

# **Yoda Module Command Set**

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**Si2 Microsystems Pvt. Ltd.**

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## About the Document

This document describes command set for configuring Yoda Module and the packet structure for sending data from one Node to another Mode.

## Revision History

Revision Number	Author	Revision Date	Reviewed By	Reviewed Date	Description of Change	Section	Page No.
1.0	Piyush Gupta	27/05/2019	Harsha		Initial Draft		

## Review Approval

Version 1.0	Name	Designation	Organization	Date	Signature
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## **Table of Content**

1.0 Introduction.....	4
2.0 Command Syntax.....	4
2.1 Data Command Format.....	4
2.2 Configuration Command Format.....	4
3.0 Commands and Responses.....	5
3.1 Overview of commands.....	5
3.2 Detailed Description of Commands.....	5
3.2.1 Send Data.....	5
3.2.2 Dump Connection.....	6
3.2.3 Channel Read.....	6
3.2.4 Channel Write.....	6
3.2.5 PAN ID read.....	7
3.2.6 PAN-ID Write.....	7
3.2.7 MAC-ID read.....	8
3.2.8 Save Default Configurations in Memory.....	8
3.2.9 MCU Reset.....	9
3.2.10 Reestablish Connection with Coordinator.....	9

## 1.0 Introduction

Yoda, the programmable intelligent RF module, combines a 2.4GHz radio transceiver module with a 16-bit MCU. The radios provide industry standard RF performance with excellent sensitivity and transmit power for long range. Designed specifically using extreme low power microcontroller and a Zigbee protocol stack on IEEE802.15.4 standards, Yoda is ideal for designs requiring long battery life, flexible application integration, and a reliable, proven, best-in-class networking solution.

Yoda Coordinator Node is responsible for creating the Zigbee network and allowing other nodes to join. Only one coordinator node can exist in one zigbee network.

Yoda EndNode Node used to connect and communicate within the network formed by coordinator node.

## 2.0 Command Syntax

Yoda Module accepts commands in Hexadecimal format. Yoda Module accepts two types of commands:

1. Data Command: Starting from header 4D 08
2. Configuration Command: Starting from header 4D 09

### 2.1 Data Command Format

Packet Header	Last 3 bytes of MAC ID	Length	--Data--
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### 2.2 Configuration Command Format

Packet Header	Command ID	Read/Write (Depends on Command ID)	Argument for the Command (Depends on Command ID)	<CR> <LF> Carriage Return & Line Feed
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Both Data and Configuration Commands can be sent to Yoda Module from PC or a Microcontroller.

## 3.0 Commands and Responses

### 3.1 Overview of commands

S No.	Command	Description
1	4D 08 FF FF FF 08 01 02	Send Data
2	4D 09 01 0D 0A	Dump Connection
3	4D 09 02 52 0D 0A	Channel Read
4	4D 09 02 57 0B 0D 0A	Channel Write
5	4D 09 03 52 0D 0A	PAN ID read
6	4D 09 03 57 00 01 0D 0A	PAN-ID Write
7	4D 09 04 0D 0A	MAC-ID read
8	4D 09 05 0D 0A	Save Default Configurations in NVM
9	4D 09 06 0D 0A	MCU Reset
10	4D 09 07 0D 0A	Reestablish Connection with Coordinator

**Note:** All Commands are in Hexadecimal format and responses of all commands are in ASCII format

### 3.2 Detailed Description of Commands

#### 3.2.1 Send Data

**Command:** 4D 08 FF FF FF 08 01 02

**Description:** This command is for sending data from one Yoda module to other Yoda module.

4D 08               = Header  
 FF FF FF         = Destination Address (Keep last 3 bytes of MAC ID of destination node)  
 08                 = Length of Packet  
 01 02             = Data

**Example:**

Suppose MAC ID of Node 1 is 002181FFFE70F231 and MAC ID of Node 2 is 002181FFFE70F260.

1. If user wants to send data [11 22 33 44 55 66] from Node 1 to Node 2, user have to send following UART command-

**4D 08 70 F2 60 0C 11 22 33 44 55 66**

2. If user wants to send data [11 22 33 44 55 66] from Node 2 to Node 1, user have to send following UART command-

**4D 08 70 F2 31 0C 11 22 33 44 55 66**

**Note:** Keep FF FF FF as destination address for broadcasting data packet from Coordinator to Endnode.

### 3.2.2 Dump Connection

**Command:** 4D 09 01 0D 0A

**Description:** This command can be used to check the Role (Coordinator or End-Device) and connection list of Yoda Module.

4D 09 = Header  
01 = Dump Connection Command ID  
0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

**NWK\_ROLE\_COORDINATOR**

Address: 0x8BAB70FEFF812100 Short Addr: 0000 PANID: 1234 Channel: 11

Available nodes

Handle	RX	DC	PANID	ADDR	LONG_ADDR	PEER_INFO
00	Y	Y	1234	0001	8BF770FEFF812100	01

### 3.2.3 Channel Read

**Command:** 4D 09 02 52 0D 0A

**Description:** This command can be used to read Channel of Yoda Module.

4D 09 = Header  
02 = Channel Command ID  
52 = Read Command  
0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

Channel = <CHANNEL NUMBER>

### 3.2.4 Channel Write

**Command:** 4D 09 02 57 0B 0D 0A

**Description:** This command can be used to write Channel to Yoda Module. Yoda supports channel from 11 to 26. Channel number can be kept in 5<sup>th</sup> Byte of Command in Hexadecimal format.

4D 09 = Header  
02 = Channel Command ID  
57 = Write Command  
0B = Channel number (0B = Hexadecimal equivalent of 11)  
0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

Channel = <CHANNEL NUMBER>

**List of Command according to Channel:**

Channel Number	Command
11	4D 09 02 57 0B 0D 0A
12	4D 09 02 57 0C 0D 0A
13	4D 09 02 57 0D 0D 0A
14	4D 09 02 57 0E 0D 0A
15	4D 09 02 57 0F 0D 0A
16	4D 09 02 57 10 0D 0A
17	4D 09 02 57 11 0D 0A
18	4D 09 02 57 12 0D 0A
19	4D 09 02 57 13 0D 0A
20	4D 09 02 57 14 0D 0A
21	4D 09 02 57 15 0D 0A
22	4D 09 02 57 16 0D 0A
23	4D 09 02 57 17 0D 0A
24	4D 09 02 57 18 0D 0A
25	4D 09 02 57 19 0D 0A
26	4D 09 02 57 1A 0D 0A

### 3.2.5 PAN ID read

**Command:** 4D 09 03 52 0D 0A

**Description:** This command can be used to read PAN ID of Yoda Module.

4D 09 = Header  
 03 = PAN ID Command ID  
 52 = Read Command  
 0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

PAN-ID = <PAN ID NUMBER>

### 3.2.6 PAN-ID Write

**Command:** 4D 09 03 57 00 01 0D 0A

**Description:** This command can be used to write PAN ID to Yoda Module. PAN ID is a two byte hexadecimal number. User can keep any PAN ID from 00 01 to FFFE. PAN ID 00 00 and FF FF is reserved.

- 4D 09 = Header
- 03 = PAN ID Command ID
- 57 = Write Command
  
- 00 01 = PAN ID
- 0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

PAN-ID = <PAN ID 2 BYTES NUMBER>

**List of Command according to some PAN ID:**

PAN ID	Command
00 01	4D 09 03 57 00 01 0D 0A
00 02	4D 09 03 57 00 02 0D 0A
00 03	4D 09 03 57 00 03 0D 0A
00 04	4D 09 03 57 00 04 0D 0A
00 05	4D 09 03 57 00 05 0D 0A
00 06	4D 09 03 57 00 06 0D 0A
00 07	4D 09 03 57 00 07 0D 0A
00 08	4D 09 03 57 00 08 0D 0A
00 09	4D 09 03 57 00 09 0D 0A
00 0A	4D 09 03 57 00 0A 0D 0A

### 3.2.7 MAC-ID read

**Command:** 4D 09 04 0D 0A

**Description:** This command can be used to read MAC ID of Yoda Module.

- 4D 09 = Header
- 04 = MAC ID Command ID
- 52 = Read Command
- 0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

MAC-ID = <MAC ID 8 BYTES NUMBER>

### 3.2 8 Save Default Configurations in Memory

**Command:** 4D 09 05 0D 0A

**Description:** This command can be used configure factory settings in Yoda Module. After sending this command, Yoda module will save default settings in memory and then reset by itself to initialize with new configurations.



Default configurations are: Channel = 11 and PAN-ID = 0001

4D 09 = Header  
05 = Default Configurations Command ID  
0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

Channel = 11  
PAN-ID = 0001  
MCU Soft Reset

### 3.2.9 MCU Reset

**Command:** 4D 09 06 0D 0A

**Description:** This command can be used to soft reset MCU of Yoda Module. Yoda Module will send a response and then restarts.

4D 09 = Header  
06 = MCU Reset Command ID  
0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

MCU Soft Reset

### 3.2.10 Reestablish Connection with Coordinator

**Command:** 4D 09 07 0D 0A

**Description:** This command will only work in EndNode module. This command can be used to reestablish EndNode connection to Coordinator module.

4D 09 = Header  
07 = Reestablish Connection Command ID  
0D 0A = <CR> <LF> Carriage Return & Line Feed

**Response:**

MiApp Establish Connection with Coordinator

<p><b>Note: Reset the Yoda Module after configuring new Channel or PAN ID to initialize the Zigbee Network with the new configurations.</b></p>
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