# PIC-PLOT 2
# -SETUP AND OPERATION QUICK REFERENCE-

## Connecting the Pic-Plot:

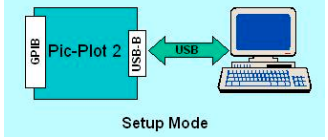
Connect Pic-plot2 to the PC USB port using a standard A-B cable. Connection to the GPIB instrument must be done with a standard GPIB cable. Because of limited I/O capabilities of the microcontroller inside the Pic-plot2, it is recommended to limit the cable length to max 2meters and to disconnect all other instrument or controllers from the GPIB bus. After checking operation with a simple point-to-point configuration, you may try loading the GPIB bus with more instruments. Pic-plot2 takes the necessary power to work from the USB bus, so no AC adaptor is needed. Maximum current drain from the bus is 50mA.

## Before starting, install the VCP drivers:

Pic-Plot2 operates by exchanging data with the PC through a Virtual COM Port (VCP). Then, if you have not already installed in your PC the appropriate drivers for the FT232R chip, you must go through this first-installation procedure **before** connecting the Pic-plot2 to the PC. The drivers are royalty-free and are downloadable at the FTDI website.


1. Go to FTDI website
http://www.ftdichip.com/Drivers/VCP.htm
2. Choose the appropriate driver for your Operating System that supports the FT232R and download it.
3. Unzip the whole content of the downloaded folder and take note of the folder where you put the decompressed files.
4. Now connect the Pic-plot2 to the PC with the USB cable. A "found new hardware" pop-up should appear and a software installation window should prompt you to specify the folder where the drivers are located.
5.Follow the guided installation and, if drivers are properly installed, the Pic-plot2 will be enumerated and its green LED will turn ON.
6.Identify and take note of the Virtual COM# that has been assigned to the Pic-plot2 (normally seen as "USB serial port"): use the Control Panel/System/Hardware/Device Manager/Ports(COM&LPT). This last step is important for the configuration of the software that will communicate with the Pic-plot2.

## Setting the Pic-Plot2:




At the first installation or at any time the GPIB settings must be changed, you may need to configure some basic parameters of the Pic-Plot2, even though most of the times the pre-programmed values will work for you. To do this the Pic-Plot2 must be connected to a PC and put in Setup mode. Setup procedure may also be useful to test the USB link between Pic-Plot2 and the PC during first installation or when troubleshooting. Setup parameters are stored in the EEPROM area of the microcontroller, therefore they remain unchanged with power cycling, but they can be reprogrammed at will by redoing the setup procedure.

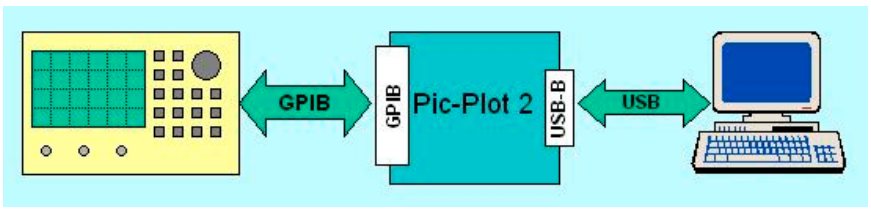

Setup procedure:
1.Connect the Pic-Plot2 to the PC if it is not already connected. Verify the green LED is ON.
2. Launch HyperTerminal, specify the COM# (virtual) associated to the Pic-Plot2 and set the communication parameters as follows:
**bit/sec=38400, databit=8, parity=none, stop bit=1, flow control=none**
These are also the same COM settings that will be needed for

plot/print capturing with HyperTerminal
3. Temporarily press the button named "SETUP" on the Pic-Plot2 board. If everything is properly working, a prompt text with SW version will show up on the HyperTerminal window. You are also allowed to disconnect the Pic-plot2 to quit the Setup procedure without changing any previously stored parameter.
4. Then you are prompted to enter a new value for the plotter address that Pic-Plot2 will respond to. Allowed values are single digit 0~9 or "q" to quit without changes, pre-programmed value is 5. The entered value is echoed for confirmation.
5. You are now prompted to enter a new value for the printer address that Pic-Plot2 will respond to. Allowed values are single digit 0~9 excluding the current plotter address, pre-programmed value is 1. You may also press "q" to quit without changes. The entered value is echoed for confirmation.
6. Next parameter to be set is the Listen On Reset function. Allowed values are y or n (lowercase), pre-programmed value is n. Set it to y (yes) only if you plan to connect the Pic-Plot2 to a GPIB instrument that has no System Controller capability. In this case the Pic-Plot2 automatically starts in Listen mode at every power-on even if not instructed to do so ("Listen-only" mode). The entered value is echoed for confirmation.
7. "END OF SETUP" will appear and the Pic-plot2 is ready to operate with the new GPIB parameters.

## Plot and print capturing with Pic-plot2:

Be sure that Pic-Plot2 is correctly connected to the host PC and the green LED is ON. If you have been able to complete the Setup procedure, then you are sure that Pic-Plot2 at least correctly communicates with the PC and is ready to work.

Pic-Plot has been designed to work with instruments having Controller capability or with Talk-only GPIB devices. Typical configuration is the following:




The instrument has to be configured exactly as it should be when connected to a real GPIB plotter or printer: refer to instrument manuals for proper settings. The choice whether to plot or to print is related to the application you have chosen in your PC but also to the actual capability of your instrument: for example there are instruments not designed to provide rasterized data to a GPIB graphic printer. On the other hand, many instruments are capable to print the raw measurement data in ASCII form, and the Pic-Plot2 is able to capture also this kind of data.

As a general reference, if the instrument has Controller capability, it should be set as System Controller. Set the Plot Address (or Printer Address) to the same value you have set on the Pic-Plot2: default values are respectively 5 and 1. Normally you can do all these settings from the instrument front panel in the GPIB settings menu. In some case you have also to specify the type of peripheral and which port you want to use for screen-dump: choose a plotter (7470 works for all), or a printer if you want to print; output port must be "GPIB". If your instrument cannot act as a System Controller, then it acts as a Talk-only Device when it outputs the screen-dumps on the GPIB: most oscilloscopes, many SA and (we believe) all curve tracers and "screenless" instruments work that way. For this kind of instruments the Pic-Plot2 has to be first configured with 'y' in the Listen On Reset option of its Setup menu (see Setting the Pic-plot2). Alternatively to a specific capturing software, you may get and store the data from the Pic-plot2 using HyperTerminal, keeping the same communication parameters already used during the Setup procedure.

## How to configure 7470.exe ver.1.67 to work with Pic-plot2:

1. open the text file connect.ini with Notepad

2. Identify the 4 lines without the **;** at the beginning: these are the lines with the parameters to be set

3. parameters must be set as follows **(NOTE: # is the number of the virtual COM associated to the Pic-Plot2):**

   **interface_settings com#:baud=38400 parity=N data=8 stop=1**
   **is_Prologix 0**
   **reset_to_local 1**
   **write_delay_ms 100**

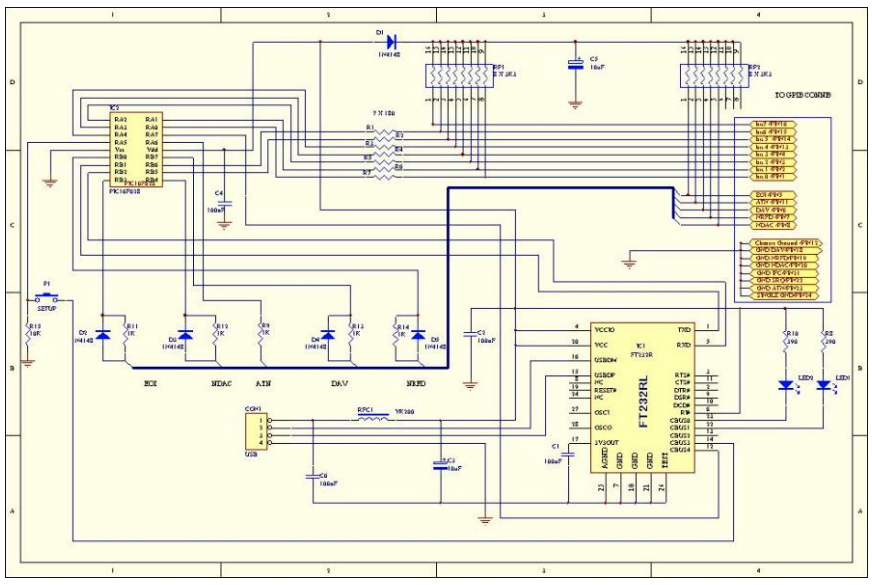
4. save and close connect.ini

## How to use 7470.exe:

Launch 7470.exe and select 'Wait for device initiated plot' in the 'Acquire' menu. Start the plot from the instrument, and see the progress of received data bytes. At the end, you should see the copy of instrument screen on your PC: if this doesn't happen, there could be an error in the GPIB communication (normally a mismatched GPIB address) or a wrong configuration of the 7470.exe. The latter often happens if you have specified a wrong COM port# in the connect.ini file. In case of doubt, verify in the Control Panel/System/Hardware/Device Manager/Ports(COM&LPT), or specify the same COM# you have set in HyperTerminal for the Setup procedure. If you want to save the plot, don't forget to press the spacebar to exit the acquisition mode first. Again, refer to John Miles' KE5FX website to get the most from his software.

## Schematic diagram:

(for reference only, subject to modifications)



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