

Xbee for wireless transmission of data over terrestrial

[Technology](#), [Development](#)



XBee Pro S1: XBee Pro S1 is used for wireless transmission of data over terrestrial or underwater. XBee is short range with low data throughput wireless communication system. It is used for point-point or multipoint transmission with UART (Universal Asynchronous Receiver/Transmitter) interface. XBee Pro S1 belongs to a popular family XBee. Asynchronous means that data is transferred without support from an external clock. Data bit can be sent at any point.

Start and stop bits are used between data bytes to synchronize the transmitter and receiver. It is most cost effective method. RS 232 Logic operates -13v to -5v indicate a data bit of value 1. For +5v to +13 v indicate a data bit value 0. In TTL logic 0 to 0.8 indicate a data bit zero and 2v to 5v indicate high data bit 1. One end of the UART is a bus of eight or so data lines on the other is two serial wires- Rx and Tx. **Arduino UNO:** Arduino is used for interfacing sensors and motors also provide base for electronics projects.

Arduino consists of microcontroller and IDE software (Integrated Development Environment) that used to write and upload code to the physical board. Also facilitate to computer programmers for software development source code, build automation tools and debugger. Arduino boards have ability to read analogue and digital inputs.

Inputs that microcontroller can receive would be a temperature sensor, a motion sensor and a distance sensor. Digital input (means button is pushed) to control the speed of motor. Whereas, the output would be a LED light, a

screen and a motor. Arduino IDE uses a simplified version of C++ language, making it easier to learn to program.

By this it's easy to create a control system with the help of standard board that can be programmed. To blink the on-board LED need only a small code. Clock speed is 16 MHz . AT mega microcontroller can execute up to 16 million instructions per units second. PWM (Pulse width Modulation) is used for controlling the amplitude of digital signal in order to control devices and applications which required power.

XBee Explorer USB: XBee explorer provides a gateway between XBee to computer. XBee explorer USB is easy to use. Plug the unit into the XBee Explorer, attach a USB cable, and will have direct access to the serial and programming pins on the XBee Pro S1 unit. The main aspect of this board is an FT231 USB-to-Serial converter. In this way translates data between computer and the XBee Pro S1.

There's also a reset button, and a voltage regulator to supply the XBee Pro S1 with plenty of power. XBee explorer USB can be used as XB evaluation (XCTU software compatible). By using this define protocols of various XBee's via XCTU software. XCTU: XCTU (Next Generation Configuration Platform for XBee Pro S1 /RF Solutions) is a multi-platform application compatible with Windows to enable to interact with RF modules through a simple-to-use graphical interface. XCTU supports configuration and support for most Digi RF modules.

In addition, XCTU uses a serial link to interface with RF modules . For communication between radio devices AT and API mode is designed. XCTU contains complex and comprehensive documentation which can be accessed at any time. XCTU Working of proposed system: For Radio Frequency data transmission two XBee Pro S1 need as one acts as a transmitter and the other works as a receiver. Here, XBee Pro S1 either work in an AT mode or API mode.