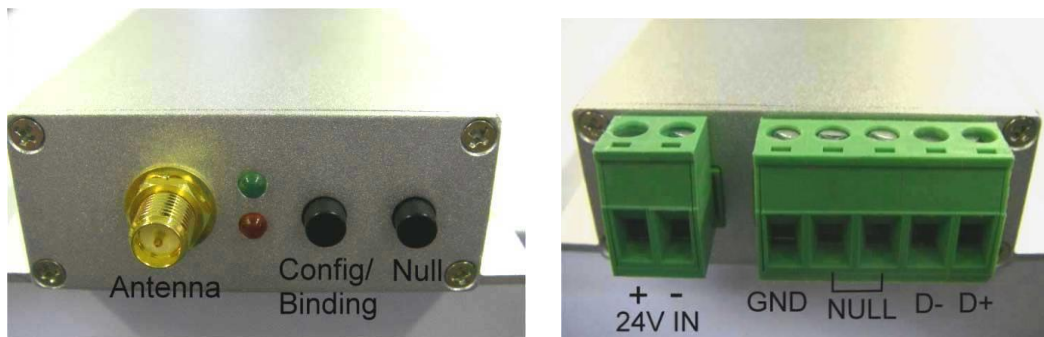# MBs-CMZBR ZigBee Communication Modules

MBs-CMZBR is a radio device that wirelessly bridges various devices. It converts serial data from wired interface (RS485/RS232) into RF packets and vice versa. With robust RF protocol, the MBs-CMZBR can be used to form a wireless network with star or peer-to-peer structure.
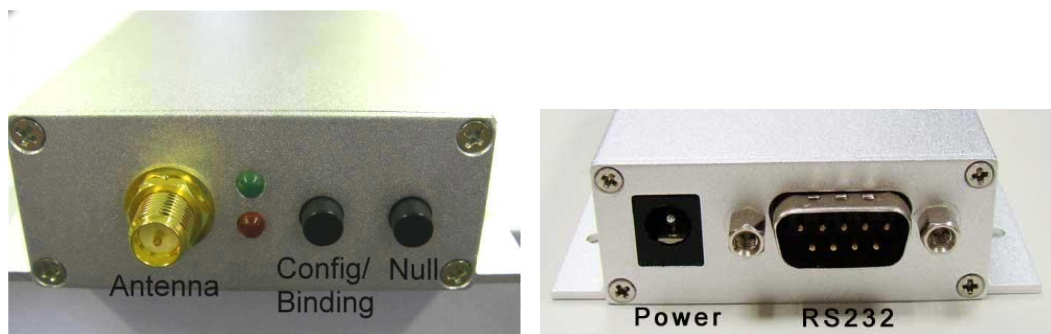
1. Introduction

a. Button & connector:

i. RS485 Type

ii. RS232 Type

b. Default value:

Com port setting: 9600, 7, E, 1

PAN ID: 0x1234 (2 Byte)

Channel: 26

Device Model: Master (Broadcast Transmit)

c. Functions:

There are two network types for MBs-CMZBRs. One is Peer-to-Peer type in which each device is in Master mode and can communicate each other when both are in a valid RF communication range.

The other is network type is Star type in which Slave devices only communicate with the only one Master. And the Master device can communicate with multiple Slave devices.

Users can configure MBs-CMZBR manually by QCU utility program (described later in this document).

MBs-CMZBR can be configured as a Master or a Slave. For two any two devices to be able to communicate, they must be set to a same PAN ID. If users want to operate two separate wireless networks in a same physical area, please group the MBs-CMZBR by different PAN ID. Each device will only receive RF packets with a same PAN ID.
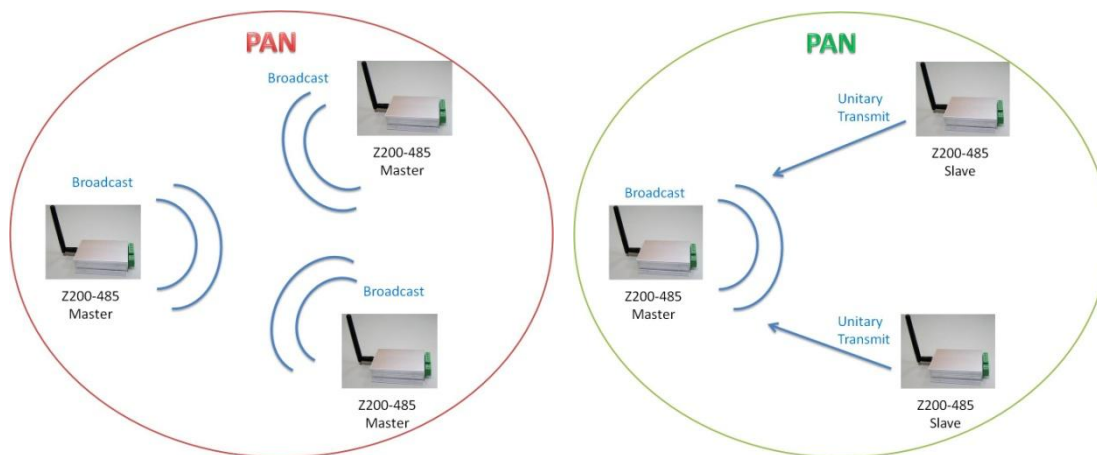
When a Master mode MBs-CMZBR sends RF packets, it broadcasts the packet to all the devices with the same PAN ID. On the other hand, when a MBs-CMZBR, as a Slave, sends data wirelessly, it only sends the data to the Master with a same PAN ID. In order for a Slave to work with a Master, user must pair each other. After successful pairing, the Slave will remember the Master's address and will be able to send RF packet directly to the Master.

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d. LED display:

    i.   Red light on: Indicating the device is power up (valid to firmware V3.6).

    ii.   Green light blinking: Indication the device is in pairing. Or the wireless communication signal of slave device is poor.

    iii.   Green light on: Indicating the slave device can successful link with the Master wirelessly.

    iv.   Green light off: Indicating link between slave device and Master device is failed. This situation only happens in one to one mode. It will never happen in broadcasting mode.

    v.   Red light blinking: Indicating the device is receiving wireless Data.

2. Power on

When a MBs-CMZBR is powered, it enters Working mode in which it will wirelessly transparently transmit the data received from wired interface. In contrast to the Working mode, there is a Configuration mode which will be detailed further in later section.

a. RS485 Type

    i.   Connect DC power wire to the green connector shown above. Please notice the +/- polarity. The input voltage ranges from 7 to 24 volt. When the power is applied to MBs-CMZBR, the green light in opposite side would go on or go flashing depending on the configured mode (Master/Slave).

    ii.   Connect RS485 D+ and D- wire to the 5 hole green connector show above and fasten screws. Then the device is ready to go.

b. RS232 Type

    i.   Plug RS232 cable to RS232 connecter shown in the above picture.

    ii.   Plug Power Adapter to DC Jack. The supply voltage ranges from 7 to 24 volt.

c. MBs-CMZBR was defaulted to be Master and green light is always on after power -up. Then MBs-CMZBR will radio received message to all other power-on MBs-CMZBR.

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d. When MBs-CMZBR is powered up, it is in the Working mode. Users can change the device's parameter by entering Configuration mode. A window-based utility program, Quan Configuration Utility (QCU), can be used to facilitate the configuration process.

3. Pairing process

If the user desires to construct a star network, he may need to employ one Master device and several Slave devices. To configure a device as Slave, please refer to following section: "Using QCU."

After the Master device and Slave device in prepared, users need to pair Slave device with Master device in order for them to work in a same Star network.

Firstly press the Config/Binding button on a Master device and then green light blinks. Secondly press the Config/Binding button on a Slave device, then green light on Slave blinks also. When pairing is done successfully, the green lights will stop blinking and turn on.

Since a pairing request would last for 30 seconds before it is cancelled, users must press both devices within 30 seconds.   If the green light stops blinking and turns off, the pairing process fails. Users may repeat the process described above until the pairing is done successfully.

4. Using QCU

Install QCU on a Window-based PC/NB and then follow the steps below:

a. Select COM PORT

i. Check Windows device manager to find out the COM PORT number which is connects to the target MBs-CMZBR.

ii. Run QCU and you will see the screen below.
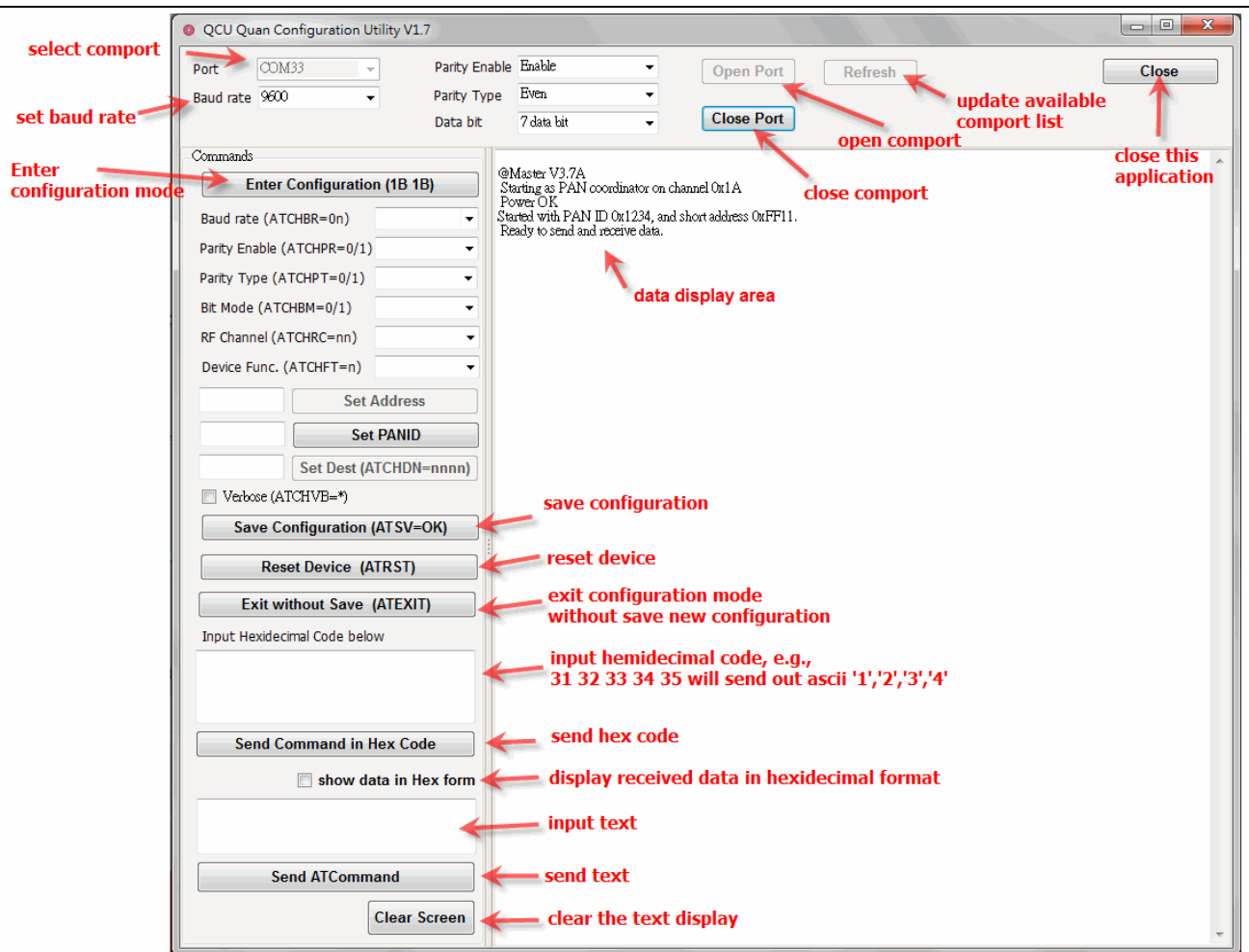
iii. In QCU, choose the correct COM PORT number and press "Open Port" button. Then the QCU is able to talk with the connected MBs-CMZBR.

b. Enter Configuration mode

Press "Enter Configuration (1B 1B)" button and the target device will enter into Configuration mode. Actually this is done by sending 2 consecutive 0x1B codes into the connected device.

c. Set Baud Rate

That is the baud rate of cable communication. By choosing the desired Baud rate, the QCU will set the baud rate inside the connected device.

d. Parity Enable

Select Enable or disable parity.

e. Parity Type

Select None, Even or Odd.

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f. Bit Mode(data+parity)

Please select adequate item for your parity and data bit condition.

Examples:

7 data bit+1 parity bit=8 bit mode

8 data bit+none parity bit=8 bit mode

8 data bit+1 parity bit=9 bit mode

g. Set RF Channel

There are 16 channels. Only the Master(Coordinator) needs to set channel. Slaves will follow Master/Coordinator's setting. By choosing the desired channel, the QCU will set the channel inside the connected device.

h. Set Device Function

There are four different functions: Master(coordinator) 、Slave(End device) 、One2One Master and One2One Slave. By choosing the desired function, the QCU will set the device function inside the connected device.

i. Set Address

No need to set self address, it is defaulted.

j. Set Personal Area Network ID (PAN ID)

Enter four hexadecimal digits into the text box and press the "Set PANID" button.

k. Destination Address

The destination address of data transmitted wirelessly. It is set by system automatically .

l. Verbose

Check/uncheck to decide whether to show system information or not.

m. Manually input command

Users can manually enter the AT command for MBs-CMZBR. There are two text boxes which are used to enter AT command. One is for hexadecimal code and the other is for entering human readable characters. Explanation of AT commands is not in the scope of this document.

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n. Save Configuration result

The changed setting is firstly kept temporarily in the RAM of the connected device. Users must save the setting into flash so as the setting get effective when power-on. By press "Save Configurations" button, the setting will be saved into the flash and kept forever.

o. Reset Device

By press "Reset Device" button, the device will reset itself.

p. Exit Configuration without Save

By press "Exit without Save" button, the device will leave Configuration mode and enter Working mode. The action will not save the setting adjust by the user. If the user wants to keep the setting change, please press "Save Configuration" button before leaving the Configuration mode.

5. Initialization

Turn off the power of MBs-CMZBR. Hold config/binding button and power up. Hold the button for 3 seconds then release the button. The system is initialized. (This function is built in firmware version 3.3 and versions afterwards .) Follow Section4 "Using QCU" to open port, then power up MBs-CMZBR. You will see firmware version shown on data display area. This information appears only in the MBs-CMZBR boot.

6. Trouble shooting

In case the MBs-CMZBR fails to transmit data smoothly, check LED light for the hint of resolutions.

LED light	Possible Problems	Solution
No light	No power	Check power chord. Make sure the power line is firmly connected.
Green light off	1. Master is off	Master power on.
	2. Remote device is out of communication range	Put the communicating device in nearer distance. Remove RF blocking barrier.

LED light	Possible Problems	Solution
Green light blinking	Bad communication situation causes the data transmission fails occasionally.	Put the communicating device in nearer distance. Remove RF blocking barrier.
Green light on but Red light blinking	1. Wrong Baud rate/ Data Bit/Parity setting	Check Baud rate, Data Bit and Parity setting. The setting for MBs-CMZBR must be consistent with the device (eg. PLC or computer) connected via wire interface (RS232/RS485).
	2. Loose connector prevent electronic signal to transmit	Check MBs-CMZBR connector