

**ZEAL**

**[Z1]**

**User's manual**

Rev.01

**Revision history**

<b>Rev</b>	<b>Date</b>	<b>Content</b>
Rev.01	27-Sep-2005	First edition

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This device complies with Part 15 of the FCC Rules and RSS-210 of the IC 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.

#### **FCC WARNING**

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

#### **FCC NOTICE**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

The antenna shown in this filing must not be co-located or operated in conjunction with any other antenna or transmitter. End users may not be provided with the module installation instructions. OEM integrators and end users must be provided with transmitter operating conditions for satisfying RF exposure compliance.

For portable applications OEM integrators need no SAR evaluation. The max source-based time-averaged output of 0.46 mW is below the low threshold of 24mW for  $d < 2.5$  cm.

This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that it is deemed to comply without testing of specific absorption ratio (SAR).

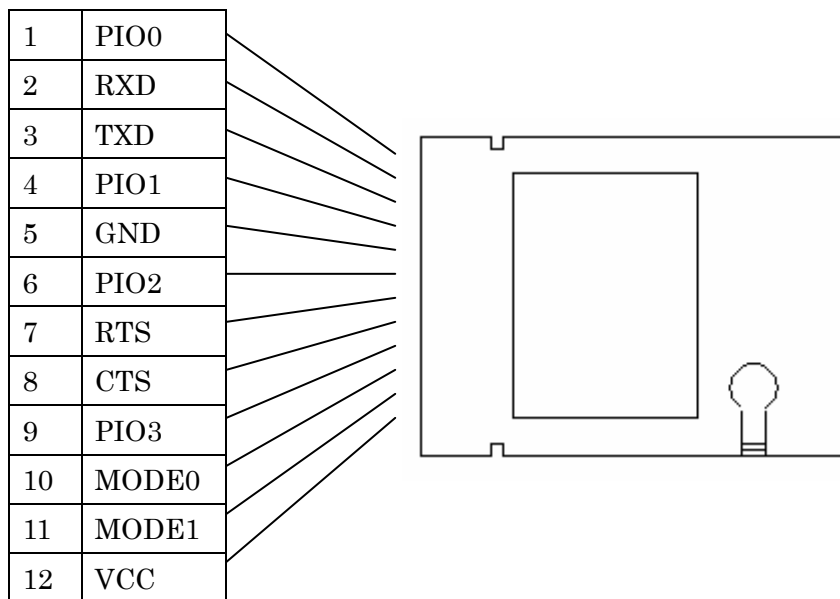
## 1.General Description

This product is Bluetooth communication unit with UART I/F.

## 2.Product specification

Item		Content
Product name		ZEAL
Product ID		Z1
Bluetooth I/F	Version	1.2
	Protocol	L2CAP, SDP, RFCOMM
	Profile	GAP, SPP, DUN
	Data Rate	723.2/57.6kbps(asymmetrical. Max)
	Modulation	FHSS/GFSK 1Mbps, 1600hop/sec.
	Output Power	Class2
UART I/F	Protocol	Asynchronous Serial Communication (Hardware Flow Control)
	Signal Level	Supply power
	Baud rate	9600bps(Default)
	Connector	LPC-12FDS+C [HONDA TSUSHIN KOGYO CO., LTD.]
Power Supply Voltage		+2.9 - +3.6V DC (Single power supply)
Operating Temperature Range		-25 - +85°C
Outside Dimensions		35.0mm(L), 26.0(W), 4.5mm(H)

### 3.Pin Layout



\*The signal is a pull-up on the inside in 51K $\Omega$

### 4.Start Mode

The start mode changes by the state of the mode pin when the power supply is turned on.

#### Nomal Mode

(MODE0,MODE1) = (1,1)

UART communications setting:9600bps,Data8bit,StopBit 1,Parity none

It starts by the command mode.

#### UART Setting Value Mode

(MODE0,MODE1) = (0,1)

It starts by the UART setting to which internal is set, and it becomes a command mode.

#### Firmware Rewriting Mode

(MODE0,MODE1) = (0,0)

When Farmuea is rewritten with a special tool, it uses it.

#### Automatic Scanning Mode

(MODE0,MODE1) = (1,0)

It starts by the UART setting to which internal is set, and it becomes a scanning mode.

The mode is set beforehand according to "BTOM" command.

#### Automatic Connection Mode

(MODE0,MODE1) = (1,0)

It starts by the UART setting to which internal is set, and the automatic connection mode.

The mode is set beforehand according to "BTOM" command.

### **5.Operation Mode**

The operation mode changes by the command input.

#### Command Mode

Command input waiting state.

#### Online Mode

Bluetooth connection state of possible data communication. The input value is delivered to the other party equipment as data.

#### Park Mode

State of low power consumption of Bluetooth(park)

#### Escape Mode

It is a state that the command can be input with the Bluetooth connection maintained.

#### Scan Escape Mode

It is a state that the command can be input with the scanning maintained.

#### Scan Mode

State of scanning of Bluetooth

#### Standby Mode

State of low power consumption to stop Bluetooth function

## 6.Command

The command character and the parameter are input following "BT".

### LIST

Command	Function	Parameter
A	To the scan mode	None or access code
B	UART baudrate change	Bit rate(100bps unit)
BM	UART communication mode change	Value of mode flag
C	Connected beginning	None or clock offset
CU	Connected beginning to specified UUID	UUID or UUID+clock offset
D	Disconnect or Release of scan mode	
DM	Disconnect message setting	Message character string
E	State confirmation	
F	Connected condition flag setting	Value of Condition flag
G	guard time setting	Guard time (80ms unit)
H	To the standby mode	
I	Inquiry	Detect maximum number
K	Link key clear	
L	Internal setting display	Value of setting flag
M	BDAAddress display	
OC	Device Class setting	Device Class
OM	Auto mode setting	Value of mode flag
P	Passkey change	Bluetooth Passkey
Q	To the park mode	Interval, None=Release
QM	park mode Transition message setting	Message character string
R	Escape mode to Online mode	
T	Information at connection equipment	Bdaddress etc
TT	Information at connection equipment	Bdaddress etc
V	Various parameter settings	Value of parameter
X	Equipment name setting	Equipment name



## 7.Result code

Character string that notifies result of command.

### LIST

Result code	Meaning
ACKN	Command receipt
CONN	Bluetooth connection completion
DISC	Disconnect
TERM	Command execution completion
NG00	Command execution failure
NG01	Undefined command
NG04	Page timeout
NG08	Connection timeout
NG0C	Command of no permission
NG12	The value of the parameter is illegal.
NG30	L2CAP connection failure of SDP
NG31	L2CAP setting failure of SDP
NG32	Server channel acquisition failure
NG40	L2CAP connection failure of RFCOMM
NG41	L2CAP setting failure of RFCOMM
NG42	Data channel establishment failure of RFCOMM
NG43	Signal channel establishment failure of RFCOMM
NG44	DLCI becomes empty of RFCOMM
NG45	PN command failure of RFCOMM
NG46	MSC command failure of RFCOMM

**Example:How to use “Zeal”****■Preparation:****●Settings of your terminal software**

Baud rate:9600

Data:8bit

Parity:none

Stop:1bit

Flow Control hardware

**■When “Zeal” is used as a slave:**

1. Issue a “BTA” command to “Zeal”.
2. Execute Device Discovery from the other Bluetooth terminal.
3. Execute Service Discovery when a device named ““Zeal”” is found.
4. Establish a connection when the “SerialPort” service is found.

**■When “Zeal” is used as a master:**

1. Issue a “BTI1” command to “Zeal” and execute Device Discovery.  
(Change the parameter depending on the number of neighborhood devices,  
e.g. if 3 devices, “BTI3”.)
2. Check whether the Bluetooth address found is the address of the other Bluetooth device.
3. Set destination by “BTT1\*\*\*\*\*”.  
(\*\*\*\*\* indicates the address of the other Bluetooth device to which the connection is made.)
4. Issue a “BTC” command. If “CONN” is displayed, connection is successful.

**●How to disconnect “Zeal”:**

- When “Zeal” disconnects itself, wait for the guard time to end(The default is 8seconds. The period can be changed by a BTG command) and then input a “@@@BTD” command.  
If “DISC” is displayed, disconnection is successful.

■ Security function:

● How to deactivate security function

1. Turn off the security function of the other Bluetooth device.
2. Turn off the security function of “Zeal”.

Issue a “BTF04” command.

(Note: The value set by the BTF command is stored.)

● How to activate authentication function

1. Issue a “BTF06” command.

(Authentication is executed upon request from one device even if the security function of the other Bluetooth device is deactivated.)

2. Input the same Password (PIN code) as the one set for “Zeal” when the other Bluetooth device requests a Password (PIN code) upon connection.

Note: The same Password (PIN code) should be used in devices like “Zeal” for which a Password (PIN code) upon connection.

(The password (PIN code is not requested) can be changed by a “BTP” command. The default is “0123”.)