

**ZEAL-C02**

**User's Manual**

## Introduction

This document has been described how to use the ZEAL-C02. ZEAL-C02 is a Bluetooth module. This module is connected to the UART. This module is operated with a simple command.

## Operating state

ZEAL has several operating state. State transition will use the command.

- Command state

ZEAL can execute the command. The input data are all recognized as a command.

- Scan state

ZEAL is a state that is waiting for a connection as a Bluetooth slave.

- Online state

ZEAL has been connected with the pair device and Bluetooth. ZEAL can perform data communication with connection device.

- Escape state

ZEAL is in connection, and command input is possible.

- Scan escape state

ZEAL is in scanning, and command input is possible.

## Boot mode

ZEAL has four boot modes. These will be switched by the mode pin.

	<b>MODE0</b>	<b>MODE1</b>
Nomal boot mode	HIGH	HIGH
Pre-settings value boot mode	LOW	HIGH
Automatic boot mode	HIGH	LOW
Firmware rewrite boot mode	LOW	LOW

- Nomal mode

This mode is start in command state with the default settings.

\*9600bps, 8bit, non parity, 1stopbit

- Pre-setting value boot mode

This mode is start in command state with the pre-settings.

- Automatic boot mode

This mode is start in the master or slave with the pre-setting.

- Firmware rewrite boot mode

This mode is used when test or firmware rewriting.

## COMMAND

ZEAL will operate in the original BT COMMAND. Command begins with BT, and followed by a command character, and termination input the CR. (CR=0x0D)

### List of commands

Command	Description
A	Scan start
C	Connect
D	Disconnect
I	Inquiry start
LT	Address setting of the link partner
LO	Automatic mode setting
LB	Baud rate setting
M	Show BD address
Y	Initialization
Z	Show firmware version

### Escape command

This is a special command to be ready for input command temporarily.

Escape command is a continuous input three times '@'.

## Result Code

This is the string to notify the results of executing the command. Termination is CR + LF is output. (LF=0x0A)

List of result codes

Result Code	Description
ACKN	Receipt of the command
CONN	Connected
DISC	Disconnected
TERM	Terminate of the command
E000	Unknown Error
E100	Undefined command Error
E101	Parameter Error
E200	State cannot execute this command
E300	Pair could not be found
E301	Failed to authenticate
E400	Incorrect setting value

## How to use

The connection process

[ZEAL will be used in Bluetooth master]

Exp : BD Address of the connected devices is 00097E00FFFF.

1. To set the BD address of the device to connect to ZEAL

**BTLT00097E00FFFF[CR]** *<- Command*

*ACKN[CRLF]* *<- Response*

2. The beginning of a connection

**BTC [CR]** *<- Command*

*ACKN[CRLF]* *<- Response*

*CONN[CRLF]* *<- Response*

\*Can send and receive data

[ZEAL will be used in Bluetooth slave]

1. The beginning of a scan

**BTA[CR]** *<- Command*

*ACKN[CRLF]* *<- Response*

3. When it is connected from Bluetooth master device.

*CONN[CRLF]* *<- Response*

\*Can send and receive data

Disconnection prosess

1. The beginning of a disconnect

**@@@BTD[CR]** *<- Command*

*ACKN[CRLF]* *<- Response*

*DISC[CRLF]* *<- Response*

\*No Bluetooth connection

Conditions on using ZEAL-C02 regulatory approvals:

- I. System integrator must ensure that its product (the “SYSTEM INTEGRATOR Product”) is electrically identical to ADC Technology ZEAL-C02. System integrator acknowledges that any modifications to ADC Technology ZEAL-C02 may invalidate regulatory approvals in relation to the SYSTEM INTEGRATOR Product, or may necessitate notifications to the relevant regulatory authorities.
- II. System integrator is responsible for ensuring that antennas used with the product are of the same type, with same or lower gains as approved and providing antenna reports to ADC technology.
- III. System integrator is responsible for regression testing to accommodate changes to ADC Technology reference designs, new antennas, and portable RF exposure safety testing/approvals.
- IV. Appropriate labels must be affixed to the SYSTEM INTEGRATOR Product that complies with applicable regulations in all respects.
- V. A user's manual or instruction manual must be included with the System integrator product that contains the text as required by applicable law. Without limitation of foregoing, an example (for illustration purposes only) of possible text to include is set forth below:

**USA – Federal Communication Commission (FCC)**

FCC COMPLIANCE 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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**INFORMATION TO USER:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver.
- Connect the equipment to 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.

Customer must include the FCC ID on the end product.

**FCC Radio-Frequency Exposure and Approval Conditions:**

1. Antennas must be installed to provide at least 20cm separation distance from the transmitting antenna to the body of user during normal operating condition.
2. The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter within a host device, except in accordance with FCC multi-transmitter product procedures.
3. Only those antennas with same type and lesser gain filed under this FCC ID number can be used with this device.
4. The regulatory label on the final system must include the statement: "Contains FCC ID:E9O001ZEAL-C02 and/or IC:10171A-001ZEALC02" or using electronic labeling method as documented in KDB784748.
5. The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-ways authentication between module and the host system.
6. The final host manual shall include the following regulatory statement:

This equipment has been test and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures;

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

Canada – Industry Canada

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation on this device.

L ' utilisation de ce dispositif est autorisée seulement aux conditions suivantes (1) il ne doit pas produire de brouillage et (2) l ' utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

**Caution: Exposure to Radio Frequency Radiation.**

To comply with RSS 102 RF exposure compliance requirements, for mobile configurations, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

System integrators must include the IC ID on the end product.