



MFP	<b>TECHNICAL TIP</b>
<b>TT-20229</b>	

Models: MX-C311/MX-C401/MX-B401  
MX-2300N/MX-2600N/MX-2700N/MX-3100N  
MX-3500N/MX-3501N/MX-4100N/MX-4101N/MX-4501N/MX-5001N  
MX-5500N/MX-6200N/MX-6201N/MX-7000N/MX-7001N  
MX-M283N/MX-M363N/MX-M453N/MX-M503N/MX-M623N/MX-M753N  
MX-M350N/MX-M450N/MX-M550N/MX-M620N/MX-M700N  
MX-M850/MX-M950/MX-M1100

**Priority:** Medium

**Date:** January 2011

**Subject:** **Printing from AS/400 with User Name and Password Authentication**

**Description:** This document shows how an AS/400 can be used to print to a Sharp MFP when user name and password authentication is enabled on the MFP.

**Details:** Follow the steps shown on the following pages to send print jobs with user name and password authentication to the Sharp MFP from an AS/400.

The IBM AS/400 can print to the Sharp MFP with User Name and Password Authentication using these instructions.

- The AS/400 must not send the print jobs in IPDS format.

These instructions can be used as a training tool for a Sharp technician and could also be provided to the AS/400 administrator for use as a guide when installing a Sharp MFP.

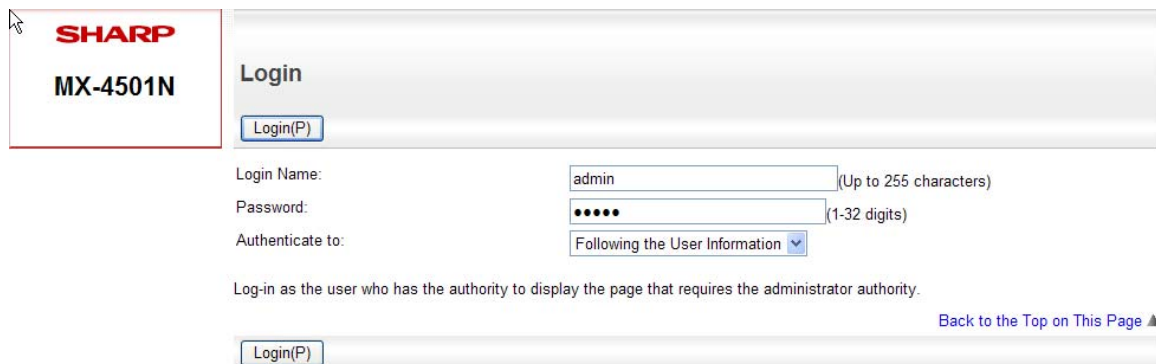
## User Login Name Authentication Sent with an AS400 Print Job

To allow printing from the *IBM AS400* when user name and password authentication is enabled on the *Sharp* MFP, follow the steps below. This requires a user account as well as an authority group be created on the MFP for use for printing from the *AS400*. The *AS400* account must be created only on the MFP with a blank password and not in the network. This method will allow the *AS400* to authenticate to the MFP for printing but will delete unauthenticated print jobs from all *Windows* users.

After setting up an account for the *AS400* to use to authenticate to the MFP, an experienced *AS400* administrator must modify a **Work Station Customizing Object (WSCST)** to add authentication credentials to the print data stream.

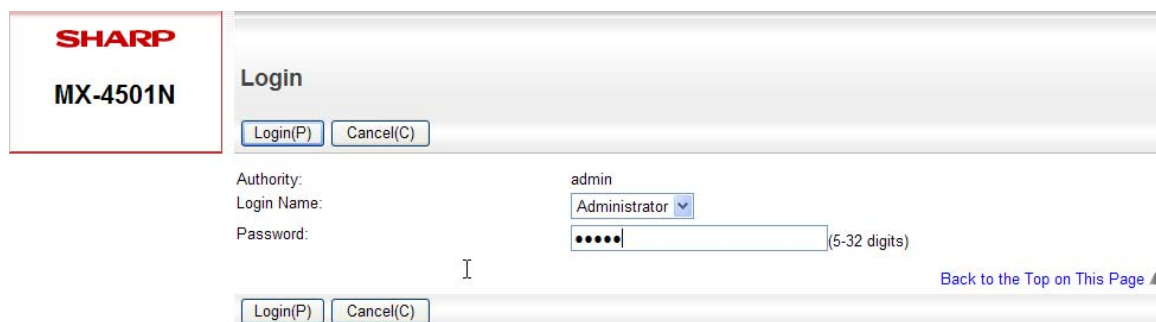
### Setting Up the Sharp MFP for Authentication

1. Browse to the web page of the *Sharp* MFP. If authentication has already been enabled, login as the administrator (login name “**admin**”, password “**admin**” all lower case if the default password has not been changed.) Note that the login name is always “**admin**” even if the password has been changed.



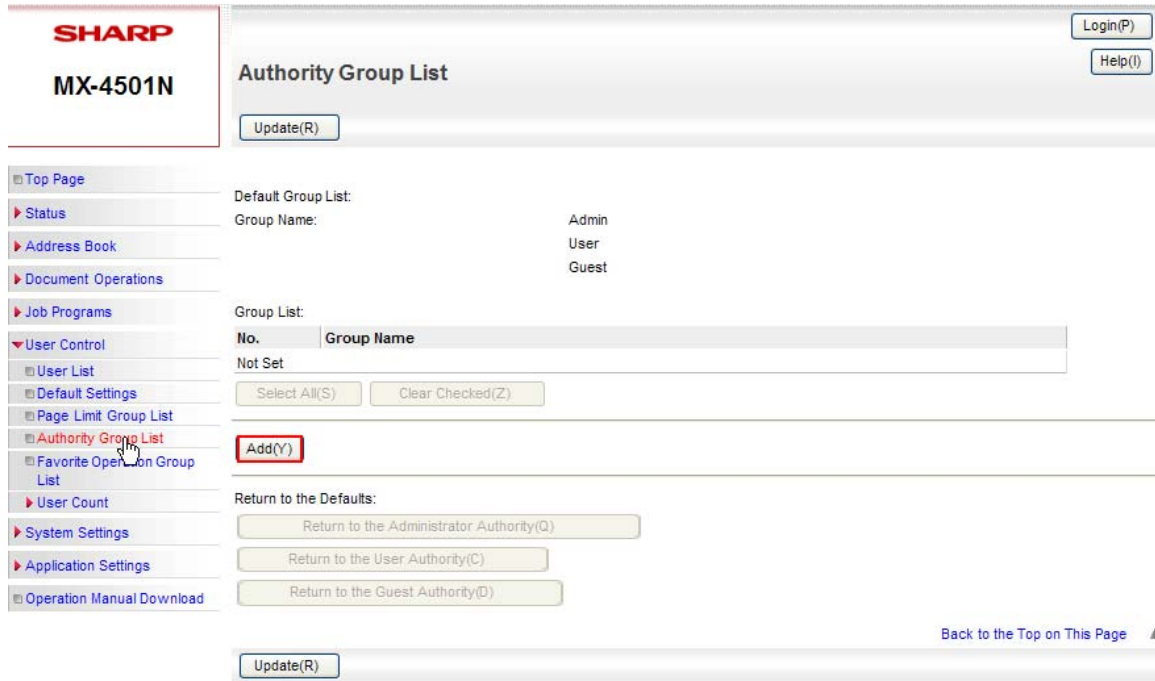
The screenshot shows the login interface for a Sharp MX-4501N MFP. On the left, there is a logo with 'SHARP' in red and 'MX-4501N' in black. The main area is titled 'Login' and contains a 'Login(P)' button. Below this, there are three input fields: 'Login Name:' with the value 'admin' and a note '(Up to 255 characters)'; 'Password:' with masked characters and a note '(1-32 digits)'; and 'Authenticate to:' with a dropdown menu set to 'Following the User Information'. At the bottom, there is a note: 'Log-in as the user who has the authority to display the page that requires the administrator authority.' and a 'Back to the Top on This Page ▲' link.

If authentication has not been previously enabled, the web page will contain a login button. Press the login button in the upper right hand corner of the web page. When the following screen appears, enter the administrator’s password (default “**admin**” all lower case).



The screenshot shows the login interface for a Sharp MX-4501N MFP. On the left, there is a logo with 'SHARP' in red and 'MX-4501N' in black. The main area is titled 'Login' and contains 'Login(P)' and 'Cancel(C)' buttons. Below this, there are three input fields: 'Authority:' with the value 'admin'; 'Login Name:' with a dropdown menu set to 'Administrator'; and 'Password:' with masked characters and a note '(5-32 digits)'. At the bottom, there is a 'Back to the Top on This Page ▲' link.

2. A new authority group must be created for use with the new account for the *AS400* to limit it to black and white printing only. This authority group will be applied to the properties of the account for the *AS400* when it is created in a later step. After logging in, click on the *User Control* menu item and then click on the *“Authority Group List”*. When the following screen appears, click on the *“Add”* button to create a new authority group.



3. When the screen on the next page appears, type in the *“Group Name”* (as an example *“Print\_OK”*) and select the *“Guest”* authority group from the drop down box to use as a template for the new group’s properties. As this group is only for the *AS400* to use for printing, set all functions except for *“Printing”* and *“Common Functions”* to *“Prohibited”*. To allow the *AS400* to print in black only, ensure that *“Color Mode Approval Setting”* for *“Black & White”* is set to *“Allowed”* and *“Full Color”* to *“Prohibited”* under the *“Printer”* function.

**SHARP**

MX-4501N

User Name: Administrator [Logout\(L\)](#)

[Help\(!\)](#)

### Authority Group Registration

- ▣ Top Page
- Status
- Address Book
- Document Operations
- Job Programs
- ▾ User Control
  - ▣ User List
  - ▣ Default Settings
  - ▣ Page Limit Group List
  - ▣ Authority Group List
  - Favorite Operation Group List
  - User Count
- System Settings
  - Network Settings
  - Application Settings
  - E-mail Alert and Status
  - ▣ Storage Backup
  - ▣ Device Cloning
  - Job Log
  - Security Settings
  - ▣ Custom Links
  - ▣ Operation Manual Download

Group Name:  (Up to 32 characters)

Select the Group Name to be the Registration Model:

[Switch to Tab Mode](#)

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#### Copy

Color Mode Approval Setting: Black & White:

Full Color:

2 Color:

Single Color:

Special Modes Usage:

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#### Printer

Color Mode Approval Setting: Black & White:

Full Color:

FTP Pull Print:

USB Memory Direct Print:

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#### Image Send

Approval Settings for Each Mode:

E-mail:

FTP:

Desktop:

Network Folder:

USB Memory:

PC Scan:

Internet Fax Send:

PC-I-Fax Send:

Color Scan:

Special Modes Usage:

- Click on the “**Submit**” button after all of the desired functions have been configured for this authority group.

**SHARP**

MX-4501N

User Name: Administrator [Logout\(L\)](#)

[Help\(!\)](#)

### Authority Group Registration

- ▣ Top Page
- Status
- Address Book
- Document Operations
- Job Programs

Group Name:  (Up to 32 characters)

Select the Group Name to be the Registration Model:

[Switch to Tab Mode](#)

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#### Copy

- Click on the “*User Control*” menu item to expand it and then click on the “*Default Settings*” item. Make sure that the “*User Authentication*” drop down selection is set to “*Enable*”. Click on the “*Authenticate a User by Login Name and Password*” radio button and ensure that the check box for “*Disabling of Printing by Invalid User*” is checked on. Click on the “*Submit*” button when all information has been entered in correctly.

**SHARP**  
MX-4501N

User Name: Administrator [Logout\(L\)](#) [Help\(?\)](#)

### Default Settings

[Submit\(U\)](#) [Update\(R\)](#)

- Top Page
- Status
- Address Book
- Document Operations
- Job Programs
- User Control
  - User List
  - Default Settings**
  - Page Limit Group List
  - Authority Group List
  - Favorite Operation Group List
  - User Count
  - System Settings
  - Network Settings
  - Application Settings
  - E-mail Alert and Status
  - Storage Backup
  - Device Cloning
  - Job Log
  - Security Settings

User Authentication: **Enable** ▾

Authentication Method Setting:

- Authenticate a User by Login Name and Password
- Authenticate a User by Login Name, Password and E-mail Address
- Authenticate a User by User Number Only

Device Account Mode Setting:  Device Account Mode

Login User: Not Set  
[User Selection\(C\)](#)

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Actions when the Limit of Pages for Output Jobs:

- Job is Completed even when the Limit of Pages is Reached
- Job is Stopped when the Limit of Pages is Reached

The Number of User Name Displayed Setting on Operational Panel: **8** ▾

A Warning when Login Fails

Disabling of Printing by Invalid User

Default Network Authentication Server Setting: **Not Set** ▾

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User Information Print: **User List** ▾  
[Print\(D\)](#)

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Release the Lock on Machine Operation Panel: [Execute\(J\)](#)

[Submit\(U\)](#) [Update\(R\)](#) [Back to the Top on This Page](#) ▲

- If enabling authentication for the first time, you must log back into the web page with the login name of “**admin**” with the current password (default “**admin**” all lower case) for the administrator account.

**SHARP**  
MX-4501N

### Login

[Login\(P\)](#)

Login Name:  (Up to 255 characters)

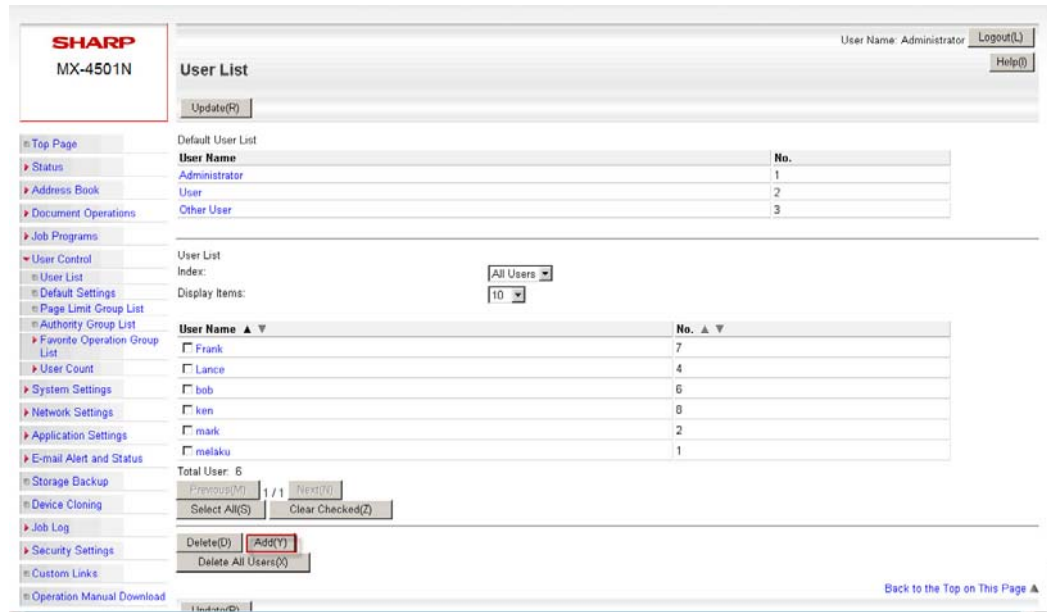
Password:  (1-32 digits)

Authenticate to: **Following the User Information** ▾

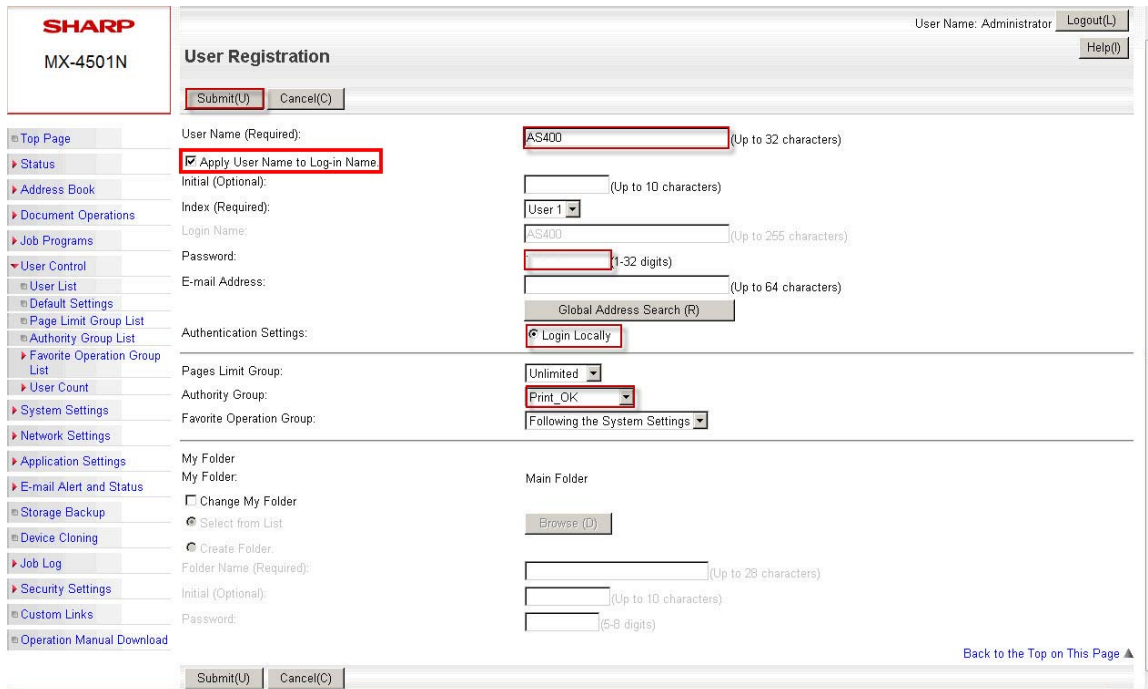
Login as the user who has the authority to display the page that requires the administrator authority.

[Login\(P\)](#) [Back to the Top on This Page](#) ▲

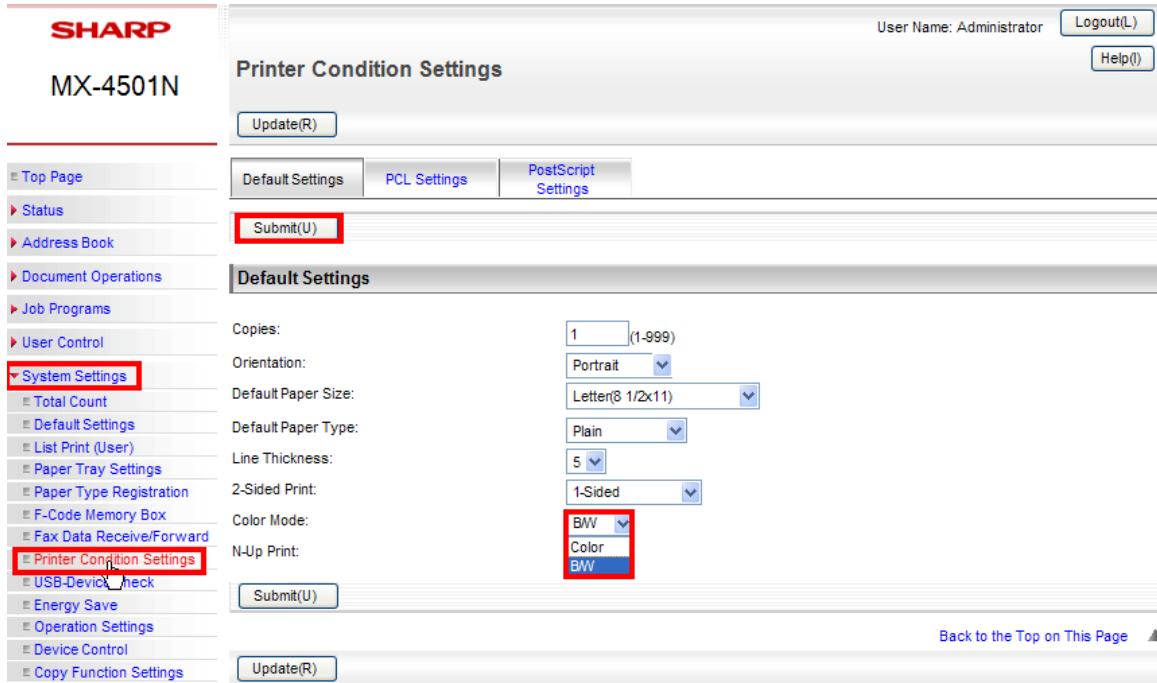
- Next, click on the “**User Control**” menu to expand it and then click on the “**User List**” menu item. Click on the “**Add**” button to create an account for the **AS400** to use.



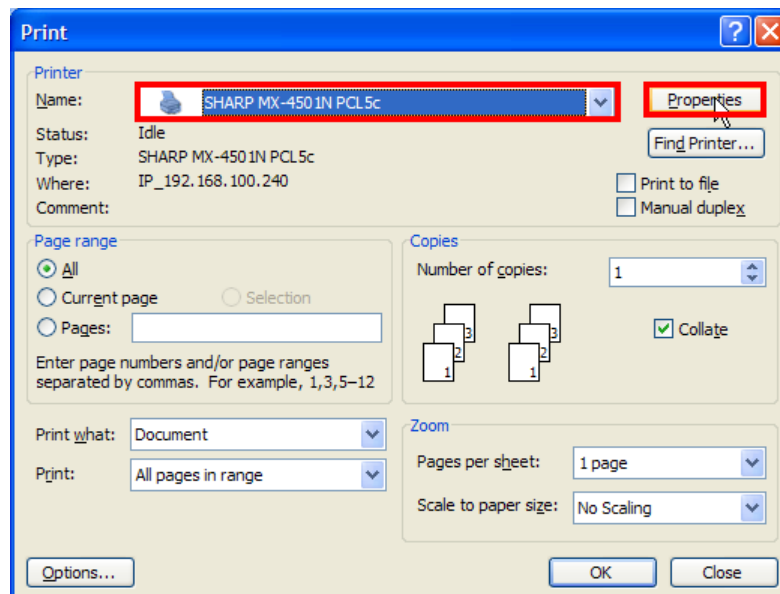
- Type in a short user name (in this example, “**AS400**”) in the “**User Name**” field, click on the checkbox “**Apply User Name to Log-in Name**” and leave the “**Password**” field **BLANK**. (NOTE: Due to a data field length restriction in the **AS400 WSCST**, a user password cannot be used) Record the user name exactly as it was typed in on the web page as it will be encrypted by the print driver. If a “**Login Locally**” checkbox option is available, be sure to click on it. For the “**Authority Group**” select the new group authority that you just created from the drop down list (“**Print\_OK**” in this example). Click on the “**Submit**” button when done.



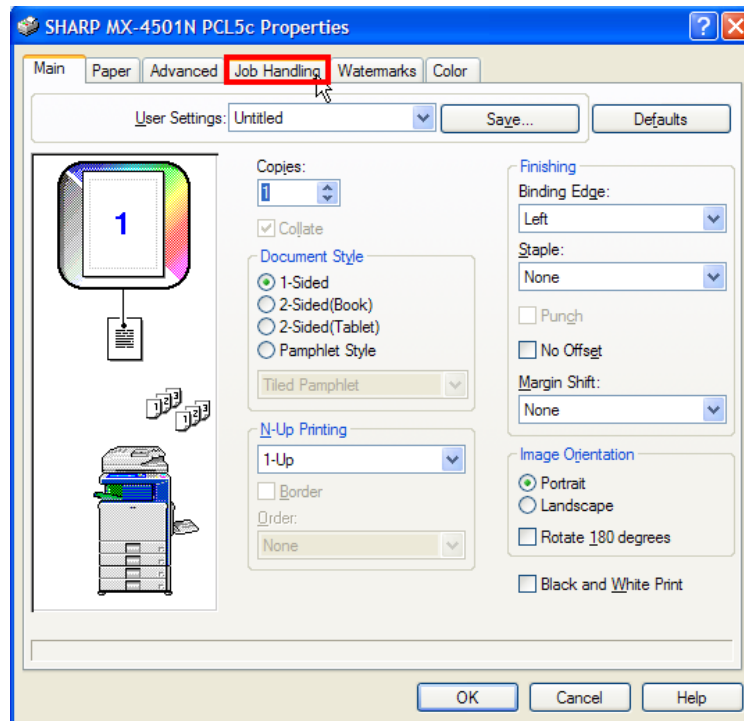
- Next, click on the “**System Settings**” menu item to expand it and then click on “**Printer Conditions Settings**”. Select “**B/W**” from the “**Color Mode**” drop down box. This will ensure that only black and white prints can be made by the AS400 account. Note that this will not have an effect on **Windows** users as the color mode is determined by the MFP print driver. Click on the “**Submit**” button to change the default color mode to black and white.



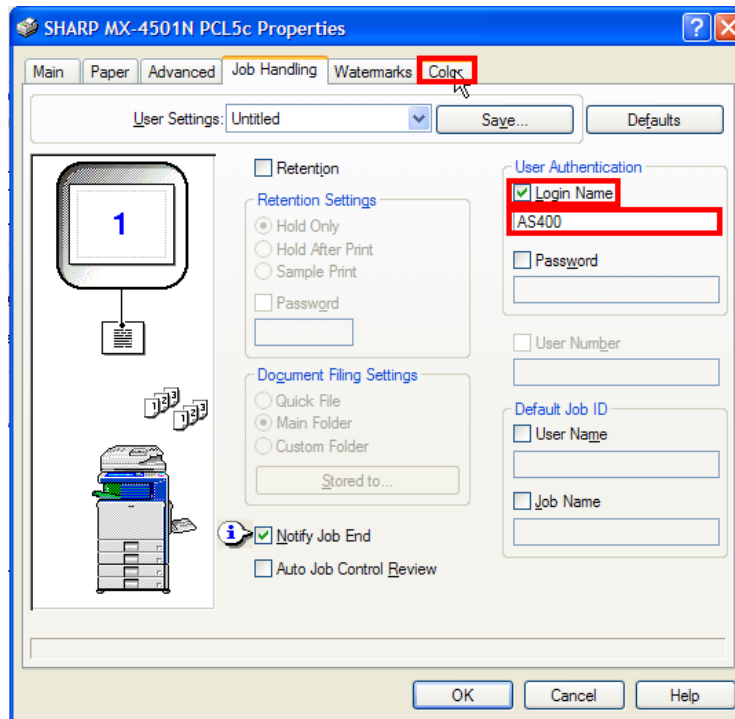
- To test the account settings, open an application such as Microsoft Word on a Windows workstation, and create a file with small amount of text. From the application file menu, select “**Print**”. When the application print dialog box opens, select the appropriate print driver for the target MFP in the drop down box and then click on the “**Properties**” button”.



11. When the print driver dialog box opens, click on the “**Job Handling**” tab.

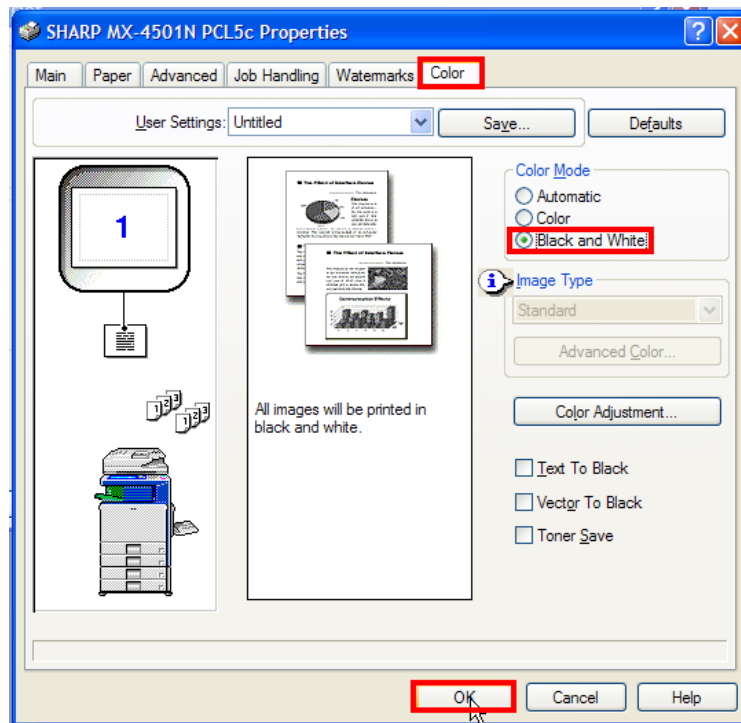


12. Under the “**User Authentication**” area, click on the check box for “**User Name**” and fill in the account name created for the AS400 (in this example, it is set to “AS400”). **NOTE: Do not click on the “Password” check box or type in a password. The password field must be left blank.**

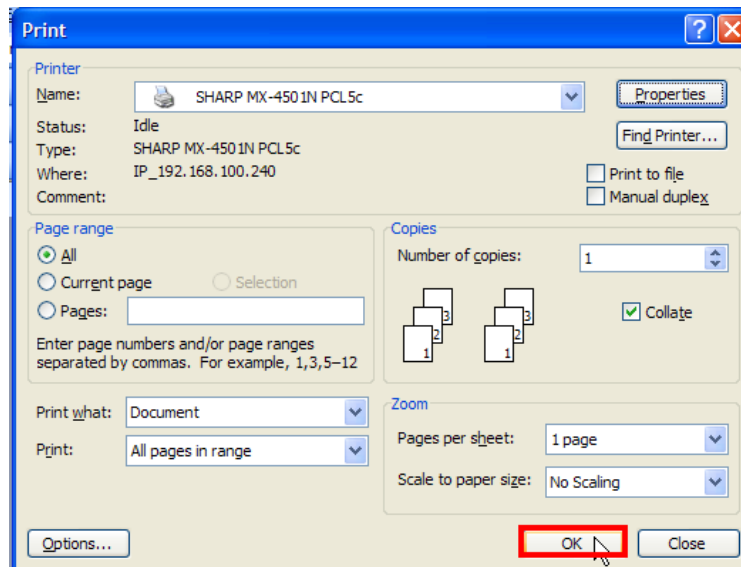




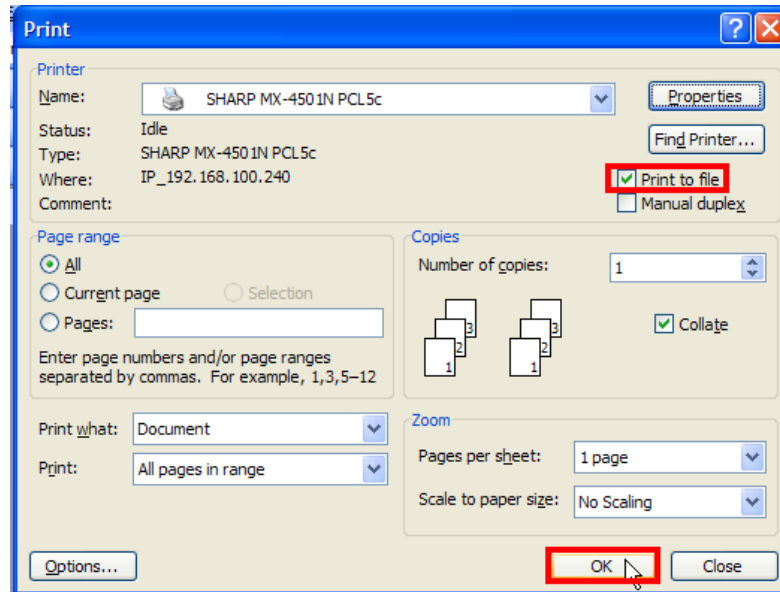
13. Next, click on the “**Color**” tab. Under the “**Color Mode**” area, click on the radio button for “**Black and White**”. Click on the “**OK**” button to close the print driver dialog box.



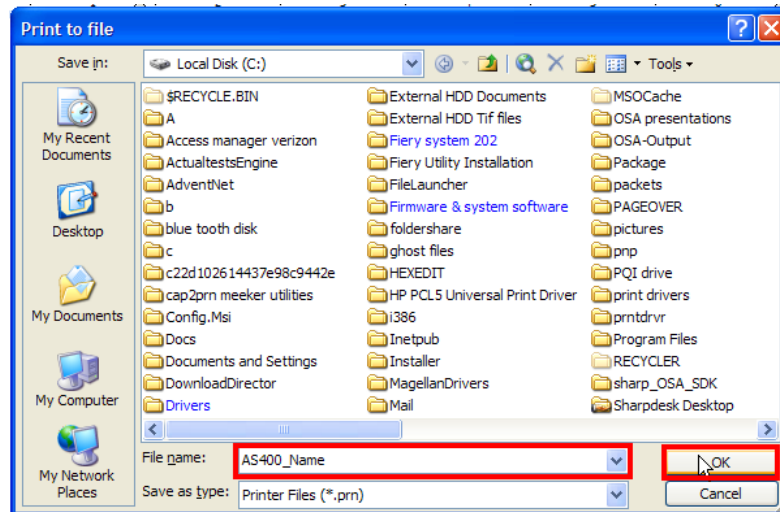
14. Click on the “**OK**” button in the application dialog box and ensure that the job prints out correctly.



15. Next, print the same job but select “*Print to File*” in the application’s print dialog box and press the “**OK**” button.



16. Save the file in a known directory with a meaningful name for later use. In this example, the file was saved as “C:\as400\_name.prn”.



## Creating the Work Station Customizing Object

**NOTE:** With this procedure, authentication credentials have to be added to a **Work Station Customizing Object (WSCST)** for the printer definition on the **AS400**. For your convenience, a source code file for a **Sharp WSCST** (“*Allsharp.*”) that can be modified is included with this document.

**NOTE:** With this procedure, authentication credentials have to be added to a **Work Station Customizing Object (WSCST)** for the printer definition on the **AS400**. For your convenience, a source code file for a **Sharp WSCST** (“*Allsharp.*”) that can be modified is included with this document.

To prevent unauthorized print jobs from non **Windows** or **MAC** users, the **Sharp** MFP requires certain **PJL** commands provided by the **Windows** or **MAC** print drivers to print when authentication is enabled. The relevant commands to authenticate with user login name to allow printing from the **AS400** are:

```
<ESC>%-12345X@PJL SET SPOOLTIME="XXXXXXXXXXXXXXXX" <CR><LF>
@PJL SET ACCOUNTLOGIN="XXXXXXXXXXXXXXXX" <CR><LF>
@PJL ENTER LANGUAGE=PCL <CR><LF>
<ESC>E
```

(The <ESC>E above is the PCL code to initiate the printer)

In the **IBM AS400** operating system, these statements must be converted from **ASCII** to **HEX** codes in the **WSCST**. When the print job is sent, the **AS400 Host Print Transform** process will convert the **HEX** codes back to **ASCII** to provide the correct authentication statements to the MFP.

Every **PJL** command file must begin with the **UEL (Universal Entry Language)** statement “<ESC>%-12345X” (the “<ESC>” represents the ASCII code (27) for the **Escape** key, a non printable character). Each **PJL** command must begin with a “@PJL” statement and be terminated by the non printable **ASCII** codes for a carriage return / line feed pair (13 and 09). When **PJL** commands are used for printer initialization, the printer reset command must contain the **UEL** statement “<ESC>%-12345X” to terminate the command file. **NOTE: PJL** commands can vary by specific models so it is important that the appropriate commands for that model be used.

The following example shows the **PJL** commands required for user login name authentication as well as determining the correct authentication information to use in the **WSCST**.

17. To determine the exact values needed for the **SPOOLTIME** and **ACCOUNTLOGIN** represented by “XXXXXX” above, open the print file you created in **Step 16**. At a command prompt, change to the directory you saved your print file to. Open the file (in this example, “*as400\_name.prn*”) with the **DOS** “**Edit**” program by typing the following at the command prompt:

“**Edit as400\_name.prn**” and press the enter key.

18. When the "Edit" screen opens, you can view all of the **PJL** and **PCL** commands sent by the *Windows* print driver for this particular *Sharp* MFP (an *MX-4501N* in this example). However, only the commands highlighted in yellow below are required for authentication.

Please note that in the *DOS Edit* program, the escape key (<ESC>) is represented by a left pointing arrow (←) and the carriage return / line feed pair (<CR><LF>) is not displayed.

```

File Edit Search View Options Help
C:\AS400_name.prn
←%-12345X@PJL JOB NAME="Microsoft Word - Document1"
@PJL SET PCNAME="US-SSG-179"
@PJL SET DRIVERNAME="SHARP MX-4501N PCL5c\ei8e"
@PJL SET JOBNAME="Microsoft Word - Document1"
@PJL SET SPOOLTIME="Wed, 02 Dec 2009 16:49:28 -0800"
@PJL SET FILING=OFF
@PJL SET USERNAME="ghazen"
@PJL SET NOTIFYJOBEND=OFF
@PJL SET HOLD=OFF
@PJL SET QTY=1
@PJL SET OUTBIN=OPTIONALOUTBIN1
@PJL SET DUPLEX=OFF
@PJL SET JOBBOOKLET=OFF
@PJL SET BINDING=LONGEDGE
@PJL SET JOBOFFSET=ON
@PJL SET ORIENTATION=PORTRAIT
@PJL SET REVERSEIMAGE=OFF
@PJL SET MARGINSHIFT=0
@PJL SET MEDIATYPE=DEFAULTMEDIATYPE
@PJL SET INTERLEAVE=OFF
@PJL SET JOBSTAPLE=STAPLENO
@PJL SET PUNCH=OFF
@PJL SET RESOLUTION=600
@PJL SET PAGEIMAGEINFO=ONEUP
@PJL SET PAGESTAMPINFO=NONE
@PJL SET PAGEOVERLAYINFO=OFF
@PJL SET PAGEFITTOPAGEINFO=OFF
@PJL SET PAGENUMORDERINFO=OFF
@PJL SET COLORMODE=BW
@PJL SET TANDEM=OFF
@PJL SET TABSHIFT=0
@PJL SET GANGING=SINGLE
@PJL SET HALFTONEENHANCE=OFF
@PJL SET PLANESINUSE=1
@PJL SET ECONOMODE=OFF
@PJL SET RENDERMODEL=G1
@PJL SET SRCOLORCONU=OFF
@PJL SET NEUTRALGRAY=OFF
@PJL SET ACCOUNTLOGIN="/vGh7Y8zsKamAQjA7Z9cig=="
@PJL SET DOCUMENTCONTROL=OFF
@PJL ENTER LANGUAGE=PCL
←E←*11R←&17H←&12A←&10U←&b1M←&p1i6c1S←*v6W@ ←*t3J←*o3W←*←&p2i6c2S←*v6W@
←%-12345X

```

19. The commands required in this case in the **Workstation Customizing Object** for the *AS400* to authenticate to the *Sharp* MFP would be:

```

<ESC>%-12345X@PJL SET SPOOLTIME="Wed, 02 Dec 2009 16:49:28 -0800"<CR><LF>
@PJL SET ACCOUNTLOGIN="/vGh7Y8zsKamAQjA7Z9cig=="<CR><LF>
@PJL ENTER LANGUAGE=PCL<CR><LF>
<ESC>E
<ESC>%-12345X

```

The last command (<ESC>%-12345X) is used to terminate the print file.

20. Before these **PJL** commands can be used in a **Work Station Customizing Object** for the **AS400**, they must be translated from **ASCII** encoding to **HEX** codes. A conversion program (**PJL2HEX.XLS**) is included with this document but there are numerous **ASCII** to **HEX** conversion utilities available on the *World Wide Web*. To demonstrate the conversions, the examples used in this document are shown below. The **ASCII** code is shown first and then the corresponding **HEX** code is shown in red directly below each line.

```
<ESC>%-12345X@PJL SET SPOOLTIME="Wed, 02 Dec 2009 16:49:28 -0800"<CR><LF>  
1B252D31323334355840504A4C205345542053504F4F4C54494D453D225765642C20303220446563203230303  
92031363A34393A3238202D30383030220D0A  
@PJL SET ACCOUNTLOGIN="/vGh7Y8zsKamaQjA7Z9cig=="<CR><LF>  
40504A4C20534554204143434F554E544C4F47494E3D222F7647683759387A734B616D41516A41375A3963696  
73D3D220D0A  
@PJL SET LANGUAGE=PCL  
40504A4C20454E544552204C414E47554147453D50434C0D0A  
<ESC>E  
1B45  
<ESC>%-12345X  
1B252D313233343558
```

21. Once the **PJL** and **PCL** statements for authentication have been translated into **HEX** codes, they must be inserted into a **Work Station Customizing Object** source code file in specific areas. The **WSCST** file contains elements referred to as **TAGS** followed by data in **HEX** format to send commands to the printer. **PJL** commands for authentication can only be placed in the data field for the **INITPRT TAG**. The statement to terminate the command file ("**<ESC>%-12345X**") must be placed in the data field for the **RESETPRT TAG**. The data field for **INITPRT** can contain a maximum of 255 characters so only a few **PJL** commands can be included. Further, when using the **AS400 Source Editor Utility**, a maximum line length of only 80 characters (including **TAGS**, spaces, quote marks, etc) can be used. If the line length exceeds 80 characters or the data field exceeds 255 **HEX** characters, the **WSCST** source code will not compile correctly.

As you can see, the first line of **HEX** code for the **PJL** commands for authentication exceeds 80 characters. This means the line of **HEX** code must be broken into smaller segments following the rules of the **IBM AS400 Source Editor Utility**:

- A. Total line length must not exceed 80 characters.
- B. The total **HEX** data for the **INITPRT TAG** cannot exceed 255 characters.
- C. **HEX** data statements must be enclosed by single quote marks (').
- D. Each data line must be terminated with an "X".
- E. The final line of the **HEX** data field must be terminated by a period (.) following the "X" character.

22. The following screen shows the source code for the “*Allsharp*” Work Station Customizing Object in the *AS400 Source Editor Utility* before modification for authenticating by user number. The **INITPRT** and **RESETPRT** data is initially set to ‘1B45’ (<ESC>E).

```

Columns . . . . :   1  71                Edit                QGPL/QTXTSRC
SEU==>                                ALLSHARP
  FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
0037.00      :NOPRTBDR
0038.00      OPTION=BOTTOM
0039.00      ORIENT=LANDSCAPE
0040.00      DATA = 240.
0041.00      :INITPRT
0042.00      DATA = '1B45'X.
0043.00      :RESETPRT
0044.00      DATA = '1B45'X.
0045.00      :BELL
0046.00      DATA = '07'X.
0047.00      :SPACE
0048.00      DATA = '20'X.
0049.00      :CARRTN
0050.00      DATA = '0D'X.
0051.00      :FORMFEED
0052.00      DATA = '0C'X.
0053.00      :LINEFEED

F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
F16=Repeat find   F17=Repeat change   F24=More keys

```

23. This code would have to be modified as shown below to send the authentication information shown in **Step 20**. Note that the modified data follows the rules for the *IBM Source Edit Utility* as shown in **Step 21**.

```

Columns . . . . :   1  71                Edit                QGPL/QTXTSRC
SEU==>                                NAME
  FMT **  ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
0036.00      DATA = 288.
0037.00      :NOPRTBDR
0038.00      OPTION=BOTTOM
0039.00      ORIENT=LANDSCAPE
0040.00      DATA = 240.
0041.00      :INITPRT
0042.00      DATA = '1B252D31323334355840504A4C205345542053504F4F4C5449'X
0043.00      '4D453D225765642C2030322044656320323030392031363A34'X
0044.00      '393A3238202D30383030220D0A'X
0045.00      '40504A4C20534554204143434F554E544C4F47494E3D222F76'X
0046.00      '47683759387A734B616D41516A41375A396369673D3D220D0A'X
0047.00      '40504A4C20454E544552204C414E475541'X
0048.00      '47453D50434C0D0A'X
0049.00      '1B45'X.
0050.00      :RESETPRT
0051.00      DATA = '1B252D313233343558'X.
0052.00      :BELL

F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
F16=Repeat find   F17=Repeat change   F24=More keys

```

24. After the “*Allsharp*” source code file is modified, save it with different file name (such as “*Name*”) before compiling it into a **WSCST**. For instructions on transferring source code files such as “*Allsharp*” from a *PC* to the *IBM AS400* and compiling the source code into a **WSCST**, see the attached document “*Transferring WSCST Source Code.PDF*”.
25. For complete instructions on setting up a *Sharp* MFP as an *AS400* print device or remote output queue, see the attached files “*Create LAN attached printer VER 1.1 .PDF*” and “*Create remote outque VER 1.1.PDF*”.