



Bluetooth Mini-Module Adapter Board With Serial Port Profile (ASY70147-3)

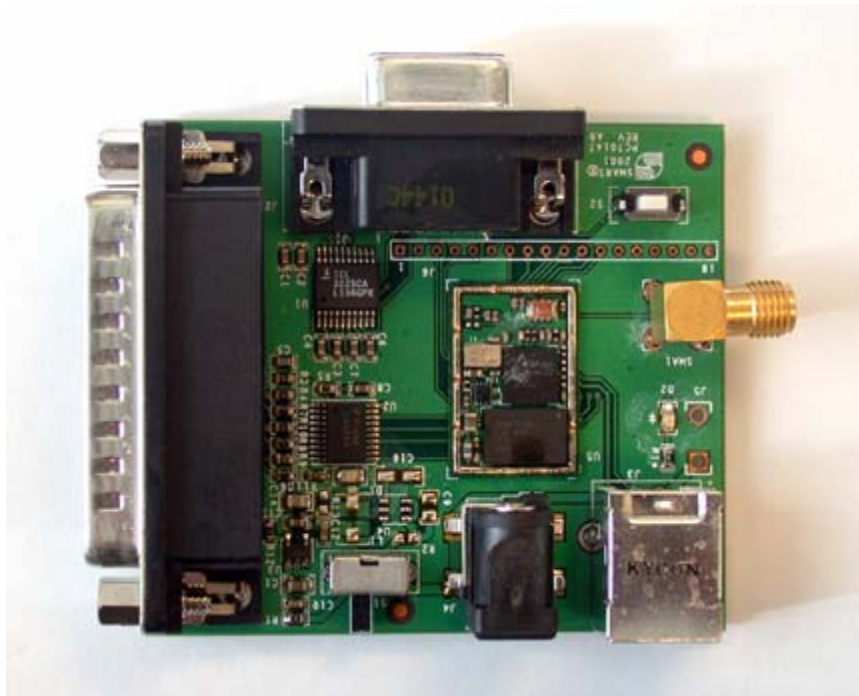


Figure 1. Photo of a 71047-3 adapter board

1. Overview

SMART Modular's 70147-3 adapter board contains SMART's 90147-3 Bluetooth Mini-Module with on-board Serial Port Profile. This development platform provides our OEM customers the opportunity to optimize their Bluetooth design application, enhance performance and interoperability and define the preferred interface. Other variants of the adapter include the 70147-1 (USB transport) and the 70147-2 (UART Transport, HCI Access).

2. Features

The 70147-3 Bluetooth adapter board features are based on 90147-3 Bluetooth module provided by smart Modular Technology. Main features of the module include:

- Class II device.
- Fully compliant with Bluetooth specification v1.1. (v1.2 once released)
- Full speed HCI UART. (921kB/s)
- USB v1.1 compliant and USB2.0 compatible.
- Pulse Code Modulation (PCM) interface.
- Programmable Parallel Input Output (PIO) ports.
- Serial Peripheral Interface (SPI).
- Full speed Bluetooth™ operation.
- Full piconet support.
- 8Mbit external Flash.
- Support for low power sleep modes.
- Firmware upgradeable via UART, USB or SPI interface.
- Conforms to FCC Part 15, ICAN RSS-210, ETSI, ARIB ST-T66 and CE.
- Temperature range: -20°C to +85°C.

3. Mechanical layout

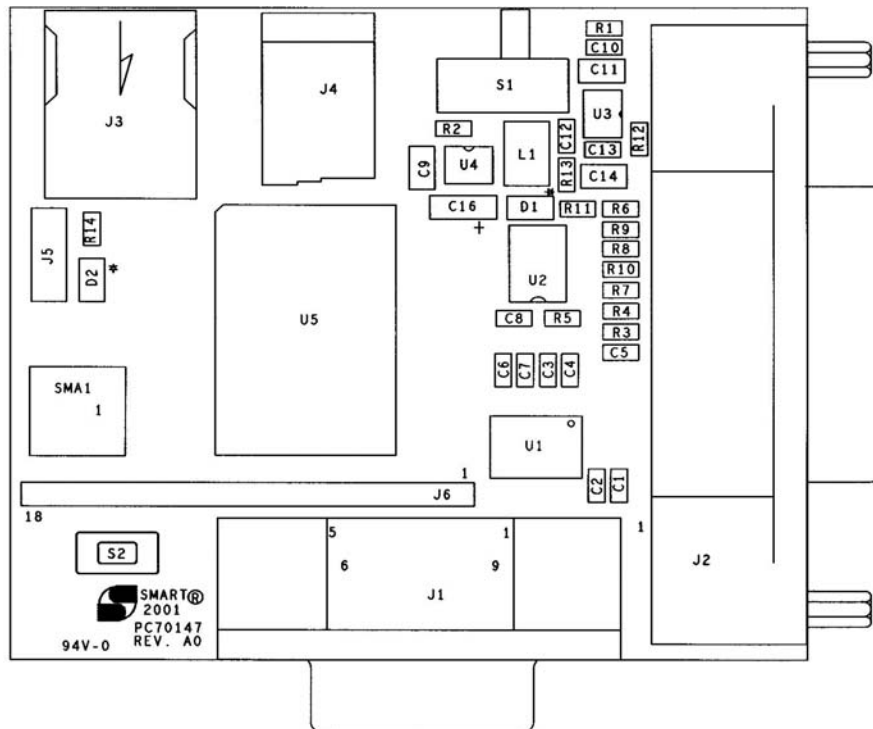


Figure 2. 70147 adapter board mechanical drawing

4. Interface and Pin-Out description

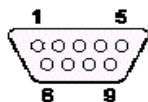
Following is a description of the items presented in Figure 2 above:

- S1:** Power On/Off switch
- S2:** Reset switch for the Bluetooth Module Only
- J1:** DB-9 female connector for RS232 access
- J2:** DB-25 male connector for development mode access only
- J3:** USB connector
- J4:** DC Power Socket for the module
- SMA1:** ANTENNA
- D2:** LED

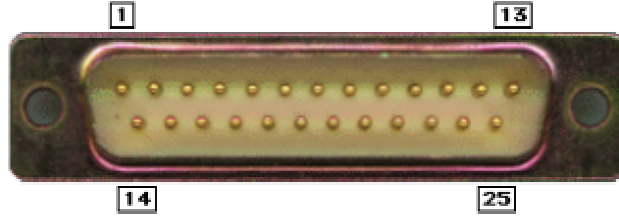
The DB-9 female connector conforms to industry standard pin outs and as such, standard communications cables (DB9 Female to DB9 Male) can be utilized:

RS232 DB9 Connector Pinout

DB-9M	Function	Abbreviation
Pin #1	Data Carrier Detect	CD
Pin #2	Receive Data	RD or RX or RXD
Pin #3	Transmitted Data	TD or TX or TXD
Pin #4	Data Terminal Ready	DTR
Pin #5	Signal Ground	GND
Pin #6	Data Set Ready	DSR
Pin #7	Request To Send	RTS
Pin #8	Clear To Send	CTS
Pin #9	Ring Indicator	RI



The DB25 Male connector also conforms to the industry standard parallel port pin out and as such, standard communications cables can be utilized:



This is the "standard" RS-232 connector, with enough pins to cover all the signals specified in the standard. The table shows only the "core" set of pins that are used for most RS-232 interfaces.

(Coming someday: a link to the complete list of signals.)

The images show the male and female versions of the DB-25 connector with pin numbers.

Function	Signal	Pin	DTE	DCE
Data	TxD	2	O	I
	RxD	3	I	O
Handshake	RTS	4	O	I
	CTS	5	I	O
	DSR	6	I	O
	DCD	8	I	O
	DTR	20	O	I
Common	Com	7	-	-

5. Default UART Communication Settings

The 90147-3 module is configured to communicate via standard H4 UART transport. The 70147-3 adapter board includes an RS232 level shifter allowing the board to be used with a standard RS232 computer port.

The default communication settings are as follows:

Baud Rate	_____	115Kbps (default)
Word Length	_____	8 bits (default)
Stop bits	_____	1 (default)
Parity	_____	none (default)
Handshaking	_____	disabled (default)

6. Power Requirements

The 70147-3 contains on board voltage regulation and will work with “off the shelf” AC to DC power supplies. Requirements for the power supply are as follows:

- The adapter board will accept +4 to +12 volts DC
- A minimum of 80mA is required
- Connector outside/inside parameters are : 5.5mm/2.0mm
- The sleeve is “-“ negative and the internal pin is “+” positive.

7. Evaluation Example

Following is a evaluation example. It requires the use of two personal computers:

Computer “A” Setup (Data Acquisition Device or server)

- a.) Connect the DB9 port (J1) on the 70147-3 to the DB9 RS232 port of computer A via the cable supplied, or an “off the shelf” cable from Radio Shack or other such source.
- b.) Connect the power supply to the barrel jack (J4) on the 70147-3. The green LED (D2) should be “on” indicating that the device is powered. If not, move the switch (S1) to the “on” position.
- c.) Via “Control Panel, System, Device Manager, Ports” make sure the COM port that the 70147-3 is connected to is set for the default parameters of 115.2K baud, 8 data bits, 1 stop bit, no parity and no hardware flow control.
- d.) Computer A will act as a Data Acquisition Device. As such, the only program needed is Hyper Terminal which is native on Windows. Open Hyper Terminal and create a new connection. Specify which COM port the module is attached to and make sure the parameters are set to 115.2K,8,N,1,No Handshake. With a successful connection you will see “Connected 0.00.xx” in the lower left box.

Computer “B” Setup (Data Processing Computer or client)

- a.) Computer B will act as the Data Processing Computer. It will initiate communication with the Data Acquisition Device and control the data flow. This computer will require the use of a Bluetooth program such as SMART Modular’s “Blue Opal” and a USB Bluetooth Dongle or Bluetooth PCMCIA card.
- b.) Install the Blue Opal software (make sure the USB Bluetooth adapter is not plugged into the USB port). Once installation is complete, re-start the computer. Upon boot-up, the program will prompt you to insert the USB Bluetooth Adapter. The appropriate drivers will now be installed and the installation complete.
- c.) On Computer B, click on the Bluetooth Icon on the desktop (not the task bar). Click on “Search”. An icon should appear called “Smart_Blue_001” or something similar. Double click on the icon to open it. The that “Smart_Blue_001” provides will now appear which is “SPP Slave”. Double click “SPP Slave” and Blue Opal will generate

a virtual COM port. Once completed, the icon will change and a hand will now be holding the 2 linked computers. Left click on the icon and right click on properties to see what virtual COM port has been assigned (e.g. COM4).

- d.) On Computer B, start the Hyper Terminal program. Create a new connection specifying the virtual COM port (e.g. COM4). Once complete, you will see “Connected 0.00.xx” in the lower left box. You can now type information on computer A or B and the data will appear on the other computer via the wireless Bluetooth link.

Should you have any issues with SMART’s 70147-3 Adapter Board, please do not hesitate to contact SMART Business Development as follows:

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