandwidths Supported:** Configurable for 1MHz, 2MHz, 4MHz, and 8MHz channel bandwidths.

3.Specifications

Category	Specification
Model	NE-CM03
Wireless Standard	IEEE 802.11ah (WiFi HaLow)
Operating Frequency Bands	903.5 ~ 926.5 MHz (for 1MHz BW) 905 ~ 925 MHz (for 2MHz BW) 906 ~ 922 MHz (for 4MHz BW) 908 ~ 916 MHz (for 8MHz BW)
Supply Voltage	DC 3.3V
Interface	SDIO 3.0 / USB 2.0 / UART
Operating Modes	Station (STA), Access Point (AP)
Security	WPA3, WPA2, WPA, WEP
Operating Temperature	[-25°C to +50°C]

4.Hardware Installation

4.1 Power Requirements

- The module must be supplied with a stable DC 3.3V power source.
- Ensure the power supply can provide sufficient current for the module's operation, especially during transmission peaks.

5.FCC Warning

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.

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

Radiation Exposure Statement:

- This equipment complies with FCC/IC 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.
- The device has been evaluated to meet general RF exposure requirement

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module. As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions. PC peripheral requirements, etc.)

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Label and compliance information:

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID: 2BSME-NE-CM03" with their finished product.

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as shown in this manual.

List of applicable FCC rules:

FCC Part 15 Subpart C 15.247 & 15.209 & 15.407.

Specific operational use conditions:

The module is a WiFi-HaLow Module

Operation Frequency:

903.5-926.5MHz for 1MHz, 905-925MHz for 2MHz, 906-922MHz for 4MHz, 908-916MHz for 8MHz.

PCB Antenna, with -5.44dBi Gain

Limited module procedures:

Not applicable, The module is a Single module and complies with the requirement of FCC Part 15 212.

Trace antenna designs:

Not applicable, The module has its own antenna, and doesn't need a host's printed board micro strip trace antenna etc.

RF exposure considerations:

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users' body. The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Antenna Type:

PCB Antenna

Impedance: 50 Ohm

Manufacturer: Xiamen CamThink Technology Co., Ltd.

Form Factor: 8MHz

Polarization: Linear Polarization

Gain: -5.44dBi Gain

After certification, adding a different antenna type requires a C2/3 PC.

Information on test modes and additional testing requirements:

Host manufacturer must perform test of radiated & conducted emission and spurious emission, e.t.c according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

Additional testing, Part 15 Subpart B disclaimer:

The host product manufacturer is responsible for compliance with 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.

Note EMI Considerations:

D04 Module integration Guide has been considered as "best practice" for RF design engineering testing and evaluation of non-linear interactions which can generate additional non-compliant limits due to module placement to host components or properties. For standalone mode, D04 Module Integration Guide was referenced, and simultaneous mode considered for the host product to confirm compliance.

How to make changes:

Only the Grantee is permitted to make permissive changes.