

IOCard Manual

USBLcd

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INTRODUCTION

The USBLcd card has been designed to manage up to 4 LCD displays compatible the standard Hitachi HD44780.

The card incorporates a connection to the USB port of the computer and the control is made by the IOCP protocol.

The software allows to manage up to 20 virtual displays that are configured in a visual way with the texts and variables that the user wants to present in the LCD display.

TECHNICAL SPECIFICATIONS

- Connection to USB port.
- Capacity to connect up to 4 LCD displays compatible with HD44780.
- It manages up to 5 virtual displays for each display.
- Software for connection to IOCP.
- Visual software of configuration.

LISTS OF COMPONENTS

C1,C4,C5,C6 = Condensers 0,1 mF

C2,C3 = Condensers 22Pf

IC1 = Microcontroller 16C745

IC2,IC3 = IC 74HC541

J1 = USB Connector

J2 = Power source connector of 2 pines

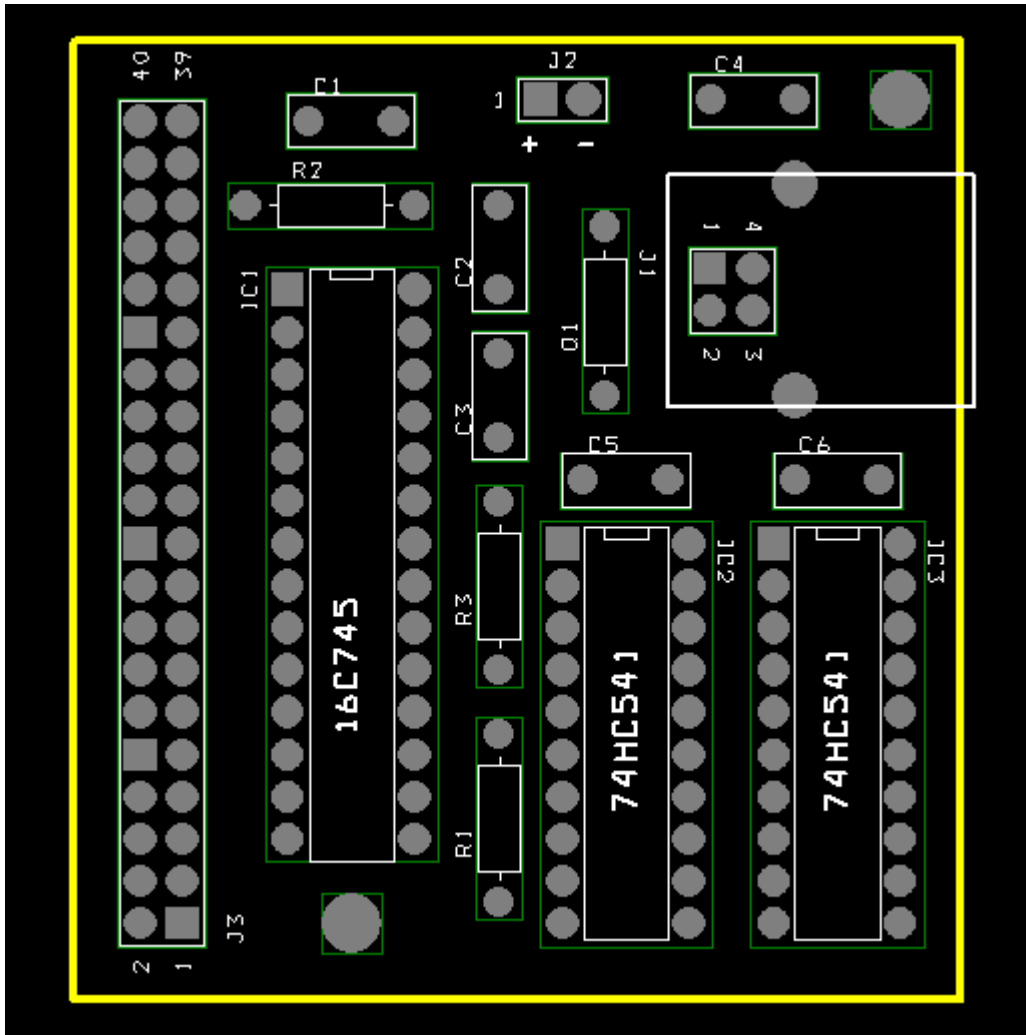
J3 = 40 pins IDC connector

Q1 = quartz Glass 6MHZ

R2,R3 = Resistances 10k

R1 = Resistance 1K5

CONNECTIONS



J1 = USB Connector.

J2 = Power connector.

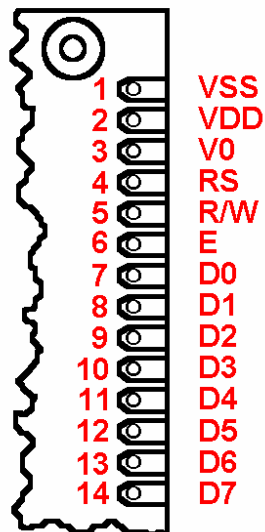
J3 = Connector of multiplexed lines for the LCD displays

OPERATION

The LCD modules (Liquid Crystal Display), they are compact and they need very few external components for a correct operation. The main function of these modules is the one of visualizing the characters wanted by the user.

Modules of different dimensions that they have from 1 to 4 lines and of 16 to 40 characters for line.

In the figure below sample the aspect and pins position of a standard LCD module. They also exist LCD modules that have 16 pins, they are called LCD with retroiluminacion, where the pin #15 (+5v.) it corresponds to the anode and the pin #16 (Ground) to the cathode of the retroiluminacion.

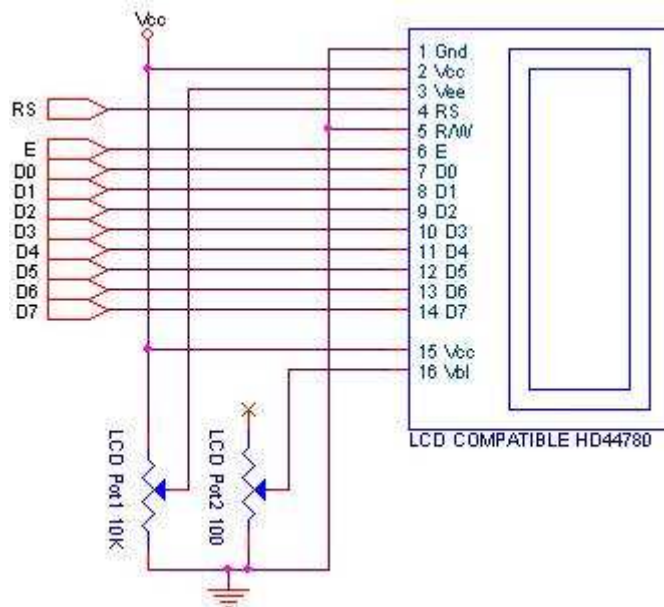
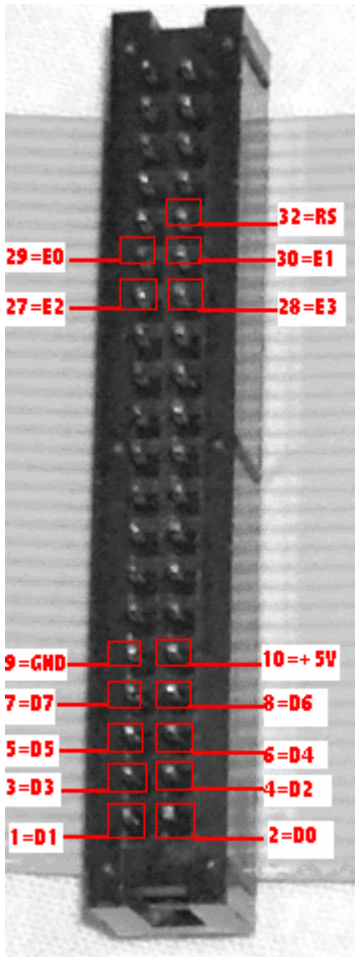


Pin LCD

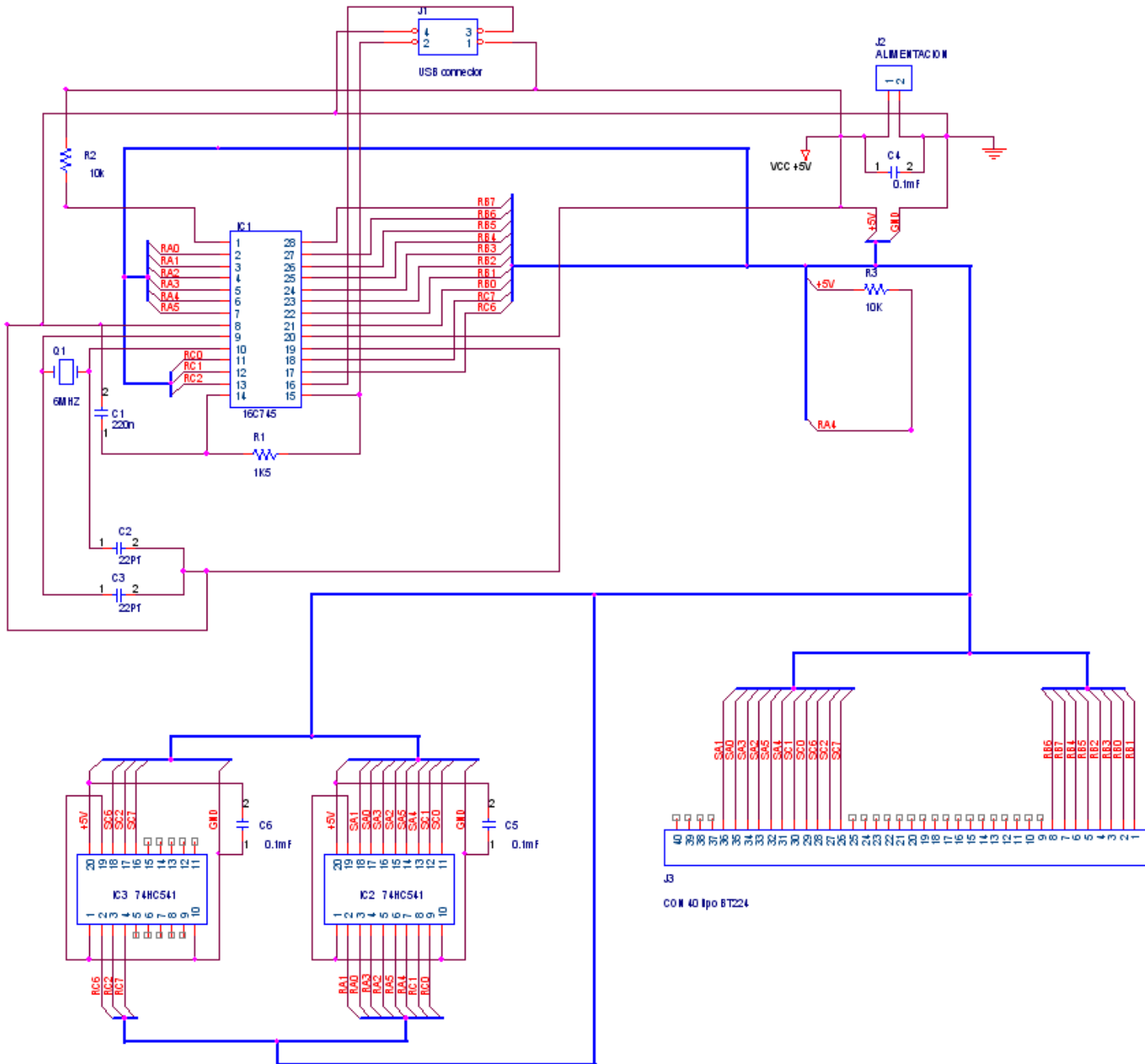
1	VSS=gnd
2	VCC=+5v
3	Vee
4	RS
5	R/W
6	E
7	DB0
8	DB1
9	DB2
10	DB3
11	DB4
12	DB5
13	DB6
14	DB7

Pin USB LCD

9
10
Pot 10K
32
9
Display0=29
Display1=30
Display2=27
Display3=28
2
1
4
3
6
5
8
7



CARD SCHEMATIC



SOFTWARE USBLCD



Two programs exist to manage the USBLcd card.

IOClcd.exe: It is a IOCP client that controls the IOCard USBLcd card through the USB port USB. The IOClcd.ini file is used for the internal configuration of the program.

IOClcd_config.exe: This program generates a IOClcd.lcd file with the configuration of the different displays and used variables.

IOClcd.exe PROGRAM

The program is configured by the IOClcd.ini file

This file contains the following configurations:

MUSB=No, we will put to YES in case we have more than a card connected in the same computer. We will need to tell him in that device is connected the card.

deviceUSB=32, Here we will tell to the controller that device is the one that should connect.

If we don't know that device is, we will connect one to one each card and we will go the number that the controller will be show us. This number is different for each USB port of the computer.

IOCP_host=localhost, we will Indicate the address of the IOCP server, where it should be connected (SIOC).

IOCP_port=8092, and here the port number.

To highlight that the IOCP server (the normal thing is that SIOC is used), it will be able to be in any computer of the net, in such a way that the cards can put them in anyone of the included computers the same one where it is connected the card.

[Tiempo en refresco de las pantallas LCD (ms)]

[Time refresh for LCD (ms)]

refresh=80



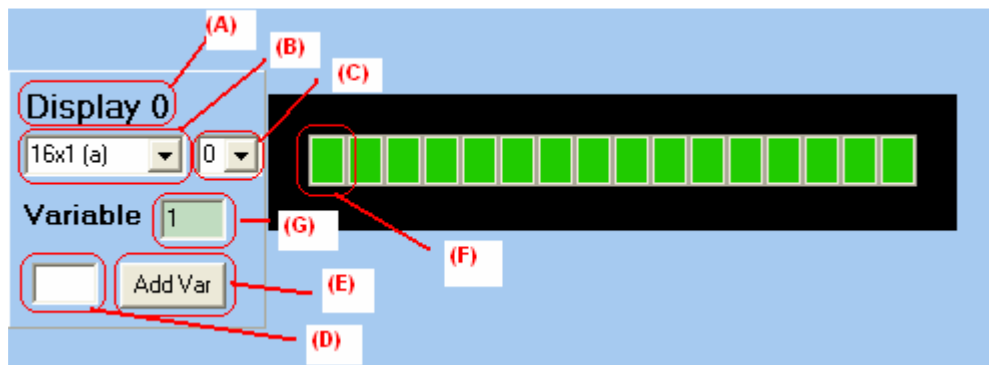
The program is started indicates us the connection address, if it has been connected the IOCP server and if there is a card located USB and working besides in that Device is this card.

IOClcd config.exe PROGRAM:

This program configure the different displays and to assign them variable IOCP.

For it the first thing that should select the display type that will use.

Remember that the card can use up to 4 displays denominated LCD Display0 to Display3 (0 to 3) and each one can be of a different type (A). Each display has up to 5 Virtual Displays (C) that can be selected in each moment by means of the variable that it appears next to each Display (G).



The first thing that should make is to select the LCD type that it has connected. For it selects it the quantity of columns and lines that it possesses (B). Some have two models depending by their memory configuration.

Important: if it changes the display pattern, all the configurations of the virtual displays will be erased.

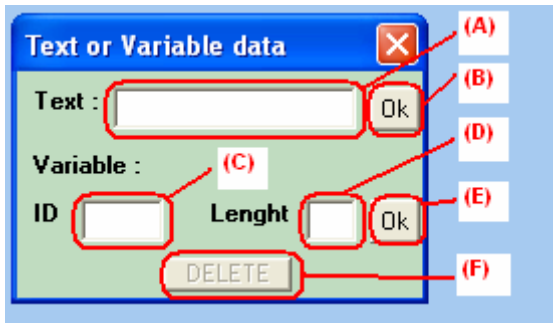
To introduce the IOCP variable that will be used for the selection of the Virtual Display, it will be typed in the (D) field and they will be pressed the corresponding button (E).

Now, if the IOCP variable that has been introduced (G), It takes the value 0, the virtual display that will be presented in the corresponding LCD will be the 0, if it takes the 1, the virtual display 1 will be presented and this way until the virtual display 4.

To configure each one of the virtual displays, select it in the field (C).

Each Virtual Display can be configured with *fixed text* or with *IOCP variable*.

To introduce these values it will be made double-click in the cell (F) corresponding, where it is wanted to begin to introduce.



When making the *double-click* a new form will appear, from where it will be able to introduce a text (A) that will be placed in the Display starting from the point where he/she was carried out the double-click, once you presses the button (B).

A IOCP variable can also introduce typing the identification of the same one in (C) and the digits length that will be reserved in (D), appearing once in the display you presses the button (E), being suitable with cells of yellow color. If it goes the mouse by the cells it will appear him an indication with the variable number to which you belong this cells.

The program takes charge of assuring that it is not introduced a variable doubly.

It can erase any text, introducing above another with the necessary spaces to make disappear the wanted text.

It can also erase a variable, making *double-click* in the yellow cells that belong to this variable. In that moment the form that opens up will only give option to the button of having erased (F) the one which, once pressed he/she will make disappear the variable of our virtual display.

When leaving the program or using the **Save** option of the menu, the file will be generated *IOClcd.lcd* that will be used by the controller for the display manage.

Once pulled up the program controller and connected to the *IOCP server*, the variables that have been configured will be presented in the different positions of the virtual displays as they have been configured, always adjusting the values to the right.

To commute the visualization in the LCD among a virtual and other display, the variable will be used fixed in the configuration, which will make when taking a value from the 0 to the 4 that the present LCD the corresponding virtual display.