XBee8PRMx (Wireless) Relay card
Low cost Data Acquisition & Control products
XBeePro wireless 8 chan relay card (range 100 metres*)

EasyDAQ
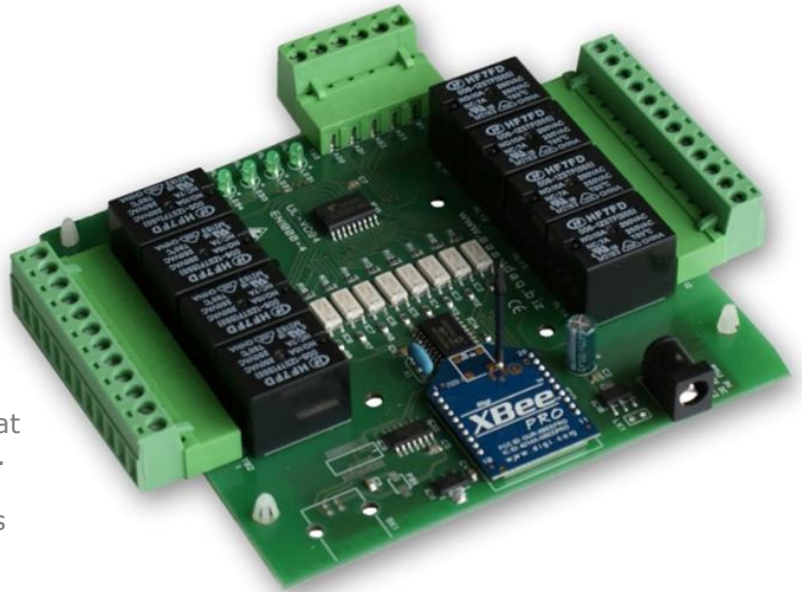Neat products, low cost, no frills

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100 metres

Features

- XBeePro wireless relay card fitted with 8 opto-isolated relays, designed to switch 120/240VAC at 10 amps (not Ethernet/wireless hub compatible). Robust secure RF DSSS Transmission protocol employing acknowledgement and multiple retries etc

- Requires USB connected XBeeTx module and XBee8PRMx relay card (sold as a pair). Each USBXBeeTx module has a pre-programmed, unique USB serial number/Device ID. Supports bi-directional 'write/read' operation.

- Transceiver range >100 metres (*line of sight). Broadcast or unique address options available.

- USBXBeeTx module is housed in a fully potted ABS case & connected/powered via 3 metre USB cable. Supplied with Velcro self adhesive pad.

- Low cost, high density, small profile, rugged design. Suitable for use in Commercial, Industrial or Home Automation applications etc

- OS compatibility: Win98SE/ME/2K/XP/Vista, Windows CE, Mac OSX and Linux. Example code downloads available for: LabVIEW, LabWindows CVI, VB, VC, C#, JAVA, Agilent VEE & Delphi + MAC Home Automation application and (open source) code

- Software interface & commanding is identical to our existing range of USB/Serial relay card products. If you have previously used our products, code written can be easily ported/adapted for use with this product

- Simple ASCII/Hex text commands mean the module can be controlled from a wide variety of programming languages & with commands input from terminal emulation programs (such as Windows HyperTerminal). Supports 'Status read' command function (you don't need to separately keep track of the relay activation status).

- Relay opto-isolation to 5000V AC. Relay contacts are uncommitted & taken direct to screw terminals,

- Relays are SPDT, Form C, changeover type, with N/O, COM and N/C contacts.

- USB8PRMx relay card is fitted with 2-part (male/female) screw terminal blocks for access to all relay contacts. LED indicators for relay activation status, fitted with nylon feet.

- Relay card requires external PSU or battery pack (5VDC to 15VDC @ 470mA with all relays on). Power connection is via 2.1mm DC jack or screw terminal block.

- CЄ, RoHS & BS9001:2000 & FCC compliant

- Full list of FCC/international certifications & approvals available on the XBeePro Product datasheet available from our website or from MaxStream (www.maxstream.net)

Description

Low cost, general purpose wireless relay card and compatible XBeePro transceiver module, fully potted & connected via a 3 metre long USB cable. Suitable for a wide range of commercial, industrial or home automation applications, the relay card is designed to handle 250VAC @ 10 amps and is fitted with 2 part (male/female) screw terminal blocks that allow rapid swap over or re-use elsewhere. The XBee family of RF devices provide 'transparent' RF serial communications capability (not Ethernet compatible).Relay module can operate from a battery pack.

Relay contacts are isolated and uncommitted. PCB & relays are designed to handle 120/240VAC@10A, but are also suitable for switching low voltage AC or DC voltages. Both modules are fitted with power and status indicator LED's. Velcro fixing pad is supplied with the USBXBeeTx module.

Example programs are available in LabVIEW, Visual C, Visual Basic, Agilent VEE and Delphi which demonstrate basic functionality of the card.

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Specifications

USB Interface
USB 1 & 2 compatible (virtual COM port). Tx module cable approx 3M long See below for explanation of Com Port number assignment/re-allocation

Operating temp range
-20 to +80^{0}C

Power
USBXBeeTx is USB powered (5V @ 70mA). XBee8PRMx relay card, 5 to 15VDC @ 470 mA (with all relays active).

Connection type
Screw terminal block, 2 part (male/female) allowing rapid swap over/re-use of relay card

Activation time (inc SW/link delay)
10mS max (comms link = 9600 Baud)

Relays
See detailed spec below

Dimensions
USBXBeeTx Module: Dimensions 40mm (D) 40mm (W) 20mm (H) (fully potted ABS case), Weight 140g (inc 3M USB cable).
XBee8PRMx relay Module: Dimensions 125mm (D) 145mm (W) 20mm (H) (exc feet), Weight 200g.

RF Tx/Rx Range*
USBXBeeTx/XBee8PRMx transceiver pair – line of sight range >100 Metres. Frequency Band = 2.4GHz. Refer to XBee website (www.maxstream.net) for full details and list of Worldwide approvals.

XBee module type
Transceivers use the XBeePro module from the MaxStream XBee family of devices. These are designed to give 'transparent RF operation' that is, communications appear exactly as if connected by direct wired connection ('plug & communicate' wireless operation).

Broadcast/Unique addressing options
Transceiver pairs are sold as either 'Broadcast' or 'Unique PAN ID address' pairs. Unique PAN ID address range is 0 to FFFFH.
(See below for more info).

Specifications: Relays

Parameter	Specification (Power relays)
Rated operate voltage/current	5VDC/50mA
Must operate/release voltage	75%/10% of rated voltage
Contact ratings	120/240VAC/10A or 30VDC/8A
Contact resistance	100mΩ max
Operate/release time	10mS/5mS
Contact bounce period	0.6mS operate/ 7.2mS release
Contact material	AgSnO$_2$
Operational life (min)	Mechanical 10^7 / Electrical 10^5
Contact arrangement	SPDT, Form C

Order codes

USBXBeeTxBC
USB transceiver module, fully potted with 3M USB cable.
Address mode set to default 'Broadcast' (see below).

USBXBeeTxUN
USB transceiver module, fully potted with 3M USB cable.
Address mode set to a fixed 'Unique' address (see below).

XBee8PRMxBC
8 channel relay card with XBeePro transceiver module.
Address mode set to default 'Broadcast' (see below).

XBee8PRMxUN
8 channel relay card with XBeePro transceiver module.
Address mode set to a fixed 'Unique' address (see below).

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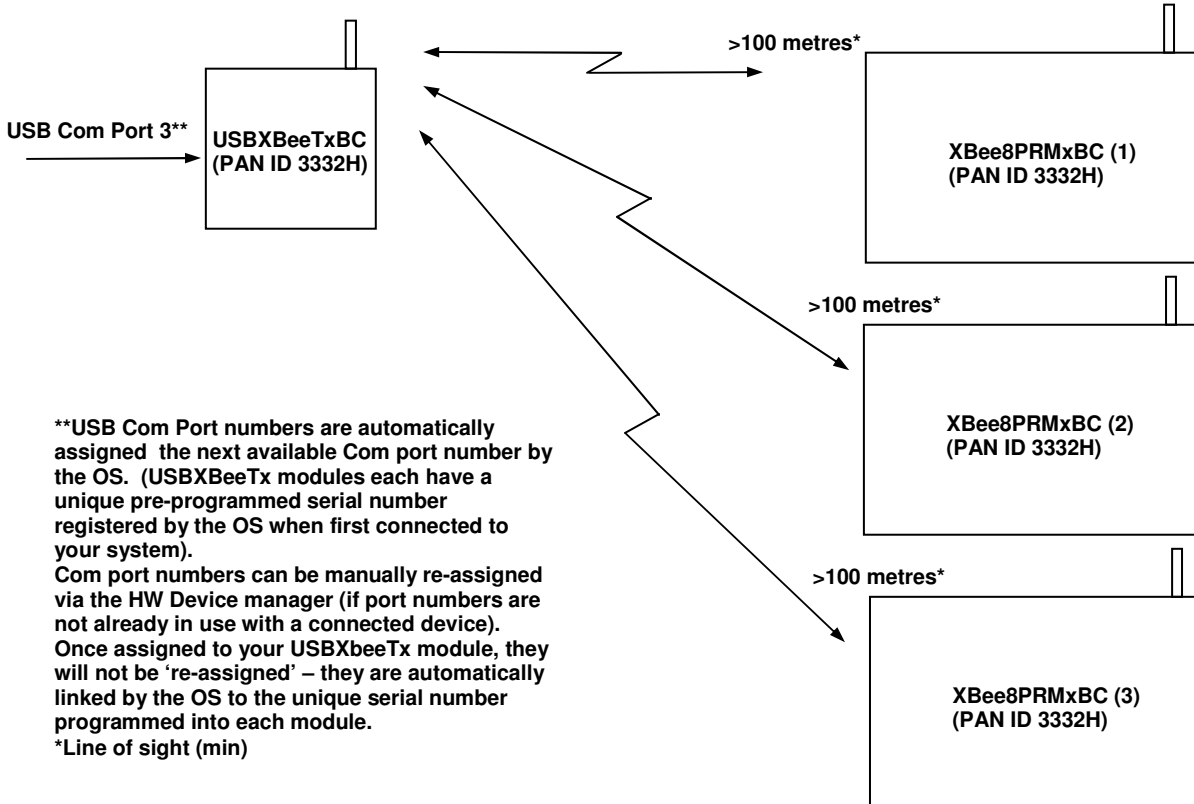
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Addressing options:
The XBeeTx/8PRMx pairs are sold with two Transceiver addressing options:

Default 'Broadcast' addressing mode (PAN ID = 3332H)
The XBeePro transceiver modules used in both the USBXBeeTx module and the XBee8PRMx relay card module are programmed with the default address (3332H). This addressing option allows one USBXBeeTx module to transmit data to/ read data from one or more XBee8PRMx relay card modules simultaneously.
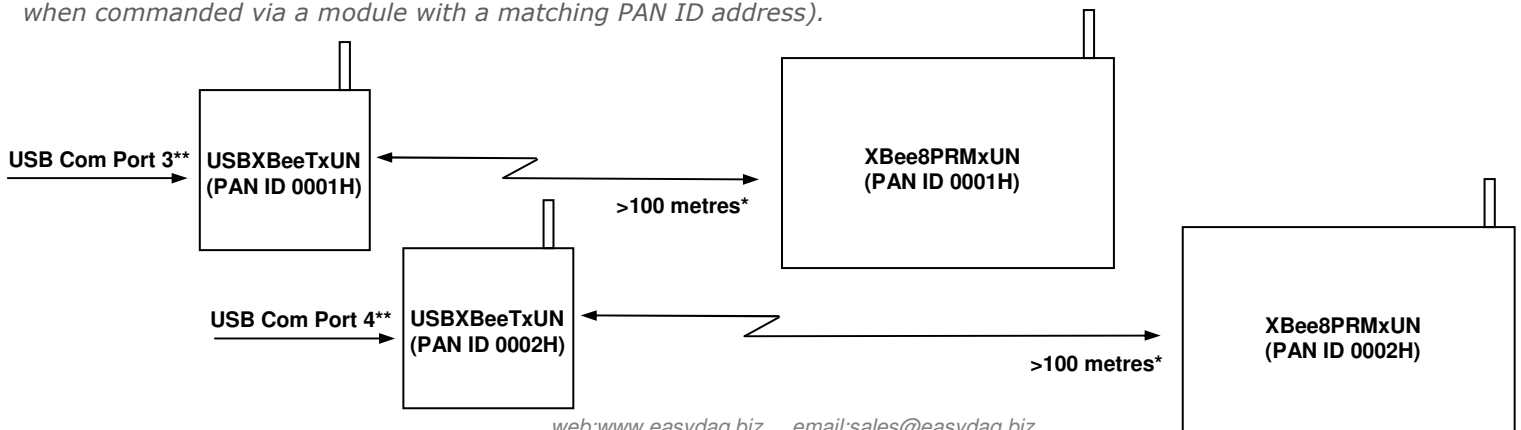
For example, one USBXBeeTx module could be used to simultaneously switch on lights at opposite sides of a theatre, or unlock/ open doors remotely in several locations with locally connected XBee8PRMx relay cards.

USB Com Port 3** → **USBXBeeTxBC (PAN ID 3332H)**

>100 metres*

XBee8PRMxBC (1) (PAN ID 3332H)

>100 metres*

XBee8PRMxBC (2) (PAN ID 3332H)

>100 metres*

XBee8PRMxBC (3) (PAN ID 3332H)

**USB Com Port numbers are automatically assigned the next available Com port number by the OS. (USBXBeeTx modules each have a unique pre-programmed serial number registered by the OS when first connected to your system).
Com port numbers can be manually re-assigned via the HW Device manager (if port numbers are not already in use with a connected device). Once assigned to your USBXbeeTx module, they will not be 're-assigned' – they are automatically linked by the OS to the unique serial number programmed into each module.
*Line of sight (min)**

Unique addressing mode (PAN ID = 0 to FFFFH)
A unique address is assigned to both the USBXBeeTx module and the XBee8PRMx relay card. (It is programmable & can be re-programmed or changed. Changing the unique address requires a separate module programming card and MaxStream software application). The XBeePro transceiver modules used in both the USBXBeeTx module and the XBee8PRMx relay card module are programmed with a unique address in the range 0 to FFFFH. This addressing option allows one USBXBeeTx module to transmit data to or read data from an XBee8PRMx relay card module pre-programmed with a matching PAN ID address.

For example, two different USBXBeeTx modules are required to control/read data from two separate Xee8PRMx cards located in separate parts of a factory or home automation system. They are assigned separate USB Com port numbers and must be individually addressed by the users controlling SW (they will not interfere with each other – they only respond when commanded via a module with a matching PAN ID address).

USB Com Port 3** → **USBXBeeTxUN (PAN ID 0001H)**

XBee8PRMxUN (PAN ID 0001H)

>100 metres*

USB Com Port 4** → **USBXBeeTxUN (PAN ID 0002H)**

XBee8PRMxUN (PAN ID 0002H)

>100 metres*

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Serial Port settings

Baud rate:	9600	Parity:	0
Data:	8 bits	Stop bits:	1
Handshaking:	None		

USB - Auto detection & com port assignment

This product uses the industry standard, FTDI Virtual Com Port chipset. When you connect it the USB port of a PC for the first time, it will be auto-detected and ask you to install the appropriate 32 or 64 bit drivers (downloadable from the 'downloads' section of our website). After installation, the card will appear as a 'Virtual' COM port and be automatically assigned a COM port number by your OS. Following installation, the COM port number can be manually re-assigned via the control panel if required. Following reboots or disconnects of the USB card, the same COM port number will be assigned. You can find the assigned COM port number via the Com Port settings of the Device Manager (under your PC's Control Panel). Note: Mac & Linux OS's do not require the VCP drivers to be installed; they are already installed as part of the standard OS build.

Command format

The card is commanded via simple single ASCII characters (+ status byte). These are commands that address each port of the PIC device (Hex equiv shown in brackets). The card can also be commanded via HyperTerminal – see below. If writing your own code, and not using one of our downloaded example programs, you need to ensure that you allow approximately 10mS between successive commands.

Port B (Channels 1-8) commands (Port A is not configurable):
ASCII 'B' (42H), X   Initialises the card (sets the port & channel I/O directions). Set direction of Port B, 1=Input, 0= output. (i.e. where X=10111111 (AFH) = sets bit 7 as an output, the rest as inputs).
ASCII 'A' (41H), X   Read Port B (Char X=don't care. Device sends 1 byte of returned data).
ASCII 'C' (43H), X   Write data X to Port B (i.e. X=00000001 (01H), sets channel 1 to active). Valid data bytes are latched by the card until a further valid data byte is written to it.

Using Windows HyperTerminal

In order to test operation, the card can be connected to a serial port and controlled from Windows HyperTerminal. Ensure port configuration is set as shown above, type (ASCII) characters shown above to achieve port direction and read or write command/data.

Example downloads

Example driver files and executables are available from the 'downloads' button for this products webpage (www.easydaq.biz). Example programs are currently available for LabView, Visual Basic, Visual C, Agilent VEE & Delphi.

Uses existing USB & serial port software examples

This card uses the same software drivers & command interface that is used in our existing range of USB & Serial port relay/ DIO card products. Therefore, if you have already used our USB or serial port products on a previous project, you may be able to re-use some or all of your code (or use this product instead of a serial port card).
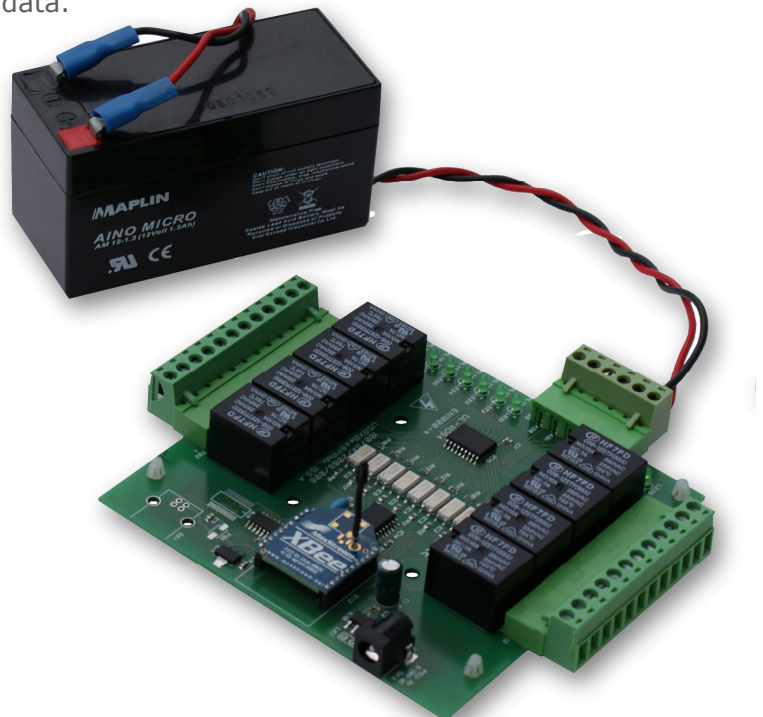
XBee8PRMx relay card powered from 12V battery