VCB-5003L6-W User Manual

Industrial WiFi/LTE CATM Module

Rev. 1.0
2019/3/12

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1. Product Overview

1.1. General Description

The VCB-5003L6-W is a data collector module which can collect data from other devices via TTL UART serial port and then send out data via WIFI or LTE. This device is built in Realtek RT8195AM which is a highly integrated single-chip low power 802.11n Wireless LAN network controller. The RTL8195AM combines an ARM-Cortex M3 MCU, WLAN MAC, a 1T1R capable WLAN baseband, and RF in a single chip. It provides useful high speed connectivity interfaces, such as USB2.0 host, USB2.0 device, and SDIO interfaces. It also provides a bunch of configurable GPIOs which are configured as digital peripherals for different applications and control usage.

The LTE function is based on Quectel BG96 module. BG96 is an embedded IoT (LTE Cat M1, LTE Cat NB1 and EGPRS) wireless communication module. It provides data connectivity on LTE-TDD/LTE-FDD/GPRS/EGPRS networks, and supports half-duplex operation in LTE networks to meet customers' specific application demands.

1.2. Features

- □ 802.11b/g/n compatible WLAN up to 150 Mbps data rate
- □ LTE Cat M1
- □ TTL UART interface
- □ One 12-pin header connector

Standard	IEEE 802.11b/g/n
Data Rate	54, 48, 36, 24, 18, 12, 9, 6 20 MHz BW: ~72.2M 40 MHz BW: ~150M
Modulation	DSSS with DBPSK and DQPSK, CCK modulations with long and short preamble. OFDM with BPSK, QPSK, 16QAM, and 64QAM modulations, QPSK, 16QAM, 64QAM and 256QAM modulations.
Operating Frequencies	2.4GHz(WIFI)
Antenna Connector	SMA male for WIFI, SMA female for LTE

2. Revision History

Revision	Date	By Whom	Remark
1.0	2019/3/12	Wronski.Su	▪ Initialize
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Federal Communication Commission Interference Statement

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.
(2) This device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications 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.

RF Warning Statement

To comply with FCC RF exposure compliance requirements, the antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.
This device is intended only for OEM integrators under the following conditions:
1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna except included WLAN & LTE. As long as two 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. To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements.

The module is limited to OEM installation ONLY. The module is limited to installation in mobile or fixed application. We hereby acknowledge our responsibility to provide guidance to the host manufacturer in the event that they require assistance for ensuring compliance with the Part 15 Subpart B requirements.

IMPORTANT NOTE:

In the event that these conditions cannot be met (for example certain laptop configurations or co-transmission with another transmitter), then the FCC authorization is no longer considered

valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2AMVP-VCB5003L6W” and “Contains FCC ID: XMR201707BG96”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

The following FCC part 15.19 statement has to also be available on the label:
This device complies with Part 15 of 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.

Manual Information to the End User

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.

In the user manual of the end product, the end user has to be informed that the equipment complies with FCC radio-frequency exposure guidelines set forth for an uncontrolled environment.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

The end user manual shall include all required regulatory information/warning as show in this manual.

The maximum operating ambient temperature of the equipment declared by the manufacturer is: -20~+70°C

Installation Guideline

Antenna information
Certified antenna: Delta model: WTTX-D24002SMA137150-180310B Max gain 2 dBi
Other antenna(s) need to be certified before use with this module.

FCC Statement of WWAN Module

According to the definition of mobile and fixed device is described in Part 2.1091(b), this device is a mobile device.

And the following conditions must be met:

1. This Modular Approval is limited to OEM installation for mobile and fixed applications only. The antenna installation and operating configurations of this transmitter, including any applicable source-based time-averaging duty factor, antenna gain and cable loss must satisfy MPE categorical Exclusion Requirements of 2.1091.
2. The EUT is a mobile device; maintain at least a 20 cm separation between the EUT and the user's body and must not transmit simultaneously with any other antenna or transmitter except the WLAN transmitter included this module.
3. A label with the following statements must be attached to the host end product: This device contains FCC ID: XMR201707BG96.
4. To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, maximum antenna gain (including cable loss) must not exceed:
   - ❒LTEB1/B2/B3/B4/B5/B8/B12/B13/B20/B26/B28<4dBi
   - ❒GSM 850/900/1800/1900<4dBi
5. This module must not transmit simultaneously with any other antenna or transmitter
6. The host end product must include a user manual that clearly defines operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.

   For portable devices, in addition to the conditions 3 through 6 described above, a separate approval is required to satisfy the SAR requirements of FCC Part 2.1093.

   If the device is used for other equipment that separate approval is required for all other operating configurations, including portable configurations with respect to 2.1093 and different antenna configurations.

   For this device, OEM integrators must be provided with labeling instructions of finished products. Please refer to KDB784748 D01 v07, section 8. Page 6/7 last two paragraphs:

   A certified modular has the option to use a permanently affixed label, or an electronic label. For a permanently affixed label, the module must be labelled with an FCC ID -Section 2.926 (see 2.2 Certification (labeling requirements) above). The OEM manual must provide clear instructions explaining to the OEM the labeling requirements, options and OEM user manual instructions that are required (see next paragraph).

For a host using a certified modular with a standard fixed label, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straight forward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: "Contains Transmitter Module FCC ID:XMR201707BG96" or "Contains FCC ID: XMR201707BG96" must be used. The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID.

The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device. The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

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. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.