USB16PRMxN/SER16PRMxN
USB 8 channel relay card + 8 DIO + 8 relay or DIO
Low cost Data Acquisition & Control products

EasyDAQ
Neat products, low cost, no frills

Product Datasheet 41

Features

- USB powered/controlled card, with 8 relays + 8 DIO + 8 Relays or DIO chan's (or a mixture, via user selectable links)

- Relays & PCB tracking are designed to handle 240VAC @ 10 amps. Stackable design with horizontal entry, 2 part (male/female) screw terminal blocks

- Relays are SPDT, Form C, changeover type, with N/O, COM and N/C contacts taken to two part screw terminal blocks (along each side of the card) allowing rapid connect/ disconnect of card from target wiring

- Command set & software interface is identical to our existing range of Serial & USB port products. If you have previously used our products, your code can be easily ported to this product

- USB interface chip has a unique (factory set) serial number programmed into it. The card will be automatically assigned the next available USB port number when first connected to your target system. The USB port number will remain the same (if later reconnected) but can be manually changed using the device manager if needed.

- Example code downloads available for: Labview, VB, VC, C#, JAVA, Agilent VEE & Delphi. Uses simple ASCII/Hex text command strings. SW overhead & operate/release time 10mS max

- OS compatibility: Win98SE/2K/XP/Vista/7, Windows CE, Mac OSX and Linux

- USB power will support activation of upto 8 relays. (External +5V DC/1A power can be connected via 2 way screw terminal connector or 2.1mm jack socket for upto 16 relays. Onboard jumper link must be removed)

- LED channel & 5VDC status indicators. DIO channels can be disconnected from LED's via jumper links

- Protective perspex cover & base & DIN rail mount option available. Supplied with nylon feet (will take self tapping screws)

- CE & RoHS & BS9001:2000 compliant

- Free shipping (Worldwide)
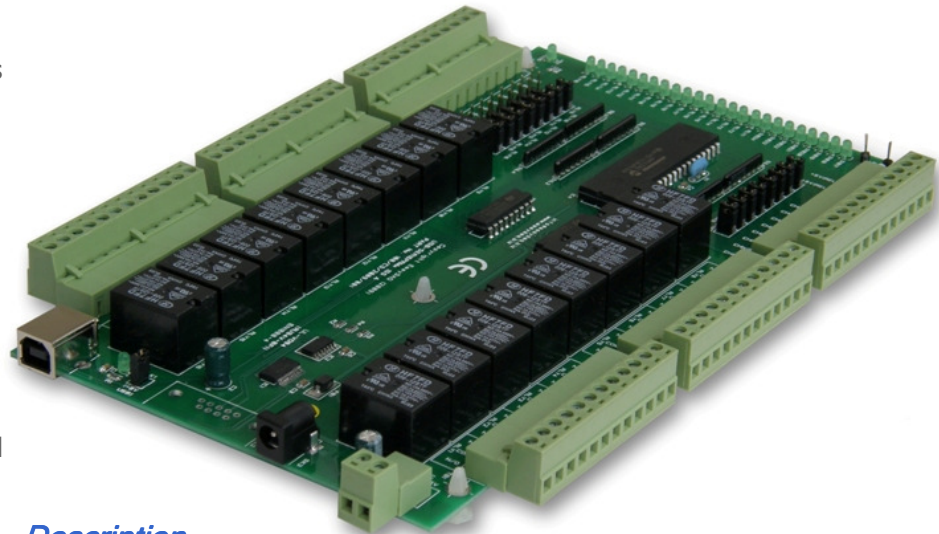
Description

General purpose USB (or RS232/ Serial) 16 channel relay card + 8/8 DIO channel. Relays & PCB tracking are designed to handle 240VAC@10A.

Relay & DIO control/activation is via simple ASCII/Hex characters. USB version appears as a 'virtual com port' when connected to your system. All relay contacts are connected to two-part screw terminal blocks along each side of the card. These allow rapid connect/disconnect or swap-over in your target system. 5VDC power connection is made via a 2 way screw terminal block in one corner of the card. Onboard link must be removed if external +5V PSU is used.

The card is stackable, via corner fixing holes. Available with a Perspex cover and DIN rail mount option if required.

DIO channels are normal logic level signals (+5V max) and can supply up to 20mA per channel.

Specifications

Control Interface
USB 1 or 2, Type B connector, hot pluggable or RS232 (9 W D Type female connector)

Power supply
USB powered (upto 8 relays) 5V DC (@ /60mA per relay)

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

Relays
See page 3 for technical details of the relays used

Dimensions
Dimensions approx 245mm (L) 160mm (W) 20mm (H) (exc feet), Weight, 440g

Order code

USB16PRMxN
USB 8 channel relay card + 8 relay/DIO + 8 DIO, fitted with 240VAC/10Amp relays & two part (right angle) screw terminal blocks giving access to NO/COM/NC relay contacts, the DIO channels and 0V/5VDC).
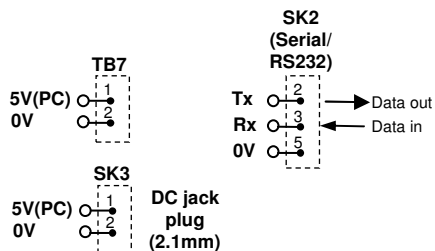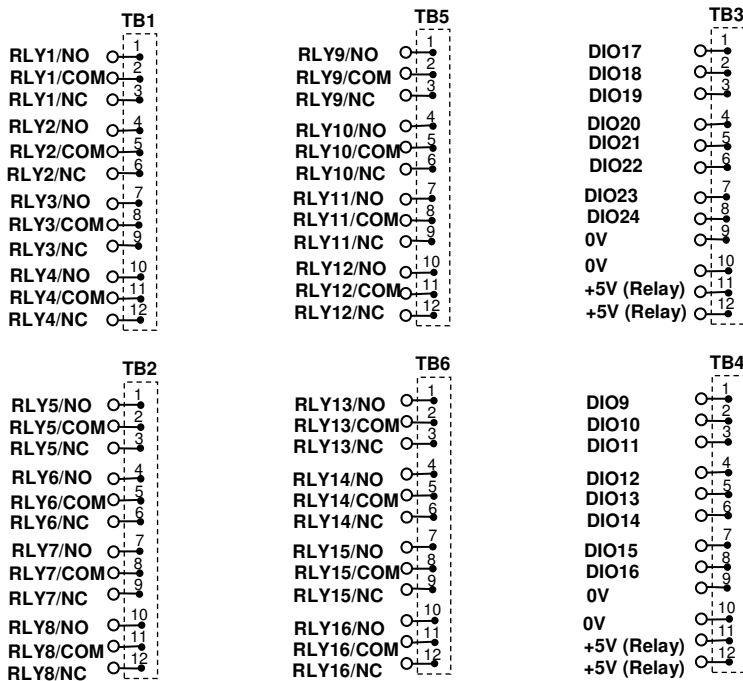
SER16PRMxN
As above, but fitted with a serial (RS232) connector and requiring an external +5V PSU connection via 2 way screw terminal block or 2.1mm DC jack connector.

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Connection details

External & screw terminal block connections to the relay cards are shown below:

TB1
RLY1/NO	1
RLY1/COM	2
RLY1/NC	3
RLY2/NO	4
RLY2/COM	5
RLY2/NC	6
RLY3/NO	7
RLY3/COM	8
RLY3/NC	9
RLY4/NO	10
RLY4/COM	11
RLY4/NC	12

TB5
RLY9/NO	1
RLY9/COM	2
RLY9/NC	3
RLY10/NO	4
RLY10/COM	5
RLY10/NC	6
RLY11/NO	7
RLY11/COM	8
RLY11/NC	9
RLY12/NO	10
RLY12/COM	11
RLY12/NC	12

TB3
DIO17	1
DIO18	2
DIO19	3
DIO20	4
DIO21	5
DIO22	6
DIO23	7
DIO24	8
0V	9
0V	10
+5V (Relay)	11
+5V (Relay)	12

TB7
5V(PC)	1
0V	2

SK3
5V(PC)	1
0V	2

DC jack plug (2.1mm)

SK2 (Serial/ RS232)
Tx	2	→ Data out
Rx	3	← Data in
0V	5	

TB2
RLY5/NO	1
RLY5/COM	2
RLY5/NC	3
RLY6/NO	4
RLY6/COM	5
RLY6/NC	6
RLY7/NO	7
RLY7/COM	8
RLY7/NC	9
RLY8/NO	10
RLY8/COM	11
RLY8/NC	12

TB6
RLY13/NO	1
RLY13/COM	2
RLY13/NC	3
RLY14/NO	4
RLY14/COM	5
RLY14/NC	6
RLY15/NO	7
RLY15/COM	8
RLY15/NC	9
RLY16/NO	10
RLY16/COM	11
RLY16/NC	12

TB4
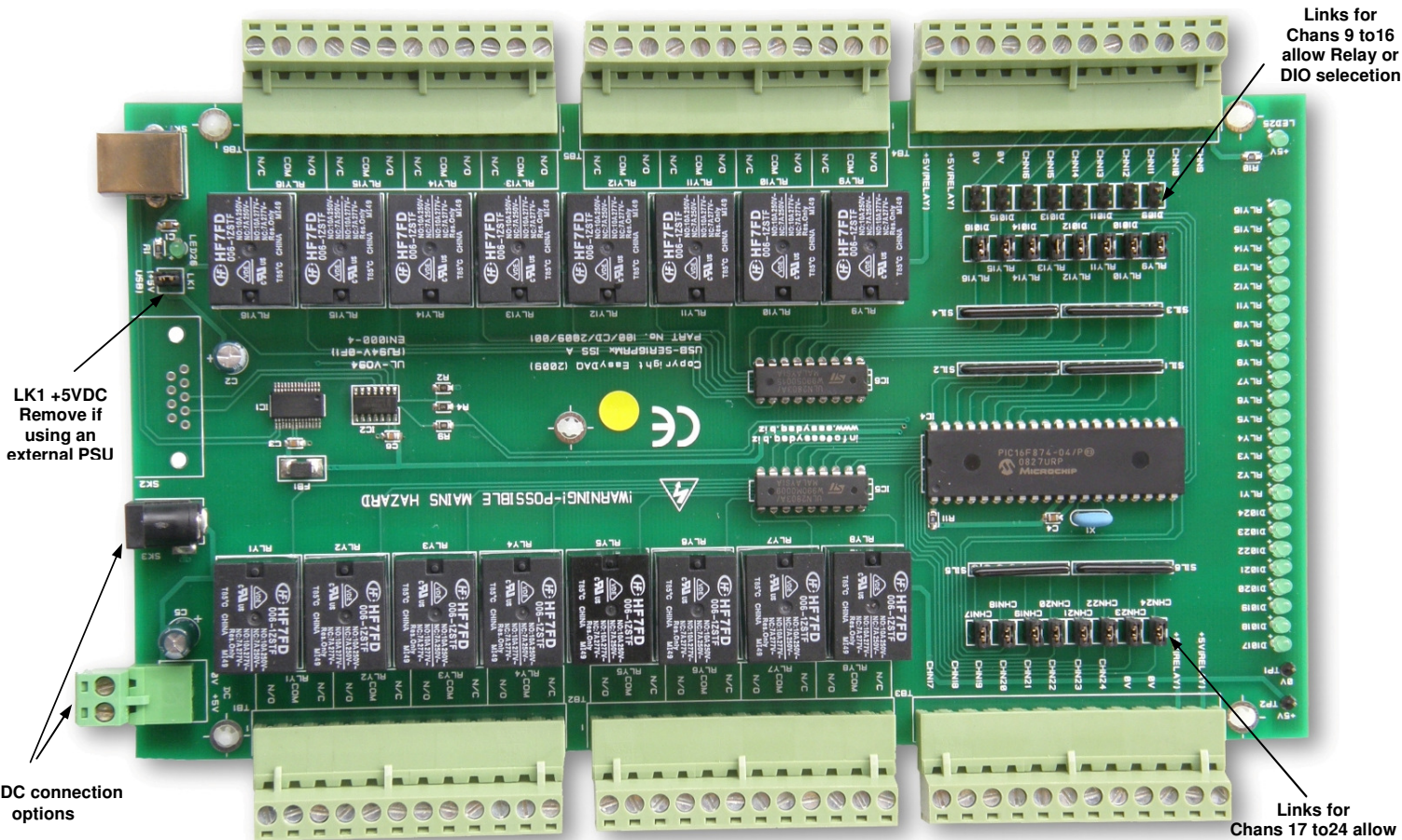|	
DIO9	1
DIO10	2
DIO11	3
DIO12	4
DIO13	5
DIO14	6
DIO15	7
DIO16	8
0V	9
0V	10
+5V (Relay)	11
+5V (Relay)	12

IMPORTANT – PLEASE NOTE:

If using an external +5VDC PSU to provide power for the relays, the link header (LK1 +5V USB) must be removed prior to connecting the card to your USB port. The USB port will then provide power to the onboard electronics, and the relays will be powered by the external PSU. (The USB port will provide enough power for 8 relays to be activated simultaneously).

Note: SER16PRMxN requires an external +5V/1A DC PSU.

DIO Chans 9 to 16 are user selectable via onboard links. They can be individually connected as either DIO channels or relays. (Default connection is to the relays)

Links allow channels 17 to 24 to be isolated from the LED indicators giving the option of a direct DIO connection. (Default connection is to the LED indicators).

Relays 1 to 8 and DIO chans 17 to 24 are not user selectable.

LK1 +5VDC Remove if using an external PSU

+5V DC connection options

Links for Chans 9 to16 allow Relay or DIO seleection

Links for Chans 17 to24 allow DIO chans to be isolated from LED's

Face view showing screw terminal connectors & LED locations

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Specifications: Relays

Parameter	Specification (Power relays)
Rated voltage/current	5VDC/80mA
Must operate/release voltage	75%/10% of rated voltage
Contact ratings	10A/240VAC/8A 30VDC
Contact resistance	100mΩ max
SW overhead/ Operate/ release time	10mS
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
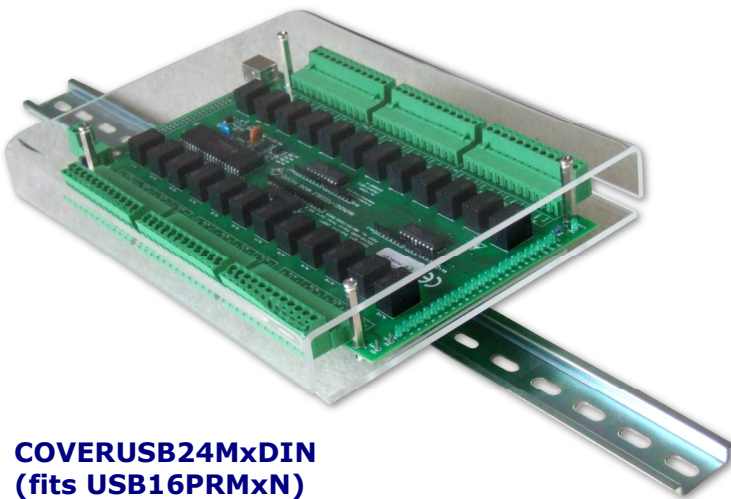
**COVERUSB24MxDIN
(fits USB16PRMxN)**
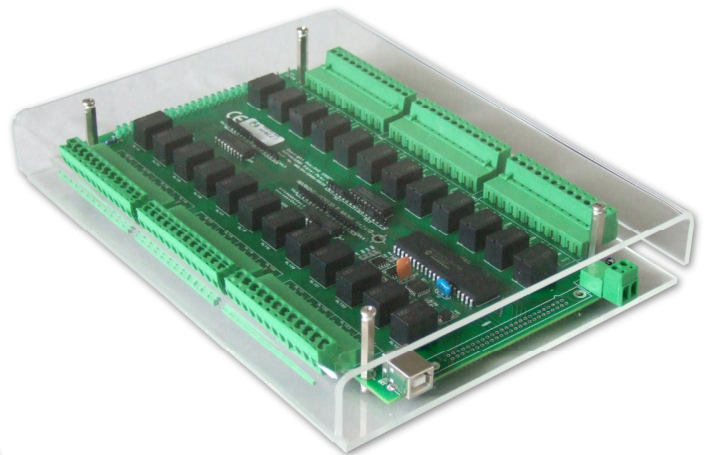
**COVERUSB24Mx
(fits USB16PRMxN)**

**SER16PRMxN
(requires +5V PSU)**

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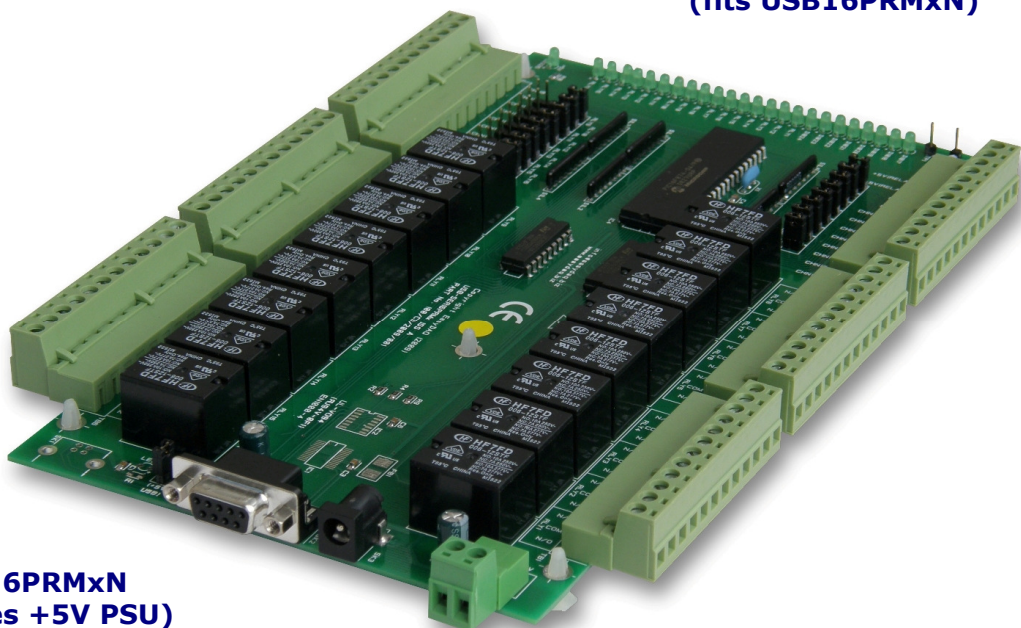
Serial Port settings

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

Auto detection & com port assignment

When you connect this card to a USB port of your PC* for the first time, it will be auto-detected and ask you to install 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. Each card has a USB virtual COM port chip with a unique (factory set) serial number. The card is automatically assigned the next available COM port number by your OS. The COM port number will remain reserved (against the unique serial number, even if card is disconnected) but can be manually re-assigned via the Device manager if required. *Mac & Linux platforms already have the USB virtual COM port drivers loaded.

Command format

The card is initialised & commanded by sending a single ASCII character followed by a hex number (representing the required port status). The commands address each port of the PIC device (there are three 8 bit ports. ASCII character Hex equiv shown in brackets). You must first set the port direction (as either input or output). If a channel is set as an input, your software must send a read command (of that channel) followed by a read of the serial port. The card can also be commanded via HyperTerminal – see below.

Port B, C & D (Channels 1-8, 9-16 & 17-24) commands:
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 '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.
ASCII 'E' (45H), X   Initialises the card (sets the port & channel I/O directions). Set direction of Port C
ASCII 'F' (46H), X   Write data X to Port C (i.e. X=00000001 (01H), sets channel 1 to active).
ASCII 'H' (48H), X   Initialises the card (sets the port & channel I/O directions). Set direction of Port D
ASCII 'K' (4AH), X   Write data X to Port D (i.e. X=00000001 (01H), sets channel 1 to active).

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 (of our website www.easydaq.biz). Example programs are currently available for LabView, Visual Basic, Visual C, C#, JAVA, 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 a USB card in place of a serial port card).

If you are a Mac or Linux user, please refer to this web link for additional information and low level details on how to address and command the cards (paste this link into your browser):

http://www.easydaq.biz/Datasheet%20Contact%20Details/indexEeePCInfoRequest.htm