

Yoda Adapter Manual

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Si2 Microsystems Pvt. Ltd.

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About the Document

This document describes the Yoda Adapter Board and how to use this board with Yoda Modules.

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
Reviewed By	Krishna Murthy	Assistant Manager	Si2 Microsystems		
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1.0 Introduction

Yoda Adapter Board provides a solution to interface Yoda module to any PC or microcontroller board. This adapter board provides an easy interface to Yoda module by converting 2mm pin spacing to breadboard friendly 0.100" spacing pitch. This board also provides an easy interface to PC via Micro USB Type AB connector.

2.0 Features

- Provides an easy interface for communication and configuring Yoda Module via onboard Micro USB connector.
- Converts Yoda Module 2mm pin spacing to breadboard friendly 0.100" spacing.
- Board is compatible with both 5V/3.3V power supply sources.
- Provides on-board level shifter. Board is compatible with both 5V/3.3V logic levels.
- Shorting Jumper for 5V/3.3V selection.
- Small form factor.
- LED for power indication

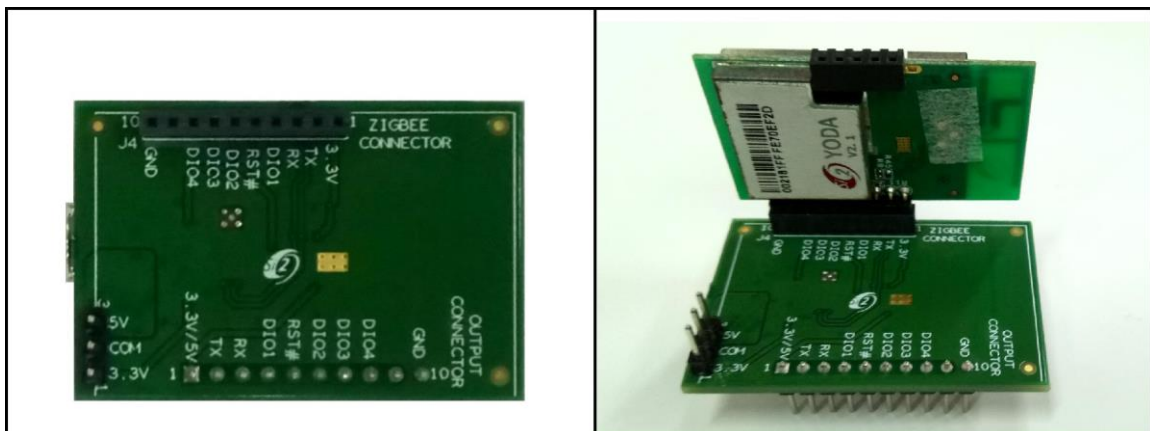


Figure 1: USB Adapter without Yoda (Left), USB Adapter with Yoda mounted on it (Right)

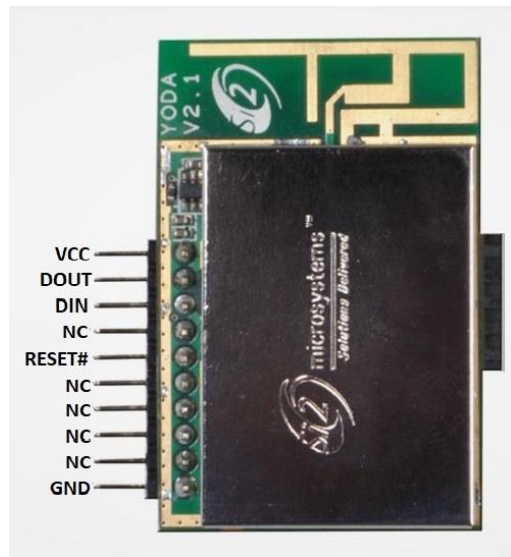
3.0 Key Specifications

- Power requirements: 3.3V/5V (selectable from jumper settings).
- Communication: USB/ UART pins
- Operating temperature: -40 to +85 °C
- Dimensions: Length 45mm, Width 30mm

4.0 Electrical Characteristics

Parameters	Min	Typ	Max	Units
Ambient Operating Temperature	-40	-	85	°C
Supply Voltage (VDD)	3.0	-	3.6	V
Input High Voltage (VIH)	0.5 x VDD	-	VDD + 0.3	V
Input Low Voltage (VIL)	-0.3	-	0.2 x VDD	V

5.0 Pin Description



Pin No.	Name	Yoda Pin Description
1	VCC	Power Supply (3.3 Volt)
2	DOUT	UART data transmit pin, TXD
3	DIN	UART data receive pin, RXD
4	NC	Not Connected
5	RESET#	Reset Pin, Active Low
6	NC	Not Connected
7	NC	Not Connected
8	NC	Not Connected
9	NC	Not Connected
10	GND	Connect to Ground

Figure 2: Yoda Pin Description

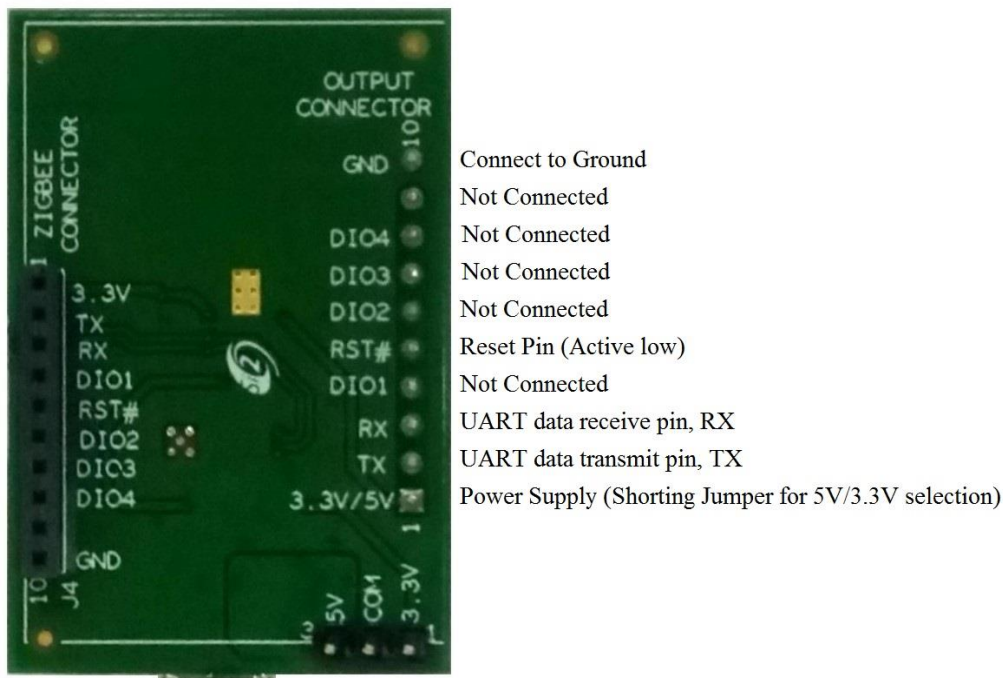


Figure 3: Yoda Adapter Pin Description

6.0 Connection and Testing

6.1 USB Driver Installation and finding the COM port in Device Manager

1. MCP2221 UART to USB converter IC is used to provide an easy interface to PC. If you wish to connect Yoda USB Adapter to your PC then first you need to install MCP2221 USB driver in your PC. You can download latest drivers from this link -

<https://www.microchip.com/wwwproducts/en/MCP2221>

2. Once the USB driver has been installed you may connect Yoda Adapter board (Yoda Mounted on it as shown in Figure 1) to PC using a USB A to Micro AB cable.

3. Press “Windows + R”, type “devmgmt.msc” and hit Enter.

4. In “Device Manager” window, expand Ports list. You will find COM Port Number assigned to USB Adapter. [Figure 4]

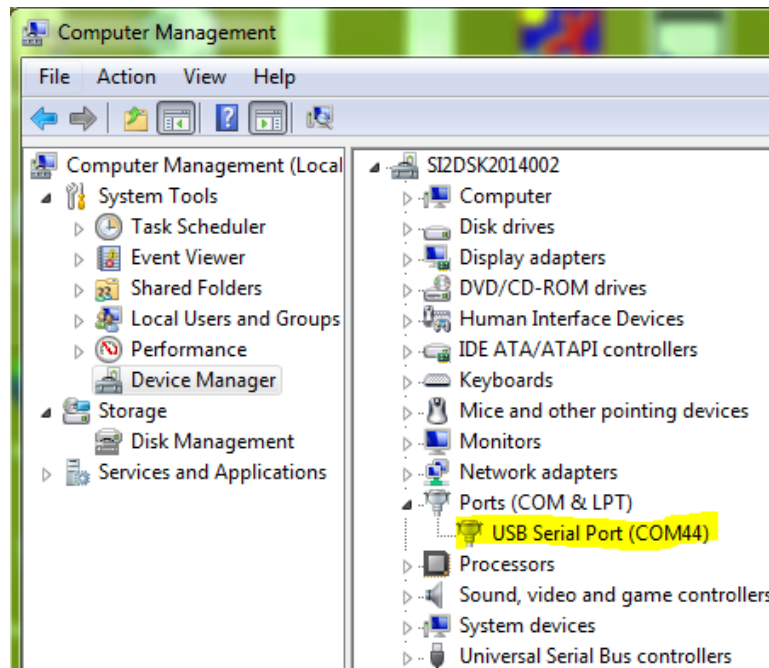


Figure 4: Device Manager Window

6.2 Docklight

Docklight is a simulation tool for serial communication protocols (RS232, RS485/422 and others). It allows you to send data or configuration commands to Yoda Module. This tool should be installed in Laptop/PC from which user wants to interface Yoda Zigbee Module. Any other serial terminal software can also be used which supports sending data in hexadecimal format.

1. Open Docklight
2. Click on Tools/Project Settings and select COM Port as shown in Figure 5.
3. Select Baud rate 9600. Click Ok.

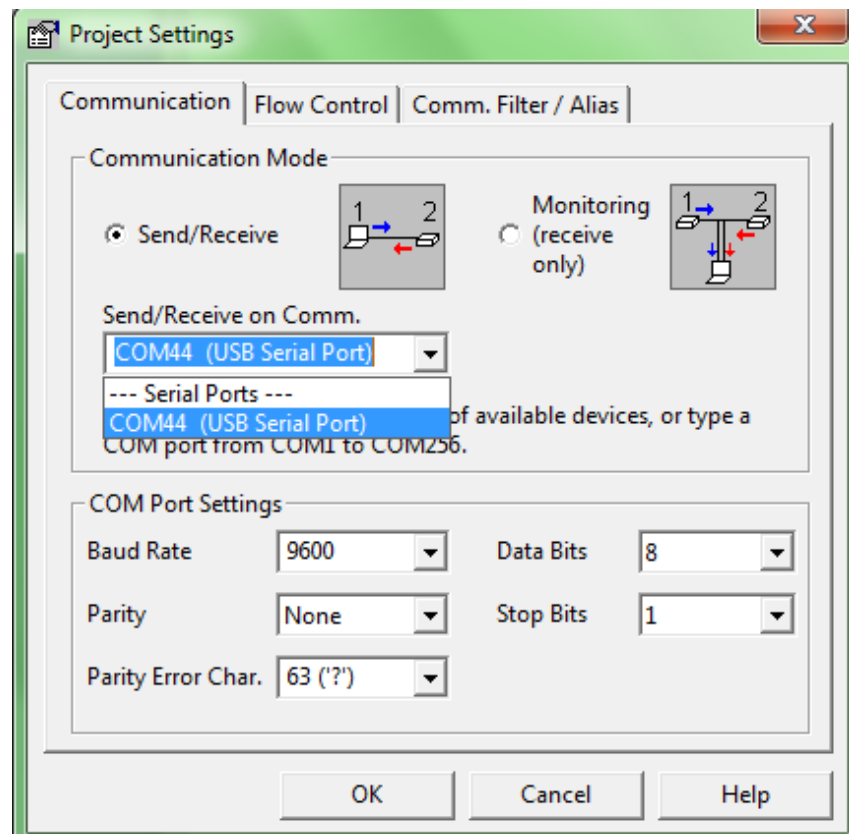


Figure 5: Docklight's Project settings window

4. Click on Edit/Edit Send Sequence List. A 'Edit Send Sequence' window will open. [Figure 6]
5. Write 'Dump Connection' in Name box. Select HEX from 'Edit Mode'. Write 4D 09 01 0D 0A Hex Command in Sequence window and then click OK. [Figure 7]
6. Now a Dump Connection command will appear in Send Sequence list. User can add multiple commands to Send Sequence list in Docklight. Command can be sent to Yoda by clicking on the Arrow next to the command. [Figure 8]

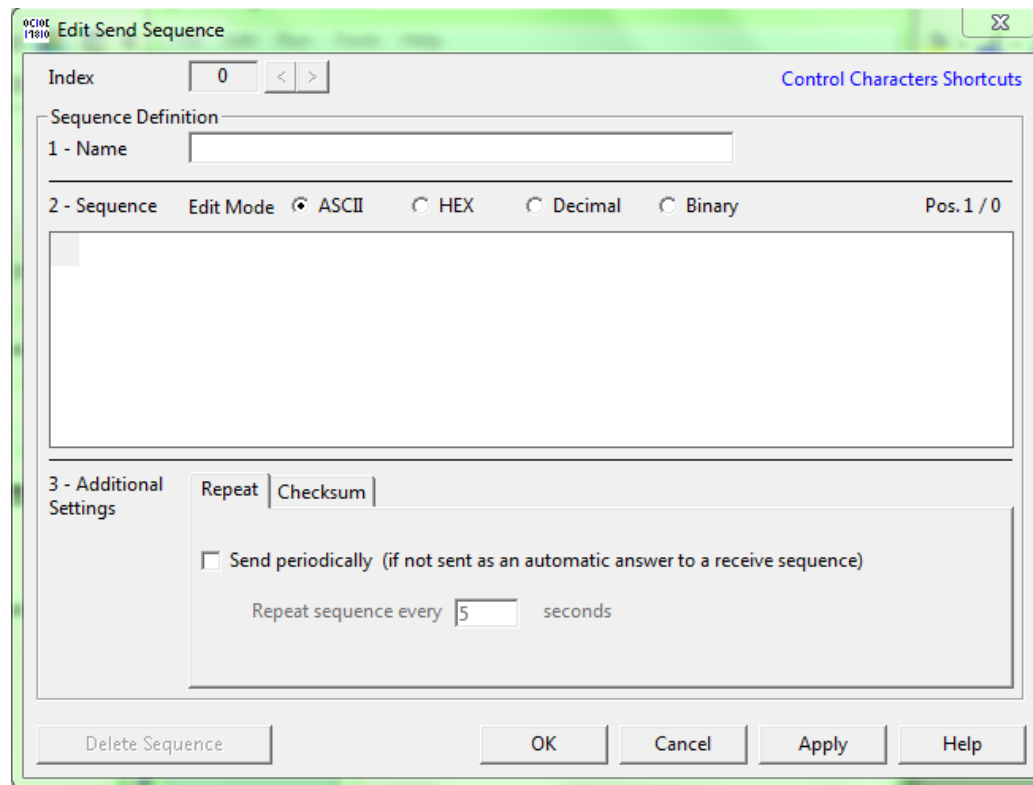


Figure 6: 'Edit Send Sequence' window

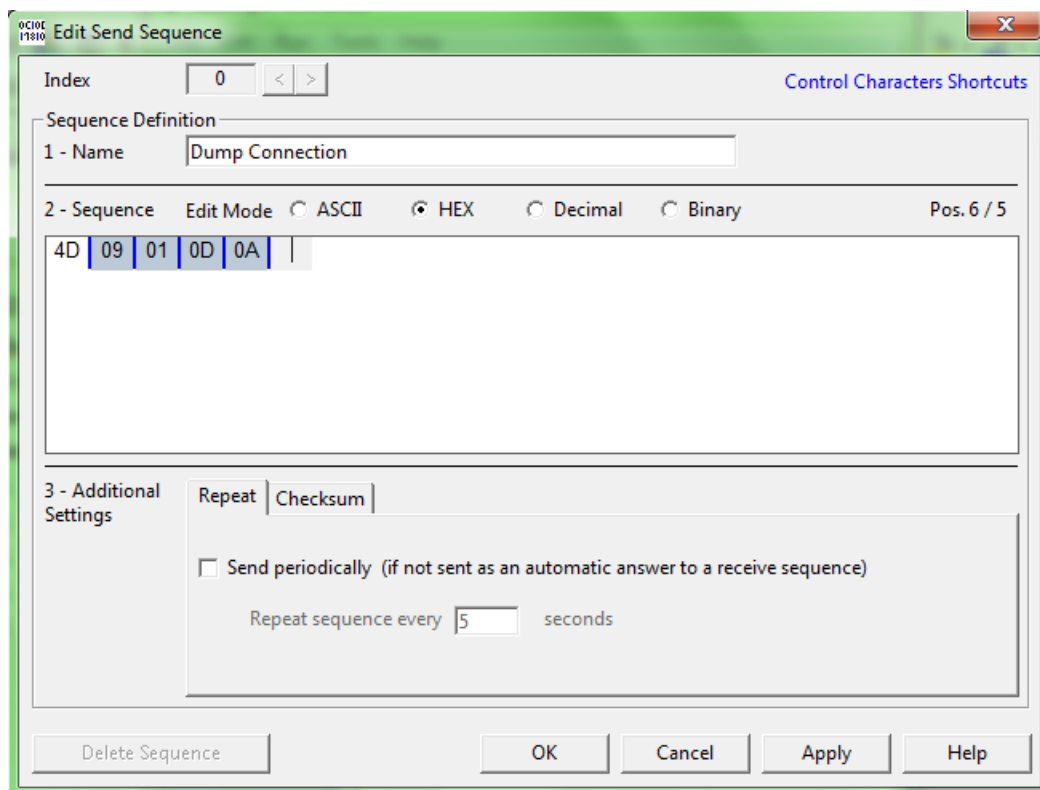


Figure 7: Adding Send Sequence in Docklight

7. Select ASCII and then send ‘Dump Connection’ command. If you are getting response from Yoda Module then PC to Yoda Module connection is working. You can test other configuration commands also.
8. Before testing communication between two Yoda modules, verify that both modules are configured in same Channel and PAN ID. This can be done by sending **Channel Read** and **PAN ID Read** command. If any of these configurations are not same, then make it same by sending **Channel Write** and **PAN-ID Write** command.

Note: For Yoda Module Commands refer “Yoda Command Set” document.

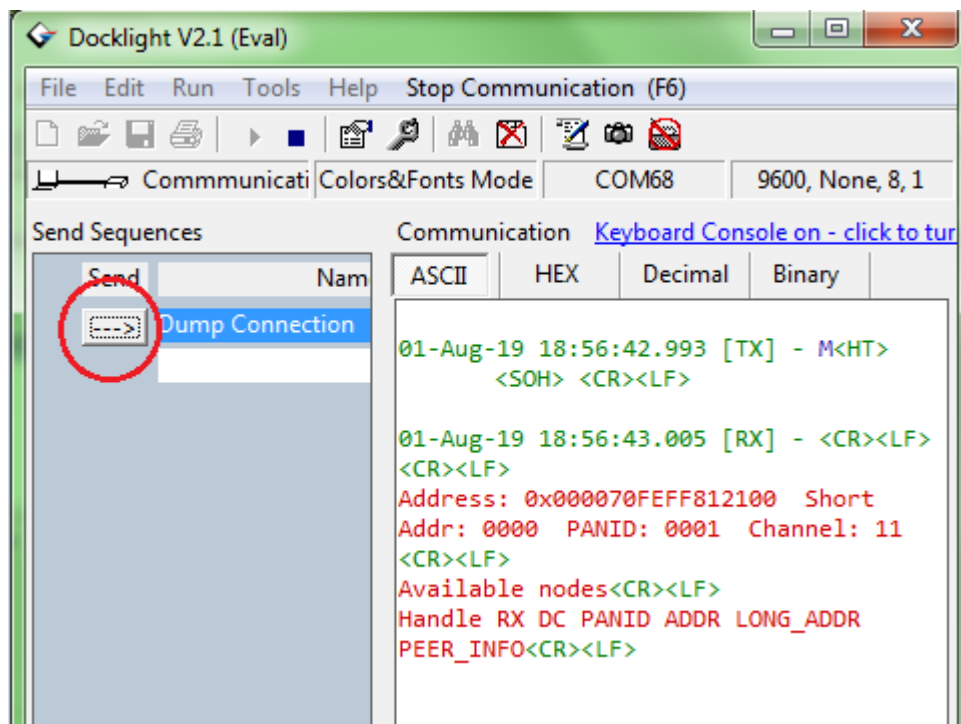


Figure 8: Dump Connection response

6.3 Steps for testing communication between two Yoda Nodes

1. Interface two Yoda USB Adapter board (with Yoda module mounted on it) to PC using two USB cables. You will get two COM ports in Device Manager.
2. Open two Docklight terminals side by side and select one COM port in first Docklight terminal and select other COM port in second Docklight terminal.
3. Click on Run/Start Communication in both Docklight terminal.

4. Send Data Command to transmit data from one node to other.
5. Data will be transmitted by one Yoda module to other and will be displayed on other Docklight terminal.
6. If data is not transmitting from one Yoda module to other then verify that both modules are in same Channel and PAN ID.

6.4 Yoda Module connection with Microcontroller

As shown in Figure 9, Yoda Module can be interfaced to Microcontroller via UART pins available on Output Connector of Adapter Board.

Configuration and Data Commands can be sent to Yoda Module via UART pins of microcontroller.

Note:

1. **Read section 7.0 of this document before interfacing Adapter board to any Microcontroller.**
2. **Switch On Coordinator Yoda module first as Coordinator is responsible for starting Zigbee Network. Then switch On Endnode Yoda module and wait for 5 seconds to start/join the network and dump connection table to the serial terminal.**

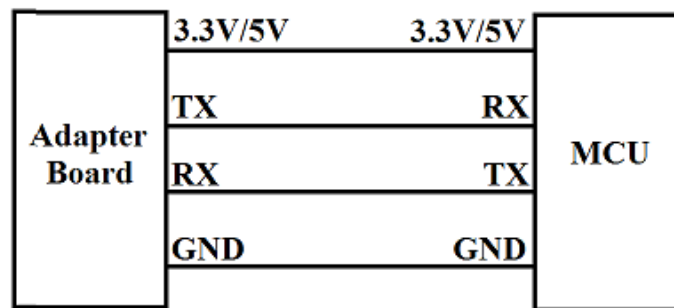


Figure 9: Yoda USB Adapter Connection to Microcontroller

7.0 Precautions

If Yoda Adapter is powered ON by USB then do not connect power to 3.3V/5V pin on Output Connector.

1. For interfacing Yoda Adapter board with 5 volt compatible MCU board (For example: Arduino Uno, Mega, Nano), short 5V and COM by shorting jumper and provide 5 volt on 3.3V/5V pin of output connector. [Figure 10]

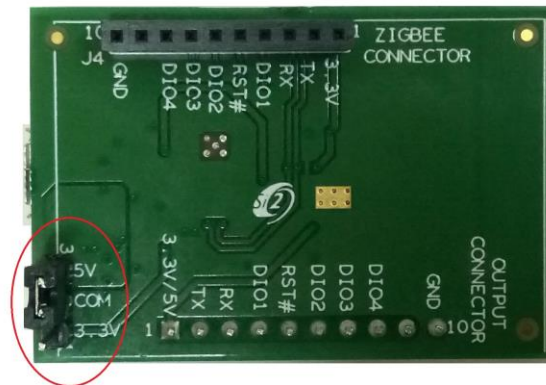


Figure 10: Showing Shorting Jumper placement for 5V selection

2. For interfacing Yoda Adapter board with 3.3 volt compatible MCU board (For example: Arduino Due, NodeMCU), short 3.3V and COM by shorting jumper and provide 3.3 volt on 3.3V/5V pin of output connector. [Figure 11]



Figure 11: Showing Shorting Jumper placement 3.3V selection