

# POD-1

## Peripheral Board

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## Overview

POD-1 allows connecting Apple® products such as iPod®, iPhone®, iPad® to MINI-MAX microcontroller boards as well as other microcontroller systems.

POD-1 can be used in many different ways such as:

- Interface between a microcontroller and iPod®, iPhone®, iPad®
- Interface between a microcontroller and XBee® ZigBee® wireless
- Interface between an XBee® ZigBee® wireless and iPod®, iPhone®, iPad®

## Specifications

POD-1 board has the following configuration:

- SPI to dual UART converter ( one UART for IPOD, one UART for XBee )
- Mode selector jumpers
- 20-pin connector for interfacing to a variety of micro-controller boards
- Single operating voltage 5VDC ( regulated to 3.3V on the board )
- Dimensions are 2.35 X 2.40 inches ( 5.97 X 6.10 centimeters )
- Mounting holes of 0.138 inches ( 3.5 millimeters ) are on four corners
- 0° to +70° C operating, -40° to +85° C storage temperature range

## WARRANTY:

BiPOM Electronics warrants POD-1 for a period of 1 year. If the board becomes defective during this period, BiPOM Electronics will at its option, replace or repair the board. This warranty is voided if the product is subjected to physical abuse or operated outside stated electrical limits. BiPOM Electronics will not be responsible for damage to any external devices connected to POD-1. BiPOM Electronics disclaims all warranties express or implied warranties of merchantability and fitness for a particular purpose. In no event shall BiPOM Electronics be liable for any indirect, special, incidental or consequential damages in connection with or arising from the use of this product. BiPOM's liability is limited to the purchase price of this product.

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Special thanks to our customer **Leon B. Chenier, Jr.** for his valuable suggestions during the development of this product.

POD-1 board should be connected to MINI-MAX/AVR-C board. It can either be stacked on top of MINI-MAX/AVR-C using stand-offs or connected in a chain configuration using flat ribbon cable.

Figure 1 shows how IPOD-PB peripheral board can be connected to a MINI-MAX/AVR-C board in a stacked fashion. Figure 2 shows the chain connection.

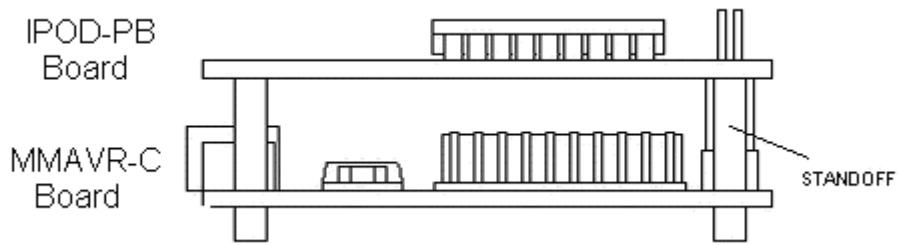


Figure 1

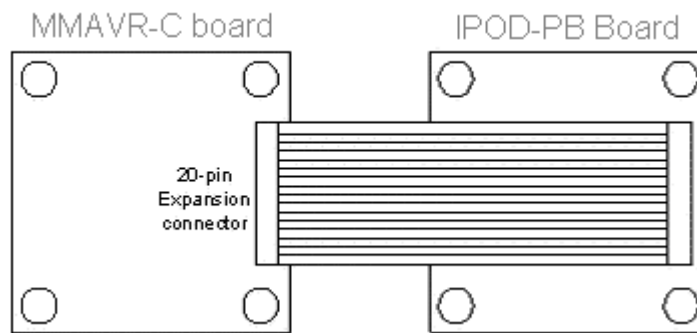
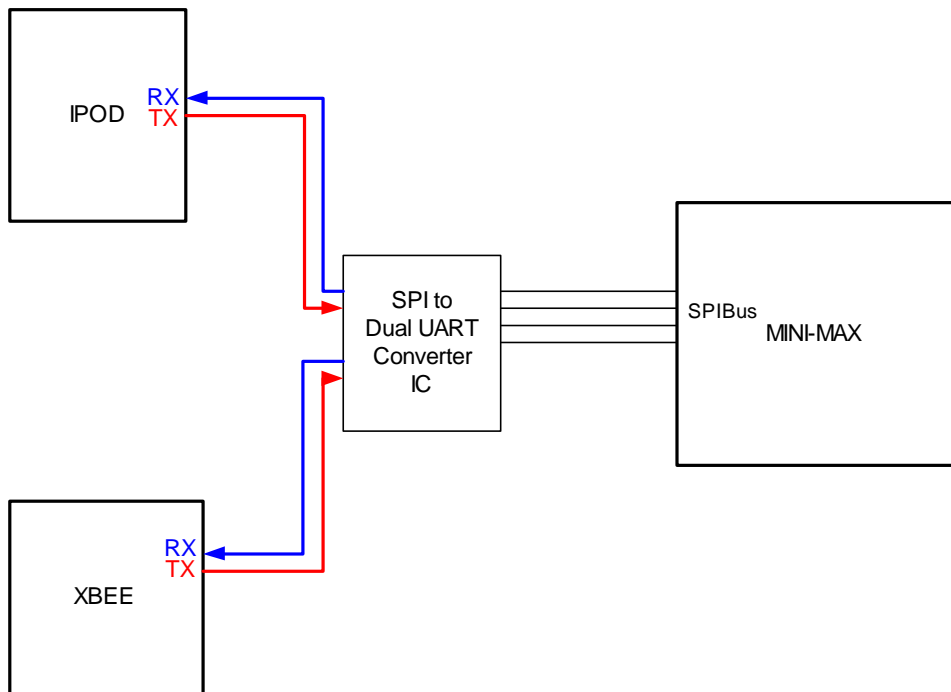
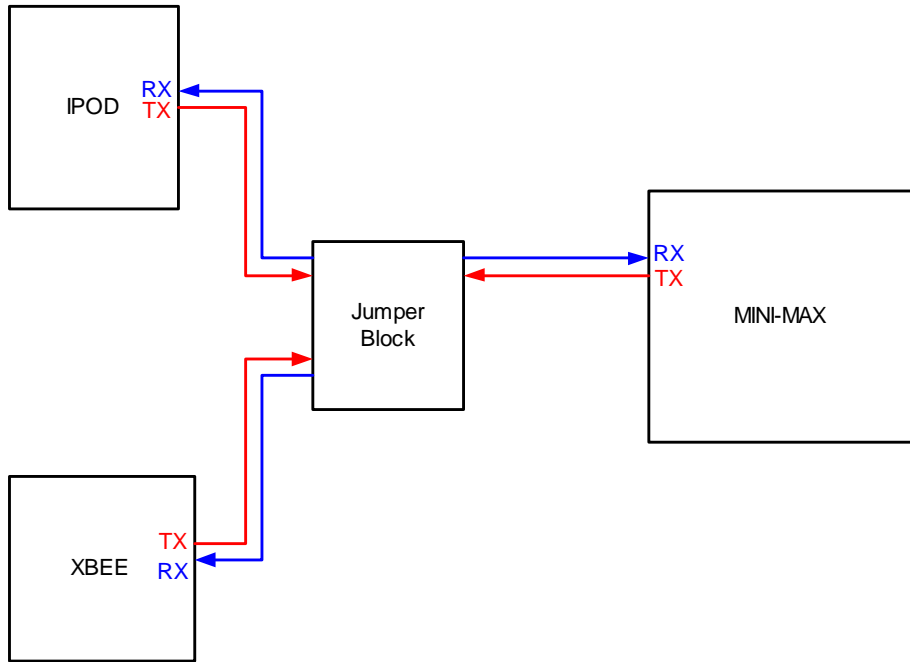


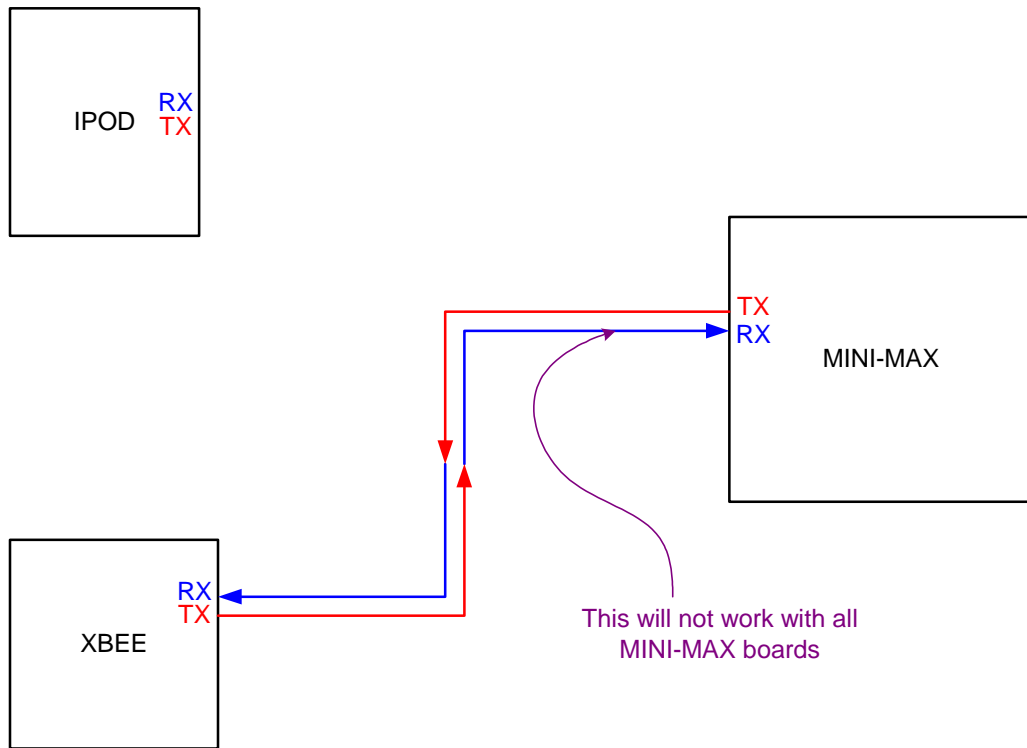
Figure 2

Connect power supply (6-10VDC) to MINI-MAX/AVR-C board through the power jack.

Using on-board jumper blocks and/or SPI to UART bridge chip, POD-1 can be configured in various modes to make connections between MINI-MAX boards, iPod and XBee wireless modules:



**Mode 1 – MINI-MAX to XBee:**



In this mode, MINI-MAX communicates directly with XBee wireless module. IPod is not used. On most of the MINI-MAX boards, Receive (RX) line on the expansion connector is controlled by the RS232 transceiver chip on the MINI-MAX board and hence cannot be used by POD-1 board. In such cases, MINI-MAX can only transmit to XBee but not receive. An exception to this is MINI-MAX/AVR-C board. MINI-MAX/AVR-C can both receive and transmit( RXD2, TXD2 lines of Expansion 1 connector).

Remove all jumpers on POD-1 Board.

Install the following jumpers: JP1, JP7, JP22, JP23. See Figure 3.

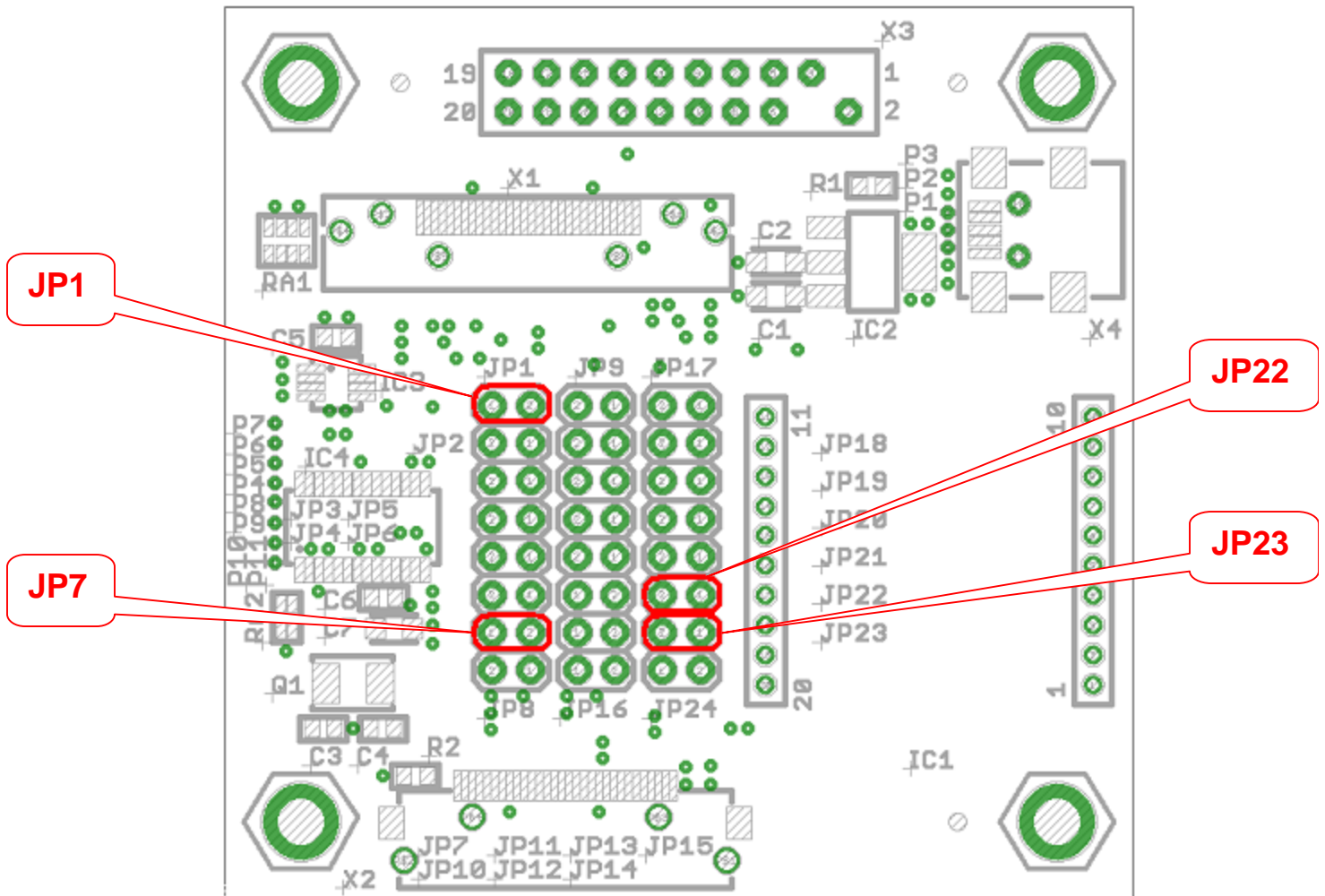
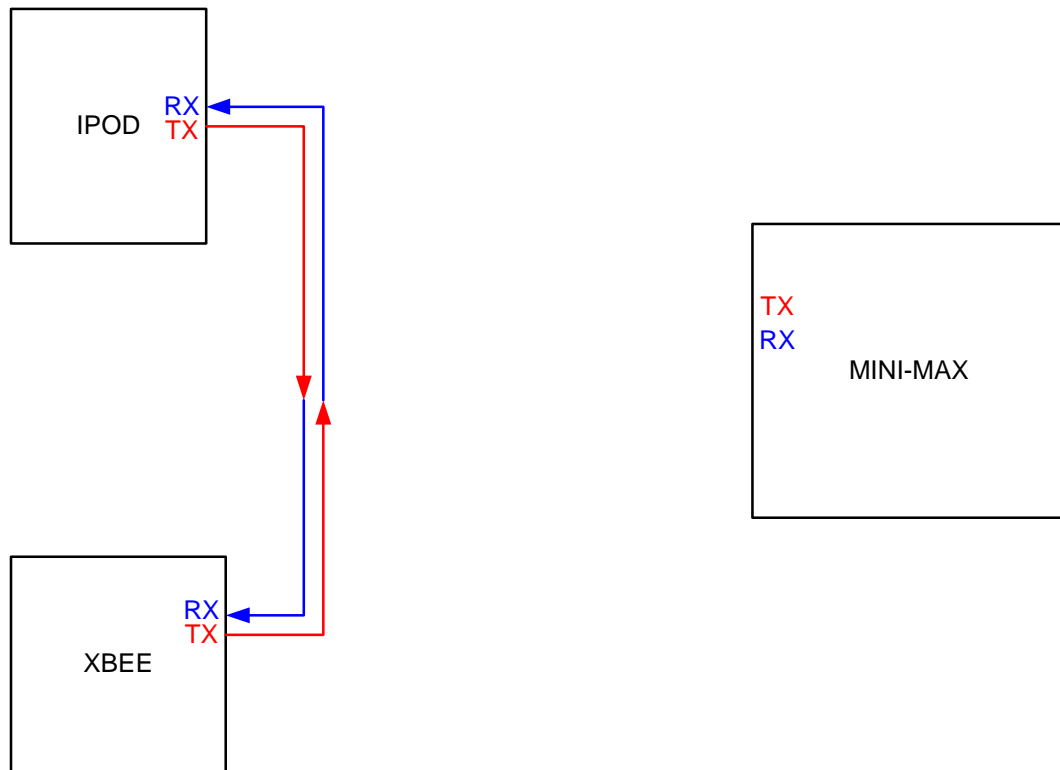


Figure 3

Connect power supply (6-10VDC) to MINI-MAX/AVR-C board through the power jack.

**Mode 2 – IPod to XBee:**



In this mode, MINI-MAX is not involved. IPod communicates directly with XBee wireless module.

Remove all jumpers on POD-1 Board.

Install the following jumpers: JP16, JP17, JP18, JP20, JP23 on POD-1. See Figure 4.

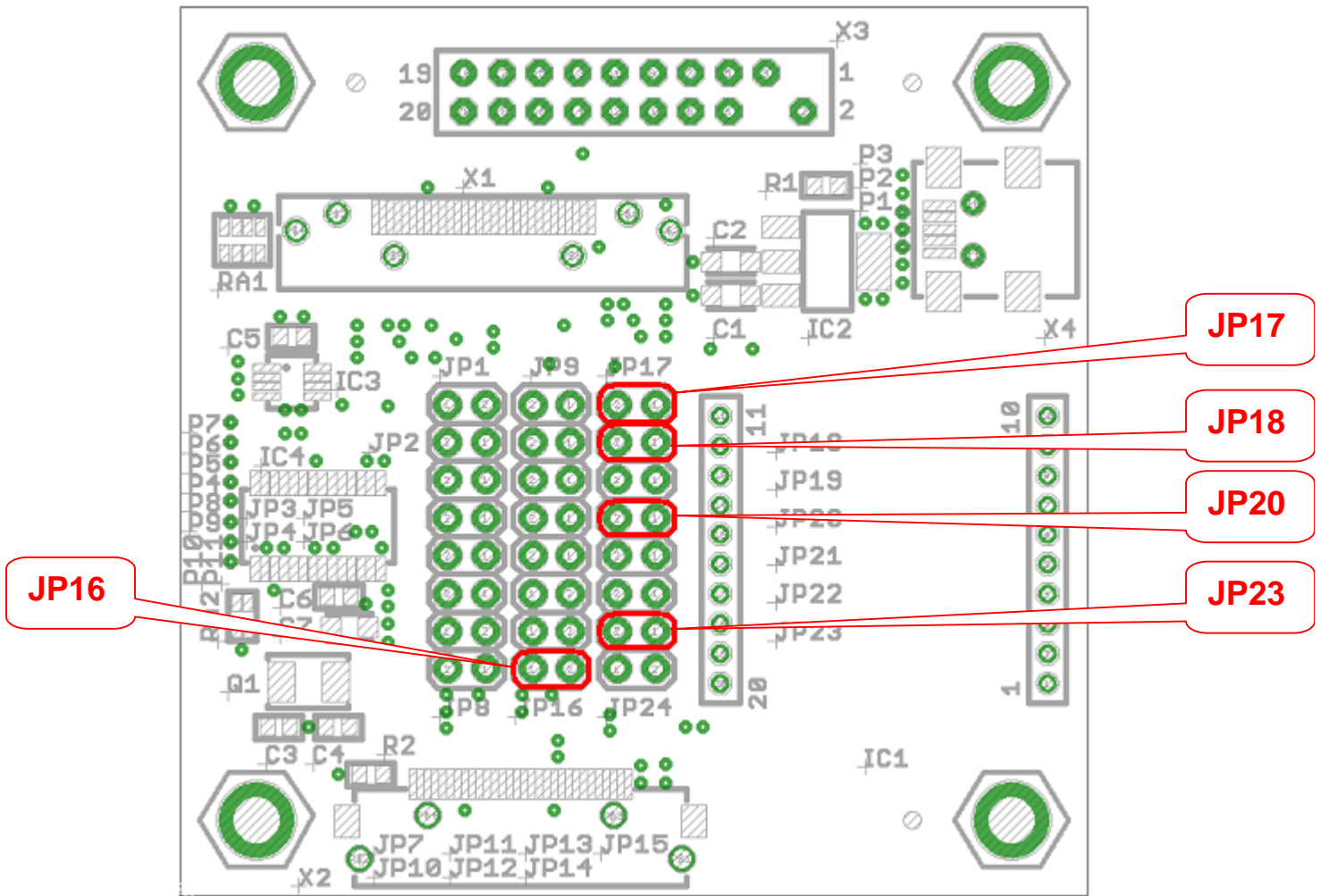
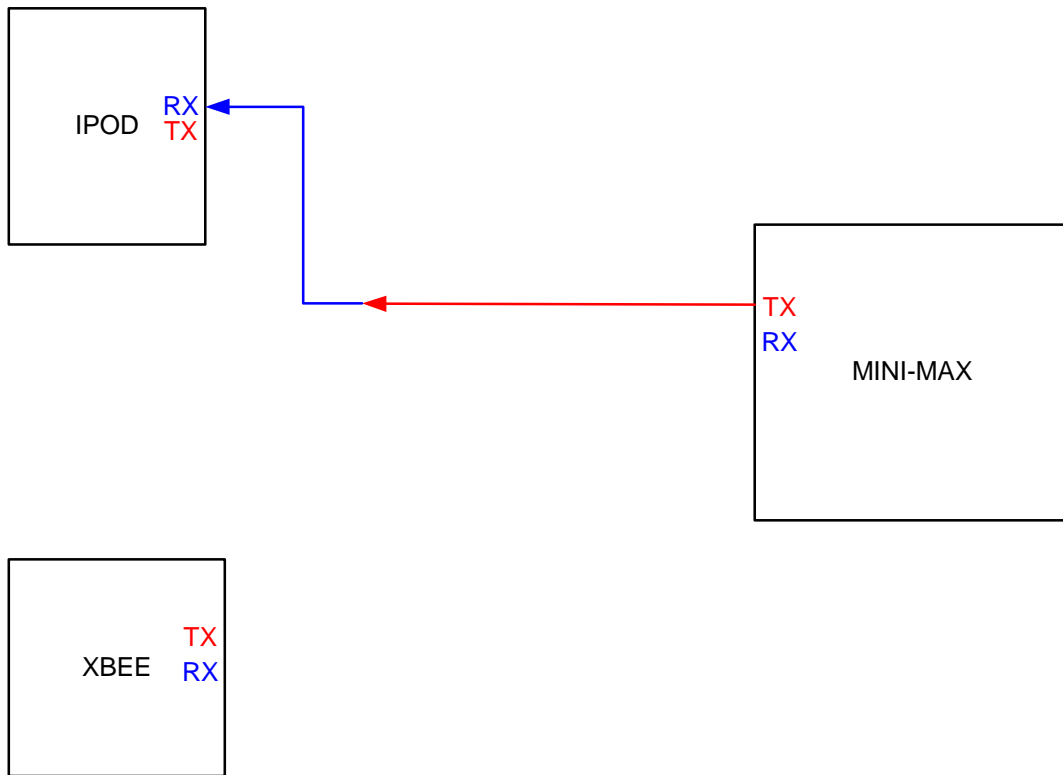


Figure 4



**Mode 3 – MINI-MAX to IPod:**



In this mode, MINI-MAX communicates directly with IPod. XBee is not used. On most of the MINI-MAX boards, Receive (RX) line on the expansion connector is controlled by the RS232 transceiver chip on the MINI-MAX board and hence cannot be used by POD-1 board. In such cases, MINI-MAX can only transmit to IPod but cannot receive. An exception to this is MINI-MAX/AVR-C board. MINI-MAX/AVR-C can both receive and transmit.

Remove all jumpers on POD-1 Board.

Install the following jumpers: JP1, JP14, JP21, JP23 on POD-1. See Figure 5.

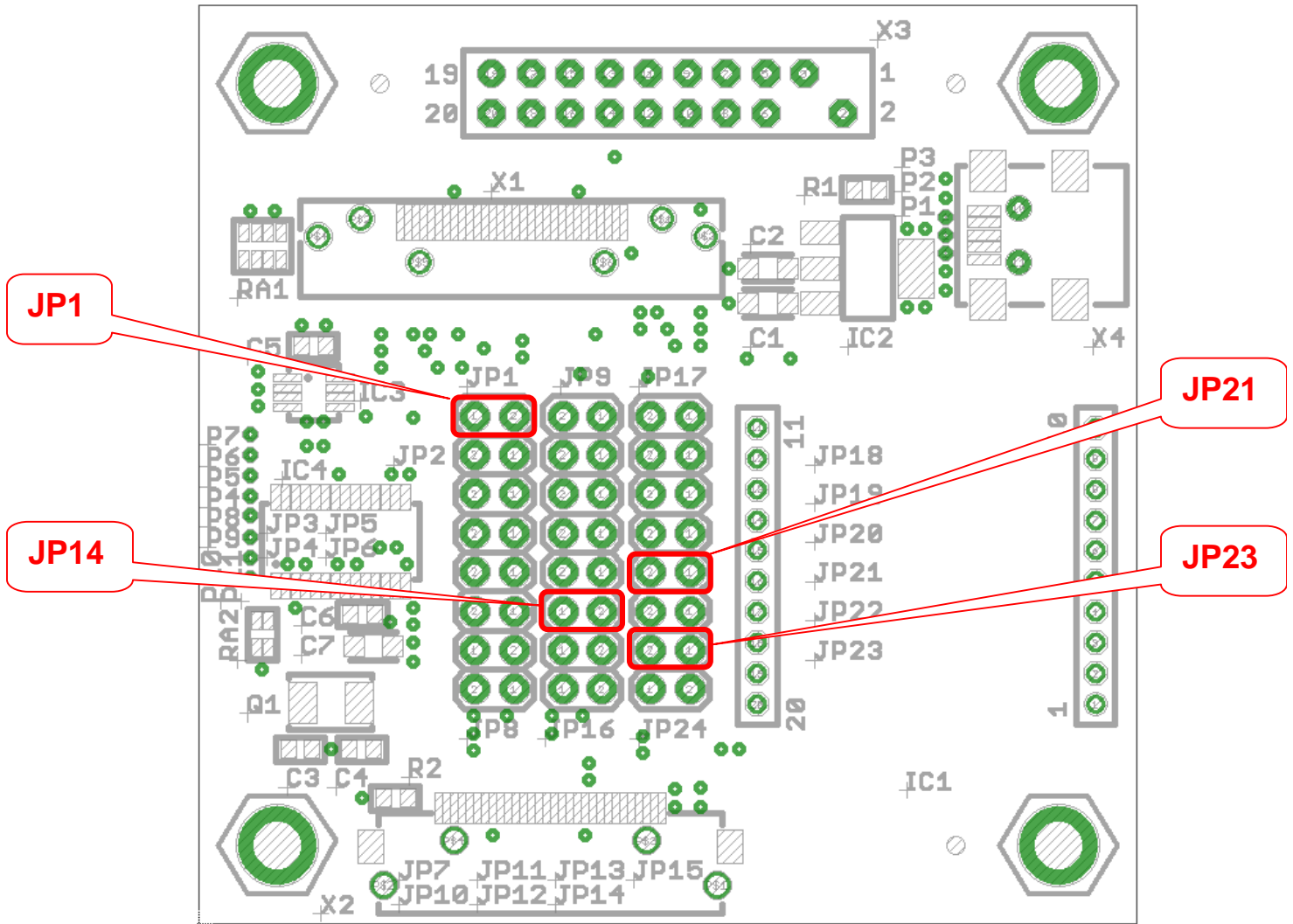
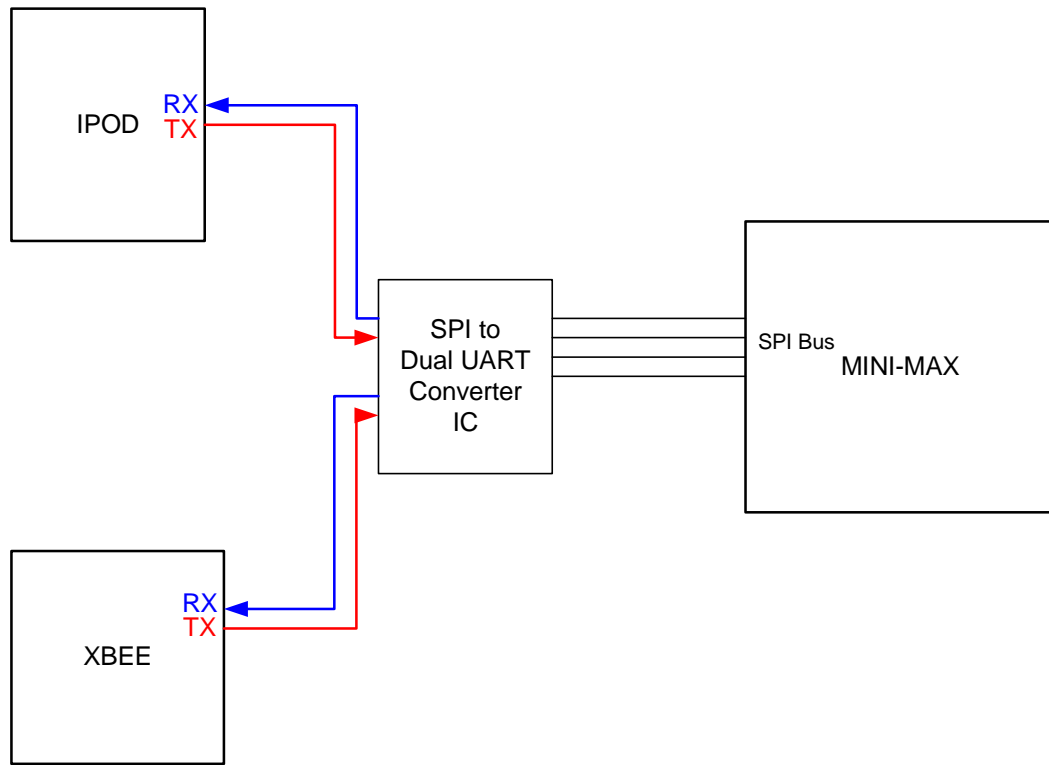


Figure 5

Connect power supply (6-10VDC) to MINI-MAX/AVR-C board through the power jack.

**Mode 4 – MINI-MAX to both IPod and XBee:**



In this mode, any MINI-MAX board can communicate with both IPod and XBee. SPI serial bus on the MINI-MAX board is translated to dual UART's for bi-directional communications with both XBee and IPod.

Remove all jumpers on POD-1 Board.

Install the following jumpers: JP6, JP8, JP9, JP15, JP19, JP23 on POD-1. See Figure 6.

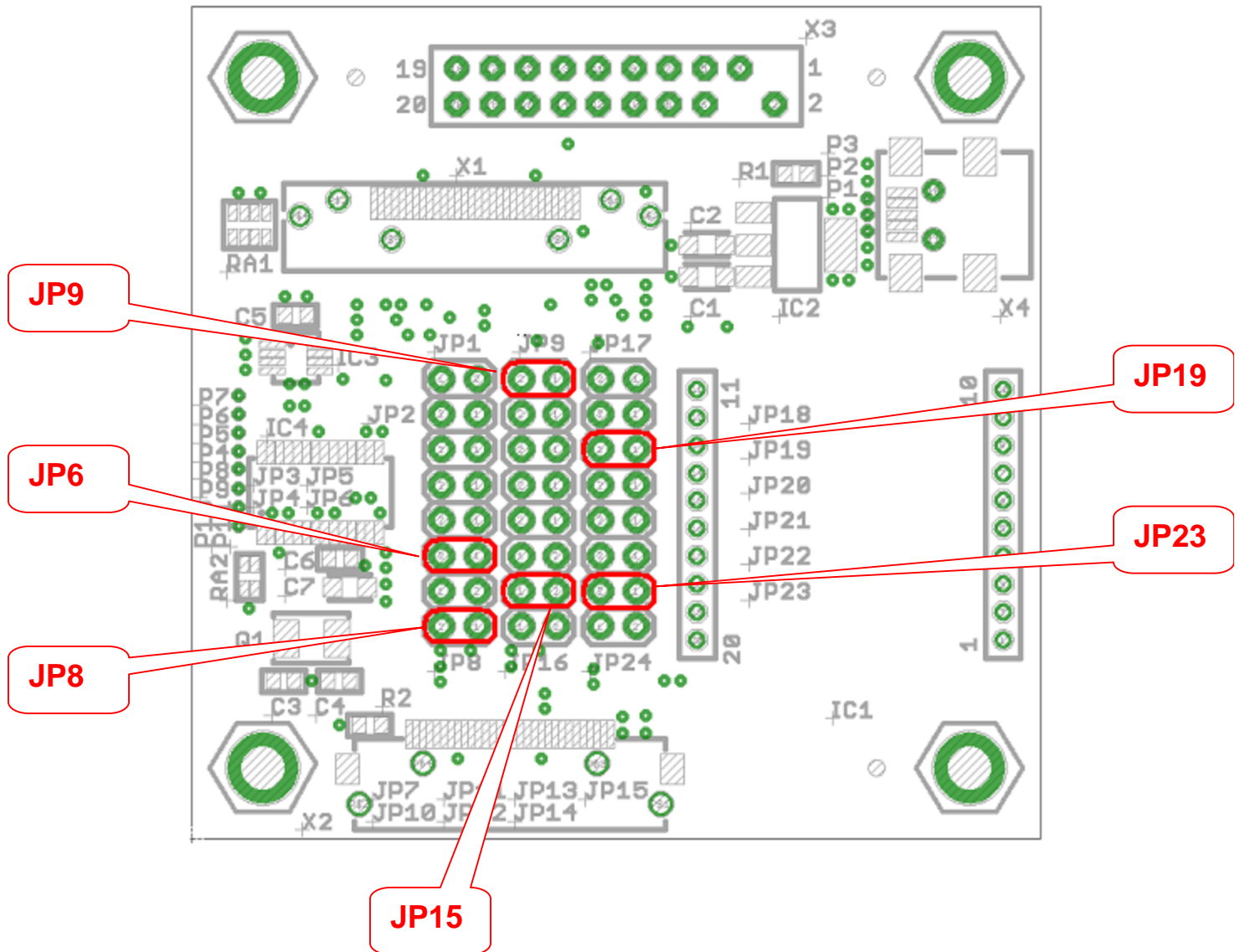


Figure 6

Connect power supply (6-10VDC) to MINI-MAX/AVR-C board through the power jack.

Table 1 shows jumper definitions and functions.

<b>Name</b>	<b>Closed</b>	<b>Open</b>
JP1	Enable expansion connection	Disable expansion connection
JP2	Enable IRQ for AVR	Disable IRQ for AVR
JP3	Enable IRQ for ARM	Disable IRQ for ARM
JP4	Enable IRQ for 51	Disable IRQ for 51
JP5	Enable IRQ for MSP	Disable IRQ for MSP
JP6	Enable TX Zigbee to SPI	Disable TX Zigbee to SPI
JP7	Enable TX Zigbee to Expansion	Disable TX Zigbee to Expansion
JP8	Enable RX Zigbee to SPI	Disable RX Zigbee to SPI
JP9	Enable SPI	Disable SPI
JP10	Enable Chip Select 1	Disable Chip Select 1
JP11	Enable Chip Select 2	Disable Chip Select 2
JP12	Enable Chip Select 4	Disable Chip Select 4
JP13	Enable Chip Select 3	Disable Chip Select 3
JP14	Enable RX IPOD to Expansion	Disable RX IPOD to Expansion
JP15	Enable RX IPOD to SPI	Disable RX IPOD to SPI
JP16	Enable RX IPOD to Zigbee	Disable RX IPOD to Zigbee
JP17	Enable +5V Expansion to +5V USB	Disable +5V Expansion to +5V USB
JP18	Enable +5V IPOD to +5V USB	Disable +5V IPOD to +5V USB
JP19	Enable TX IPOD to SPI	Disable TX IPOD to SPI
JP20	Enable TX IPOD to Zigbee	Disable TX IPOD to Zigbee
JP21	Enable TX IPOD to Expansion	Disable TX IPOD to Expansion
JP22	Enable RX Zigbee to Expansion	Disable RX Zigbee to Expansion
JP23	Enable Power +5V from Expansion	Disable Power +5V from Expansion
JP24	Enable Power +3.3V from Expansion	Disable Power +3.3V from Expansion

Table 1