

Product Datasheet 64 DRAFT

Features

- USB powered & controlled, 24 channel relay card
- Example code downloads available for: Python, LabVIEW, VB, VC, C#, JAVA, Agilent VEE & Delphi. Uses simple ASCII/Hex text command strings
- OS compatibility: Windows 98SE, 2K, XP, Vista CE, 7, 10, 11 Mac OSX and Linux
- Choice of either 240VAC/10 Amp power relays or 30VDC/1A, high sensitivity (AuAg overlay, Ag Alloy contact, low contact resistance) signal relays
- USB24PRMxV2 version PCB Tracking is designed to handle 240VAC @ 10 amps
- Relays are SPDT, Form C, changeover type, with N/O, COM and N/C contacts taken to two-part screw terminal blocks allowing quick connect/disconnect of card
- USB power will support activation of up to 8 off 5 or 6V relays. See [Link Options](#)
- DC external power can be connected via a 3-way screw terminal connector to operate more than 8 relays (See [Link Options](#)) or 12V and 24V relay versions
- **NEW Onboard +9 to +30V Dc-Dc power supply**
- **NEW optional full isolation between USB bus and Relay operation. See [Link Options](#)**
- **NEW 4-bit, 5V logic DIO port with up to 4 inputs and up to 3 outputs.**
- Operate/release time 5mS Max
- LED channel & supply status indicators are located along one end of the card giving visual indication of activation status. **NEW Tx and RX data indicators for debugging.**
- Stackable design with horizontal entry, 2-part (male/female) screw terminal blocks
- Supplied with nylon feet (will take self-tapping screws)
- Protective polycarbonate cover & base available & DIN rail mount option
- UKCA, CE & RoHS compliant



Description

General purpose USB 24 channel relay card, available with a choice of either power (240VAC/10amp) or high sensitivity signal (gold contact, low contact resistance) relays.

Relay control/activation is via USB 'virtual com port' commands. All relay contacts are connected to two-part screw terminal blocks along each side of the card.

External power connection is made via a 3-way screw terminal block in one corner of the card.

New optional full isolation between USB bus and Relay operation.

New 4-Bit, 5V logic DIO with user selectable pull-down resistors. The DIO directions are software selectable with up to 4 inputs and up to 3 outputs.

New onboard 5V SMPSU with 9VDC to 30VDC supply range for system logic and/or relay power.

The card is stackable, via corner fixing holes, allowing low-cost implementation of relay stack or matrix functions.

Specification

Control Interface

USB 1 or 2, Type B connector, hot pluggable.

Power supply

USB powered (up to 8 relays) 5V DC (@ 40mA /80mA per relay) required for >8 relays

Operating temp range

-20 to +80°C

Relays

See page **Error! Bookmark not defined.** for technical details of the relays used

Dimensions

Dimensions approx. 205mm (D) 126mm (W) 22mm (H) (exc. feet), Weight 360g (signal relays), 540g (power relays).

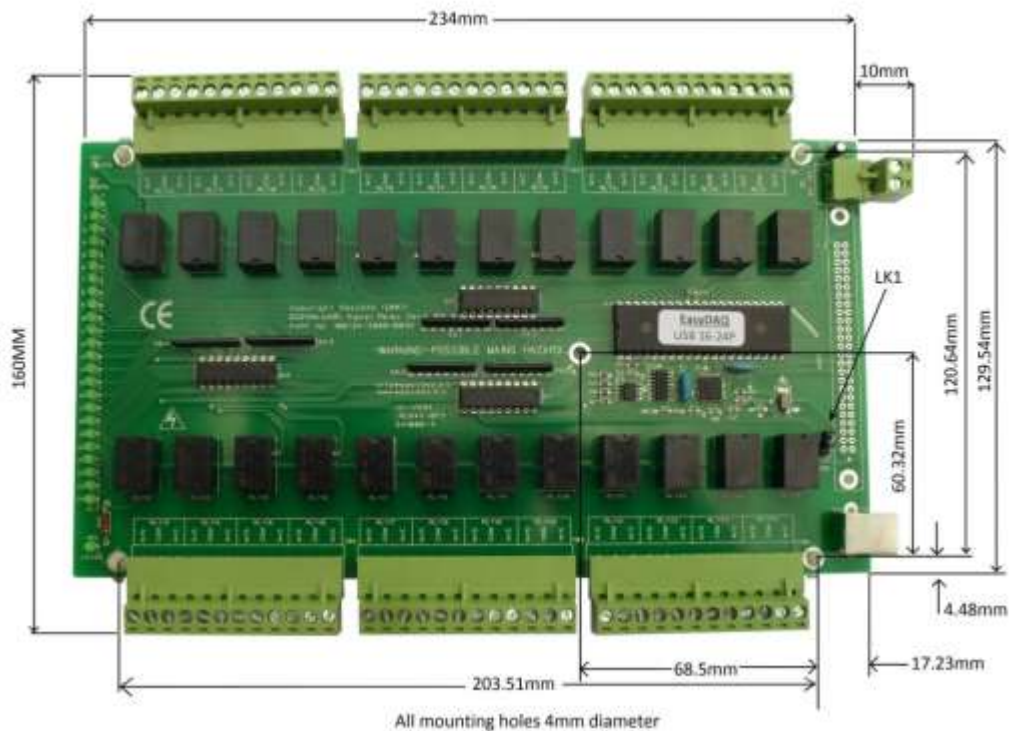


COVERUSB24Mx accessory

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<i>Specifications: Relays</i>					
Parameter	5V Power relays	6V Power relays	12V Power relays	24V Power relays	Signal relays
Rated voltage/current	5VDC/71mA each	6VDC/60mA each (50mA at 5V)	12VDC/44mA each	24VDC/22mA each	5VDC/42mA each
Must operate/release voltage	75%/10% of rated voltage				75%/10% of rated voltage
Contact ratings	10A/240VAC or 8A 30VDC				1A/120VAC or 1A 30VDC
Contact resistance	100mΩ max				100mΩ max
Operate/release time	10mS/5mS				5mS/5mS
Contact bounce period	0.6mS operate/ 7.2mS release				0.6mS operate/ 7.2mS release
Contact material	AgSnO ₂				AuAg overlay, Ag Alloy
Operational life (min)	Mechanical 10 ⁷ / Electrical 10 ⁵				Mechanical 10 ⁷ / Electrical 10 ⁵
Contact arrangement	SPDT, Form C				SPDT, Form C

Dimensional drawing (USB24SRMx shown)

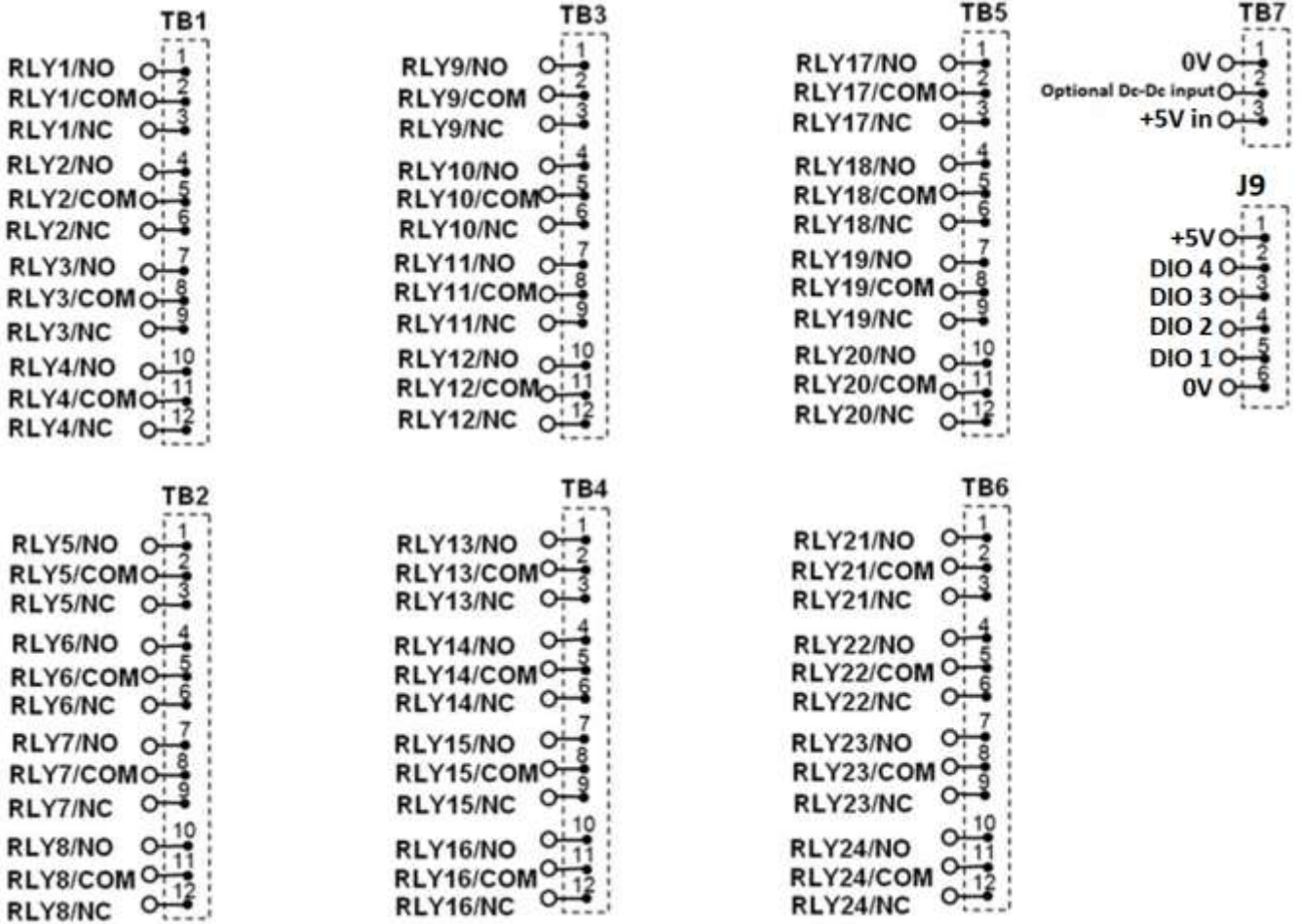


<i>Order codes</i>	
USB24PRMxV2	Our original USB 24 channel relay card, fitted with 6V relays (activated from 5V for lower power operation), 240VAC/10Amp, SPDT Power relays and two-part (right angle) screw terminal blocks giving access to NO/COM/NC relay contacts for all channels. NEW onboard +9 to +30V Dc-Dc power supply, opto-isolation and DIO.
USB24PRMxV2-5V	As USB24PRMx above, but fitted with 5V relays for normal operation, preferably using an external power supply and links set to external power. NEW onboard +9 to +30V Dc-Dc power supply, opto-isolation and DIO.
USB24PRMxV2-12V	As USB24PRMx above, but fitted with 12V relays for normal operation, using an external power supply and links set to external power. NEW onboard +9 to +30V Dc-Dc power supply, opto-isolation and DIO.
USB24PRMxV2-24V	As USB24PRMx above, but fitted with 24V relays for normal operation, using an external power supply and links set to external power. NEW onboard +9 to +30V Dc-Dc power supply, opto-isolation and DIO.
USB24SRMx	As above, but fitted with 5V, 30VDC/1A, high sensitivity (AuAg overlay, Ag Alloy) signal relays. Suitable for low voltage/current, or low contact resistance signal switching applications. Use a 5V external power supply and LK1 open if more than 8 relays are to be activated at one time. NOTE. Not yet available using a V2 board. V2 of this board is not yet in production. See Datasheet 25.

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Connection details

External screw terminal connections to the cards are shown below:



COVERUSB24MxDIN option

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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 computer 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.

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 equivalent shown in brackets). The card can also be commanded via a Terminal Emulator – see below.

Port B (Channels 1-8) commands:

ASCII 'A' (41H), X Read Port B. The value 'X' can be any value. The byte returned represents the states of relays 1 to 8.
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.

Port C (Channels 9-16) commands:

ASCII 'D' (44H), X Read Port C. The value 'X' can be any value. The byte returned represents the states of relays 9 to 16.
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 9 to active).

Port D (Channels 17-24) commands:

ASCII 'G' (47H), X Read Port D. The value 'X' can be any value. The byte returned represents the states of relays 17 to 24.
ASCII 'H' (48H), X Initialises the card (sets the port & channel I/O directions). Set direction of Port D
ASCII 'J' (4AH), X Write data X to Port D (i.e. X=00000001 (01H), sets channel 17 to active). Note, ASCII 'I' is not used here.

Port E (DIO 1 to 4) commands:

ASCII 'K' (4BH), X Read Port E. The value 'X' can be any value. Bottom 4 bits of the returned value correspond to DIO channel 1 to 4.
ASCII 'L' (4CH), X Initialises the card (sets the Port E channel I/O directions). Set direction of Port E. Note only the lower 4 bits affect the port.
ASCII 'M' (4DH), X Write data X to Port D (i.e. X=00000001 (01H), sets DIO channel 1 HIGH).

Notes on the USB24PRMx V2 DIO port:

All 4 bits need to be set to INPUT or OUTPUT as required before use. This port is connected to the processor via 120R resistors to give a small measure of protection.

Input and output signals are 0V to 5V.

Channel 3 is input only and will remain as an input if an attempt is made to set it to an output. This is a limitation of the processor.

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JP12 "Attenuation" acts as 20K Ohm pull down selection. If the link for one of the is removed then the Pulldown is disabled for that channel and the input will float.

Using a Terminal Emulator

In order to test operation, the card can be connected to a serial port and controlled from a terminal emulator program such as "PuTTY" or "Realterm". See our "[Data Sheet 50 \(Using Terminal Emulators to control and test EasyDAQ cards\)](#)". Ensure port configuration is set as shown above, type (ASCII) characters shown above to achieve port direction and read or write command/data.

Link options

For USB24SRMx see datasheet 28.

For USB24PRMxV2 EDQ-PCB-018-03 and higher variants:

The board has 3 links to route power to the logic and relays.

For the standard USB24PRMxV2 the default links are set up for USB power to the logic and relays. See [Figure 1](#)

Link	Description	Position	Setting	Notes
JP13	Logic 5V selection	1-2	Link to USB+5V	USB 5V powering logic
		2-3	Link to onboard DC-DC	DC-DC powering logic
JP14	Relay power selection	1-2	Logic 5V selection	Logic selection also powering relays
		2-3	Link to direct to External Vin	External Vin powering relays
JP15	0V link	1-2	Link to USB+0V	USB 0V reference
		2-3	Link to External 0V	External 0V reference

Default link positions		
JP13	1-2	Relay +V = Logic +5V
JP14	1-2	Logic +5V = USB +5V
JP15	1-2	0V = USB 0V
J12	1-2	DIO 1 pull down
J12	3-4	DIO 2 pull down
J12	5-6	DIO 3 pull down
J12	7-8	DIO 4 pull down



Figure 1 USB24PRMxV2 Default links

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However, the default link settings setting will only allow a maximum of 8 off 6V relays at a time to be controlled reliably and does not fully isolate the USB from the relay circuits.

An external power supply is required for powering more than 8 of the standard 6V relays. This can be a +5V supply connected to terminals 1 and 3 on TB7 or +9V to +30V connected to terminals 1 and 2 of TB7.

Onboard DC-DC powering logic and 5V or 6V Relays:

Onboard DC-DC link positions		
JP13	2-3	Relay +V = Logic +5V
JP14	1-2	Logic +5V = DC-DC +5V
JP15	2-3	0V = Ext. 0V



Figure 2 Links for external DC-DC power and USB isolation.

The above configuration allows full Opto-isolation of the USB circuit from the relay circuit.

If higher voltage relays are being used then these can be powered directly from the external Voltage input.

Onboard DC-DC and external Vin link positions		
JP13	2-3	Relay +V = Ext. Vin
JP14	2-3	Logic +5V = DC-DC +5V
JP15	2-3	0V = Ext. 0V



Figure 3. This configuration also gives full opto-isolation.



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NOTE.

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This is a DRAFT version of a new datasheet. Some details may change. Contact us if there is any information that you require.

Document versions

Version number	Date	Notes
V1.0 Draft	18 th June 2024	Original. Currently still a draft document. Based on Datasheet 28 V1.1. For boards prior to EDQ-PCB-018-3.
V1.1 Draft	12 th Aug. 2024	For EDQ-PCB-018-3. Power supply options changed. DIO added.

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