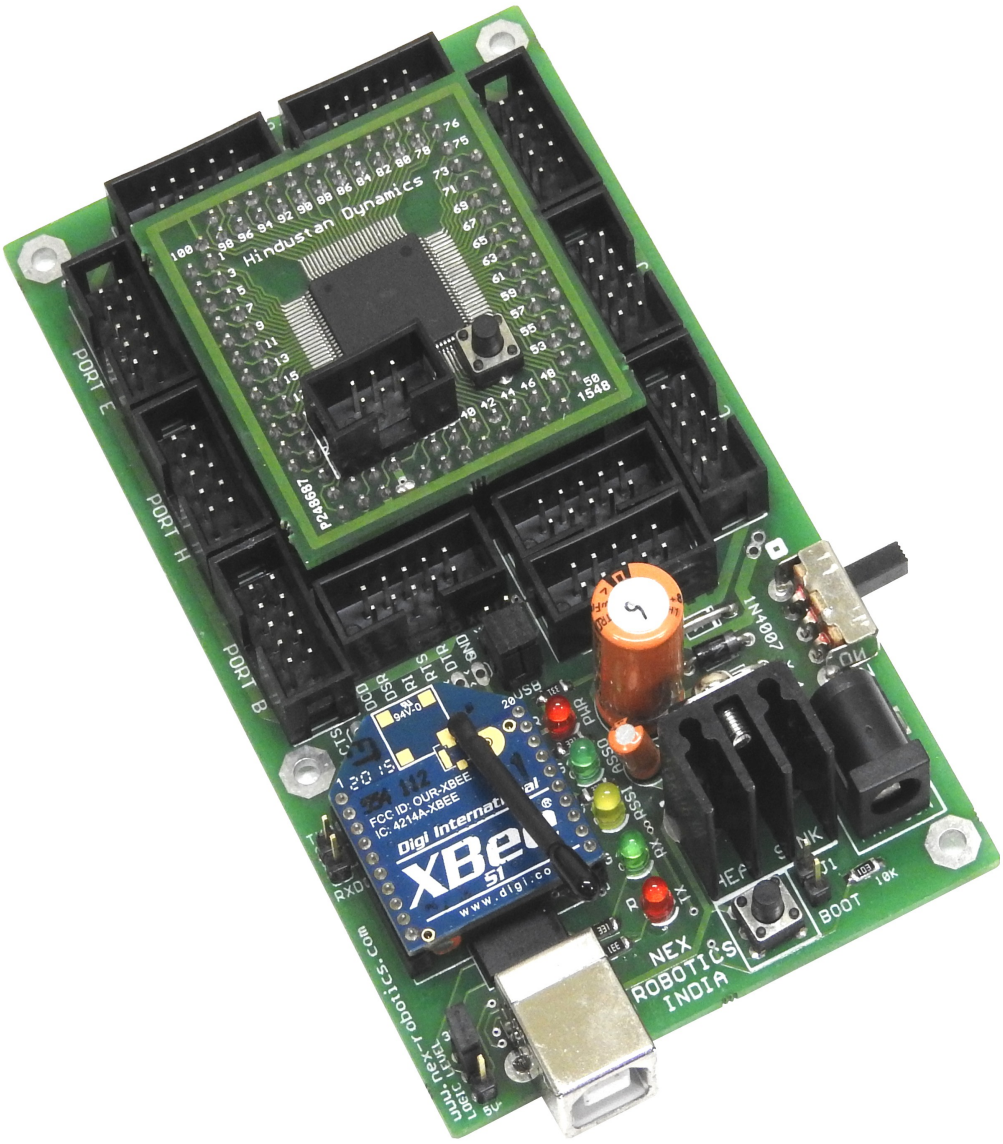
ATMEGA2560 Development Board Mini integrated With Xbee/USB Interface



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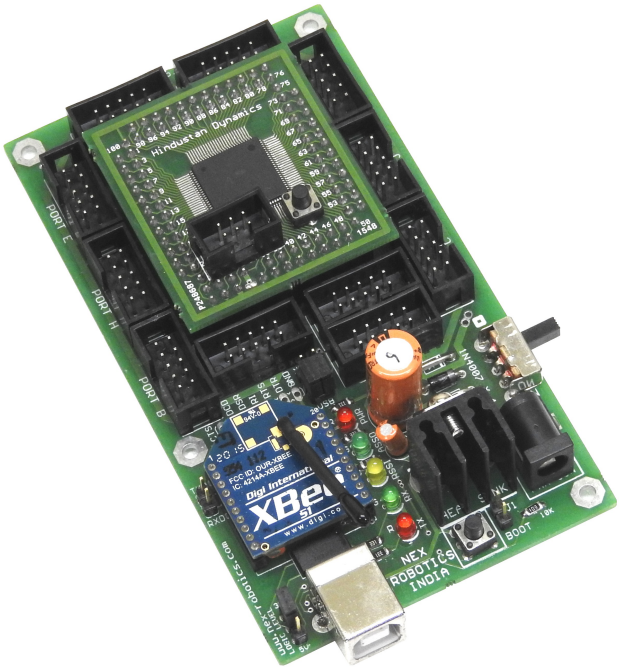

Introduction

ATMEGA2560 Mini is a massive and one of the most feature rich AVR microcontroller from Atmel featuring 256K Flash, 8K RAM, 86 I/O lines arranged in nine 8 bit ports, 16 ADCs, 4 UARTs, 6 timers, 8 interrupts and much more. ATMEGA2560 Development Board Mini exposes all the pins of the microcontroller in near PORT wise configuration. It is made from double sided PTH PCB board to provide extra strength to the connector joints for increased reliability. Board can work on 7 to 15V AC or DC supply. It has built-in reverse polarity protection. 7805 voltage regulator has heat sink for heat dissipation so that it can supply 1Amp current continuously without getting over heated. It has switches for boot loading, reset and power. It also has Xbee/USB interface. All the ports are connected to standard 10 pin FRC connectors.

Specifications

- Microcontroller: ATMEGA2560 with 14.7456 MHz crystal (Also supports ATMEGA640/128)
- Double side high quality PTH PCB for added strength.
- Power: 7 to 15V, AC or DC, Heat sink on 7805 for better current rating
- Reverse polarity protected
- Switches: Boot, Reset, Power
- 10 pin FRC connectors for all ports
- Xbee/USB interfacinfg.
- Application examples in AVR studio provided in the documentation CD

Package contains

- ATMEGA2560 Development Board Mini with ATMEGA2560 microcontroller.
- Documentation CD containing tutorial for ATMEGA2560 microcontroller programming in AVR studio and application examples.

Documentation CD contain following Application examples

- I/O Port operation Interrupts control
- Timer to generate accurate delay in overflow interrupt mode
- Buzzer
- ADC (Analog to digital conversion)
- UART (Xbee / USB communication)
- LCD (Print string of data on LCD)

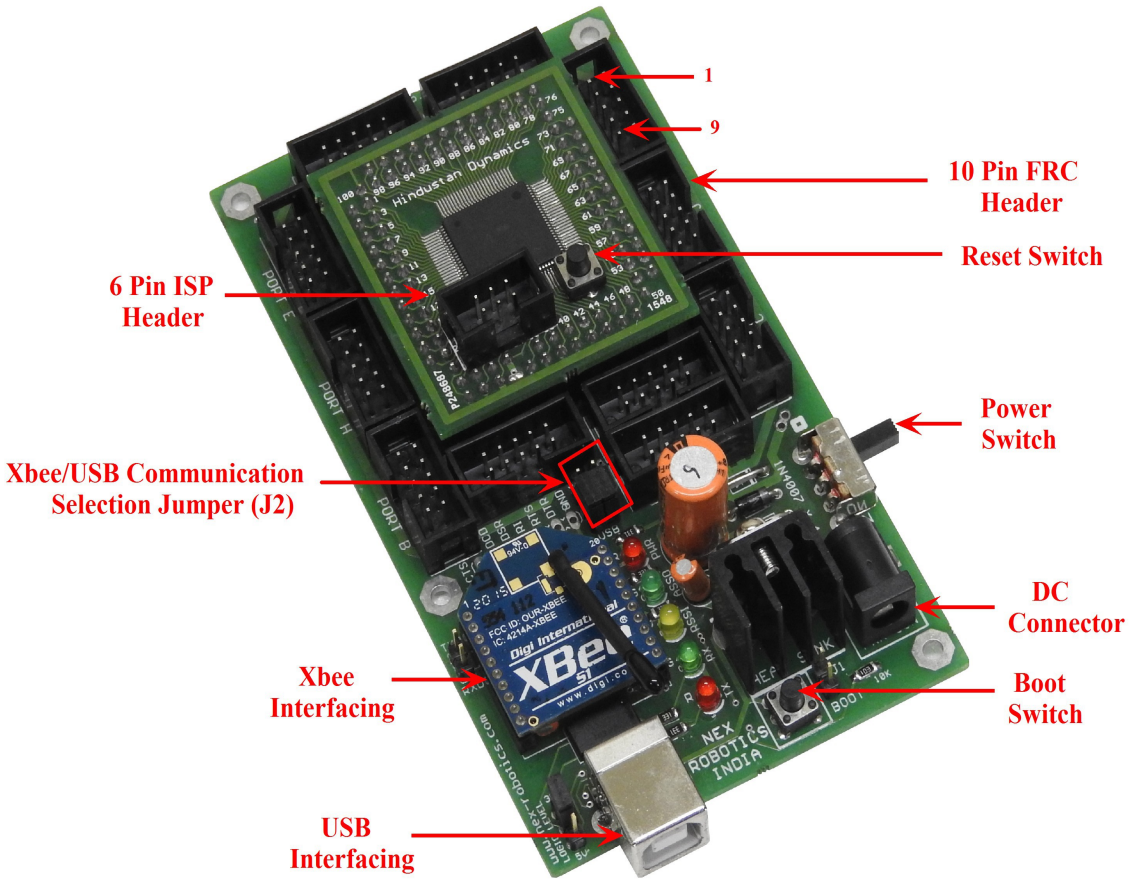

Figure 1: Atmega2560 Development board mini with Xbee / USB interfacing

Warning:
Do not provide power more than 15V DC to development board.

Note:
ATMEGA2560 Development Board Mini with Xbee/ USB interfacing schematic is available in a documentation CD provided with development board.

10 Pin FRC header pin configuration table:

Pin No.	Pin Function
1	Pin 0 of PORT X
2	Pin 1 of PORT X
3	Pin 2 of PORT X
4	Pin 3 of PORT X
5	Pin 4 of PORT X
6	Pin 5 of PORT X
7	Pin 6 of PORT X
8	Pin 7 of PORT X
9	5V 1A output of 7805 voltage regulator
10	Ground

Table No 1 : 10 pin FRC header pin configuration.

Serial Communication:
ATMEGA2560 development board mini can communicate with other devices serially using either wired link or wireless module. Serial communication is done in asynchronous mode.

ATMEGA2560 development board mini support following two mode of serial communication

1. USB Communication using on board FT232 USB to serial converter.
2. ZigBee Wireless Communication with ZigBee wireless module is installed on ZigBee holder.

Serial port of the ATMEGA2560 can be switched between USB port and Xbee wireless module using jumper setting connector J2.

USB interfacing with ATMEGA2560 Development board:
USB interface is used for interfacing development board with the PC and loading hex file on the development board using boot loading utility from NEX Robotics. USB communication is achieved by UART0 port of ATMEGA2560 via FT232 USB to Serial converter. To connect FT232 USB to Serial converter with the microcontroller, you have to set Jumper J2 in correct way. In this setting J2 connects TXD0 and RXD0 pins of the microcontroller with the FT232 USB to serial converter.

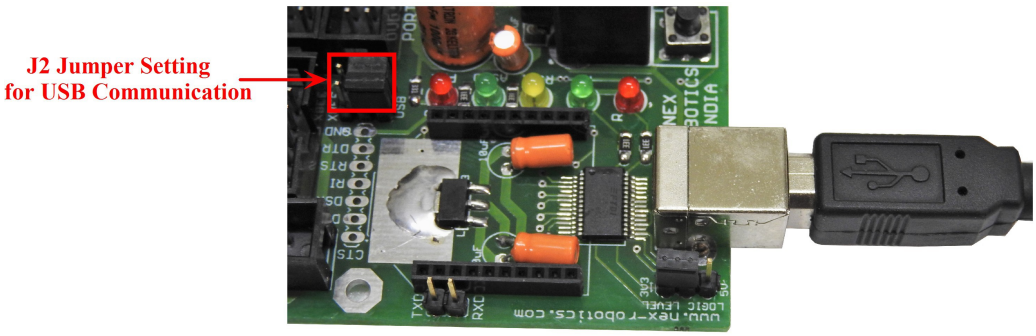

Figure 2: J2 jumper setting for USB communication

Figure 2 shows jumper setting for connecting FT232 USB to serial converter to the ATMEGA2560 microcontroller. USB LEDs marked by TXD and RXD shows the serial port activity.

Installing FT232 USB to Serial converter driver:
Before using USB port we need to install a driver software for FT232 USB to serial converter. A software is located in the "Software and Drivers \ CDM 2.06.00 WHQL Certified" folder. To install drivers for FT232 USB to serial converter and to identify or change COM port number, refer Driver installation procedure manual inside a "Documentation CD\Manual" folder.

Xbee wireless interface
XBee USB Wireless Module from the NEX Robotics enables wireless transmission of serial data through PC's USB port. It uses Xbee module for wireless communication. The Xbee module can be configured via PC's USB port easily using X-CTU utility to change frequency, baud rate etc which is located in the "Software and Drivers" folder in the documentation CD. XBee wireless modules accepts serial data from any device. To connect XBee USB Wireless Module to PC you need to install FT232 USB to serial converter driver. To install drivers for FT232 USB to serial converter and to identify or change COM port number, refer Driver installation procedure manual.

On the PC side this device is treated as the Communication Device Class (CDC) of USB family and it is assigned a virtual Comport number allowing the user to make use of exisisting serial terminal. The destination side (Development board / Robot) requires another XBee wireless module.

Make sure that XBee wireless module is installed on the development board. Serial port of the ATMEGA2560 can be connected to either USB port via FT232 USB to serial converter or to XBee wireless module. To established communication between microcontroller to XBee wireless module, set jumper J2 in the correct way as shown in figure 3.

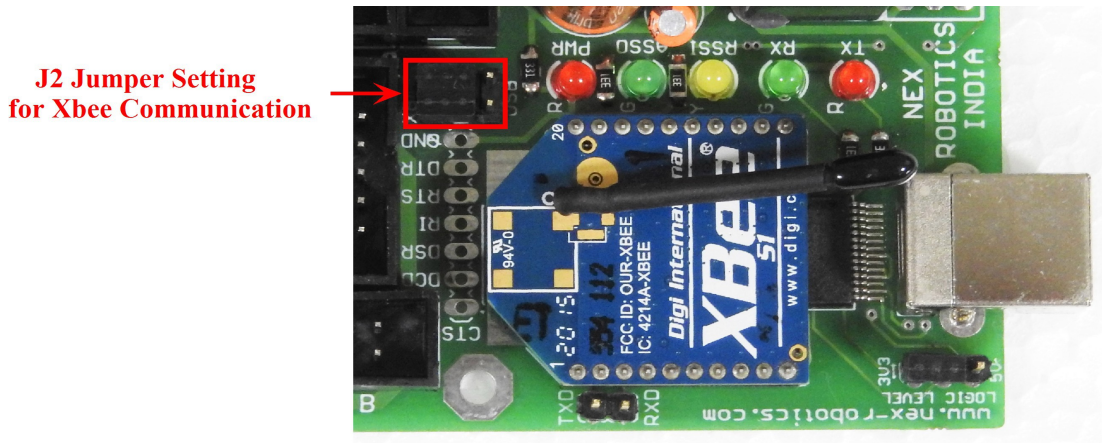

Figure 3: J2 jumper setting for Xbee communication

"ASSO" LED shows the association over the network. "RSSI" LED shows the strength of the wireless signals. For more details, refer to XBee wireless module's datasheet from the datasheet

folder of the documentation CD.

Application example for serial communication

Note: All the application examples are identical in nature. Development board can be communicate using wired or wireless link with PC from these application examples.

Serial communication over Wireless Xbee module or USB using FT232 USB to serial converter Located in the folder “Experiments \ ” folder in the documentation CD.

Note for all the application examples:

1.Make sure that in the configuration options following settings are done for proper operation of the code

Microcontroller: ATMEGA2560
Frequency: 14745600
Optimization: -O0

2. Also put the Jumper on J2 for selecting the either USB Module or XBee Wireless Module.