

Network USB Device Server Over IP

USB Server Windows Client User Manual

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1. Introduction

USB-IP application enables the virtualization of USB devices over LAN (Local Area Network) as if they are connected local to your PC. By this implementation, USB devices connected to be made available to remote Clients over LAN.

Key Features of the USB-IP application are

- Allows USB Devices to be used and shared by client PC's over LAN.
- Supports wide variety of USB devices.
- Compatible with bulk, interrupt and isochronous type USB devices.
- Supports printing to USB printer from both Wired and Wireless Interface.
- Supports printer auto-reconnect while sharing the printer to different Client PC's.
- Supports auto sharing of USB devices.
- Supports USB device safe removal.
- User-Friendly Application interface.

2. Windows utility

USBIP Admin utility Setup is an Install Shield based application, which can be used for installing, uninstalling and upgrading the Client S/W. Please run the self-explanatory Install shield application to install the USB SERVER Admin Utility.

Admin utility application enables the USB devices virtualization along with USB Server Firmware loaded onto USB SERVER. Any USB device connected to USB SERVER can be made available over the Network, for different Windows hosts to use the device. USB Server supports monopoly type connection i.e USB device connected to USB SERVER can be accessed by one host at a time. Other Windows host can access this USB device, once first host relinquishes the connection. Different Windows hosts can access different USB devices connected to USB SERVER.

Eg : If USB Pen Drive, USB Audio device, USB 1.1 Web Cam & USB DVD Rom drive are connected to USB SERVER. Then PC1 can access Pen Drive, PC2 can access Audio device, PC3 can access Web Cam & PC4 can access DVD ROM drive.

Pen Drive can be accessed by PC2 or PC3 or PC4, once PC1 relinquishes the connection. In-case of Printers, USB Server application's Auto Reconnect feature enables multiple Windows hosts to use the Printer simultaneously.

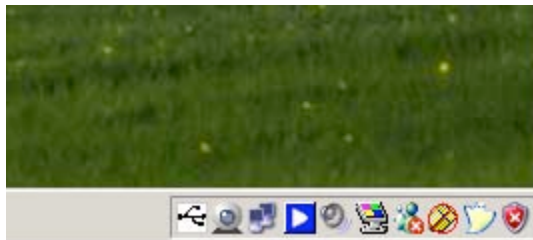
USB SERVER & all the Windows Hosts need to be connected to same LAN & under same IP subnet for above.

2.1. Virtual USB-IP Driver Software

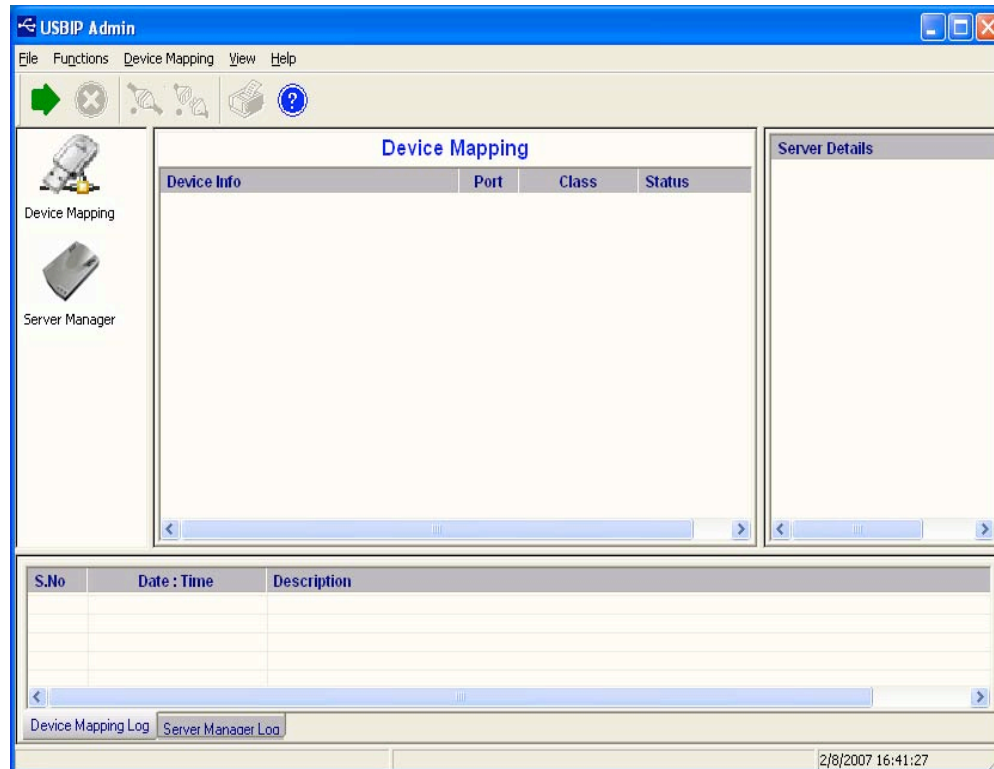
This contains a Virtual Bus Enumerator driver & Virtual Bus driver. These drivers will help in **virtualizing** the USB devices attached on the USB-Server.

Virtual Bus driver takes the USB traffic from the USB Client drivers on Windows Host and passes it to the USB SERVER USB-Server, which is sitting remotely on the network.

As soon as the utility is installed this application will be placed in the system tray as shown in the figure below.



Double click the icon on the system tray to view the Full screen mode of the PC client application as shown below.



USBIP

Admin tool

The application has four panels, which are docked in the application.

- 1) Main window: This displays all the Device server and the USB Devices connected on them
- 2) Function Panel: This panel enables to switch between the Device Mapping and Server Manager Application.
- 3) Server/Device Details Panel: This displays the more information of the server and the device selected on the main window.
- 4) Log panel: Any event on the USB server creates a log in the Log panel. This helps in continuous monitoring of USB device servers on the network.

USB SERVER Admin Utility has two main functionalities built in

- a) Device Mapping
- b) Server Manager

2.2. Device Mapping

Device Mapping enables virtualization of all USB Devices connected to the USB SERVER board on to your PC, over LAN.

Click on the Green Arrow Button in the Admin utility to start the device mapping, which will automatically start the 'Found New Hardware' wizard to install the Virtual USB driver.

Continue the Add New Hardware wizard to install the Virtual USB driver for the USB SERVER Admin utility.

Make sure "Search for a suitable driver for my device (recommended)" is selected. Click on Next

and the Operating System automatically searches for the driver until the Virtual USB over IP driver is installed.

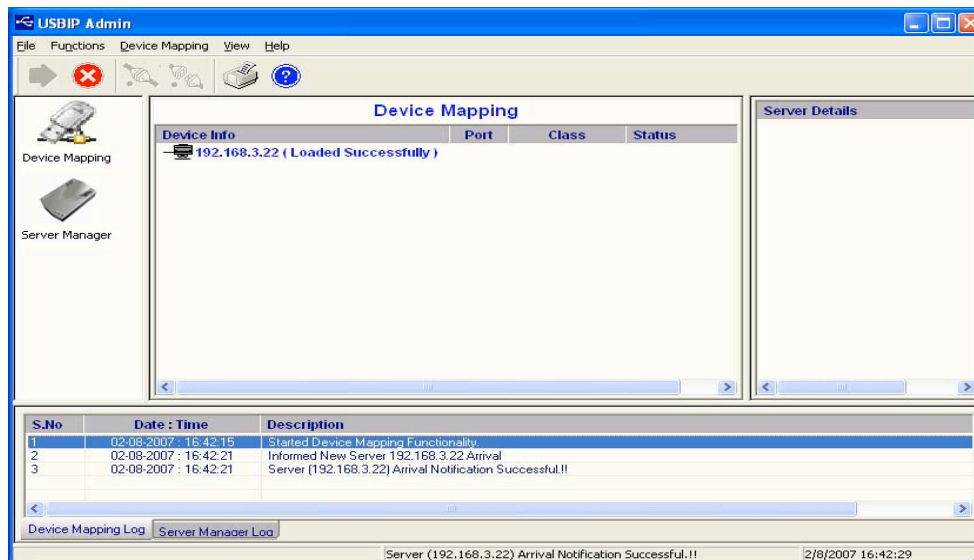
Make sure that you click on “Continue anyway” if a Windows dialog pops up about the Digital Signature as shown below.



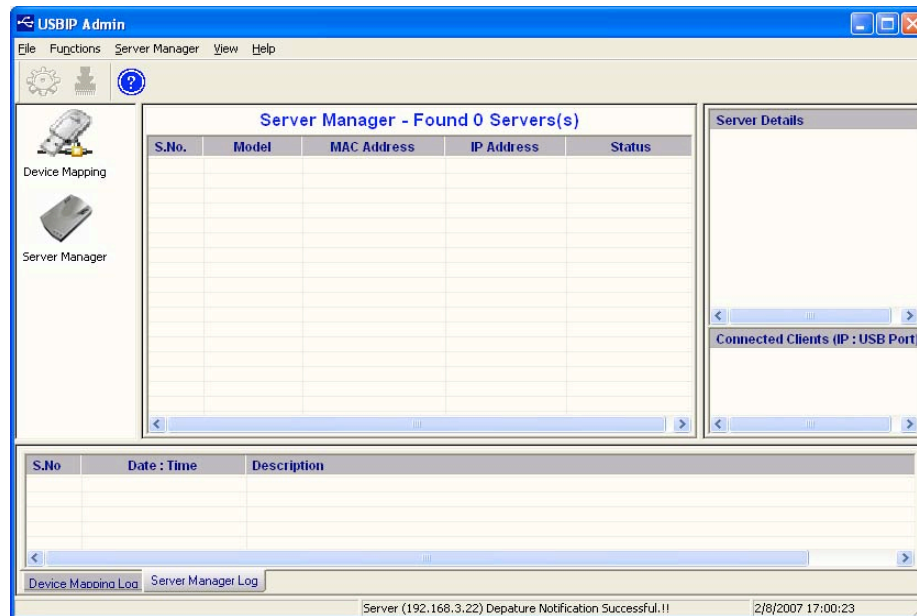
Power on the USB SERVER board and connect an Ethernet cable from the USB SERVER Ethernet port to your Local Area Network.

The USBIP Windows Admin utility is capable enough to identify the USB SERVER based USB Servers by it's IP address on the network. As soon as the USB SERVER box is detected with a specific IP address the Windows automatically invokes a Found New Hardware Wizard to install the drivers for the USB server box. Continue the Installation to see the USB SERVER board and the USB devices connected in the Admin utility as shown below.

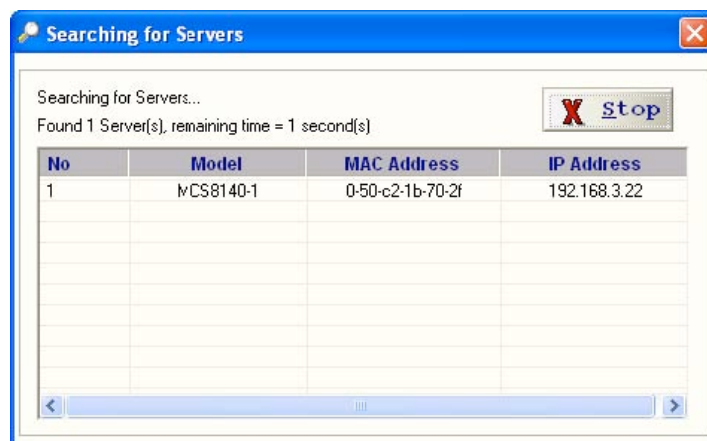
NOTE: For proper enumeration of device, disable the Firewall option on the Windows PC.



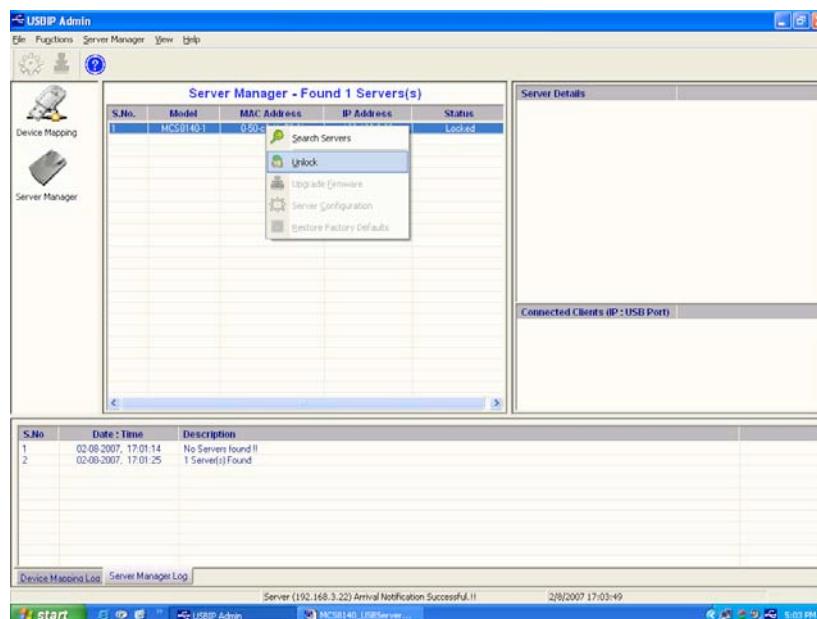
In the Device mapping window, all the USB devices connected are shown as a tree under the USB Server. Right click on any device and click on “Connect” to virtualize that USB device onto your PC as shown below.



It pops up the 'Searching for Servers' dialog and list all the USB SERVER USB server devices on the Network as shown below



The USB Device Server search is password protected and should be unlocked in order to configure the selected device.



On selecting 'Un-Lock' the password dialog pops up as shown below. Key in the password in the 'Password' dialog. The default password for the USB IP Server is "usbip"



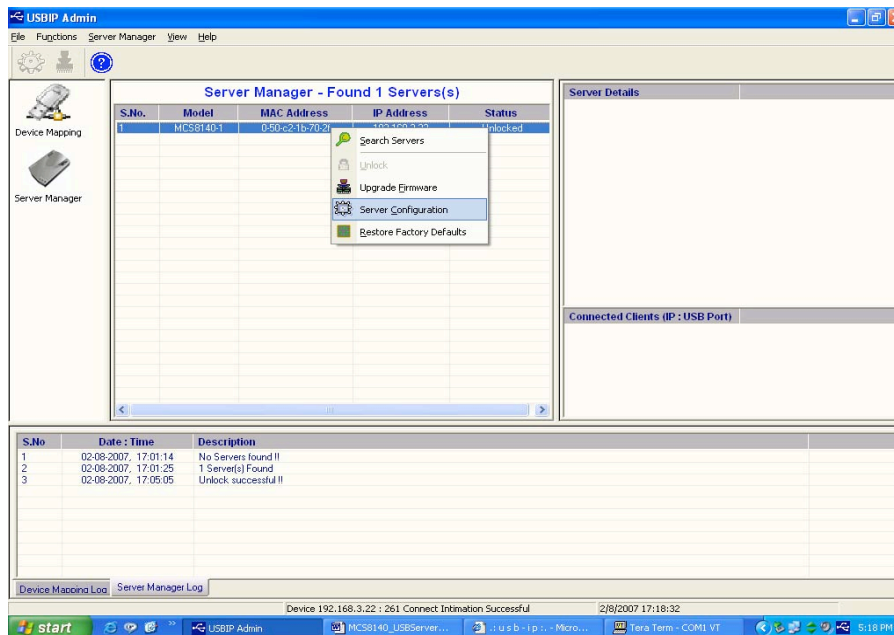
If the Authentication is successful a 'Unlock OK' dialog appears.

Now the Device server can be configured for various settings as given below.

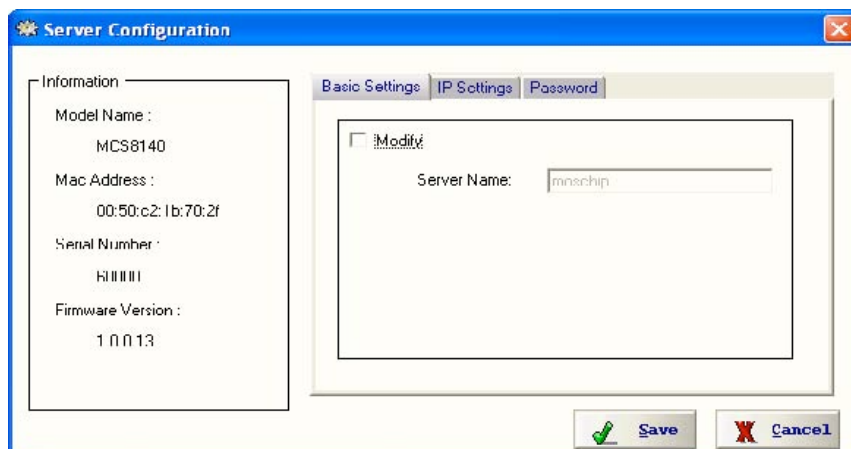
a) Server Configuration

Server Manager has an option to change Server Configuration settings through USBIP Admin Utility.

To open server configuration window right click on the USB SERVER server displayed on the Server Manager Main window and select "Server Configuration" option as shown below..

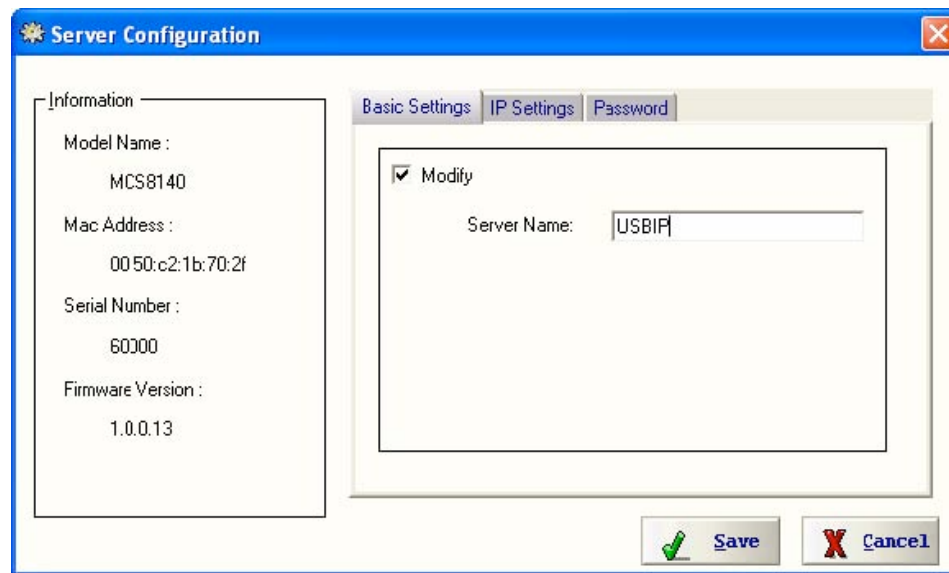


It pops up Server Configuration window as shown below.



Basic Settings Page

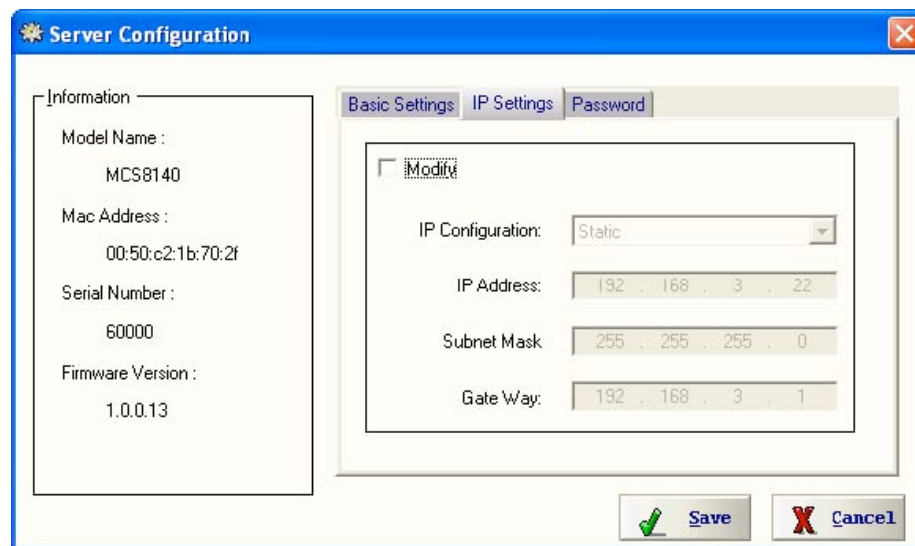
The Basic Settings page allows you to specify a server name .Check the modify box and enter server name as shown below.



The screenshot shows the 'Server Configuration' window with the 'Basic Settings' tab selected. On the left, the 'Information' section displays: Model Name: MCS8140, Mac Address: 00:50:c2:1b:70:2f, Serial Number: 60000, and Firmware Version: 1.0.0.13. The main area has a 'Modify' checkbox checked and a 'Server Name' text field containing 'USBIP'. At the bottom right are 'Save' and 'Cancel' buttons.

IP Settings Page:

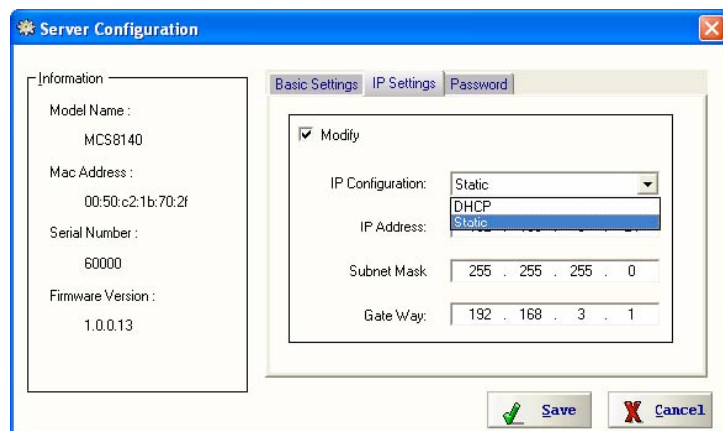
The IP Settings page allows you to modify USB SERVER box IP Address as shown below.



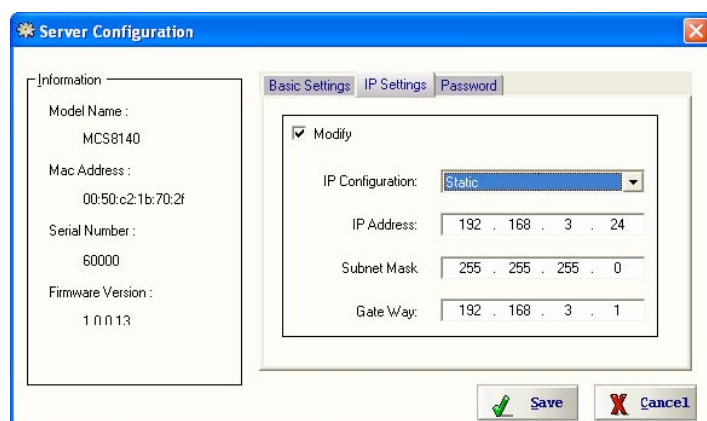
The screenshot shows the 'Server Configuration' window with the 'IP Settings' tab selected. The 'Modify' checkbox is checked. The 'IP Configuration' dropdown is set to 'Static'. The IP Address field shows '192 . 168 . 3 . 22', the Subnet Mask shows '255 . 255 . 255 . 0', and the Gate Way shows '192 . 168 . 3 . 1'. The 'Save' and 'Cancel' buttons are at the bottom right.

The Default IP Address is **192.168.3.22**

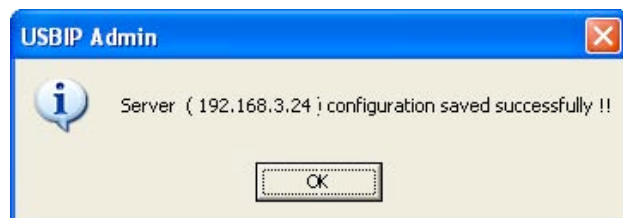
To modify the IP Address of the USB SERVER box, check the 'Modify' box and Select IP Configuration (Select IP configuration Static/DHCP from IP Configuration drop-down box) as shown below.



After Selecting IP Configuration key in the IP Address of the USB SERVER box in the IP Address field followed by proper Subnet Mask & Gate Way as shown below.



After entering IP address, Subnet Mask & Gate Way then click on “save” button. Then USBIP Admin shows progress bar for some time and after it pops up a message box as shown below.



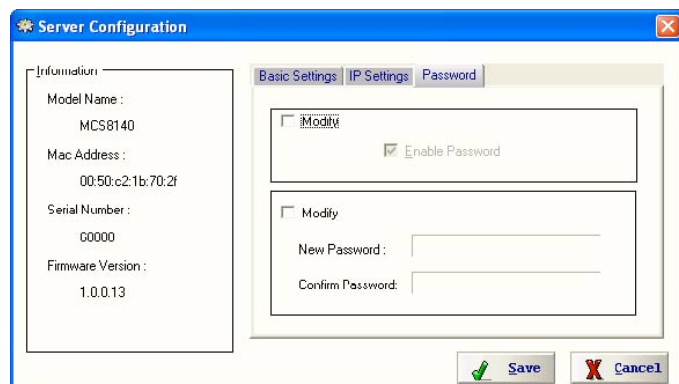
Note: Every board in the network is identified by its IP address. The utility treats each IP address as unique device. Even if the IP address of the box is modified it treats the same box as a different device and will pop up a Found New Hardware Wizard.

Continue the Found New Hardware Wizard to install the Virtual USB-over-IP bus driver.

Now MCS 8140 box appears with changed IP Address under USBIP Admin utility.

Password:

The Password Settings page allows you to change or Enable/Disable password of the USB SERVER box. The Password settings page will be as shown below.

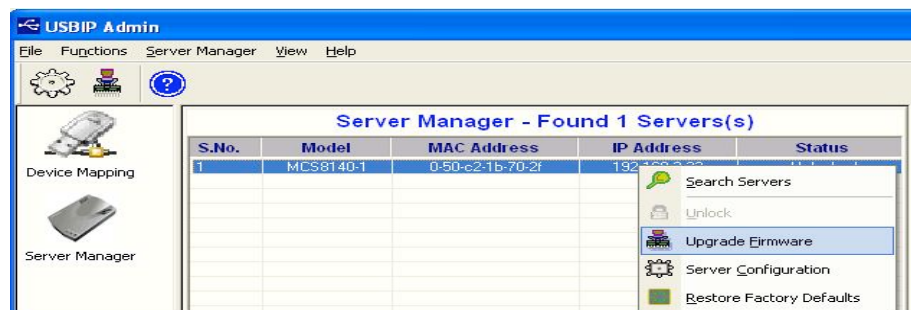


Check the Modify box to Enable or Disable password option to USB SERVER box.

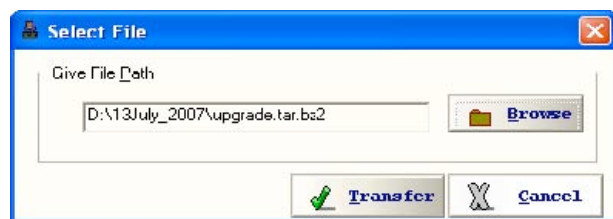
b) Upgrade Firmware

USB SERVER USB Server Firmware can be upgraded remotely using the Firmware upgrade option.

Select the server on the Server manager. Right Click on the server and Select Upgrade Firmware option to upgrade the firmware.

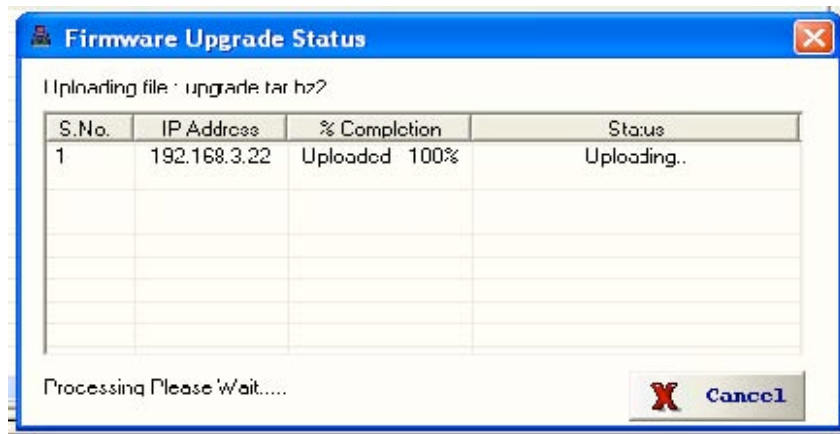


Select the upgrade file by clicking on the Browse option in the “Select File” dialog as shown below.



A upgrade.tar.bz2 file is required to upgrade the firmware. The upgrade .tar file can be downloaded from our website.

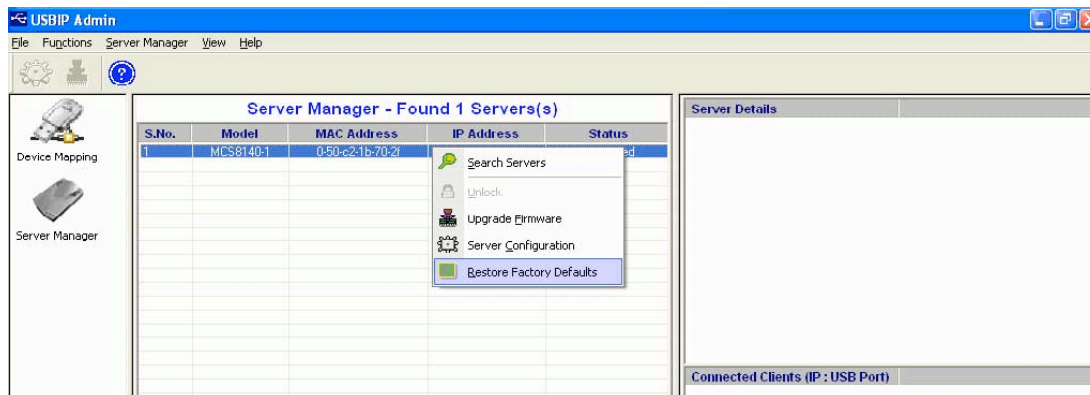
Click on “Transfer” to upgrade the firmware. A firmware upgrade status is displayed which automatically relinquishes once the transfer is completed.



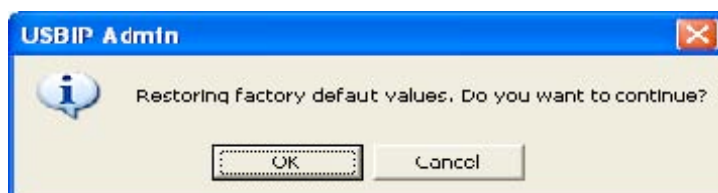
As soon as the transfer is completed, the USB SERVER USB server box automatically restarts to apply the upgraded firmware settings.

c) Restore factory defaults

Right click on the USB SERVER Server under Server Manager Window and select the Restore Factory Defaults function to obtain Default settings as shown below.



Then USBIP Admin Utility pops up a window asking for to continue or not. If we select Ok button it will get default settings.



2.4. Printer Auto-Connect

USB Admin Utility enables Printers be shared between multiple clients making it a bidirectional Print Server.

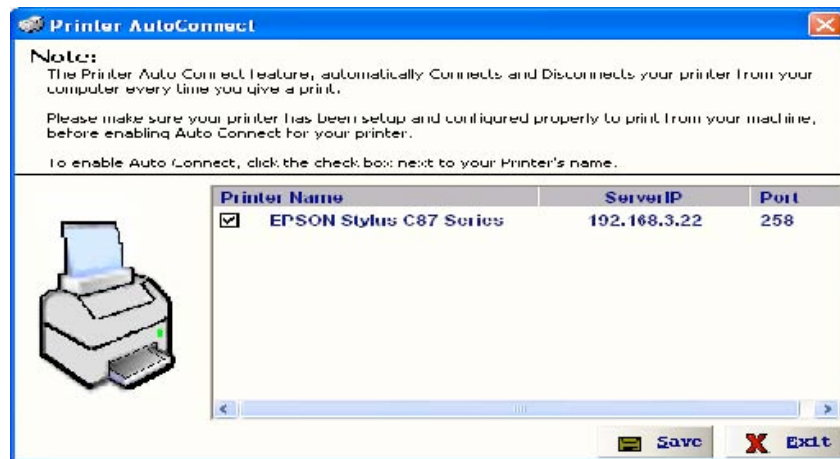
In order to share the printer between multiple clients, user may need to connect the printer at least once to install the driver for the Printer.

Once the printer is enumerated disconnect the Printer form the Device Mapping Window, Select

the Printer Auto Reconnect button



on the Menu bar to open the Printer Auto-Connect Window.



Select the Printer which was connected and Click on “Save” and close the Window.

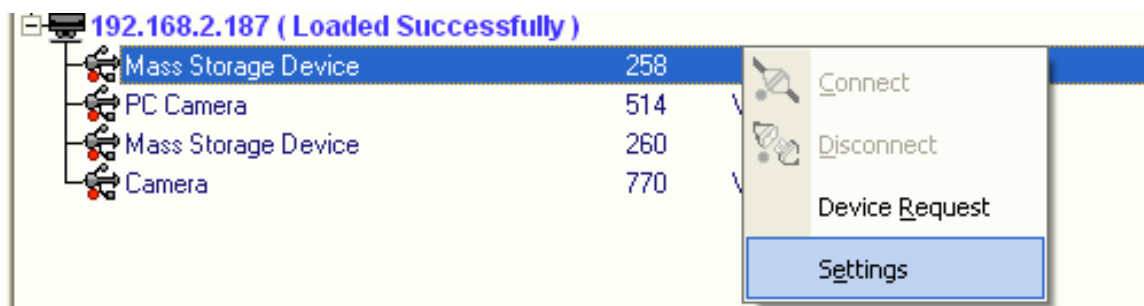
Once the Printer is configured for Auto-Connect mode, It remains free as long as the Printer is connected and becomes “Busy” only when a user prints to the printer connected.

Multiple User print jobs will be executed on a time sharing basis.

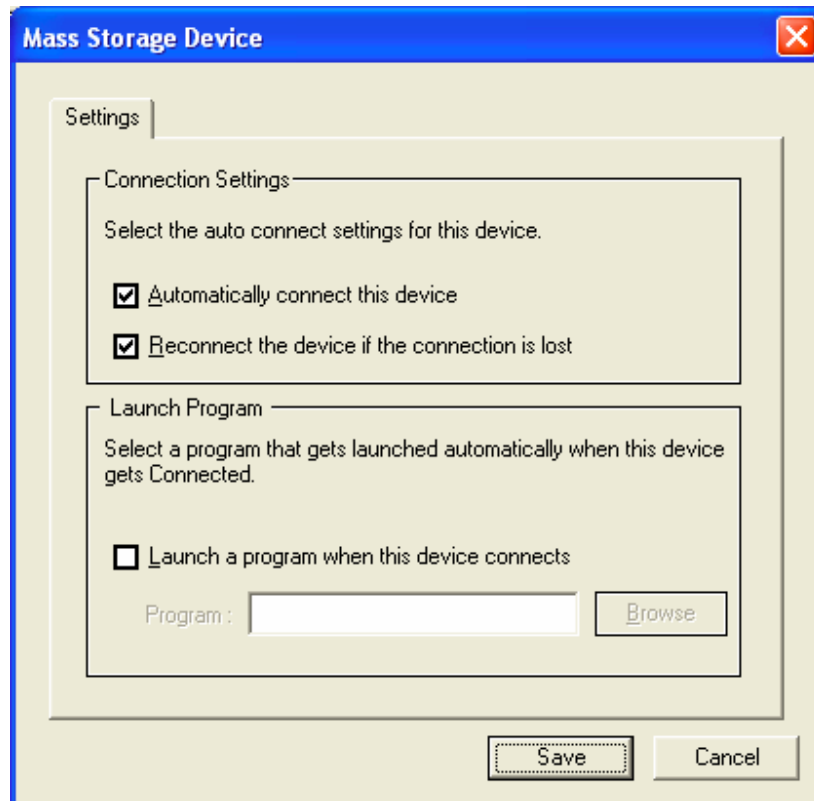
2.5 Auto Connect Mode:

Auto Connect feature enables the USB devices to be mapped on to the Client machine automatically as soon as the USB devices are physically plugged to the USB ports of USB Server on the network. Auto Connect feature works, once the Device Mapping is started / initiated on specific PC Client.

The Auto Connect function can be enabled / disabled for each device. Right click on the device in the Device mapping Window and select “Settings” option as shown below. By default, this feature is enabled for all devices.



A dialog appears with the name of the selected device. By default auto connect option is enabled.

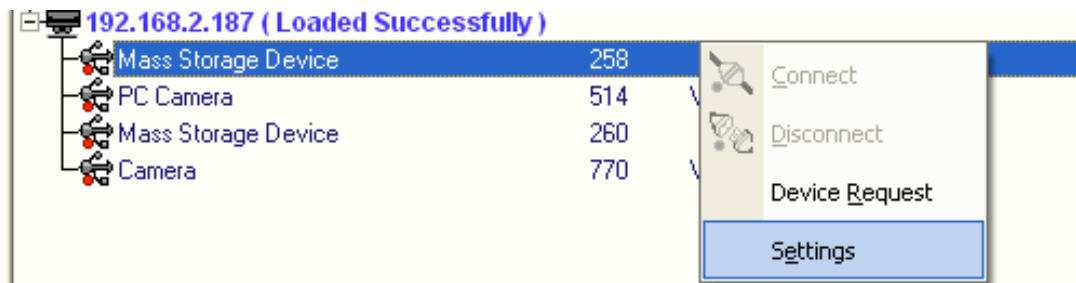


Uncheck the “Automatically connect this device” option to manually connect the device.

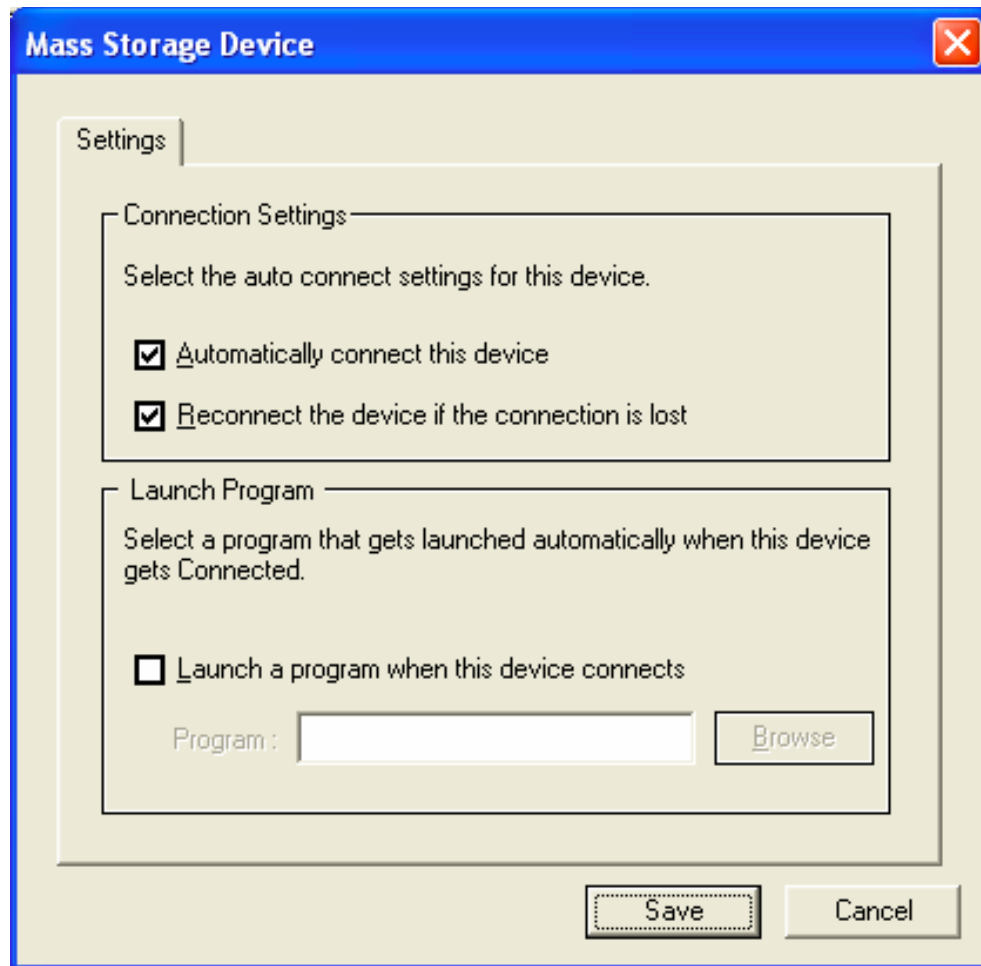
2.6 Auto Re-Connect USB Devices

The **Auto Re-Connect** is a feature, which re-establishes the connection back with the device automatically when there is a Network Link Loss or when the USB SERVER box is power cycled. Network Link Loss can happen when ever a network cable gets unplugged at USB Server side (Or) a cable is unplugged at client PC side.

Right click on the device in the Device mapping Window and select “Settings” option as shown below.



The Auto Reconnect feature is enabled by default for every new device plugged to the USB ports.



2.7 Device Request:

The USB Server application is based on a single user model i.e. only one user can access a USB device at a time.

In a multi-user network, multiple PC Clients can use the USB Devices connected to USB Server product. These users can connect to USB devices one at a time only & user wanting to claim a specific USB device will have to wait for other user to relinquish the connection. When a specific USB device is claimed by one user, it gets shown as “Busy” to other users on the network.

By means of “Device Request” feature, if a PC Client (Call it User-A) user wants to connect to currently used device (“Busy” with User-B) then User –A can issue a “Device Request” command to the User-B. This feature allows the User-A to send a request to another user (User-B) to free the device which he has connected. If User-A accepts the device request, then the USB Device is available for User-B to use.

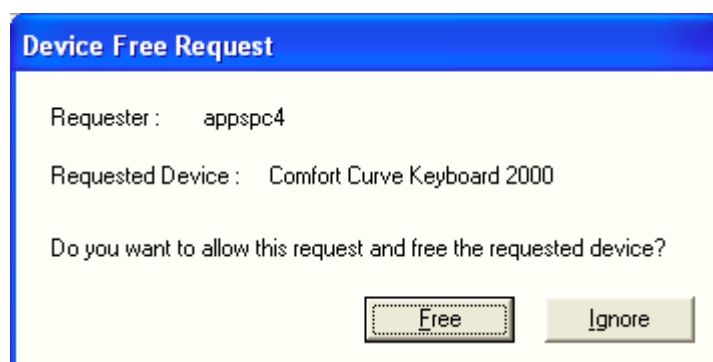
The user can request a busy USB device by right clicking on the USB device in the Device Mapping window and by selecting the “Device Request” option in the popup menu. The “Device Request” option can also be selected from Device Mapping function of Menu Bar.



As soon as the “Device Request” is initiated by the requestor an acknowledgment dialog appears that the request has been sent successfully as shown below.



A “Device Free Request” message is sent to the current user accessing the USB device, to intimate that the requestor is willing to access the USB device as shown below.



The current user can either opt to “Free” the USB device or ignore the “Device Free Request” message initiated by the requestor.

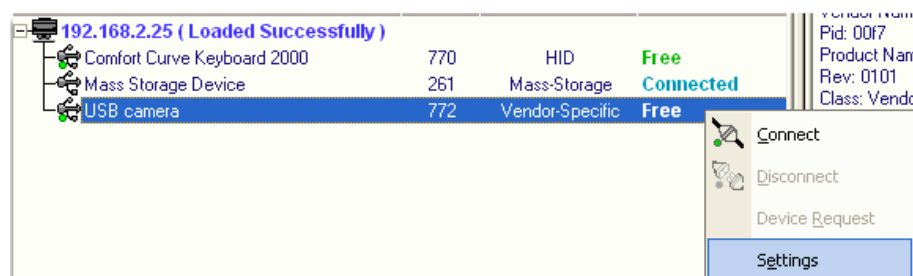
The requestor can only access the USB device if the current User Frees the device.

Device request popup message is a modeless message box. User can perform any operations on the UI even when a device request message is displayed. If the user does not attend to a device request popup message and receives another device request, then the previous unattended popup will be closed and the new request will be displayed.

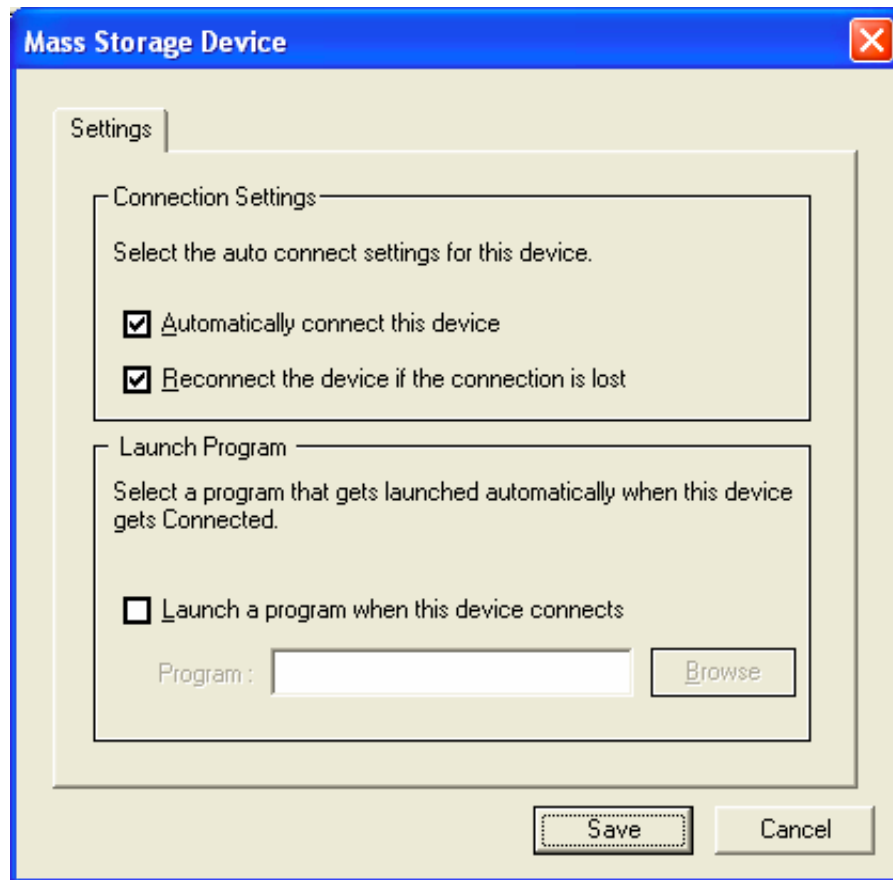
2.8 Auto Launch

The Auto launch feature enables the USB IP Admin to launch a specific application when a specific (Make, Type & Model#) of the USB device is connected to USB Server box. This setting is per PC Client & specific to given user profile. Right click on the USB device and select “Settings” option as shown below.

Eg: When a specific USB Speaker is connected, you can select auto launch option for some MP3 audio application to be auto launched on Windows Client.



A dialog appears with the name of the selected device. Check the 'Launch a program when this device connects' option and click on "Browse" to select the path of the application which needs to be launched when the USB device is connected.



After specifying the path of the application in the program field, click on "Save". Then a Window will appear as shown below and intimates the user that settings are successfully saved.



To turn off "Auto Launch" user can uncheck the Check box and then click on Save. The Auto launch feature is a Device specific feature and the same application gets launched for devices with same Make and Model Number.

3. USB Server USB-IP Web Server

It is an administrative web interface for this USB-IP application. A web server running on USB SERVER board allows administrator to view and change some of the key configuration of USB SERVER USB Server box.

3.1. Web-Interface overview

USB SERVER USB-IP web-server is an administrative web interface for the USB-IP application. Ordinary users can easily administe it. The web interface has four configuration pages and a home page.

The home page displays the current network settings, Server name and Firmware version.

From the “Network” page you can easily change the settings of the both wired and wireless Interfaces. For the wired interface you can configure the Static IP manually or set the box to automatically obtain an IP address by setting to the Dynamic (DHCP) mode.

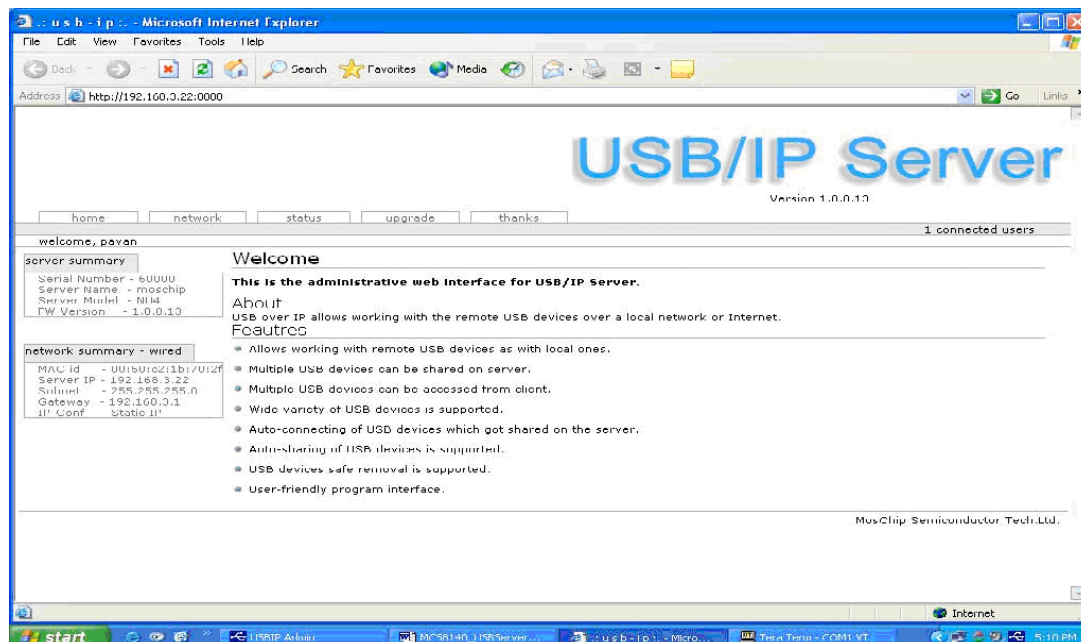
Through “Status” tab you can view the USB devices, which are connected to the USB SERVER USB-IP Server, the product and vendor ID of the device, the IP Address of the host and also the Status of the devices.

The Upgrade tag allows you to upgrade the firmware.

3.2. Home Page

USB SERVER USB-IP Web Server can be accessed by typing the IP address of the server in the URL of the browser, which will displays the default home page of the Server. Default IP address is 192.168.3.22, for USB Server application & USB SERVER will have this IP address when USB Server Firmware is loaded on to it.

<http://192.168.3.22>



On password prompt please give ‘**admin**’ as user name and ‘**usbip**’ as password. This will bring the home page. If there is no prompt for password please ensure ‘proxy settings’ are disabled in the Windows PC Browser software (Eg. Internet Explorer).

- 1) Home Page contains the information about current network settings, it displays.
- a) Server Summary:

Serial Number
Server Name
Server Model
FW-Version

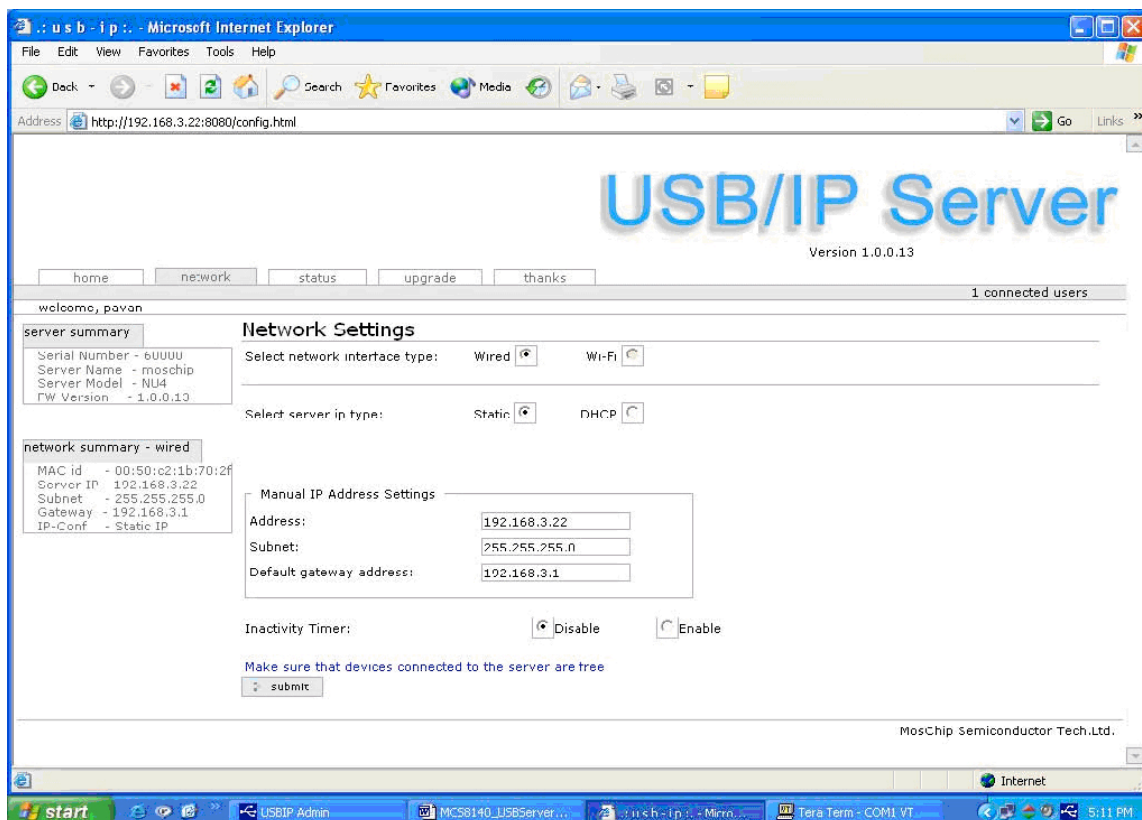
b) Network Summary:

MAC id
Server IP
Subnet
Gateway
IP-Conf

2) It also shows a welcome greeting and the number of connected users.

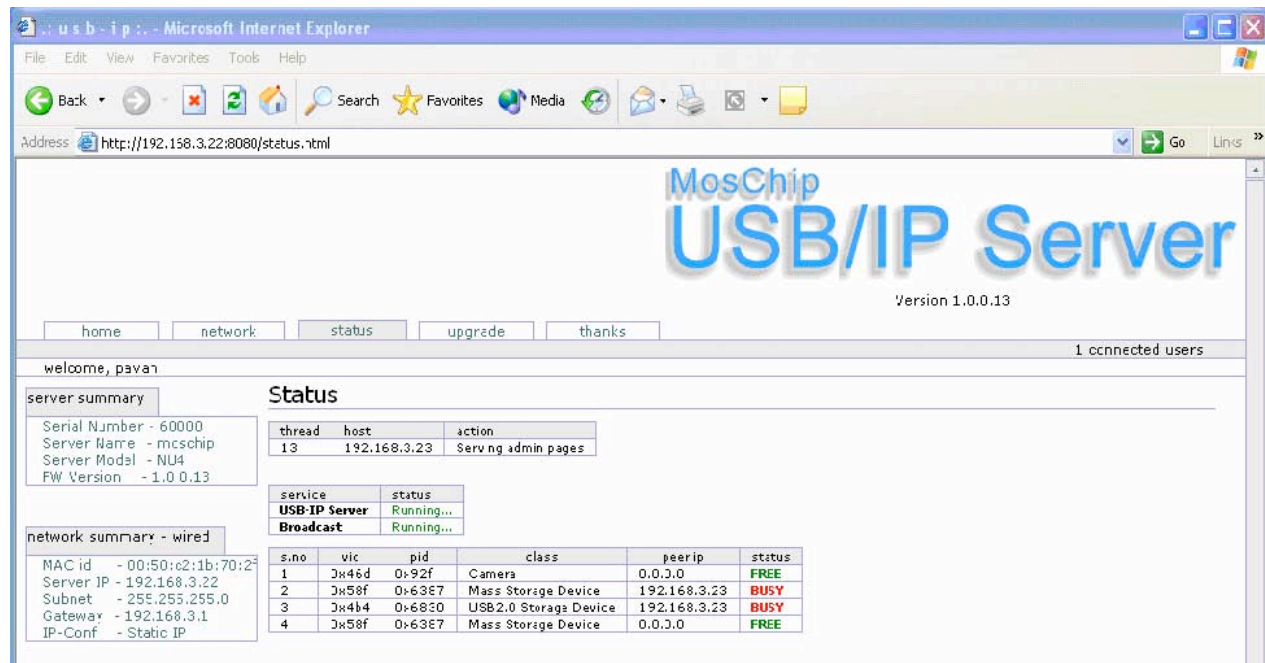
3.3. Network Page

The “Network” tab allows you to configure both wired as well as wireless interfaces. The default page is of wired interface and it appears as shown below.



For the wired interface you can configure the Static IP, Subnet Mask, and Gateway manually or set the box to automatically obtain an IP address by setting to the Dynamic (DHCP) mode.

3.4. Status Page



The status page displays the current status of the USB devices attached.

a) Thread Status:

Thread
Session
Host
Action

b) Service Status:

Service
Status
Control

c) Device Status:

Vendor Id
Product Id
Class Id
Peer-ip address
Status

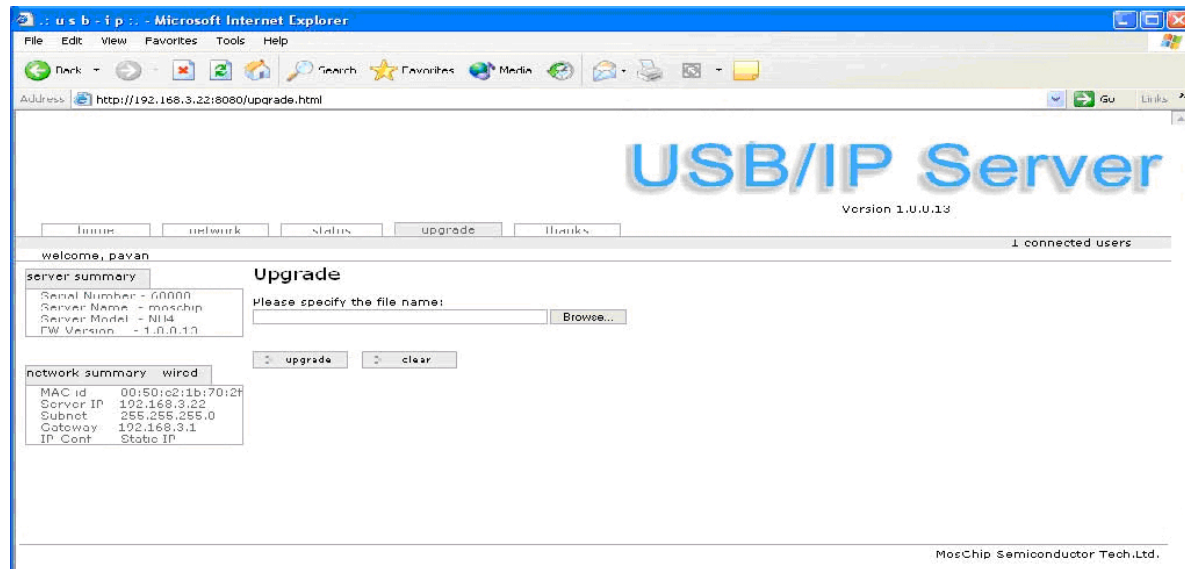
This status page is updated automatically every 10 seconds and it shows the device connected to USB SERVER board.

The Device Status table shows the Vendor Id, Product Id, Class, Peer-IP and the Status of the Device connected. The Peer-IP is the IP Address of the computer on which the device is currently accessed. Whenever any Device is Busy the Status of that device changes to "BUSY" and whenever it is not being used it changes to "FREE" as shown below.

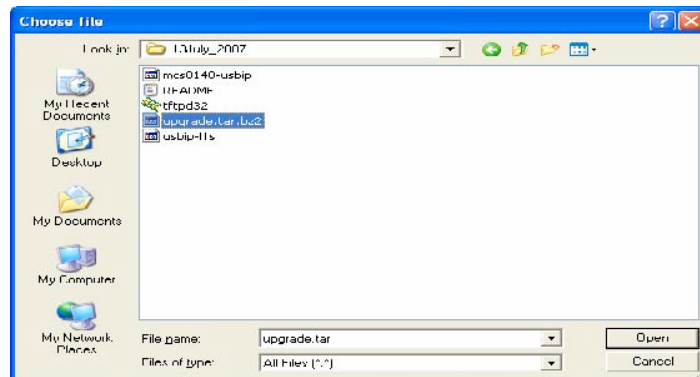
s.no	vid	pid	class	peer ip	status
1	01116d	01192f	Camera	0.0.0.0	FREE
2	0x58f	0x6387	Mass Storage Device	192.168.3.23	BUSY
3	0x4b4	0x6000	USB2.0 Storage Device	192.160.3.23	BUSY
4	0x58f	0x6387	Mass Storage Device	0.0.0.0	FREE

3.5. Upgrade page.

The Upgrade page allows you to upgrade the firmware.



Select the file to be upgraded by click on the Browse option on the Upgrade page as shown below.



A upgrade.tar.bz2 file is required to upgrade the firmware. The upgrade .tar file can be downloaded from our website.

.. u s b - i p . : - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://192.168.3.22:8080/upgrade.html>

USB/IP

home network status **upgrade** thanks

welcome, root

server summary
 Serial Number - 60000
 Server Name - moschip
 Server Model - NU4
 FW Version - 1.0.0.9

Upgrade

Please specify the file name:

C:\Documents and Settings\pavan\Desktop Browse...

upgrade clear

network summary - wired
 MAC id - 00:80:67:12:ef:44
 Server IP - 192.168.3.22
 Subnet - 255.255.255.0
 Gateway - 192.168.3.1
 IP-Conf - Static IP

Click on “upgrade” to upgrade the firmware

.. u s b - i p . : - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://192.168.3.22:8080/upgrade-status.html>

USB/IP

Version

home network **status** upgrade thanks

welcome, root

server summary
 Serial Number - 60000
 Server Name - moschip
 Server Model - NU4
 FW Version - 1.0.0.9

File Successfully uploaded

Restarting device...Please wait for a while

network summary - wired
 MAC id - 00:80:67:12:ef:44
 Server IP - 192.168.3.22
 Subnet - 255.255.255.0
 Gateway - 192.168.3.1
 IP-Conf - Static IP

A file successfully uploaded message is displayed and the webpage also indicates that the USB

SERVER USB server box is restarting to apply the upgraded firmware settings.