

USBRelays

User manual

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ver 1.0

INTRO

USBRelays card has been designed to control up to 7 relays and 5 analogue axles.

It can be connected to the USB port and the card is controlled by IOCP protocol.

The card can be also connected to Master card, using 7 outputs in this case.

There are a reduced version of this card that can only be connected to Master card. This reduced version doesn't include analogue axles.

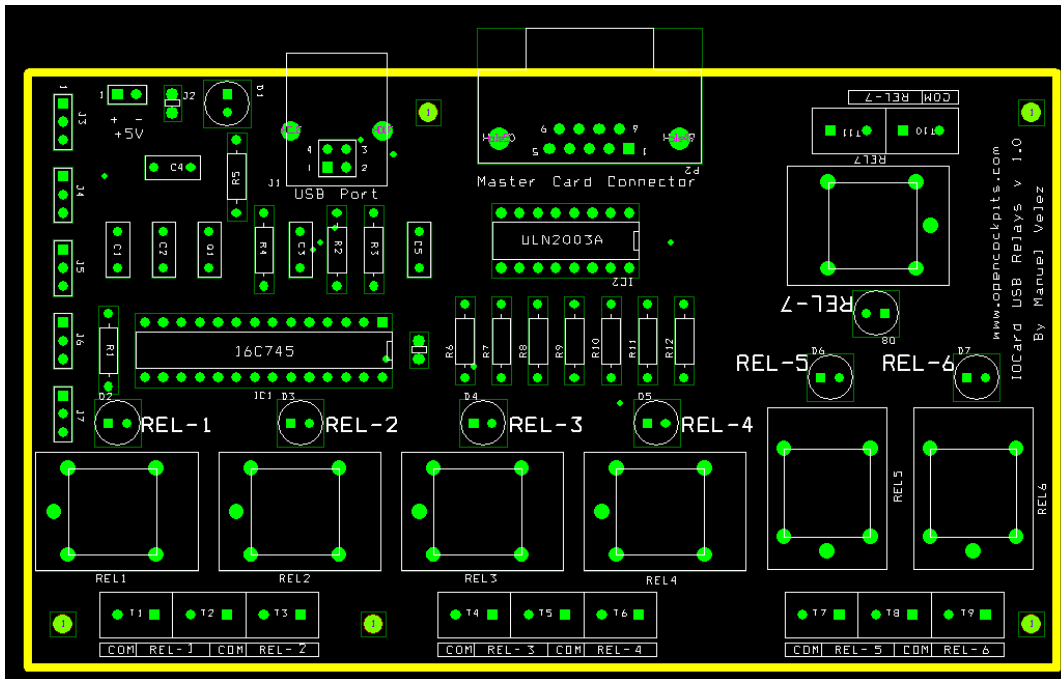
TECHNICAL SPECIFICATIONS

- USB connection (excepto for the reduced version).
- Control of 7 relays (10 amperes; 250 volts).
- 5 8-bits analogue axles included.
- Specific software that connects to IOCP.
- 7 2-positions relays (with indication light).
- Cables are fitted with just a screw driver. No need of welding.
- Connection to Master card is possible.

COMPONENTS LIST

C1 condenser 220nf
C2,C3 condensers 22Pf
C5,C4 condensers 0.1mF
D1,D2,D3,D4,D5,D6,D7,D8 Diodes Leds
IC1 Microcontroller 16C745
IC2 IC ULN2003A
+5V external power source connector
J1 USB connector
J2 jumper (external/internal power source selection).
J3,J4,J5,J6,J7 3-pins connectors
P2 DB9 connector
Q1 6 MHz quartz
REL1,REL2,REL3,REL4,REL5,REL6,REL7 Omrom G5LE-1 relays
R1 1K5 resistor
R2 10k resistor
R3 100 ohms resistor
R4 -not used-
R5,R6,R7,R8,R9,R10,R11,R12 470 ohms resistors
SW1 -RESET- (not used)
T1,T2,T3,T4,T5,T6,T7,T8,T9,T10,T11 Relays connectors.

LAYOUT



J1 = USB connector.

P2 = DB-9 connector (for Master card).

+5V = external power source connector.

J2 = power source selection jumper (closed=internal, opened=external).

J3 – J7 = analogue inputs.

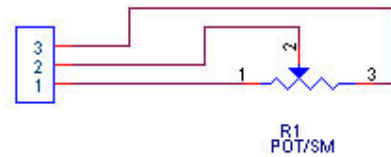
T1 – T11 = relay connectors.

J3 a J7 – Analogue inputs

Pin 1 = GND

Pin 2 = Data

Pin 3 = +5V



POTENCIOMETRO 10K

T1 – T11 = relay connectors.

For every relays:



The first pin (**COM**) is the common pin; the second one is the relay position 1 (enable when the relay is disabled); and the last pin is the relay position 2.

The relay works like a two positions switch, following this diagram:



P2 = DB-9 connector for Master card.

This connector is only used when USBRelays is connected to Master card. **NEVER** use USB and DB9 connections at the same time!

The pins assignment in this connector correspond with the DB9 connector on Master card. Just use a female-female DB9 extension cable.

When connected to Master card, if the power source jumper is closed, Master card is the power source for USBRelays card.

COMPONENTS LIST (REDUCED VERSION)

C5,C4 condensers 0.1mF

D1,D2,D3,D4,D5,D6,D7,D8 Diodes Leds

IC2 IC ULN2003A

+5V external power source connector

J2 power source selection jumper (closed=internal, opened=external).

P2 DB9 connector

REL1,REL2,REL3,REL4,REL5,REL6,REL7 Omrom G5LE-1 relays

R6,R7,R8,R9,R10,R11,R12 470 ohms resistors

T1,T2,T3,T4,T5,T6,T7,T8,T9,T10,T11 Relays connectors.

* Rest of components are not used in the reduced version card.

USBRELAYS SOFTWARE

IOCRelays.exe: connection to IOCP

USBRelays card is configured with the file IOCRelays.ini

We can find the following parameters in it:

MUSB=No , we'll set YES in the case several cards are connected to the same PC. We'll indicate the device number in this case.

deviceUSB=2048 , we'll set here the device number the controller must connect to.

If we don't know the device number, we will connect one card after other, writing down the device number shown by the controller. This number is different for each USB port.

IOCP_host=localhost , IOCP server address where to connect.

IOCP_port=8092 , and the corresponding port.

IOCP server (normally SIOC) can be located in any network PC, so USBRelays can be connected to any of these PCs.

USB_AD=5 , Number of analogue axles to use (0-5).

IOCP_timeout=4000 , Maximum answer time for IOCP information packages.

IOCP_Var0=0, IOCP variable that controls Relay #1

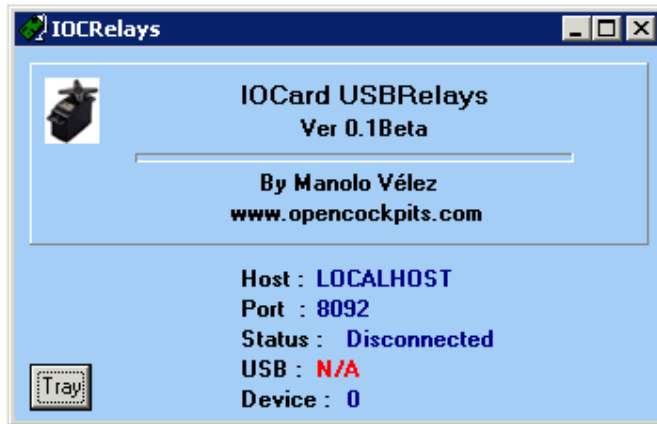
...

IOCP_Var6=6, IOCP variable that controls Relay #7

IOCP_Var7=7, IOCP variable where to read analogue axle A/D #1

...

IOCP_Var11=11, IOCP variable where to read analogue axle A/D #5



When the software is started, the address and port is shown (if the connection to IOCP server has been succesful). If the card has been located and is working correctly, then the device number is shown too.

To control the relays, we just create a small SIOC program in which the relay control variable is set to 0 (1) to connect (disconnect) the relay. Relay connected = position 1; Relay disconnected = position 2.

Card won't be enabled until the first data is sent to it. The USB led will be turned off until then.

The rprogram includes a TRAY option to hide it in the icons tray. If we set this parameter to YES in the ini file, then the program is send to the tray when it's started.