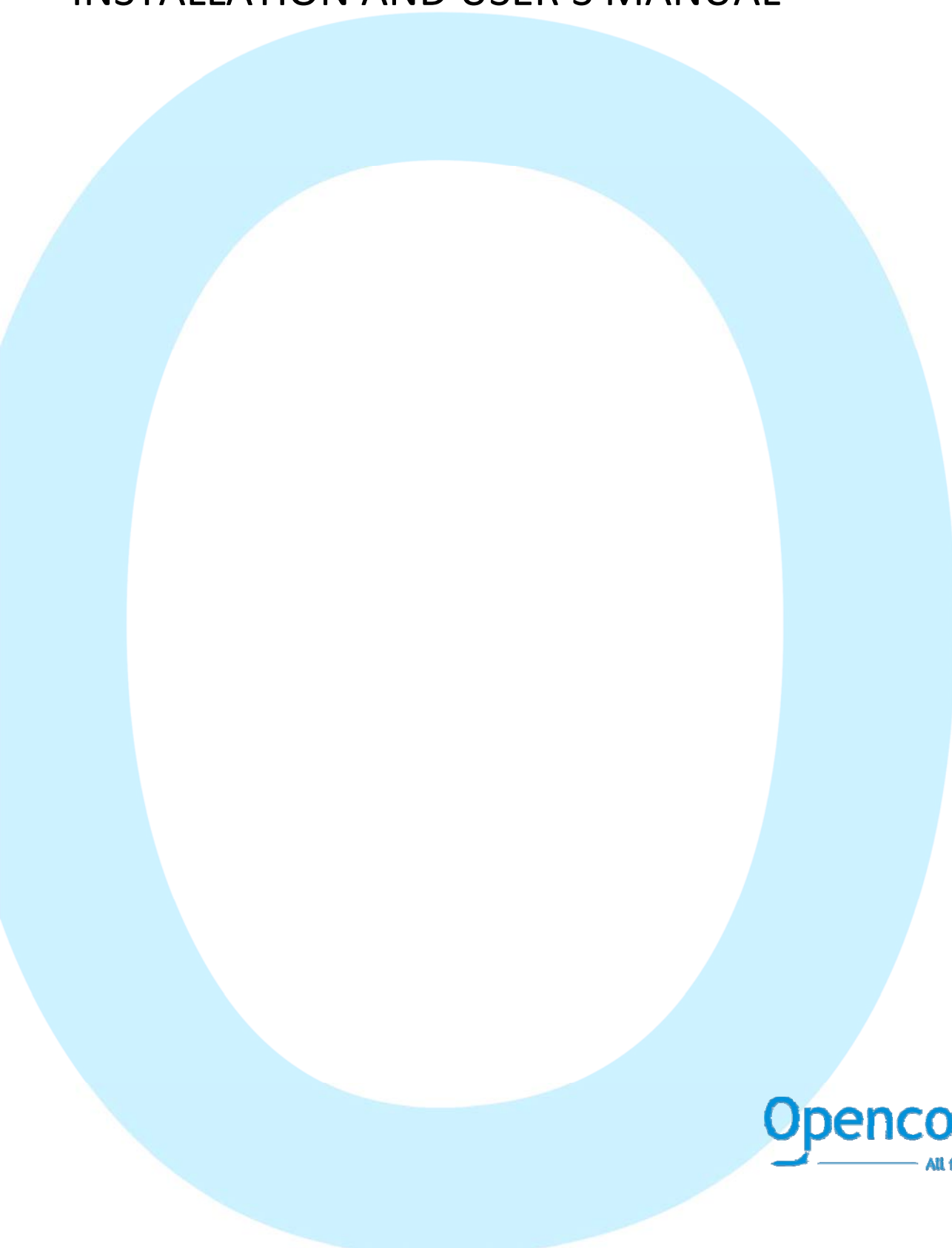


OPENCOCKPITS IOCard USBOUTPUTS
INSTALLATION AND USER'S MANUAL



INTRODUCTION

This card allows us to manage easily up to 64 outputs up to 40V and 500mA on each output, with a total amount of 2,5A.

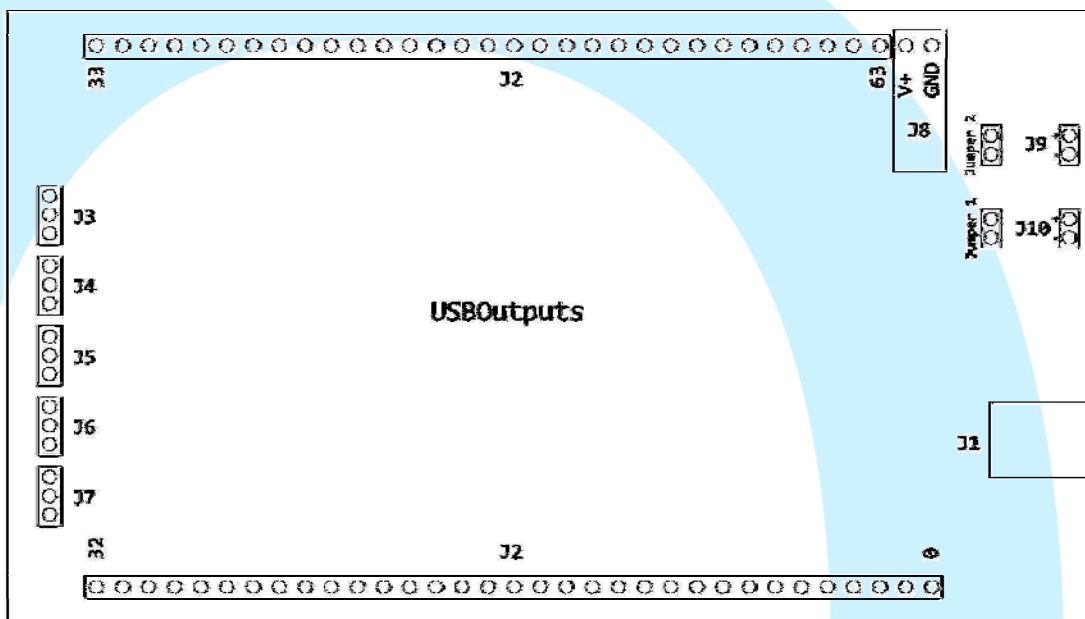
Also, the card have a brightness control of 7 bits (0-127) through PWM, that is ideal to control leds or lamps for indicators, as the total control for the backlighting.

It have also 5 analogic inputs, that can be used with devices as potentiometers.

The card will connect on the USB port and automatically is installed when it's detected as a HID device.

The controller is managed via IOCP protocol and SIOC language.

CONNECTORS DESCRIPTION:



- USB Connector (J1)
 - Allow the connection to the PC directly, at the moment to connect the card will be recognized and automatically install it as a HID device.
- Fast connectors for the outputs (J2)
 - Numbered from 0 to 63, there we can connect the ground poles (GND) of leds, lamps or another elements.
- Power source connector (J8)
 - Here we must connect the external power source to feed the devices connecteds to the outputs.
- External power connector (J10)
 - This connector provides feed to the circuit in case that the USB don't have enough amperaje to feed it.
- Output power connector (J9)
 - Here we have the same voltage as on the outputs connectors.
- Analogic inputs connector (J3...J7)
 - Inputs to use with the analogic devices, as a potentiometers

JUMPERS

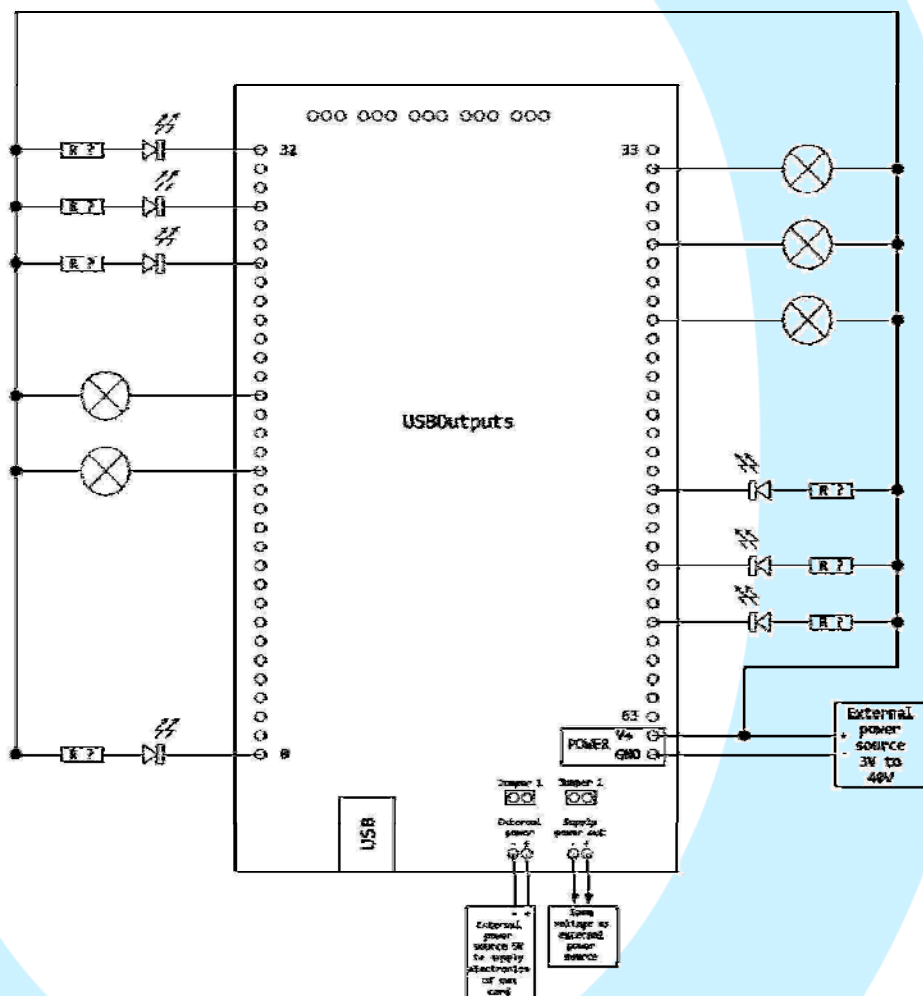
The card have two jumpers of two pins each, to organize the power connections, and must be connected as on the following table:

JUMPER 1	JUMPER 2	ALIM. PLACA	ALIM. SALIDAS
DISCONNECTED	DISCONNECTED	EXTERNAL	EXTERNAL
CONNECTED	DISCONNECTED	USB PORT	EXTERNAL
CONNECTED	CONNECTED	USB PORT	EXTERNAL (only 5V)
DISCONNECTED	CONNECTED	--	--

WARNING: If you want to connect a power source for the outputs with a different value of +5V and you have the jumper1 and jumper2 connected, the card can be damaged.

WIRING DIAGRAM

On the following image you can see an example of wiring for some leds and lamps, as the power connections.



We must see that the common for all connected devices is on the positive pole, we must consider this when we connect leds, due that they have anode and cathode, not the same in lamps that don't have significance on polarity. The resistor are used also on leds, because they work usually on low voltages as 2 or 3V.

SOFTWARE

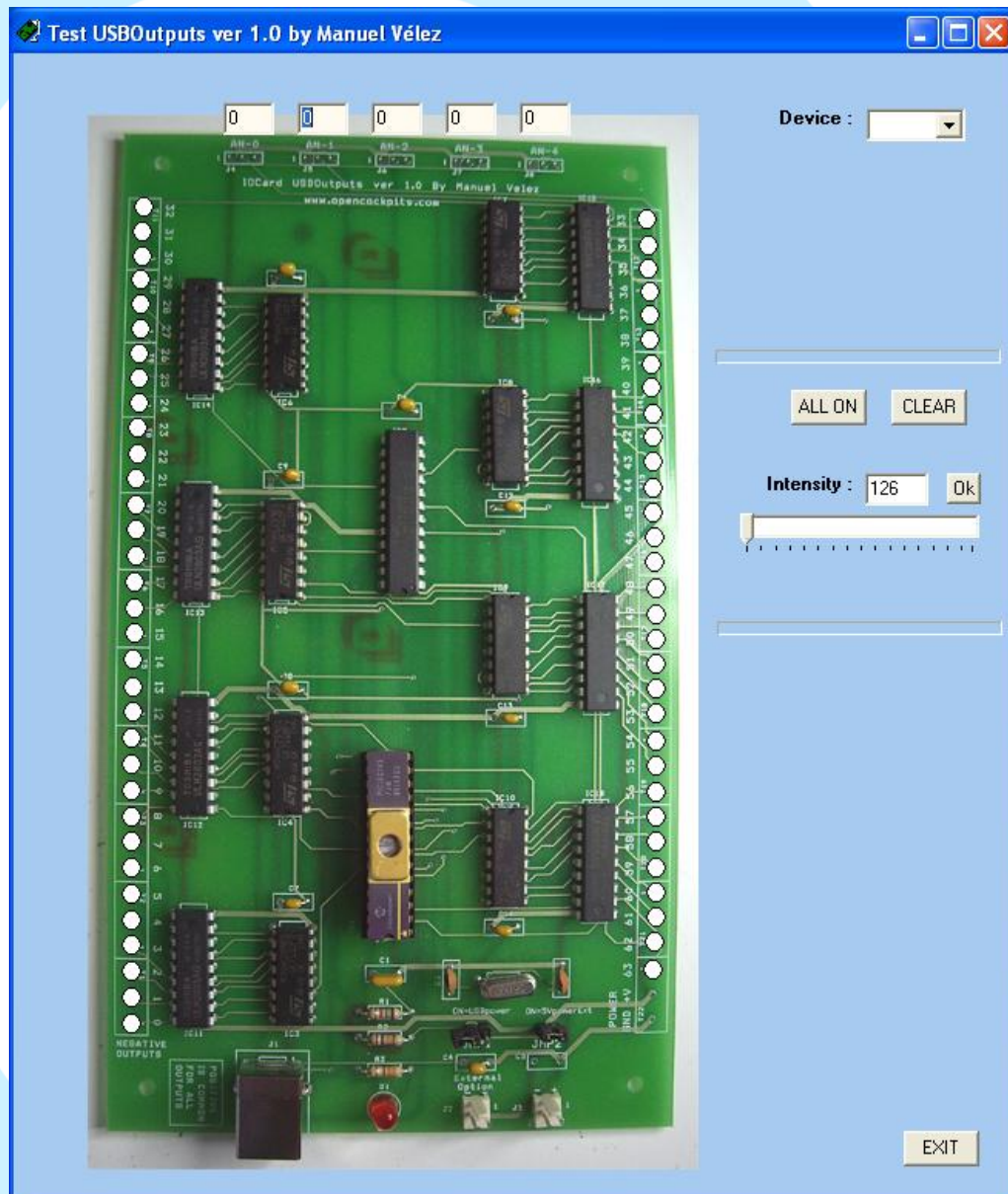
PROGRAM test_outputs.exe

This application is used to test the card functioning.

To do this we can run directly and appears an image of the own card, where you can see all the outputs and we can click over they, and with this simulate the activation/deactivation of each input we have click, in this way we can check if each works.

Also we have information about the analogic inputs, appearing a field for each input, where we have the exactly position of each input.

On the right fields we have information about device numbers, and an sliding control to test the brightness control, as well as two buttons to put ON or OFF all outputs at the same time.



USING SIOC

First of all, assure that you have properly installed the versión 3.46 or higher, if you don't have it, you can download from here:

http://www.opencockpits.com/catalog/info/information.php?info_id=31&cPath=2

When you have this installed, the first thing to do is to configure the sioc.ini parameters to allow sioc to know which, where and how is connected this card.

We must create a new line in sioc.ini, so we assign an index of device to each card that we install, creating one line for each card USBOutputs connected, and it will be in the following format:

```
MASTER=XX,6,1,YY
```

Where XX is the number of index in our PC system and YY the Device number of the USB port that is connected.

For example, if we connect two cards USBOutputs with the numbers of devices as 35 and 42 (those number are easy to know, simply run the test_outputs.exe and there you can found they), then we can write ththese lines:

```
MASTER=1,6,1,35
```

```
MASTER=2,6,1,42
```

Isn't a problem to have more IOCards connected to this PC, while they are correctly declared, nor to have Opencockpits modules also connected.

OUTPUTS:

To refer to the number of output accurately, we must consider the index number we have assigned to each USBOutputs card.

Now in SIOC , we must define the output on the estándar form:

```
Var VVVV, name NNNNNNNNNNNNNN, Link IOCARD_OUT, Output SS, device DD
```

- VVVV= SIOC offset number
- NNNNNNNNNNNNNN = SIOC offset name (*optional*)
- SS = output number 0-63
- DD = Device number, d3efined in sioc.ini

Definition example:

```
Var 0001, name lft_gear_green, Link IOCARD_OUT, Output 15, device 1
```

The brightness control will be defined in the following form, using the display format (Link IOCARD_DISPLAY), but assigning affixed value to the digit (Digit 1) and to the number of digits (Numbers 3).

```
Var 0010, name bright_ctrl, Link IOCARD_DISPLAY, Digit 1, Numbers 3
```

Can take values between 0 (mínimum intensity) to 127 (máximum intensity)

ANALOGIC INPUTS:

To read the analogic inputs we must use the following format:

Var VVVV, name NNNNNNNNNNNN, Link IOCARD_ANALOGIC, Input# EE, posL LLL, posC CCC, posR RRR, device DD

- EE = Analogic input number
- LLL = Maximum position to the left
- CCC = Central position
- RRR = Maximum position to the right

The rest of parameters are as on the outputs definition

Definition example of an analogic input:

Var 1506, name pot_flaps, Link IOCARD_ANALOGIC, Input# 2, posL 1, posC 128, posR 255, device 2

SIOC SCRIPT EXAMPLE

We must connect two indicators to the card outputs (leds or lamps) on the outputs numbered as 21 and 23 and we load the below script on the config_sioc.exe, and then we can save as sioc.ssi

Now, we run FS and SIOC, with this script loaded we can see that the indicator for the gear on transit (red one) is illuminated when the gear is going to up, and it is OFF when the gear in completely UP.

Also, when the gear is completely DOWN the indicator for this (green one) is ON, so, when the gear starts to go UP then the indicator is OFF.

```
Var 0001, name fs_ldg_nose, Link FSUIPC_INOUT, Offset $0BEC, Length 4 // landing gear position value in FS
{
  IF &fs_ldg_nose = 0
  {
    &ns_trs_ind = 0
    &ns_dn_ind = 0
  }
  IF &fs_ldg_nose >= 1
  {
    IF &fs_ldg_nose <= 16382
    {
      &ns_dn_ind = 0
      &ns_trs_ind = 1
    }
  }
  IF &fs_ldg_nose = 16383
  {
    &ns_dn_ind = 1
    &ns_trs_ind = 0
  }
}
```

Var 0002, name ns_dn_ind, Link IOCARD_OUT, Output 21, device 1 // landing gear nose
down indicator

Var 0003, name ns_trs_ind, Link IOCARD_OUT, Output 23, device // landing gear nose
transit indicator

Note:

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