DS-MPE-SER4M Serial Port
RS232/RS422/RS485

Protocol Selection Software User Manual

Revision	Date	Comment
A.0	8/11/2015	Initial release

CONTENTS

1. INTRODUCTION

The DS-MPE-SER4M is a rugged, low cost 4-port high speed PCIe MiniCard module that is ideal for serial I/O expansion in embedded and OEM applications. It offers four RS-232/422/485 serial ports. Data rates on every port are up to 1Mbps in RS-232 mode, and 10Mbps in RS-422 and RS-485 modes. The board's protocols can be set by jumpers or programmatically selected with GPIO lines built into the UART and controlled via software.

This document details steps for protocol selection through software for both windows and Linux environment. To configure protocol via Jumper configuration, refer hardware user manual of this product.

2. DRIVER INSTALLATION STEPS

2.1 Windows Driver Installation

1. Download the driver DS-MPE-SER4M/OPT Windows 7 driver.zip from DSC website
   http://www.diamondsystems.com/files/binaries/xr17x35x-vista7-driversonly-v2.5.0.0.zip
2. Open the device manager and right click on "PCI Serial Port" as shown in below image,
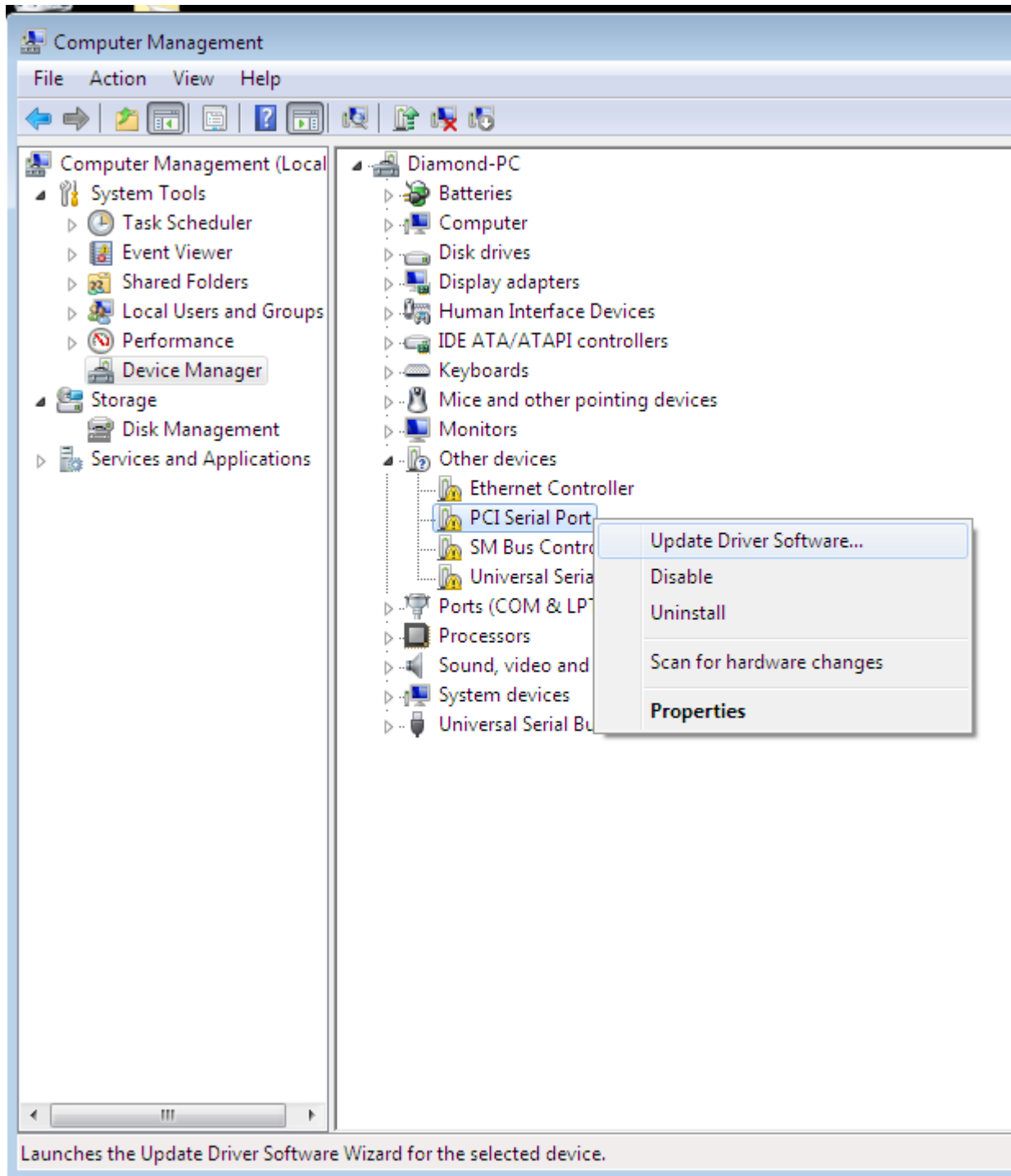3. Click on "Update Driver Software".

Figure 1: Update Driver Software for PCI Serial Port

4. Choose the "Browse my computer for driver software" option.
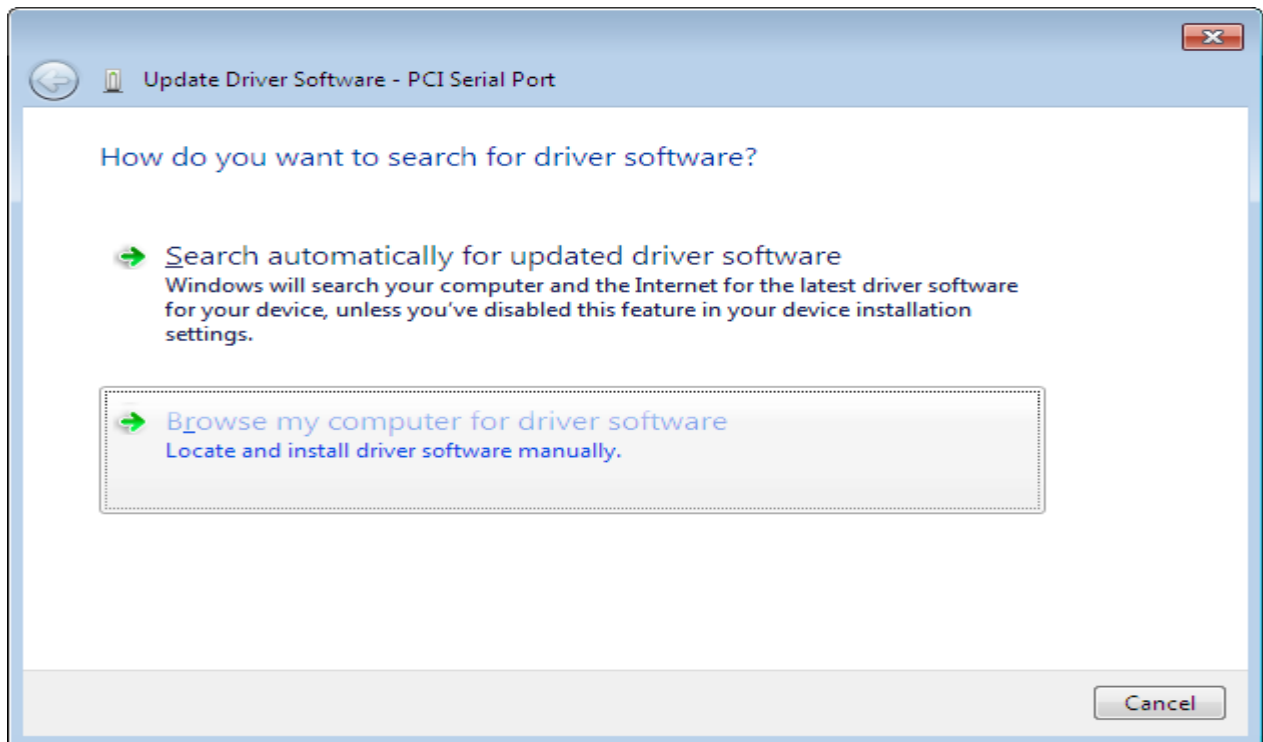
Figure 2: Browse my computer for driver software

5. Click "Browse" option and choose driver software path, and click "Next" to install the software, after installing the driver it will show the following image.(x86 for 32bit)

Figure 3: Choose Browse and Click Next

6. Click on "Close".
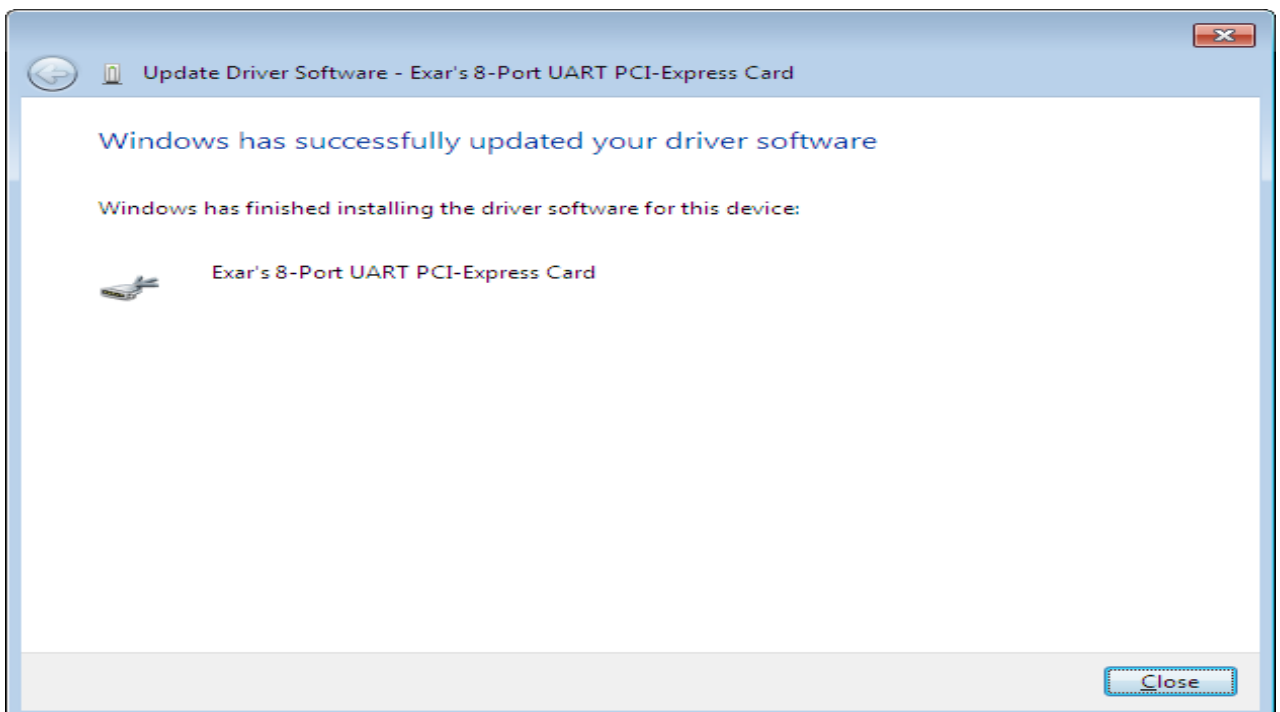
Figure 4: Click Close

7. Right click on "Multifunction Device" and choose "Update Driver software"
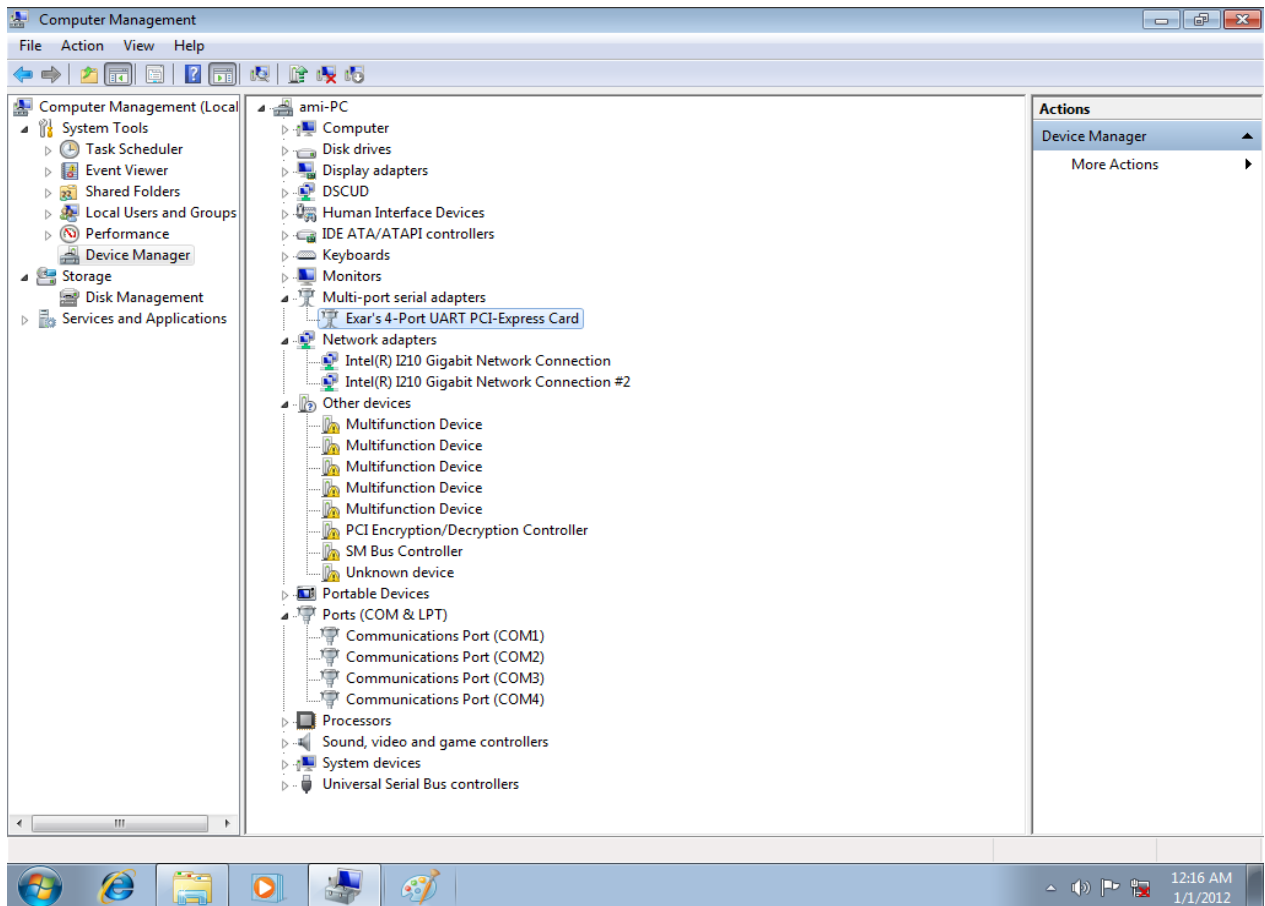
Figure 5: Select Multifunction device

8. Choose the "Browse my computer for driver software" option it will show the following image
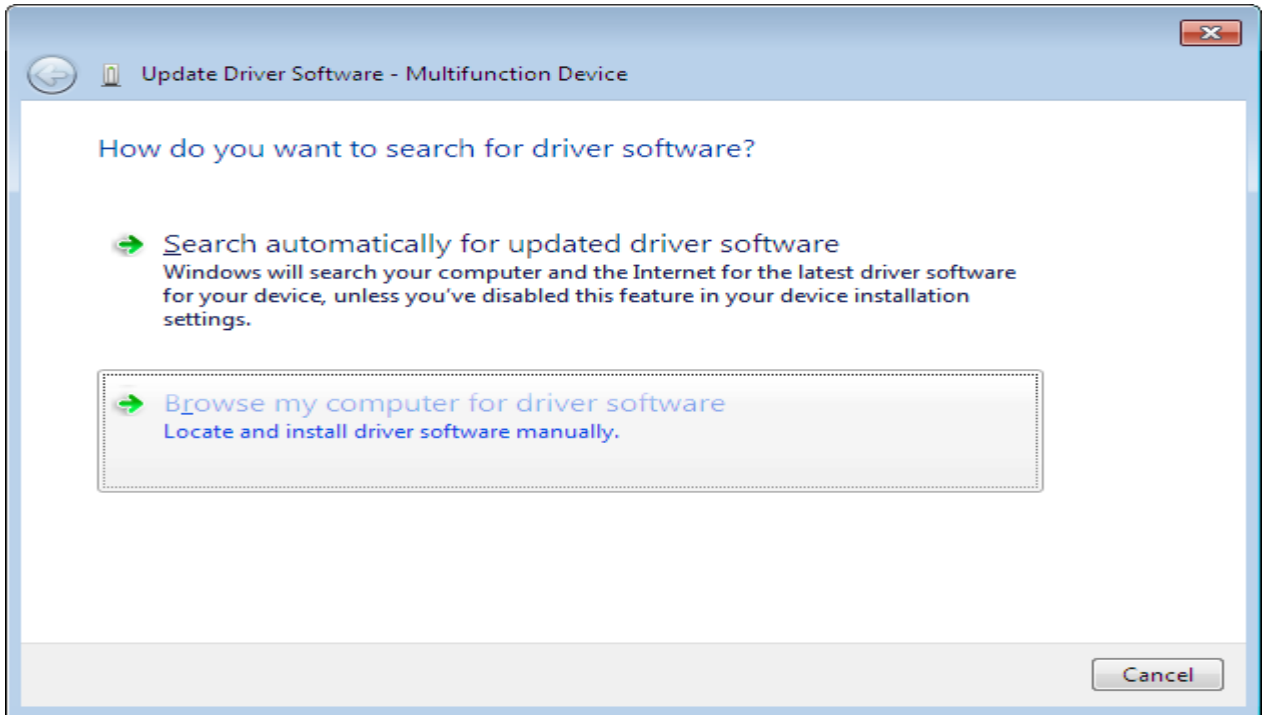
Figure 6: Update Driver Software – Multifunction device

1. Click "Browse" option and choose driver software, and click "Next" to install the software, after installing the driver it will show the following image. (x86 for 32bit)
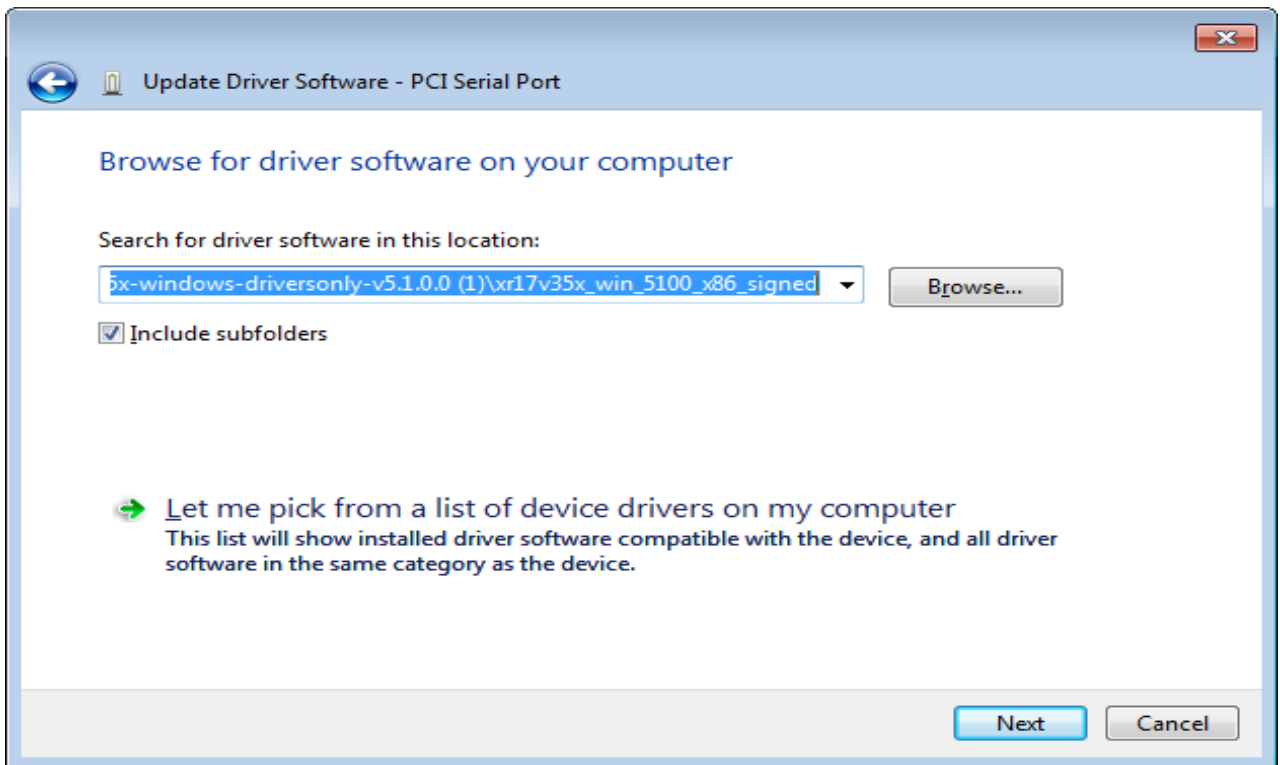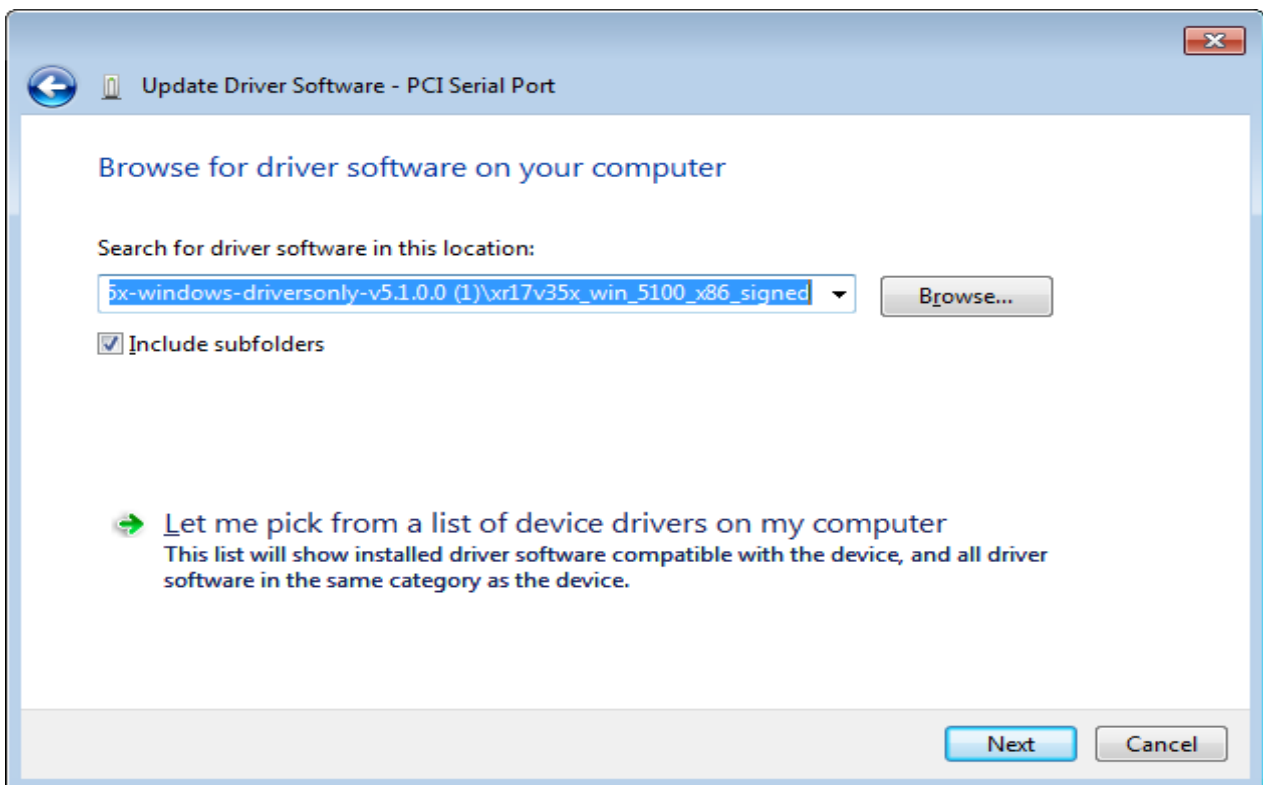

Figure 7: Browse for Driver software on your computer

2. Click on "Close".
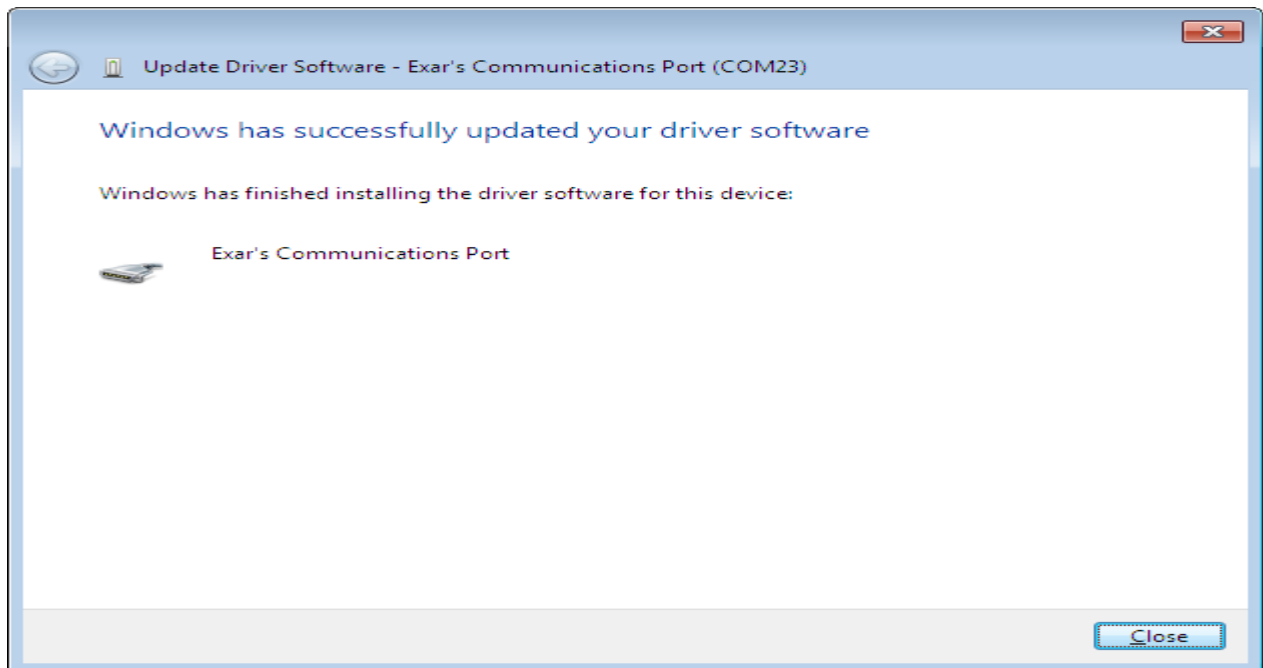
Figure 8: Windows has successfully updated driver software

3. Repeat steps 6,7,8,9 for next the four 'Multi-function Devices'.

4. After updating the driver for five 'Multi-function Device', the **EXAR's 4-Port UART PCI-express Card driver** and **ExarMPIO Acess Device driver** are installed.
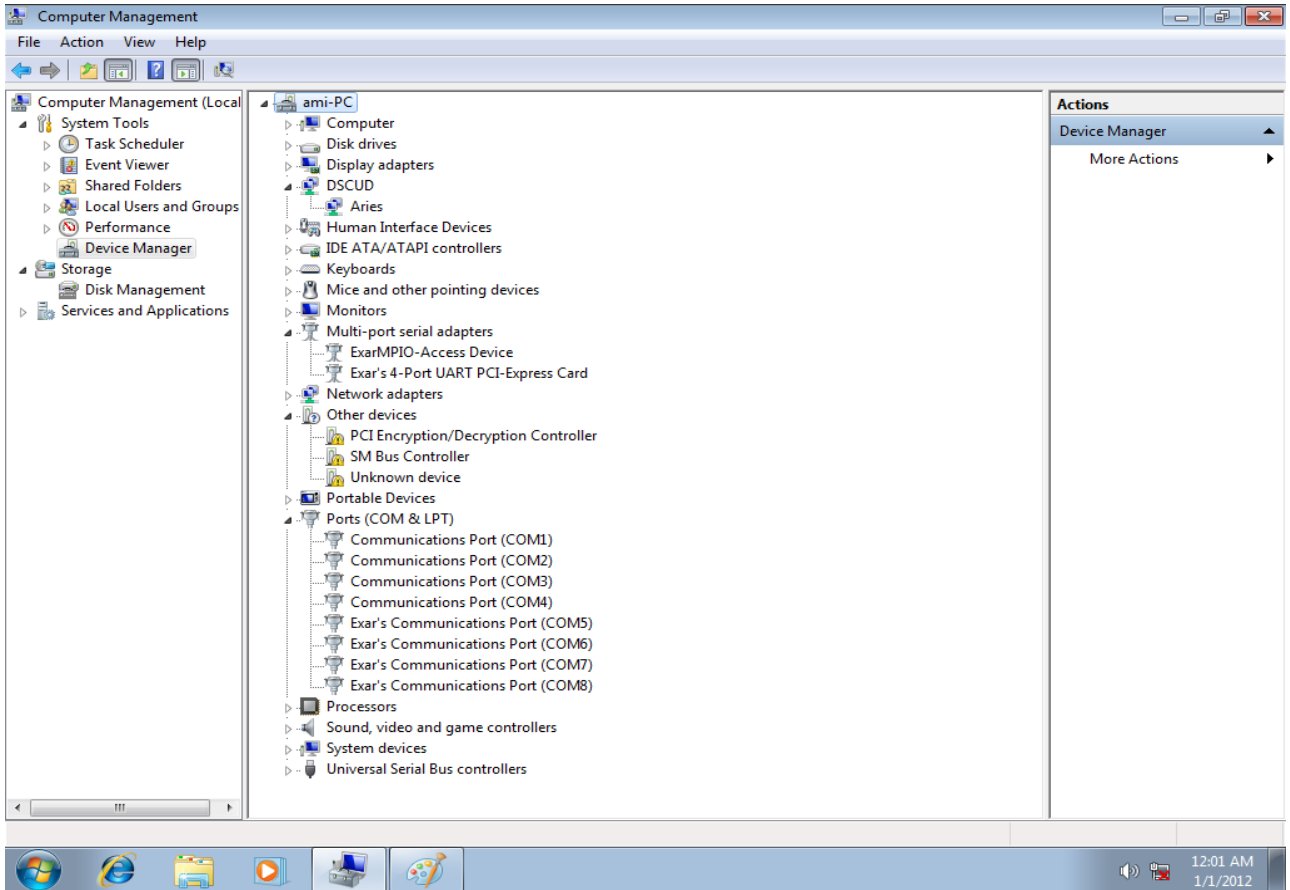
Figure 9: Update Driver for Multifunction device

2.2 Windows Driver Uninstallation

1. Open device manager
2. Right click on first "Exar's Communication Port (COM5)" and choose "Uninstall", it will show the following image
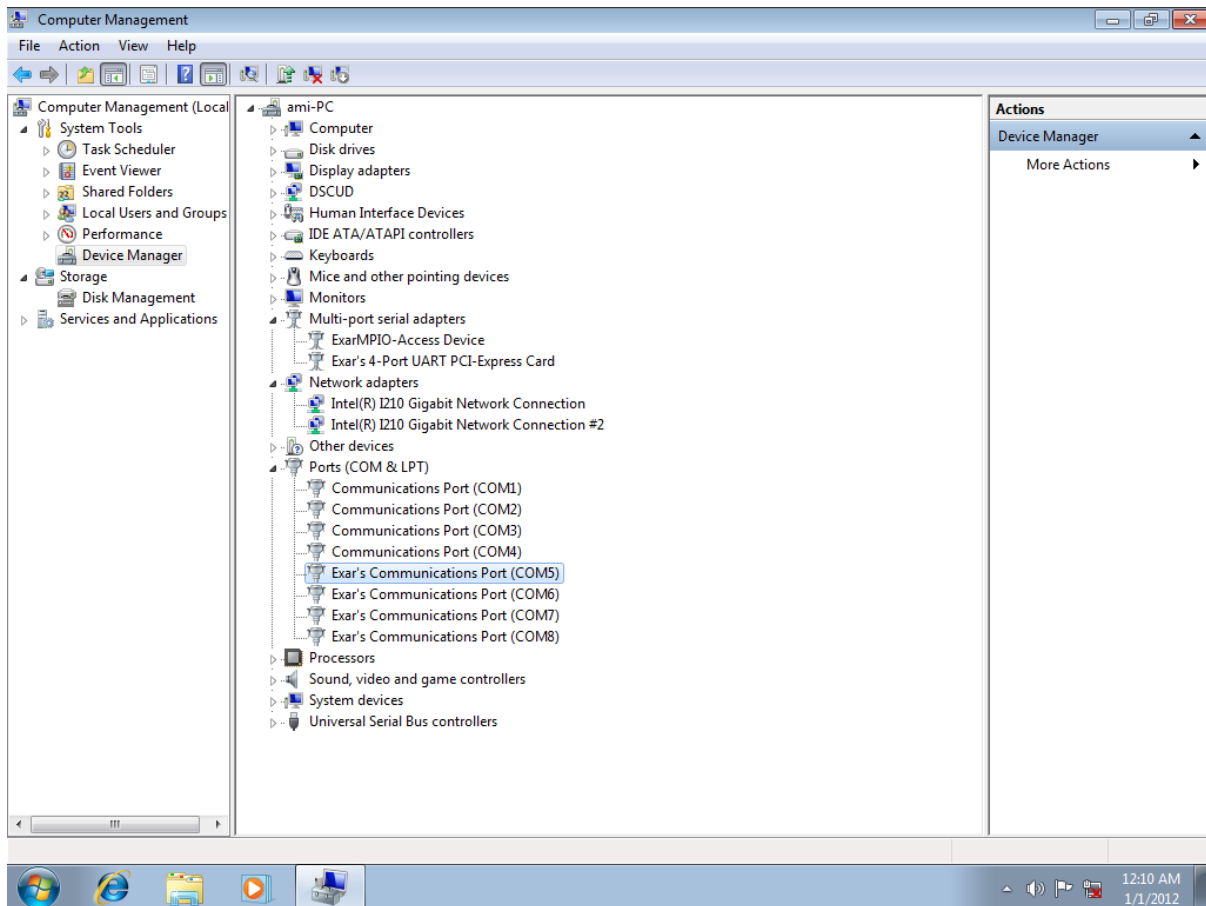
Figure 10: Uninstall "Exar's Communication Port (COM5)"

3. Enable the "Delete the driver software for this device" and press "OK", it will uninstall the driver.
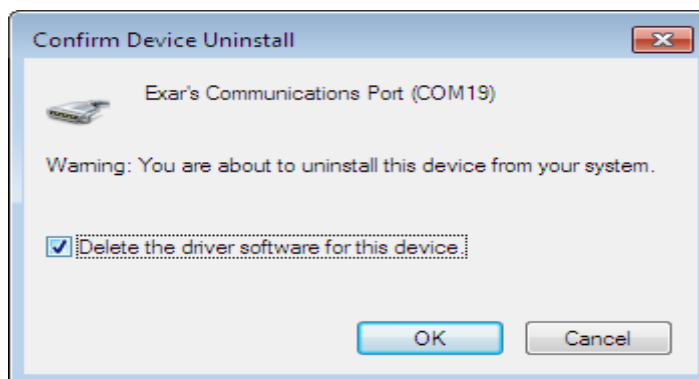
Figure 11: Confirm "Exar's Communication Port (COM5)" Uninstall

4. Follow the same steps for uninstalling remaining Exar's Communication Ports.
5. After uninstalling all the ports, uninstall "Exar's 8-Port UART PCI-Express Card" and "exAR-MPIO access Device" as mentioned above in steps 2 and 3.

Figure 12: Uninstall "Exar's 8-Port UART PCI-Express Card"

Figure 13: Confirm "Exar's 8-Port UART PCI-Express Card" Uninstall

2.3   Linux Driver with kernel 3.7 and older version Installation

- Download the driver from DSC website
- Open the terminal
- Become the root user
  Type the following in the command prompt
  $ sudo su
  $ provide the password
- Navigate to the directory Linux\Linux_3.7_and_older_version\DSMPESER4MDriver
- Type the following command in the command prompt
  $./compile.sh
  $ ./install.sh

2.4   Linux Driver with kernel 3.7 and older version Uninstallation

- Open the terminal
- Become the root user
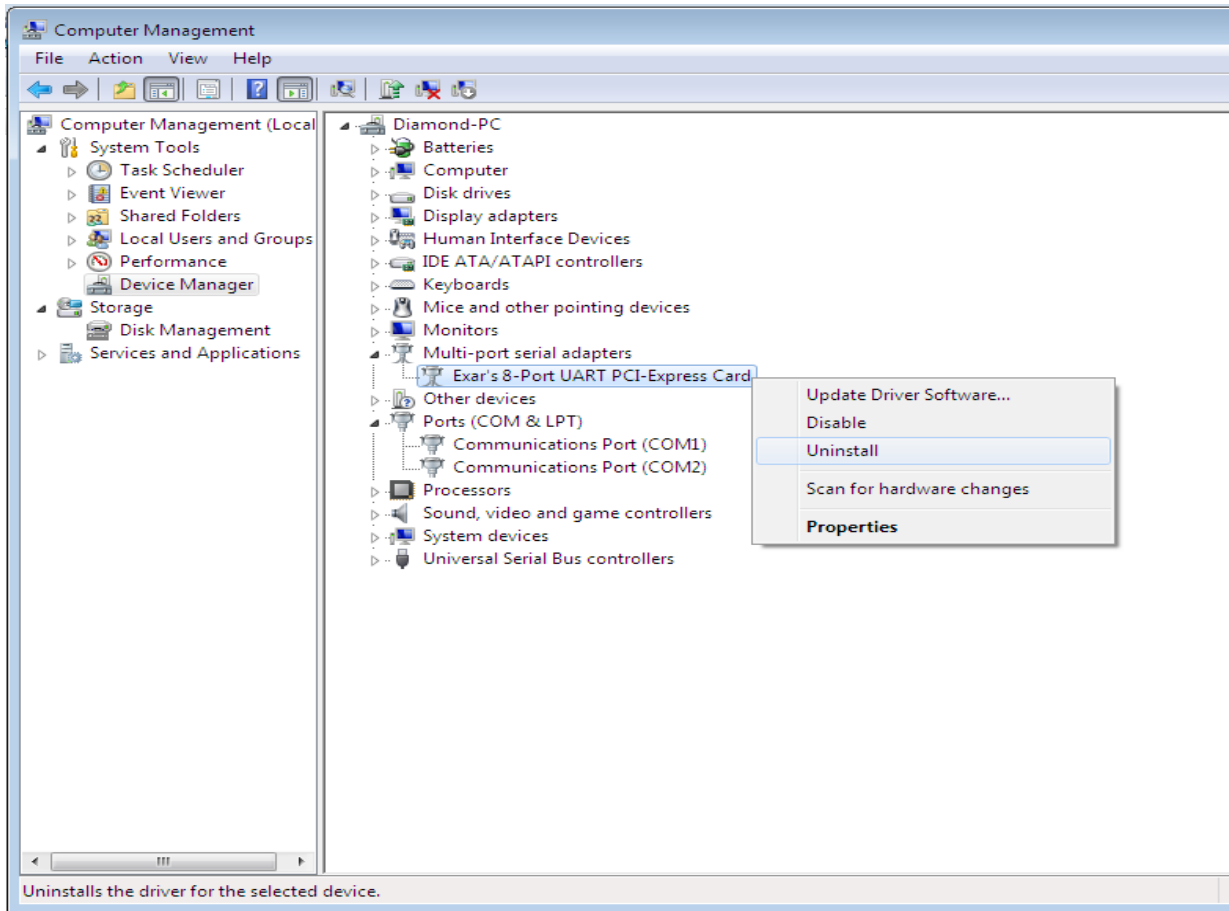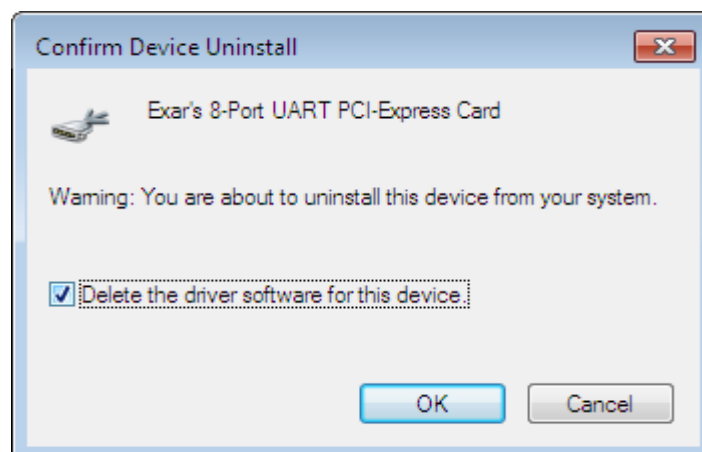 Type the following in the command prompt
  $ sudo su
  $ provide the password
- Navigate to the directory Linux\Linux_3.7_and_older_version\DSMPESER4MDriver
- Type the following command in the command prompt
  $ ./uninstall.sh

2.5   Linux Driver with kernel 3.8 and newer version Installation

- Download the driver from DSC website
- Open the terminal
- Become the root user
  Type the following in the command prompt
  $ sudo su
  $ provide the password
- Navigate to the directory Linux\Linux_3.8_and_newer_version\DSMPESER4Mdriver
- Type the following command in the command prompt
  $./compile.sh
  $ ./install.sh

2.6   Linux Driver with kernel 3.8 and newer version Uninstallation

- Open the terminal
- Become the root user
  Type the following in the command prompt
  $ sudo su
  $ provide the password
- Navigate to the directory Linux\Linux_3.8_and_newer_version\DSMPESER4Mdriver
- Type the following command in the command prompt
  $ ./uninstall.sh

3. EXECUTING THE CONSOLE APPLICATION

3.1 Running the Windows application

- Download the application from DSC website
- Double click on the DSMPESER4MSerialProtocolSelection.exe application

  This application allows you decide the protocol for serial ports.
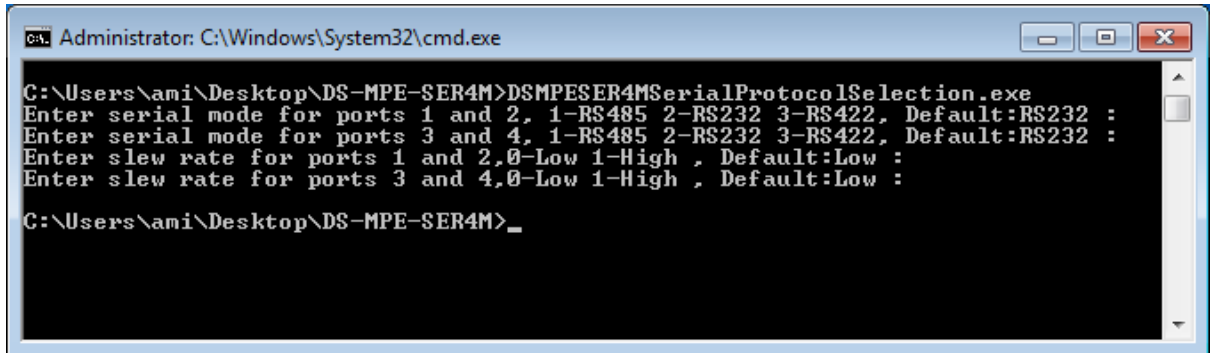
Figure 14: Running the windows application

3.2 Testing the Serial ports in Windows

- Connect the serial ports with cables in desired protocol, refer hardware user manual for pin details.
- Open two HyperTerminal with COM ports as 5 and 6.

3.3 Running the application in Linux with kernel 3.7 and older version

- Download the application DSC website
- Open the terminal
- Become the root user
  Type the following in the command prompt
  $ sudo su
  $ provide the password
- Navigate   to   the   folder
  Linux\Linux_3.7_and_older_version\DSMPESER4MSerialProtocolConfiguration
- Type the following in the command prompt
  $./ DSMPESER4MSerialProtocolConfiguration

  This application allows you decide the protocol for serial ports.

3.4 Testing the Serial ports Linux with kernel 3.7 and older version

- Connect the serial ports with cables in desired protocol
- Open the terminal and become root user
- Type the following in the command prompt
- $ minicom –s
  - ➢ Set the port as ttyXR0
  - ➢ Click on save as Default option
- Open the terminal and become root user
- Type the following in the command prompt
- $ minicom –s
  - ➢ Set the port as ttyXR1
  - ➢ Click on save as Default option
- Type in one window and check for the received characters in another window.

3.5 Running the application in Linux with kernel 3.8 and newer version

- Download the application from DSC website
- Open the terminal
- Become the root user
  Type the following in the command prompt
  $ sudo su
  $ provide the password
- Navigate to the folder
  Linux\Linux_3.8_and_newer_version\DSMPESER4MSerialProtocolConfiguration
- Type the following in the command prompt
  $./DSMPESER4MSerialProtocolConfiguration

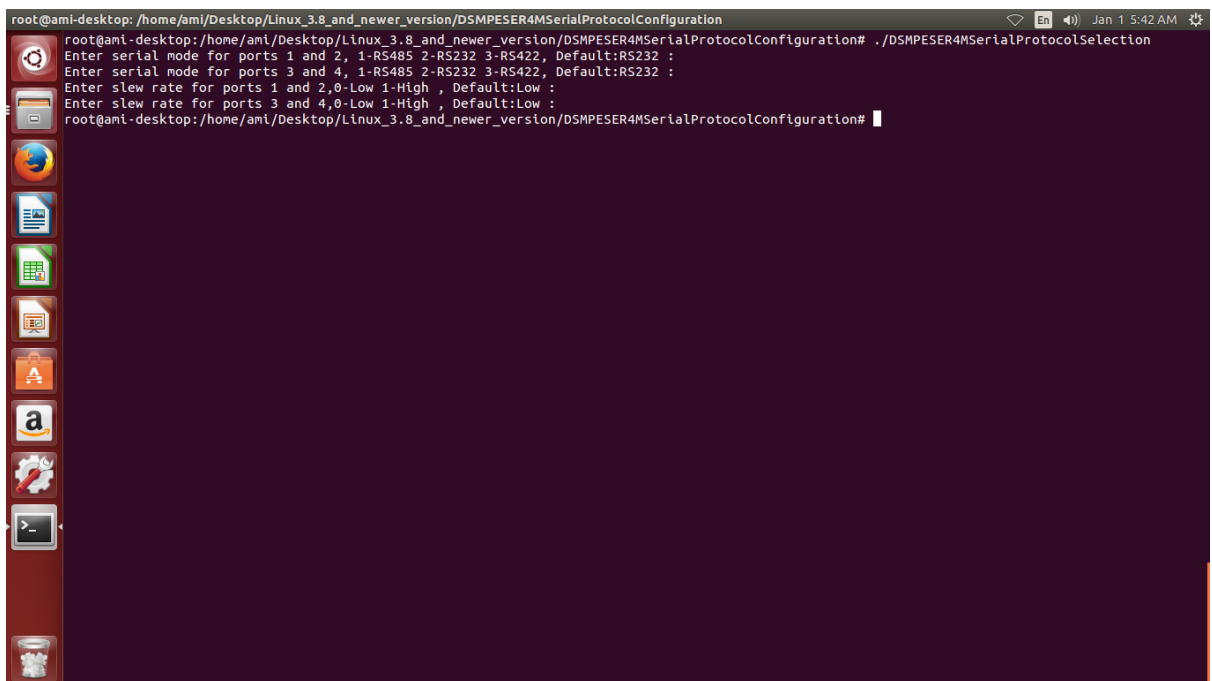 This application allows you decide the protocol for the serial ports.

Figure 15: Running the application in Linux with kernel 3.8

3.6 Testing the Serial ports in Linux with kernel 3.8 and newer version

- Connect the serial ports with cables in desired protocol
- Open the terminal and become root user
- Type the following in the command prompt
  $ dmesg|grep XR17V35X
  It will list as
  [1.108904] 0000:03:00.0: ttyS4 at MMIO 0x90a00000 (irq = 18, base_baud = 7812500) is a XR17V35X
  [1.109137] 0000:03:00.0: ttyS5 at MMIO 0x90a00400 (irq = 18, base_baud = 7812500) is a XR17V35X
  [1.109369] 0000:03:00.0: ttyS6 at MMIO 0x90a00800 (irq = 18, base_baud = 7812500) is a XR17V35X
  [1.109643] 0000:03:00.0: ttyS7 at MMIO 0x90a00c00 (irq = 18, base_baud = 7812500) is a XR17V35X
  Look out for ttyS and note it. This is the Serial port number assigned by Linux OS.
- $ minicom –s
  - ➢ Set the port as ttyS4
  - ➢ Click on save as Default option
- Open the another terminal and become root user
- Type the following in the command prompt
- $ minicom –s
  - ➢ Set the port as ttyS5
  - ➢ Click on save as Default option
- Type in one window and check for the received characters in another window.

4. EXECUTING THE CONSOLE APPLICATION AT THE RUN TIME

A separate application is provided for configuring the protocol at boot time, download the application from DSC website. Edit Configuration.ini file as per the requirement, the application reads the protocol type from this file and updates accordingly.

4.1 Running the windows application at boot time

- Click the Start button, click All Programs, right-click the Startup folder, and then click Open.
- Open the location that contains the DSMPESER4MSerialProtocolSelection.exe to create shortcut
- Right-click the item, and then click Create Shortcut. The new shortcut appears in the same location as the original item.
- Drag the shortcut into the Startup folder.
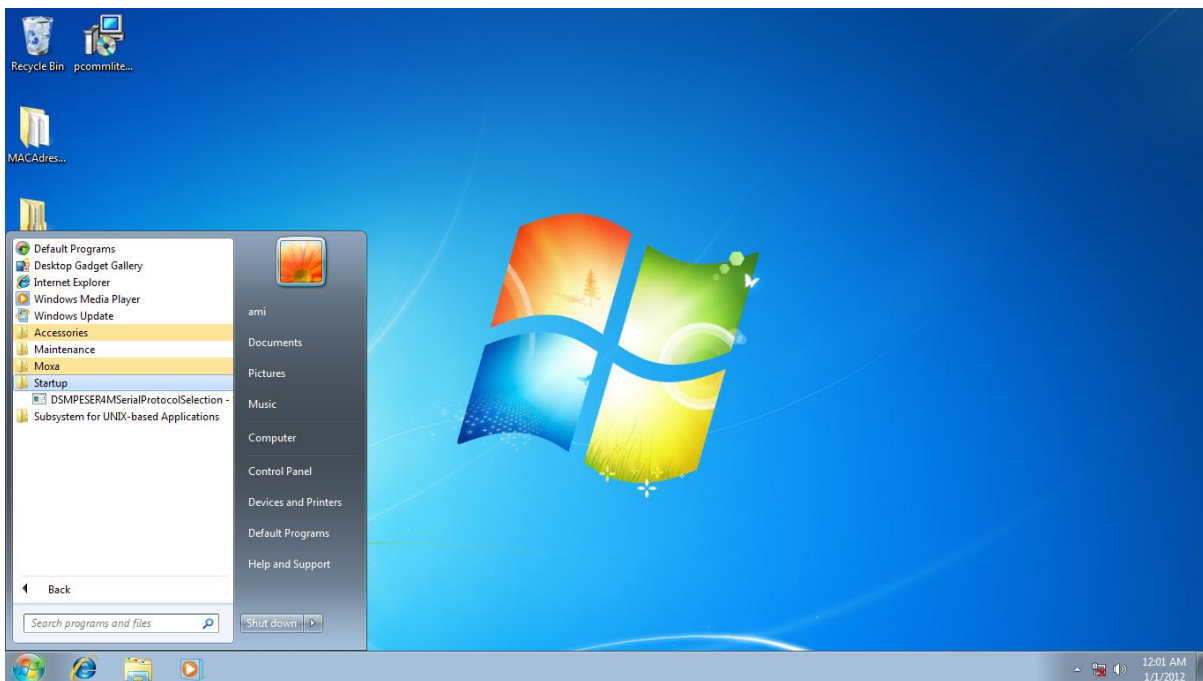- Restart the computer

Figure 16: Running the windows application at boot time

4.2   Running the Linux application at the boot time

- Open the rc.local file present in the path /etc/rc.local.
- Add following two lines in the above file to run the application at boot time

/PATH/TO/DSMPESER4MLinuxDriverFolder/install.sh
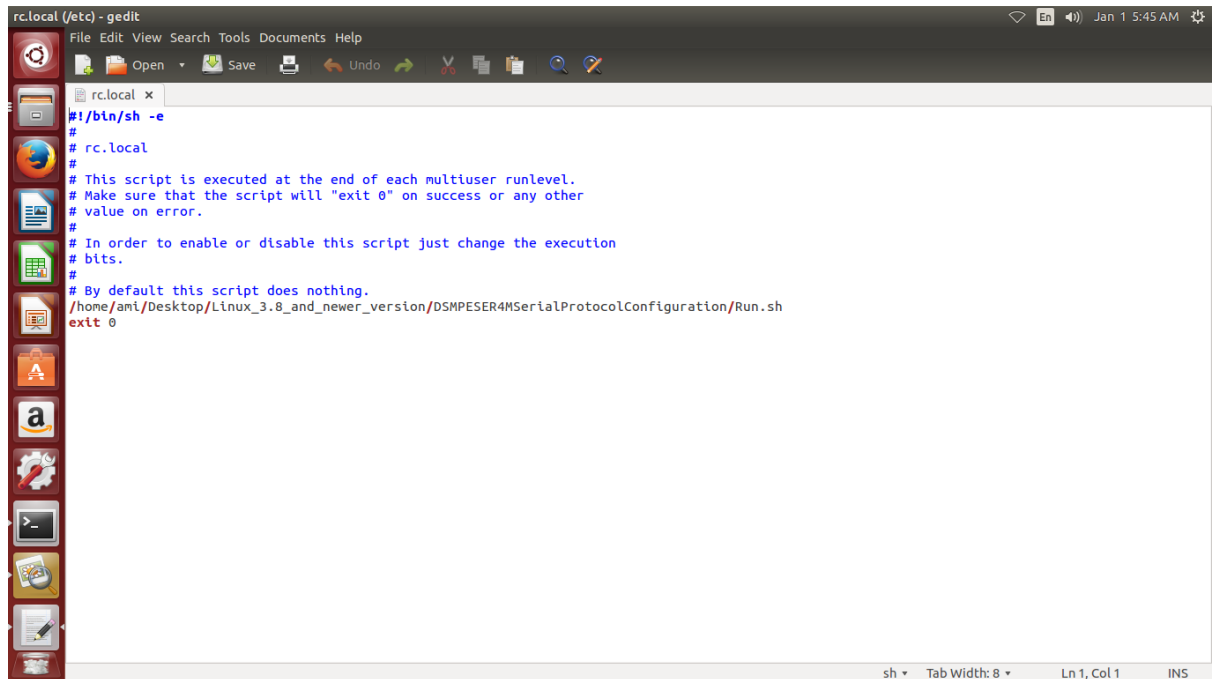/PATH/TO/ SerialProtocolConfigurationAppFolder/Run.sh

Figure 17: Running the Linux application at boot time

- Restart the computer.