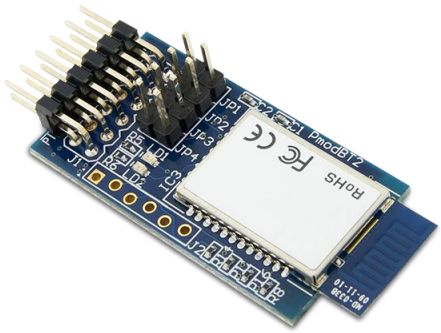
1300 Henley Court
Pullman, WA 99163
509.334.6306
www.digilentinc.com

PmodBT2™ Reference Manual

Revised April 15, 2016
This manual applies to the PmodBT2 rev. A

Overview

The PmodBT2 is a powerful peripheral module employing the Roving Networks® RN-42 to create a fully integrated Bluetooth interface.



The PmodBT2.

Features include:

- Bluetooth 2.1/2.0/1.2/1.0 compatible
- Add wireless capability with this low power, Class 2 Bluetooth radio
- Supports HID profile for making accessories such as pointing devices, etc.
- Secure communications, 128-bit encryption
- Supports Bluetooth data link to iPhone/iPad/iPod Touch
- Six different modes
- Small PCB size for flexible designs 1.5“ × 0.8” (3.8 cm × 2.0 cm)
- 12-pin Pmod port with UART interface

1 Functional Description

The PmodBT2 uses a standard 12-pin port and communicates via UART. There is a secondary SPI header on the board for updating the RN-42 firmware if needed.

1.1 Jumper Settings

The PmodBT2 has several modes available to the user via jumper settings. JP1 through JP4 provide various modes of operation as indicated in Table 1 below. Each jumper is active when shorted. JP1 restores the device to factor default settings after three transitions of the jumper setting (short-to-open or open-to-short). After the third transition, the device returns to factor default except for the Bluetooth name. The other three jumpers, JP2-JP4, only sample in the first 500 ms of operation to allow the pins that they tie to on the RN-42 module to serve a separate purpose later in the modules operation. JP2 enables pairing with a special device class defined by the user in software. This may be used so that the PmodBT2 operates as a substitute for an RS232 cable. JP3 enables auto connect to a stored address defined by the user. Finally, JP4 chooses whether to operate at the stored baud

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rate (115.2kbps default) or a baud rate of 9600 regardless of the software selected rate when shorted. For more detailed information on jumper settings and functionality, refer to the RN-42 user manual.

Jumper	Description
JP1 (PIO4)	Factory Default
JP2 (PIO3)	Auto Discovery/Pairing
JP3 (PIO6)	Auto Connect
JP4 (PIO7)	Baud Rate Setting (9600)

Table 1. Set jumper description.

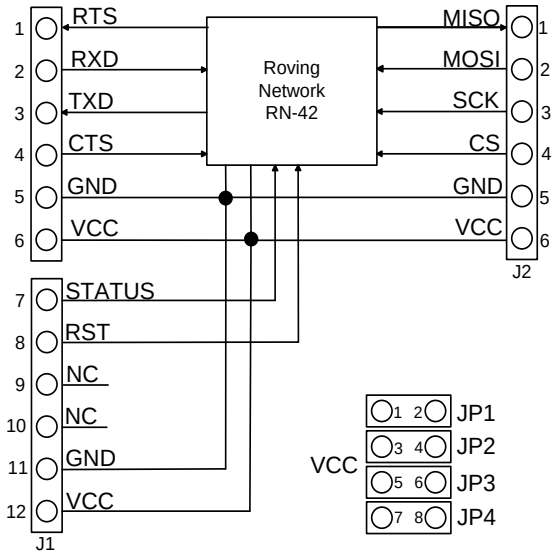

Figure 1. PmodBT2 block diagram.

1.2 UART Interface

By default, the UART interface uses a baud rate of 115.2 kbps, 8 data bits, no parity, and a single stop bit. The startup baud rate may be customized to predefined rates or set to a specific user customized baud rate. Predefined baud rates range from 1200 to 921k.

The reset pin (RST) on J1 is active low. If the RST pin is toggled, the device will undergo a hard reset. This hard reset performs similarly to a power cycling of the device. The second interface besides the standard UART signals is the STATUS pin also on J1The STATUS pin directly reflects the connection status of the device. STATUS is driven high by the device when connected and is driven low otherwise.

For more information on the devices UART interface and RST and STATUS pins refer to the RN-42 user manual on the Roving Networks website.

1.3 Command Mode

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In order to enter the command mode, the PmodBT2 must receive "$$$" to which it will respond "CMD". When in command mode, the module will respond to a large number of commands allowing the user to customizing the module for specific applications. In order to exit command mode, send "---<cr>" (three minus signs in a row and where <cr> stands for the carriage return character) to which the device will respond "END". Remote configuration, or configuration over a Bluetooth connection, is possible through the command mode but has several restrictions. The configure time, which defaults to 60 sec, defines the time window in which the PmodBT2 may be configured remotely. Outside of this time, the PmodBT2 will not respond to any remote commands. It is important to note that any of the "set" commands available for the PmodBT2 must be followed by a power cycle to take effect in any design.

Connector J1 – UART Communications		
Pin	**Signal**	**Description**
1	RTS	Ready to Send
2	RX	Receive
3	TX	Transmit
4	CTS	Clear to Send
5	GND	Power Supply Ground
6	VCC	Power Supply (3.3V)
7	STATUS	Connection Status
8	~RST	Reset
9	NC	Not Connected
10	NC	Not Connected
11	GND	Power Supply Ground
12	VCC	Power Supply (3.3V)
Connector J2 – SPI Connector (Firmware Update Only)		
1	MISO	Master in/ Slave out
2	MOSI	Master out/ Slave in
3	SCK	Serial Clock
4	~CS	Chip Select
5	VCC	Power Supply (3.3V)
6	GND	Power Supply Ground

Table 2. Connector descriptions.

The various modes of operation are accessed by using the "SM,<5,4,3,2,1,0>" command while in command mode. The PmodBT2 can be put into one of six available modes of operation. The modes in order, 0 to 5, are: slave, master, trigger master, auto-connect, auto-connect DTR, and auto-connect ANY. For more detailed information on the different modes of operation, refer to the RN-42 user manual. For the full list of device commands, how to use remote configuration, and more detailed information on the different modes of operation, see the RN-42 data.

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Телефон: +7 812 627 14 35

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Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
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