

# ZigBee pro API

ZigBee / IEEE 802.15.4

ZM101, ZM101PA, ZM102, ZM201  
EZport, SZport, ZIOport



# ZigBee pro API format

## Objective:

ZigBee pro API is established in between ZigBee and the Application to prevent system loss and communication errors that usually occur between continuous mode transitions.

ZigBee module when set in *Protocol Mode*, will analyze data according to the API format. Later, following the data type to perform various functions without the need to switch between different modes.

## To enter API mode

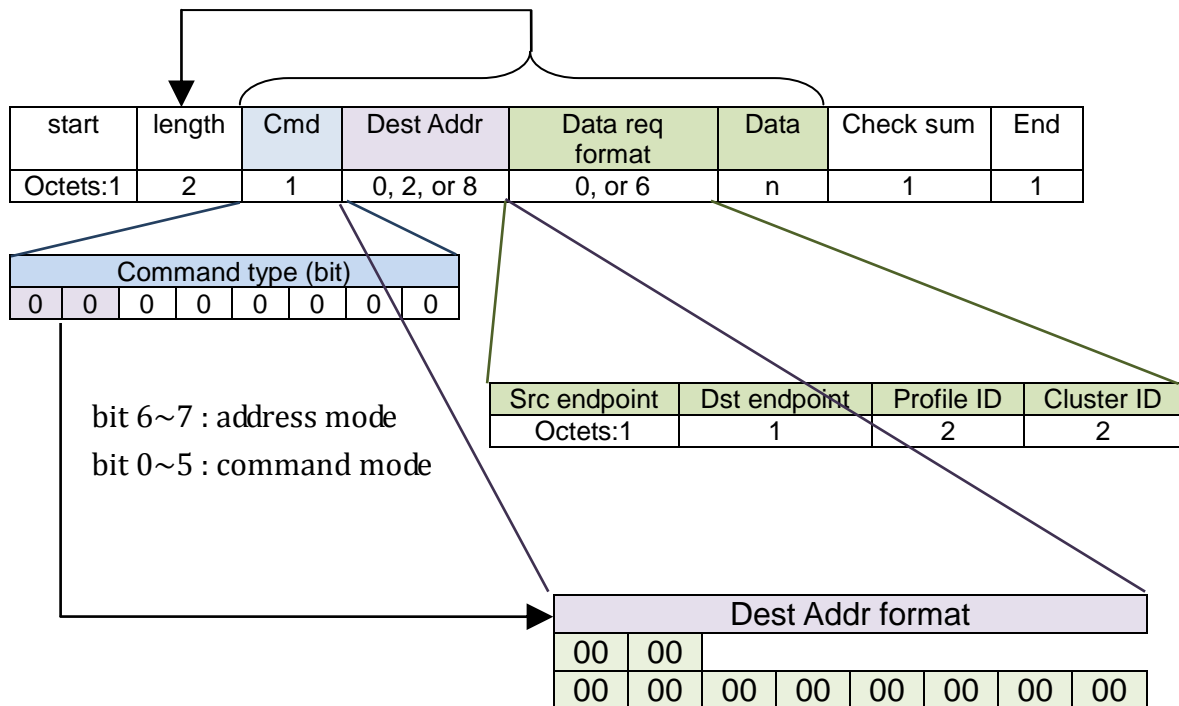
In Terminal enter:

**AT+CONSOLE [0000] 3**

- [0000] is the preset initial value
- 3 is to enter protocol API mode

## API format syntax

[02] [length] [cmd][addr] [data req] [data] [checksum] [03]



Short/Group address: two bytes.

Extend address: 8 bytes.

## 1.Start Delimiter

Initial Char 02

## 2.Length

Total packet length, that does include start, checksum and end byte.

## 3.Command

Command type(1 octet)							
Bit7	6	5	4	3	2	1	0
Address mode		Console mode					

### Bit0~5: Console mode

- 000000 API\_ATCMD,
- 000001 API\_P2P,
- 000010 API\_GRP,
- 000011 API\_REMOTEAT,
- 000100 API\_STAR ,
- 000101 API\_RAW;

### Bit7&6: Address mode:

(These two bits specify the Dest Addr format.)

- 00 NOTPRESENT: Address field is empty.
- 01 GROUP: This is a two byte group ID.
- 10 SHORT: This is a two byte short address.
- 11 EXTENDED: The extended address mode is the 64 bit MAC address.

## 4. DestAddr format

If "bit7&6: address mode" of *Command* is set then the following Addr format need to be specified. In the Addr format fill in the destination address.

- If *bit7&6: address mode* = 00 then Addr format = N/A
- If *bit7&6: address mode* = 01 then Addr format = 2 byte (Group ID of ZM)
- If *bit7&6: address mode* = 10 then Addr format = 2 byte (short address of ZM)
- If *bit7&6: address mode* = 11 then Addr format = 8 byte (MAC address of ZM)

## 5.Data req format

If “bit0~5: command mode” of *Command* = 000101 (API\_RAW) then Data req format need to be specified; Need to specify Source end-point, Destination end-point, Profile ID, Cluster ID.

Src endpoint	Dst endpoint	Profile ID	Cluster ID
Octets:1	1	2	2

## 6.Data

- contain all payload data
- if under ZCL, include only ZCL payload
- if under P2P, include only data to be transferred

## 7.Check sum

Check sum, the total sum does not include Start Delimiter 02.

## 8.End delimiter

End char 03

Upon receive 03 the function will be executed

## API supports the following mode

Support the following mode:

### *AT command mode:*

Basic ATcommands are a collection of functions, which are capable of modifying the settings of ZigBee Module. They serve the purpose of diagnostic and managing ZM networks.

start	length	Cmd	Data	Check sum	End
Octets:1	2	1	n	1	1

Example:

- **ATINFO**

```
[02][0007][00][atinfo][77][03]
```

```
[02][0007][00][6174696E666F][77][03]
```

```
020007006174696E666F7703
```

- **ATNEIGHBOR**

```
[02][000B][00][atneighbor][D1][03]
[02][000B][00][61746E65696768626F72][D1][03]
02000B0061746E65696768626F72D103
```

*P2P mode:*

It is used between nodes to automatically transfer data from point to point.

start	length	Cmd	Dest Addr	Data	Check sum	End
Octets:1	2	1	2, or 8	n	1	1

Example:

- **to send P2P data hello to 0BB8**

```
[02][0008][81][0BB8][hello][check sum][03]
[02][0008][81][0BB8][68656C6C6F][9F][03]
020008810BB868656C6C6F9F03
```

*Group mode:*

Establish different communities within the network and data transfers can be targeted to the specified community groups.

start	length	Cmd	Dest Addr	Data	Check sum	End
Octets:1	2	1	2	n	1	1

Example:

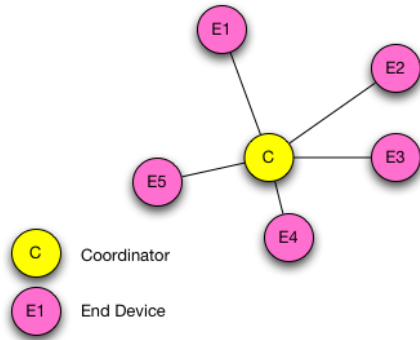
- **send hello to group id = 5678**

```
[02][0008][82][5678][68656C6C6F][93][03]
02000882567868656C6C6F9303
```

*Star mode:*

Coordinator will broadcast to all child nodes and End Devices will only unicast to Coordinator.

start	length	Cmd	Dest Addr	Data	Check sum	End
Octets:1	2	1	2, or 8	n	1	1



Example:

- using **Star mode to send hello to all device**

[02][0006][04][68656C6C6F][checksum][03]

0200060468656C6C6FE103

*Remote AT mode:*

Remotely enter a node, control it, changes its settings or sends out data from it.

start	length	Cmd	Dest Addr	Data	Check sum	End
Octets:1	2	1	2, or 8	n	1	1

Example:

- using **Remote AT to perform atinfo command**

[02] [0009] [83] [1234] [atinfo] [checksum] [03]

[02] [0009] [83] [1234] [6174696E666F] xx [03]

*RAW mode:*

Payload, user defines the parameter of the packet to be sent out (following the format below).

start	length	Cmd	Dest Addr	Data req format	Data	Check sum	End
Octets:1	2	1	2, or 8	6	n	1	1

Example:

- **ZCL send to coordinator to turn on LED**

[02][000C][85][0000][11][11][1234][0006][110101][ED][03]