IMC INSTRUMENTS, INC.

APLICATION NOTES….

FOR THE EAGLE LINE OF SOLAR CONTROLLERS

RS232 SERIAL INTERFACE for PC's and LAPTOPS Using Windows HYPER TERMINAL as the main communications software   …………..

Direct connection to a PC SERIAL PORT
If you are using a standard towered/desk top PC you will have at least one RS232 serial port available. It is located on the back of the console as a serial DB-9 male pin connector. The EAGLE data port connector connects directly to this port. In the event there is more than one port, please make sure you know which **serial port** number it is. When you set up HYPER TERMINAL you will need to know this port number. Please proceed directly to the section …**SETTING UP HYPER TERMINAL.** Please omit any references to USB converters as this topic is not applicable. Just proceed to enter the **port number** you physically connected the DATA PORT ADAPTER into the Hyper Terminal window . You may also use a different file setup name such as **SERIAL EAGLE PORT** instead of SERIAL_USB.

<u>SERIAL CONNECTION to a USB PORT</u> such as a LAP TOP
Why do you need a USB to SERIAL converter when towered PC's all have SERIAL PORTS??
Because almost all LAP TOPS don't have serial ports any more. They have a USB port instead.
Thus we need to purchase and install a USB to SERIAL converter. The installation can be any were from very easy to somewhat difficult. Please be careful in following the installation steps given below. !! I will later describe setting up HYPER TERM in Windows to display the serial Data the EAGLE Controller sends at regular intervals.

<u>AUTOMATIC INSTALLATION </u>for XP computers
The following assumes that your system already has administrator privileges to install new drivers!

1   Plug in the USB connector type-B into the USB port on the adapter, and connect the USB type-A on the other end of the cable to the host USB port in your computer.
2   The connection brings up **"Found New Hardware Wizard"**
3   Click **"Next"**
4   Select **"search for the best driver for my device(recommended)",** click **"Next"**
5   Select **"specify a location"** and click **"next".** In the **"Copy Manufacturer's file from"** type the drive letter that your CD-ROM is… for example **"D"**
6   Windows driver file searches for the device **"USB High Speed Serial Converter"**
7   Click **"Next"** to continue
8   Windows has finished installing the software. Click **"Finish"** to complete the first part of the installation.
9   The **"Found New Hardware Wizard"** appears again, and will complete the installation for the device "USB" Serial Port

Your installation is now complete!!

The next discussion will deal with CONFIRMING that the installation is OK and also setting up the **COMMUNICATIONS PROGRAM** called **HYPER TERMINAL**
The following instructions are for the SERIAL to USB adapter manufactured by MICRO INOVATIONS
Model no USB610A. I have chosen this converter because it is WELL supported and it is easy to install.
There are other OFF SHORE manufacturers with models down to $10 dollars. Their installation is the same

Install the DRIVERS for the USB to serial converter Model 610A according to the printed instructions furnished with the CD from Micro innovations in a similar manner as described above. The driver NAME for this MODEL is **_"Prolific USB"_**"and will appear as such in the following descriptions: FOR WINDOWS XP
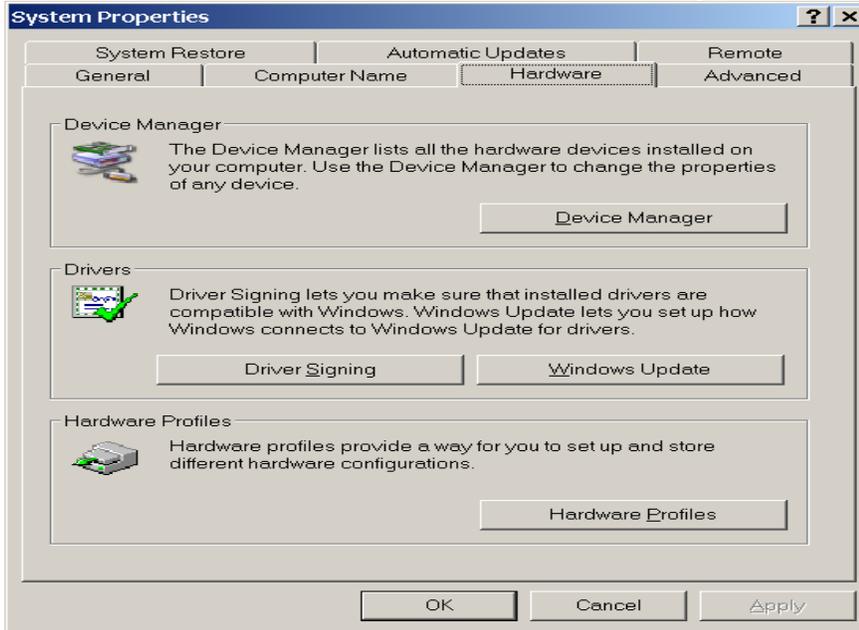
Go to START and select control panel… the following will appear:
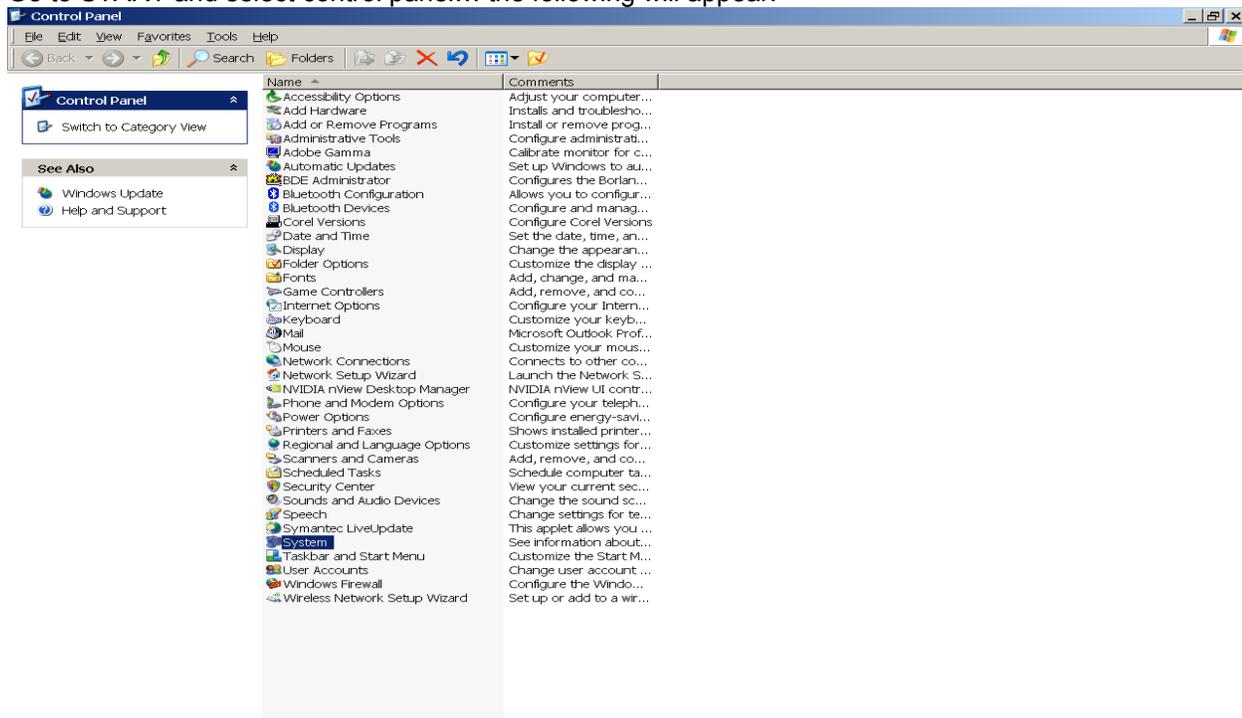
Select **SYSTEM** as shown above……… The following will appear

Select **HARDWARE** as sown above…….The following screen will appear….

Select **DEVICE MANAGER** as shown above…………… the following will appear….
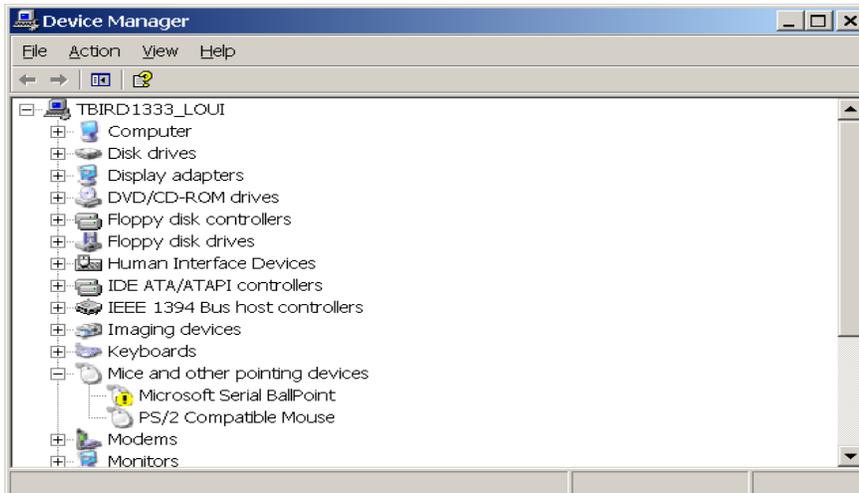
Scroll down to **PORTS** as shown below…..
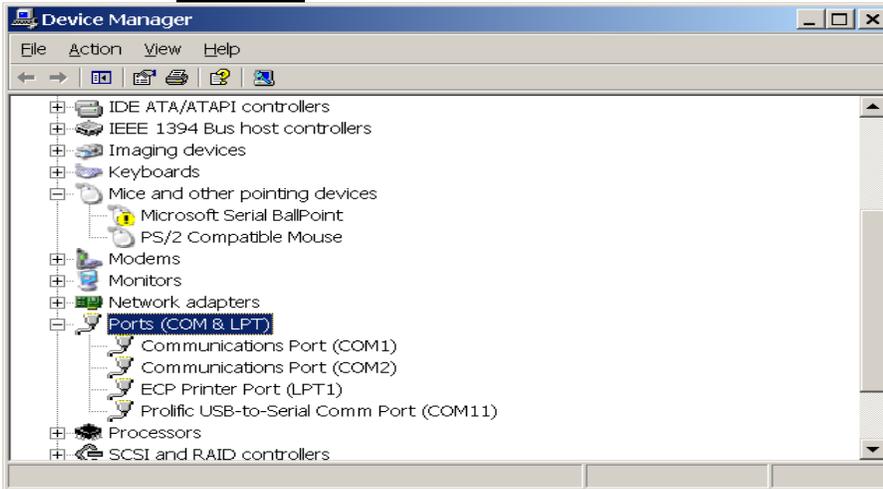
Select Prolific USB as shown below and double CLICK

The screen below will appear after double clicking. Please observe that the assigned PORT is 11

As shown above …make sure that Device Status shown "working properly" and it is enabled!!

Select **PORT SETTINGS** tab and see the screen below

Prolific USB-to-Serial Comm Port (COM11) Properties
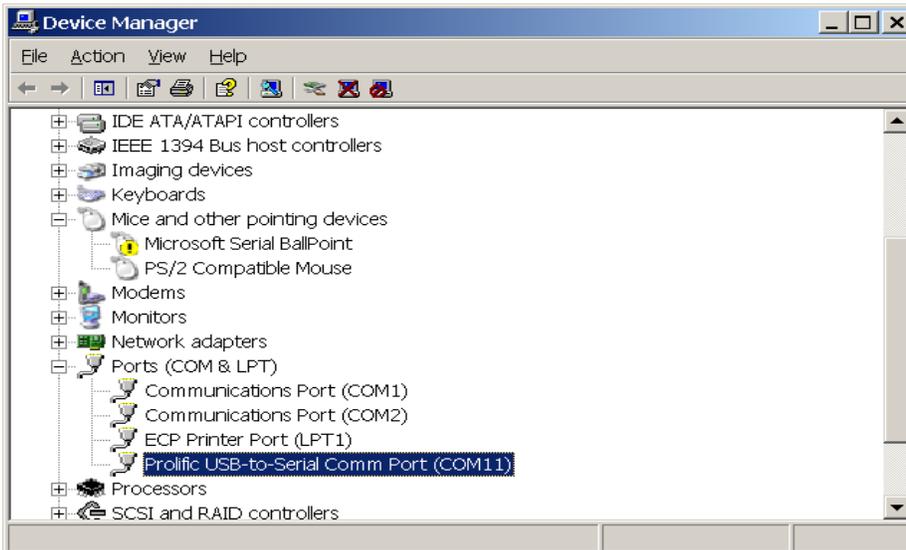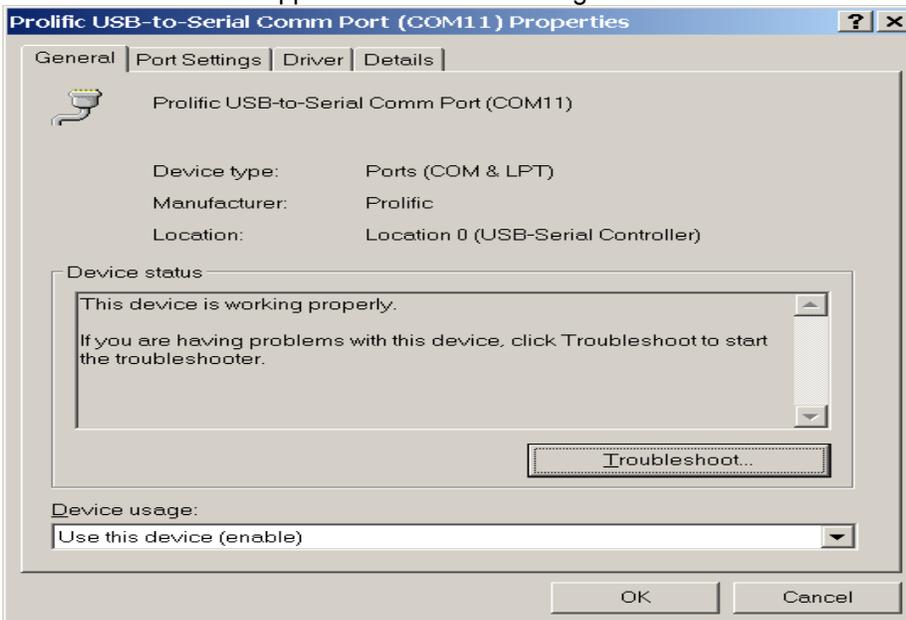
General | Port Settings | Driver | Details

Bits per second: 2400
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None

Advanced...   Restore Defaults

OK   Cancel
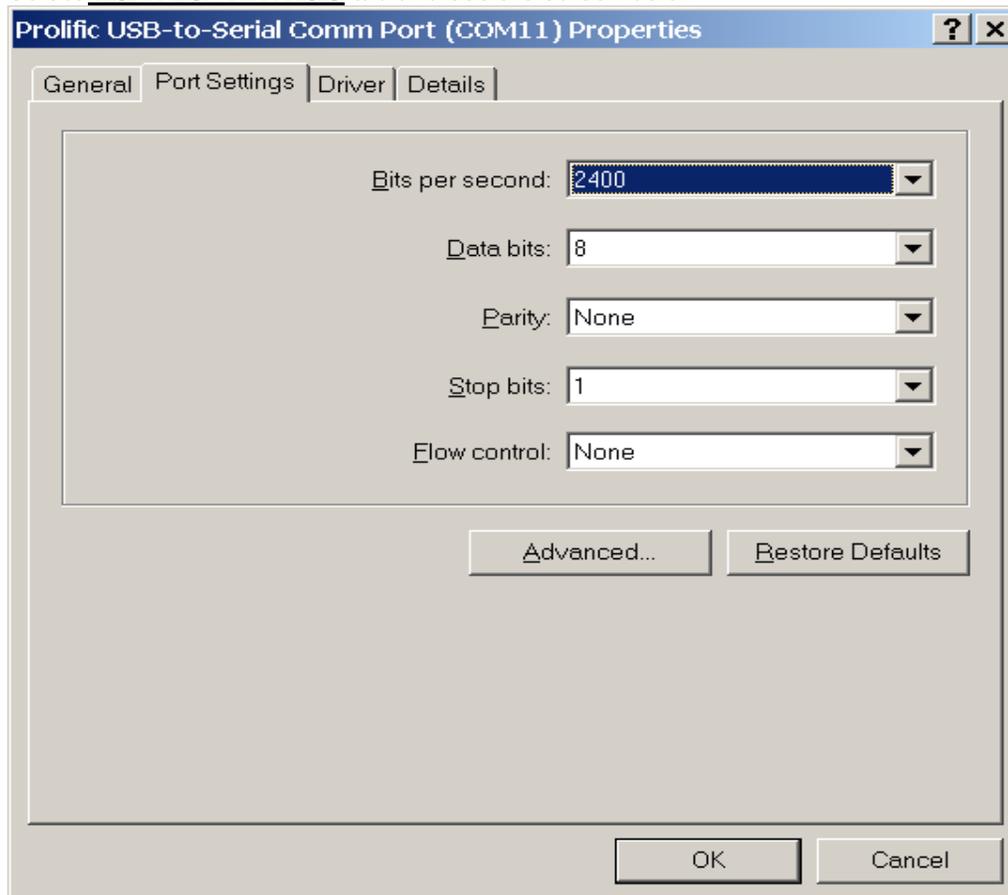
Please match all the values in the windows shown above to the values in your computer

Then click on the **ADVANCED** Tab and observe the screen below

Advanced Settings for COM11

☑ Use FIFO buffers (requires 16550 compatible UART)

Select lower settings to correct connection problems.
Select higher settings for faster performance.

Receive Buffer: Low (1) ———————————— High (14)   (14)
Transmit Buffer: Low (1) ———————————— High (16)   (16)

OK
Cancel
Defaults

COM Port Number: COM11
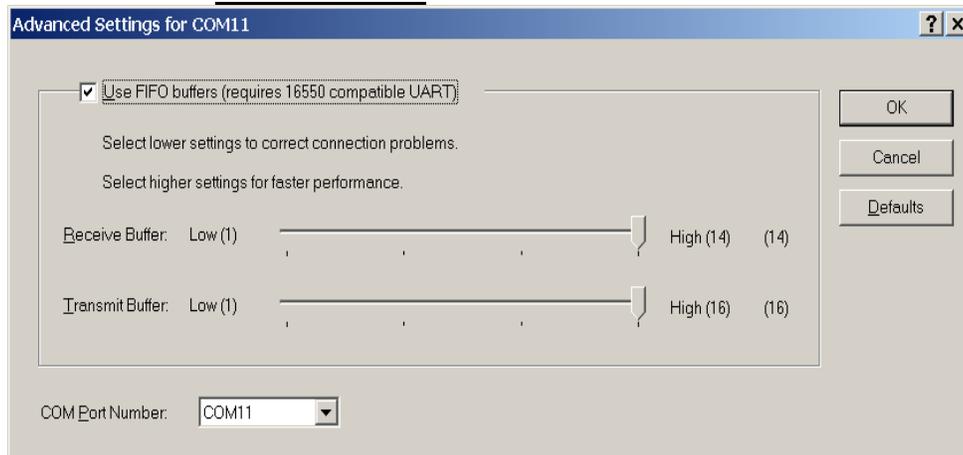
The **Com Port number** is shown in the window above. It is "**11**" in my case. Yours will be different.
Please record this number because it is the communication port that has been auto-selected at the time of DRIVER INSTALLATION.
This is the port that the USB connection communicates with. Please also match the balance of the settings shown in the window above.

Other examples of selected COM PORTS will follow. They were generated when an other SERIAL to USB converter was installed. This one was EASYSYNC which is one of many other converters available.
In this example COM PORT4 has been assigned to be the USB port connection as shown below.
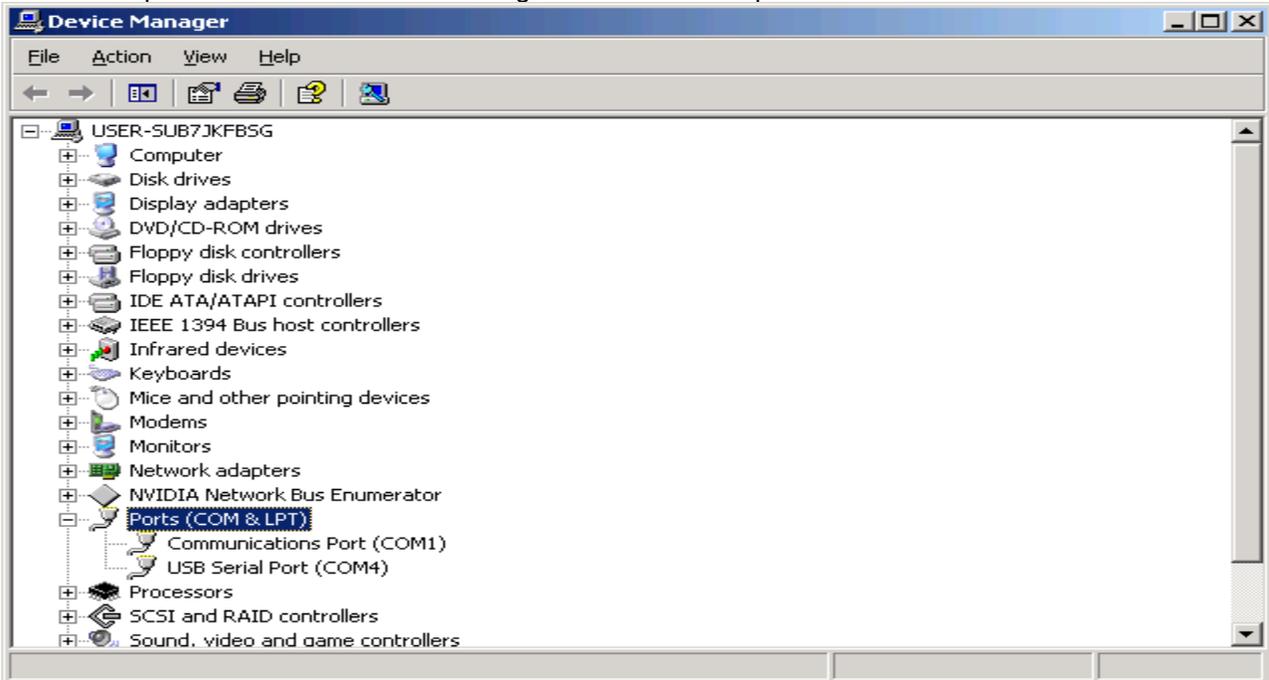
and here are the COM PORT 4 settings
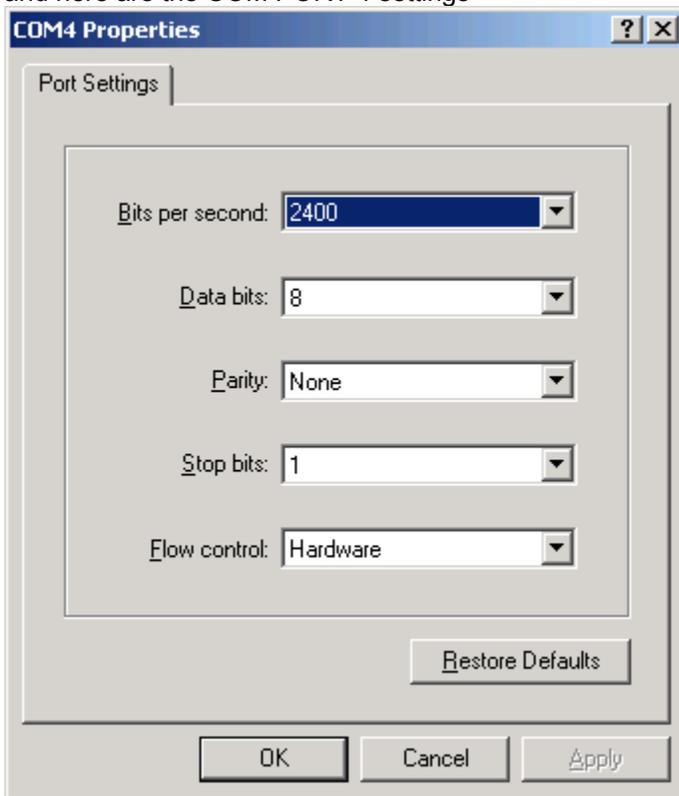
Proceed to set up HYPERTERMINAL and make sure that the PORT information is properly entered in the HYPERTERMINAL settings.

SETTING UP HYPER TERMINAL

Proceed to find and run HYPER TERMINAL as shown below:
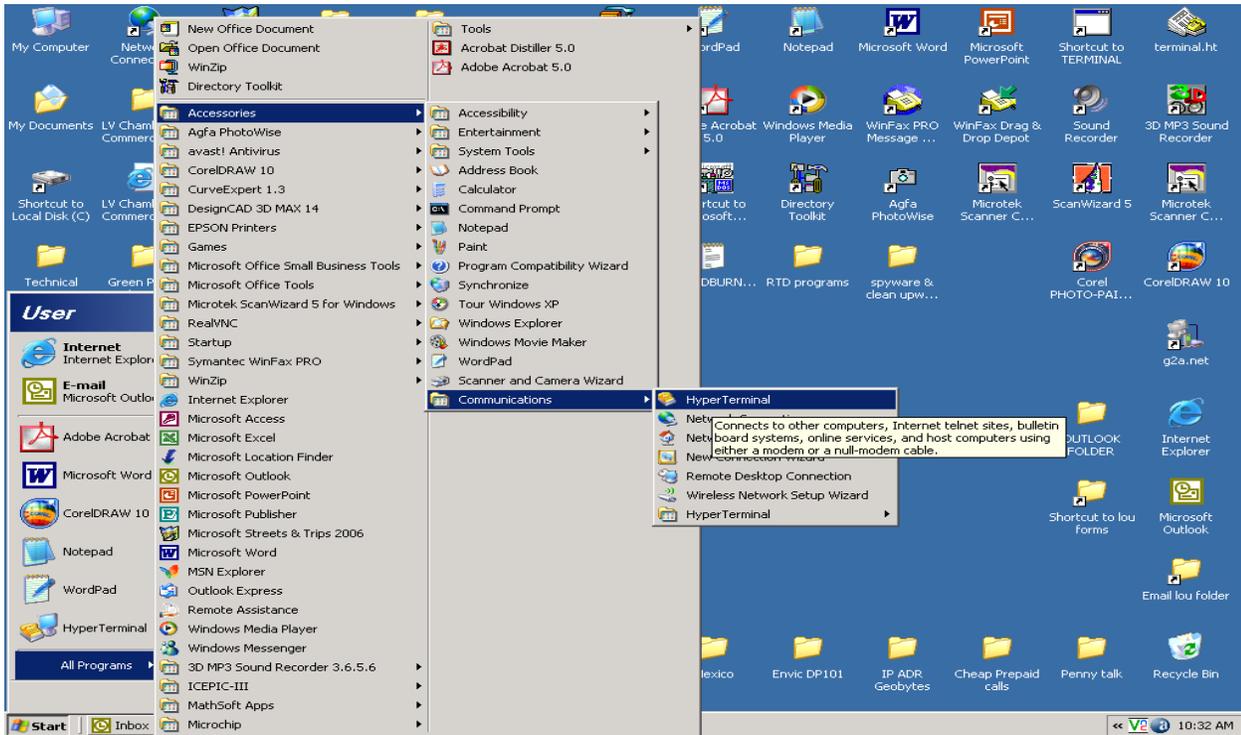
Click on the **HYPER TERMINAL** icon to run it as shown below. The following window will appear.
Enter "**SERIAL_USB"** for a name or any other one you may choose.

Click **"OK"**

Click on **"connect using"** and observe the COM PORT pull down window open up as shown below:
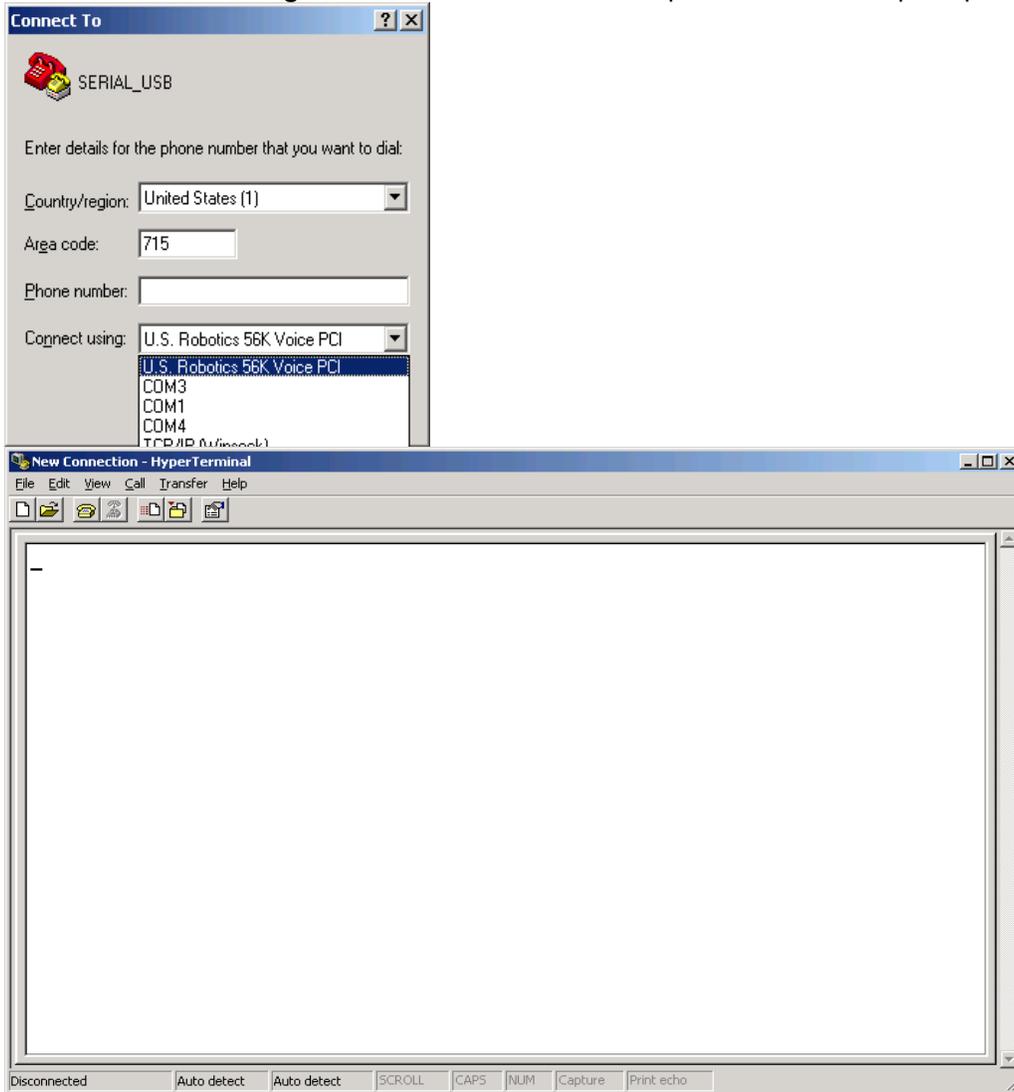
In this example we have installed the EASYSYNC Serial to USB converter and the assigned COM PORT is 4.
Point to **COM4** and **click**

The following will appear:

Connect To

📞 SERIAL_USB

Enter details for the phone number that you want to dial:

Country/region: United States (1)

Area code: 715

Phone number:

Connect using: COM4

OK   Cancel
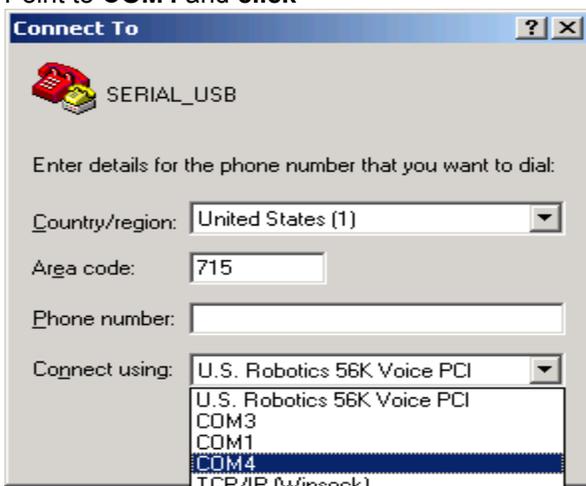
Click on "OK" in above window:

The following window will appear:

COM4 Properties

Port Settings

Bits per second: 2400

Data bits: 8

Parity: None

Stop bits: 1

Flow control: Hardware

Restore Defaults

OK   Cancel   Apply
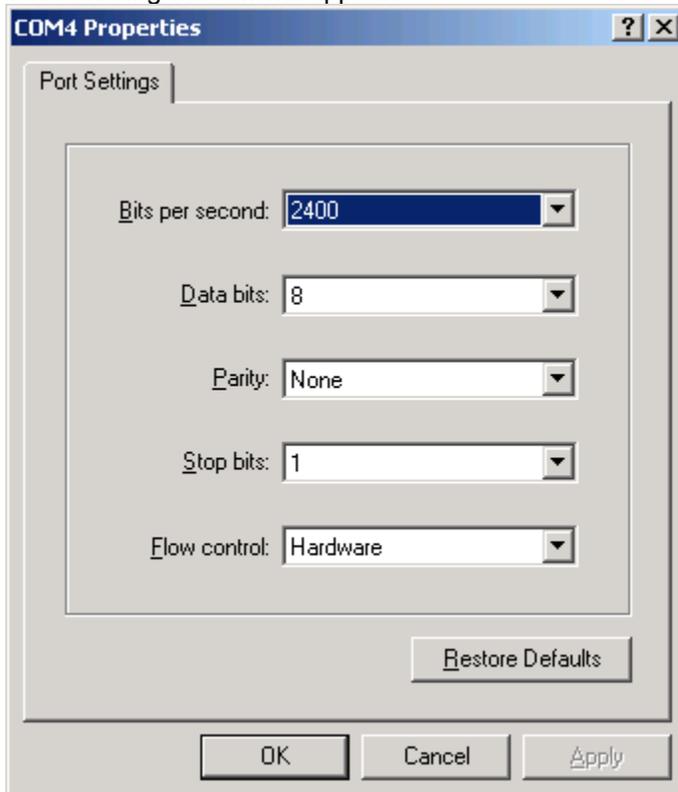
Make sure that you match the settings shown in above window and **click"OK"**

The following window will appear. Please observe that its title is **SERIAL_USB-Hyper Terminal**
This is now the active window that will display the serial data being sent by the EAGLE Line of controllers. You should see lines of text appear across the screen. **THIS IS THE DATA COLLECTED BY THE EAGLE CONTROLLER.** New lines will appear as often as 2 seconds or every 6 minutes depending on the selected Jumper settings inside the eagle controller

```
SERIAL_USB - HyperTerminal                                        _ | □ | ×
File  Edit  View  Call  Transfer  Help

RUNTIME COLL-T   STOR-T   DIFF-T   HILI-T    PUMP      UP-Lim     FAULT
0:06     64.9     64.9     08.0     157.5     OFF       OFF
0:06     65.0     64.9     08.0     157.5     OFF       OFF
0:06     65.0     64.9     08.0     157.5     OFF       OFF
0:06     65.0     64.7     08.0     157.5     OFF       OFF
0:06     65.0     64.9     08.0     157.5     OFF       OFF
0:06     65.0     64.9     08.0     157.6     OFF       OFF
0:06     65.0     64.9     08.0     157.6     OFF       OFF
0:06     64.9     64.9     08.0     157.5     OFF       OFF
0:06     65.0     64.9     08.0     157.6     OFF       OFF
0:06     64.9     64.7     08.0     157.5     OFF       OFF

RUNTIME COLL-T   STOR-T   DIFF-T   HILI-T    PUMP      UP-Lim     FAULT
0:06     64.9     64.7     08.0     157.5     OFF       OFF
0:06     64.9     64.9     08.0     157.5     OFF       OFF
0:06     65.0     64.9     08.0     157.5     OFF       OFF
0:07     65.0     64.9     08.0     157.5     OFF       OFF
0:07     64.9     64.9     08.0     157.5     OFF       OFF
_

Connected 0:23:34      Auto detect      2400 8-N-1      SCROLL   CAPS   NUM   Capture   Print echo
```
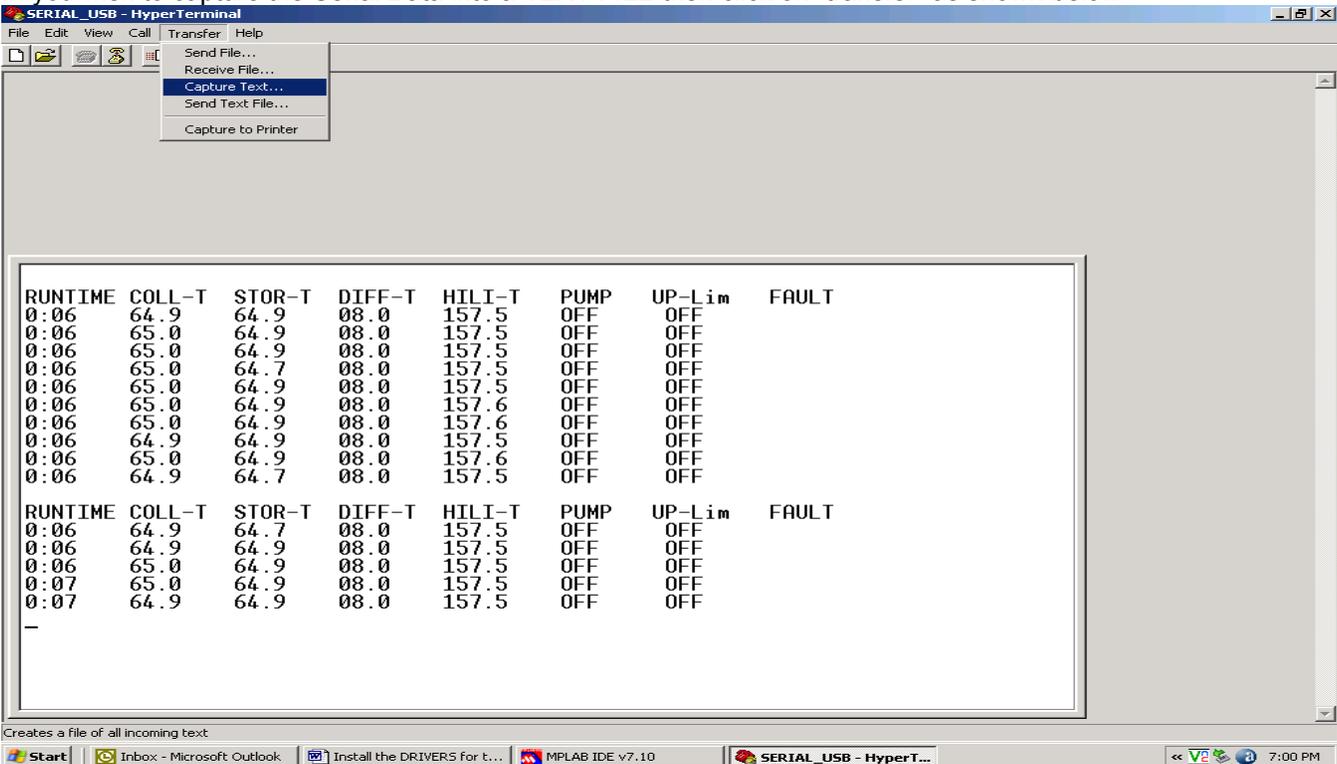
IF you wish to capture the Serial Data into a TEXT FILE then click on "transfer" as shown below

```
SERIAL_USB - HyperTerminal                                              _ | 8 | ×
File  Edit  View  Call  Transfer  Help

         Send File...
         Receive File...
         Capture Text...
         Send Text File...

         Capture to Printer

RUNTIME COLL-T  STOR-T  DIFF-T  HILI-T  PUMP   UP-Lim   FAULT
0:06    64.9    64.9    08.0    157.5   OFF    OFF
0:06    65.0    64.9    08.0    157.5   OFF    OFF
0:06    65.0    64.9    08.0    157.5   OFF    OFF
0:06    65.0    64.7    08.0    157.5   OFF    OFF
0:06    65.0    64.9    08.0    157.5   OFF    OFF
0:06    65.0    64.9    08.0    157.6   OFF    OFF
0:06    65.0    64.9    08.0    157.6   OFF    OFF
0:06    64.9    64.9    08.0    157.5   OFF    OFF
0:06    65.0    64.9    08.0    157.6   OFF    OFF
0:06    64.9    64.7    08.0    157.5   OFF    OFF

RUNTIME COLL-T  STOR-T  DIFF-T  HILI-T  PUMP   UP-Lim   FAULT
0:06    64.9    64.7    08.0    157.5   OFF    OFF
0:06    64.9    64.9    08.0    157.5   OFF    OFF
0:06    65.0    64.9    08.0    157.5   OFF    OFF
0:07    65.0    64.9    08.0    157.5   OFF    OFF
0:07    64.9    64.9    08.0    157.5   OFF    OFF
_

Creates a file of all incoming text
Start   Inbox - Microsoft Outlook   Install the DRIVERS for t...   MPLAB IDE v7.10   SERIAL_USB - HyperT...        7:00 PM
```

Then select **"capture text"** as shown below and select a drive/folder you wish to have the **"capture"** file created. DATA capture will continue until it is stopped in the Hyper-T erminal program. The HYPER TERMINAL program can be minimized and RUN IN THE BACKGROUND !! This will allow the PC to continue to be used for other tasks unaffected by the DATA CAPTURE.

RUNTIME	COLL-T	STOR-T	DIFF-T	HILI-T	PUMP	UP-Lim	FAULT
0:06	64.9	64.9	08.0				
0:06	65.0	64.9	08.0				
0:06	65.0	64.9	08.0				
0:06	65.0	64.7	08.0				
0:06	65.0	64.9	08.0				
0:06	65.0	64.9	08.0				
0:06	65.0	64.9	08.0				
0:06	64.9	64.9	08.0	157.5	OFF	OFF	
0:06	65.0	64.9	08.0	157.6	OFF	OFF	
0:06	64.9	64.7	08.0	157.5	OFF	OFF	

RUNTIME	COLL-T	STOR-T	DIFF-T	HILI-T	PUMP	UP-Lim	FAULT
0:06	64.9	64.7	08.0	157.5	OFF	OFF	
0:06	64.9	64.9	08.0	157.5	OFF	OFF	
0:06	65.0	64.9	08.0	157.5	OFF	OFF	
0:07	65.0	64.9	08.0	157.5	OFF	OFF	
0:07	64.9	64.9	08.0	157.5	OFF	OFF	

Capture Text

Folder: C:\Documents and Settings\User

File: C:\Documents and Settings\User\   [Browse...]

[Start]   [Cancel]

Connected 0:40:02   Auto detect   2400 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo

Start | Inbox - Microsoft Outlook | Install the DRIVERS for t... | MPLAB IDE v7.10 | SERIAL_USB - HyperT...   7:02 PM

Here is a brief list of some of the sources for SERIAL to USB converters and their links

www.SewellDirect.com
Part No. SW-1301
Mfg. Part No. AP1102
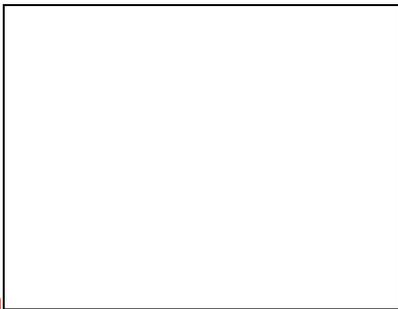
$13.45 ea

USB to DB9 Serial Port Adapter Cable
 Our Price: $9.95 (Free Shipping)

www.easysync-ltd.com

ES-U-1001-A : USB-RS232 with detachable USB cable

$24.45 $18.35

1

** Special promotional offer **

 Larger picture

You can conduct your GOOGLE SEARCH as shown below.
There are many manufacturers of these converters !

Google   **Web**   Images   Video   News   Maps   **mor e »**

| serial to USB converters | Search |

Advanced Search
Preferences

Web