Technical Note

NV8500 v3.8.0 Upgrade and Downgrade Procedures

Overview

This document presents 4 procedures:

Upgrading an NV8500 router to v3.8.0 from firmware versions 2.2.0 or later Page 2
Upgrading an NV8500 router to v3.8.0 from any firmware version ***prior to*** v2.2.0 Page 21
Reverting an NV8500 router from firmware version 3.8.0 to versions 2.2.2 or newer Page 41
Reverting an NV8500 router from firmware version 3.8.0 to versions 1.1 or 1.5 Page 57

The two upgrade procedures differ because of a bug that was fixed at v2.2.0.

The two downgrade (or reversion) procedures differ substantially because there are substantial architectural differences between versions 1.*x* and 2.2.2.

Be careful to follow the procedure for your system and follow that procedure exactly.

MRC

You should use version 3.7.1 of MRC or later. The latest firmware (.rf) file will be sent to you with the MRC installation file.

Requirements

The upgrade has certain requirements.

- A PC running MRC (version 3.7.1 or later).

  Do not attempt to run MRC (or NV9000-SE Utilities) on the NV9000.

- The firmware file(s). You will need a version 3.8.0 firmware file for an upgrade, and an earlier version of the firmware file (1.1, 1.5, 2.x, 3.1.*x*, etc.) if a downgrade becomes necessary.

  At this revision, the applicable firmware file is **`NV8500_HYB_FW_3.8.0.3306.RF`**.

- If your router has frame sync cards, you will need a frame sync application software file. The name of this file, at this release, is **`APC2_160build0041.bin`**. (See SV1192-02.) This file is shipped with the **`NV8500_HYB_FW_3.8.0.3306.RF`** file.

  If you need to revert to an earlier version of the frame sync application software, you will need the software file for that version.

  See Updating Frame Sync Card Application Software on page 73 for the frame sync upgrade/downgrade procedure.

- If your router has IP gateway cards, you might need, at some point, an IP gateway application software file. The name of this file, at this release, is **`IP_Gateway_110build0125.bin`**. (See SV1216-01.) This file is also shipped with the **`NV8500_HYB_FW_3.8.0.3306.RF`** file.

- If you want the benefit of MADI updates in this release, you will have to upgrade the firmware in your NV8900s. It is easy to do using MRC and the **`NV8500_HYB_FW_3.8.0.3306.RF`** file. See Updating NV8900 Firmware on page 77.

Limitations

These procedures disrupt router service for a period of approximately one-half hour, but possibly more.

If your facility cannot tolerate this disruption, contact Grass Valley Customer Service.

The Upgrade Procedure for Routers at Firmware Version 2.2.0 and Later

Most of this procedure is order-dependent. Do not deviate from the procedure.

Upgrade Summary

This is a summary of the upgrade procedure. Details follow after the summary.

1 Install the latest version of MRC.

2 Disconnect (or stop) the NV9000 (or third-party) control system.

3 Create a router configuration "snapshot."

4 Update the boot ROMs in control cards (if yours are -03 or earlier).

*Let the active control card be called **Card A** and the standby control card be called **Card B**.*

5 Remove **Card B**. Then update to newer firmware in **Card A**.

6 Update to newer firmware for all IOXM[1] cards.

7 Redefine the I/O card types, using the 'Module Types' page of MRC, for **Card A**.

8 Set input attributes (if needed) for **Card A**.

***Card A** now has new firmware and a correct configuration.*

9 Remove **Card A.** Reinsert **Card B**. Then update to newer firmware in the **Card B** (which is now active).

10 Reinsert **Card A**. Reset **Card B** (currently active). **Card A** becomes active and **Card B** becomes standby (as they were before you started)

11 Copy the control card configuration from **Card A** to **Card B** using the 'Copy Settings' page of MRC.

Card B** now has new firmware and the same configuration as **Card A.

12 Create another snapshot of the router in MRC. Reconnect (or restart) the NV9000 (or third-party) control system.

1 MRC

☑ 1 Install the latest version of MRC. The installation is quick.

You contacted Grass Valley customer service either to obtain an upgrade for your NV8500 router or because Grass Valley recommended an upgrade. A Grass Valley service technician will have sent you (1) a copy of the MRC software installer, (2) the (.rf) firmware file you need to perform the upgrade, (3) the .rf firmware file for the system you have presently in case you need to revert to your old firmware, and (4) this technical note that you are reading.

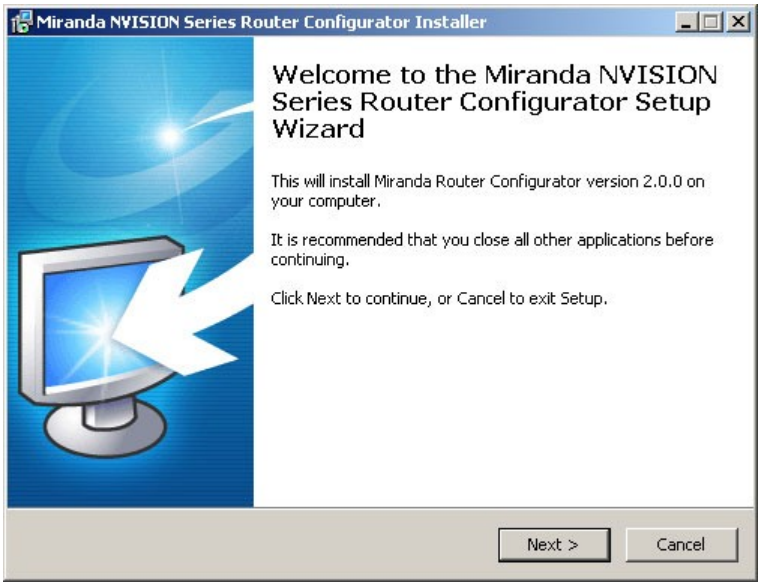
The means by which you receive the upgrade materials depends on an agreement between you and the Grass Valley technician. You might receive the materials through an FTP site, through the mail, or by courier. A technician might visit your site and bring the materials to your site.

1. IOXM is a term that means input, output, crosspoint (XPT) and monitor cards.

To install MRC. . . .

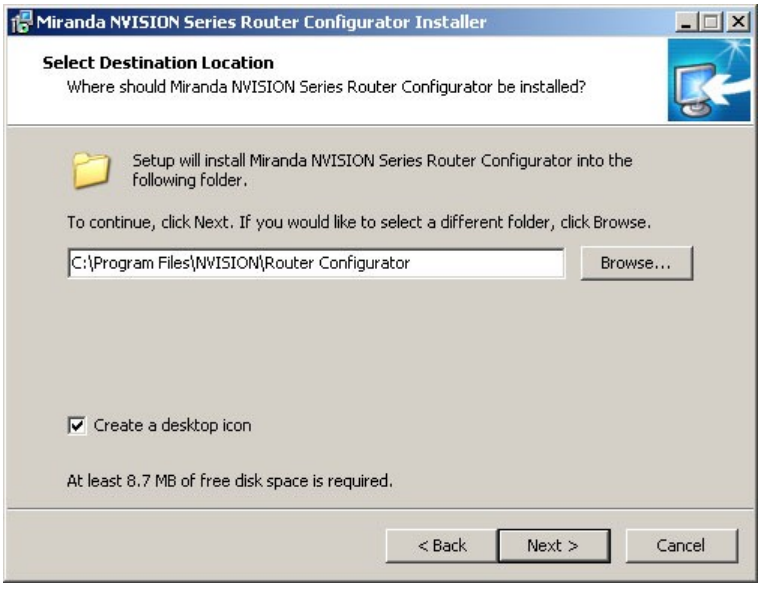
Copy the MRC installer and the .rf file(s) (either from an FTP site or from the USB device you received, as the case may be) to a folder in the PC that you use for configuring the router.

Double-click the installer file to launch the installer. The initial installer window appears:



Click ‘Next’.

A window appears in which you can designate the location on the PC in which to install MRC:

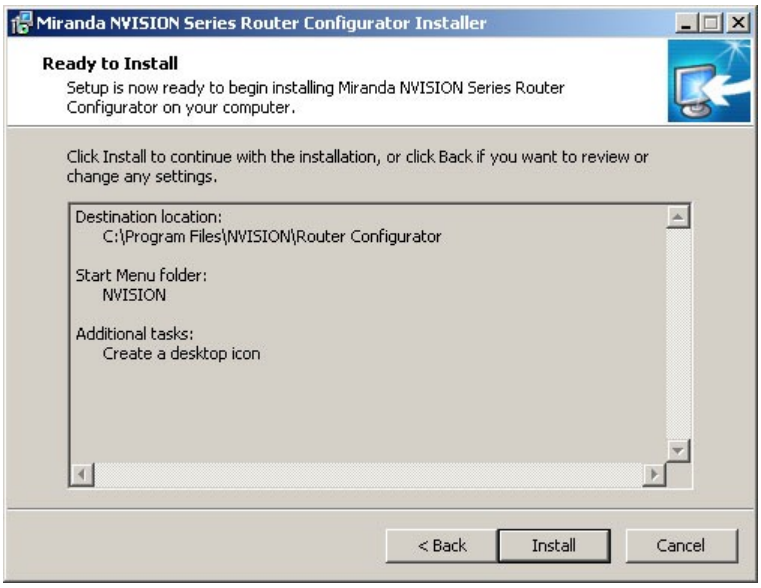


The window presents the default location. If you prefer another location, click ‘Browse . . .’ to navigate to a different folder.

Uncheck ‘Create a desktop icon’ if you do not want an MRC shortcut to appear on your PC desktop.

The window tells you the disk space needed for the installation. If you do not have that much space, the installation will fail.

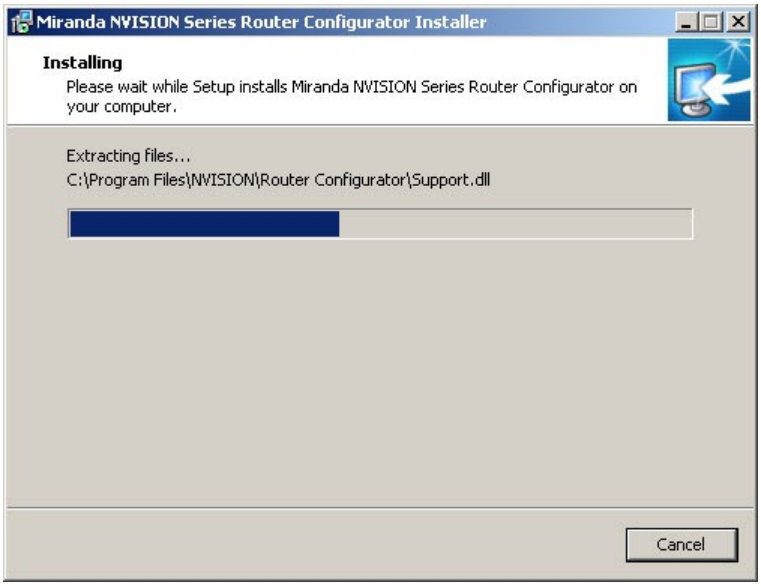
When you are satisfied with the pathname and options, click ‘Next’. A confirmation window appears:



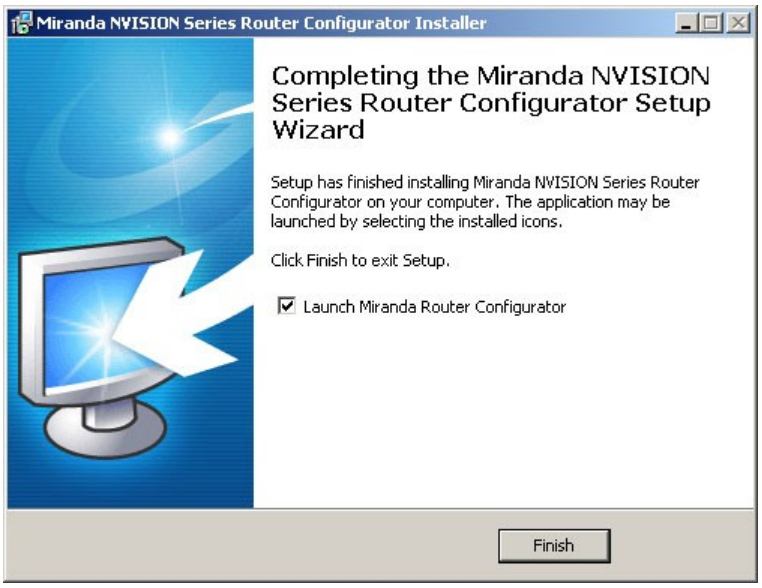
If the options presented are not correct, click ‘Back’ to go back to the previous window and re-enter a pathname or change options.

Otherwise, click ‘Next’ to start the installation or click ‘Cancel’ to stop the installer.

When you start the installation, a progress window appears:



After several seconds, the installation will complete. The completion window appears:



Uncheck ‘Launch Grass Valley Router Configurator’ if you do not want to run MRC immediately.

Click ‘Finish’.

2 Control System

Disconnect the NV9000 (or third-party) control system from the router.

☑ ***Preferred Method:*** Use this method if you have an NV9000 control system and you can stop the NV9000 without disrupting your entire system.

1 Stop the NV9000. To stop the NV9000, launch NV9000-SE Utilities. Go to the ‘System Management’ page and click the ‘Stop Controller 2’ button and the ‘Stop Controller 1’ button.

It is recommended that you stop the inactive controller before you stop the active controller.

☑ Alternate Method: Use this method if you cannot stop the NV9000 or if you have a third-party control system.

1 Remove the cables (whether serial or Ethernet) from the control ports of the router. (Doing this will cause alarms in the NV9000 system. You can safely ignore the alarms.)

If you have MRC running, removing Ethernet cables from the router’s control cards will cause MRC to lose contact with the router.

2 Connect your PC (that is running MRC) to the router’s control ports via a small Ethernet switch.

3 Router Snapshot

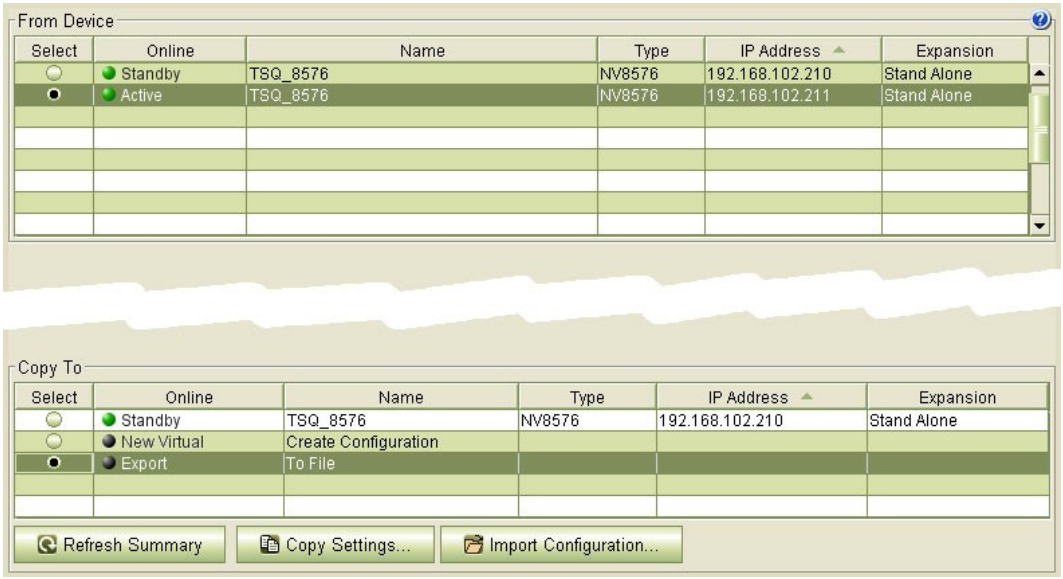
These steps create a file that records all the router settings. It is important to have this file, which you can send to Grass Valley, if your upgrade does not succeed. Make this file before doing anything else.

☐ 1 Launch MRC. Go to its 'Copy Settings' page.

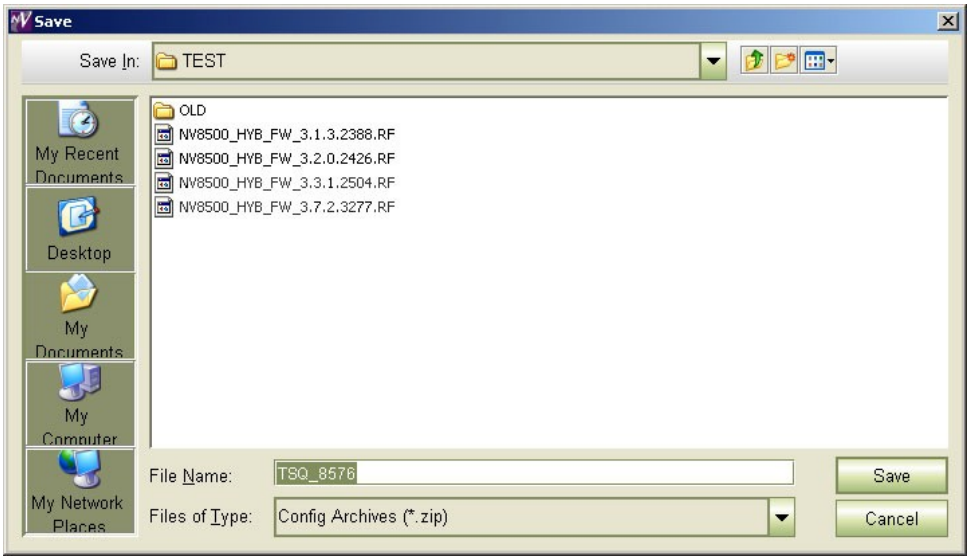
☐ 2 Select the active control card in the upper section of the page.

☐ 3 Choose 'Export' in the lower section of the page.

☐ 4 Click 'Copy Settings'



☐ 5 A dialog appears in which you can browse to name a file and location in which to store the settings:



Choose a folder and a file name. The saved file will be a .zip file.

☐ 6 Click ‘Save’ and wait for the confirmation notice:

4 Boot ROM

For each EM0833 control card, ensure that the boot ROM is up-to-date. You need a -04 or -05 boot ROM. The -05 boot ROM is a requirement only for expanded NV8576-Plus frames.

The boot ROM is in the same location (U10) on all revisions of the EM0833 control cards. The part number for the ROM is UZ0453-00. Its code is SV1038-05. The label for the -05 version reads:

MIRANDA © 11
SV1038-05,A
V 2.0.0.0
CS=0x2625

To change the boot ROM, remove the old boot ROM from its socket. Note the orientation of the ROM IC. Insert a new boot ROM in the socket with the same orientation.

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

Frame1 Frame2 ▲ Keep the router door closed as much as possible when you are doing this.

☐ ☐ 1 Remove the standby control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Follow the instructions under Replacing the Boot ROM on page 40. Then replace the standby card in the frame.

☐ ☐ 2 Switch control to the standby card. To do that, press the reset button on the active control card. Wait for the standby card to become the active card. (When a control card is active, its amber LED is on.)

☐ ☐ 3 Remove the formerly active control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Follow the instructions under Replacing the Boot ROM on page 40Then replace that control card in the frame.

☐ ☐ 4 Switch control back to the formerly active control card.

*(In the following steps, call the presently active control card **Card A** and the standby control card **Card B.**)*

5 Firmware Update for Card A

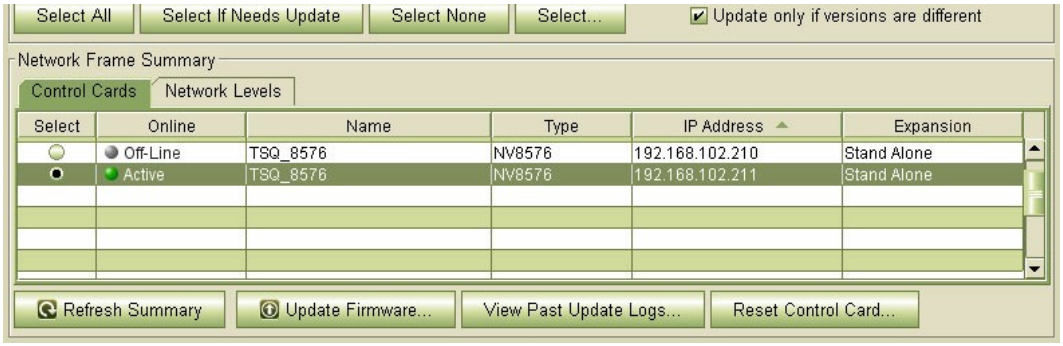
Frame1 Frame2

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Completely remove **Card B** (the standby control card, assuming there is one). Close the router door.

☐ ☐ 2 Go to the 'Firmware' page in MRC. Click 'Refresh Summary'.

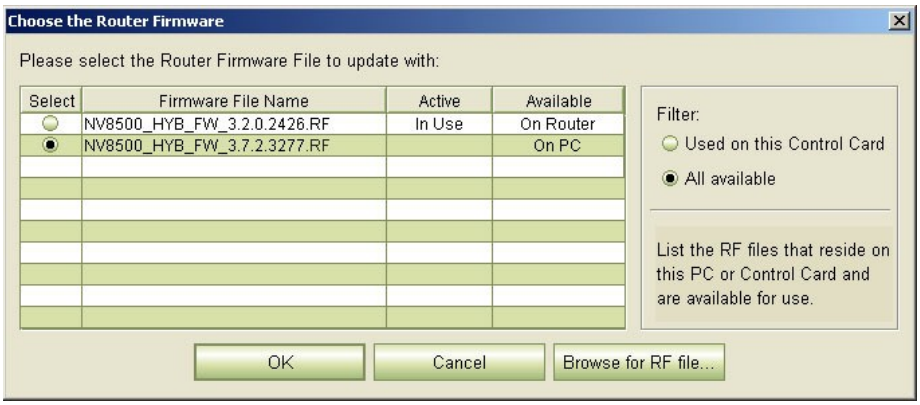
3 Select **Card A** at the bottom of that page.



The stand-by card (**Card B**) should read 'Off-Line'.

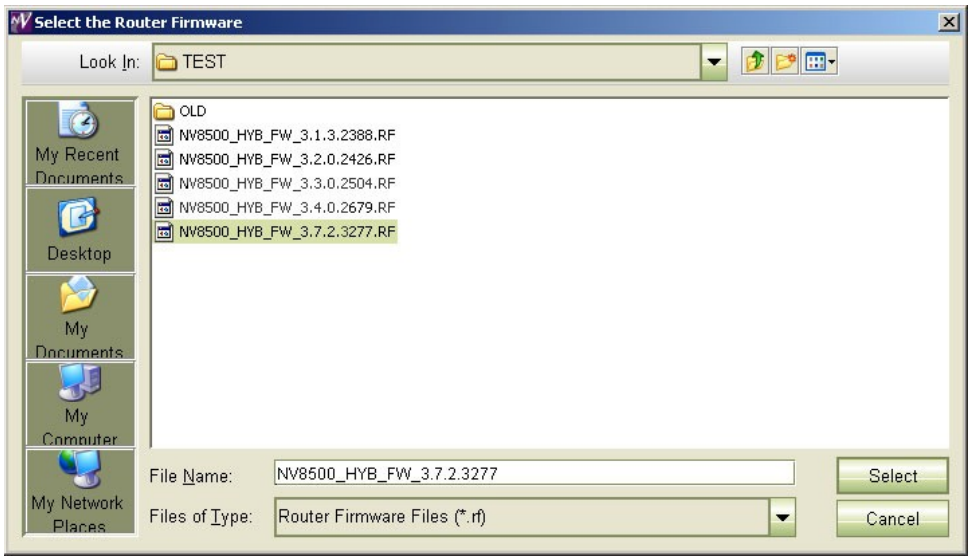
☐ ☐ 4 Click the 'Choose' button, at the top of the page, to locate the firmware file. At this revision, that is **`NV8500_HYB_FW_3.8.0.3306.RF`**.

The 'Choose Router Firmware' dialog appears:



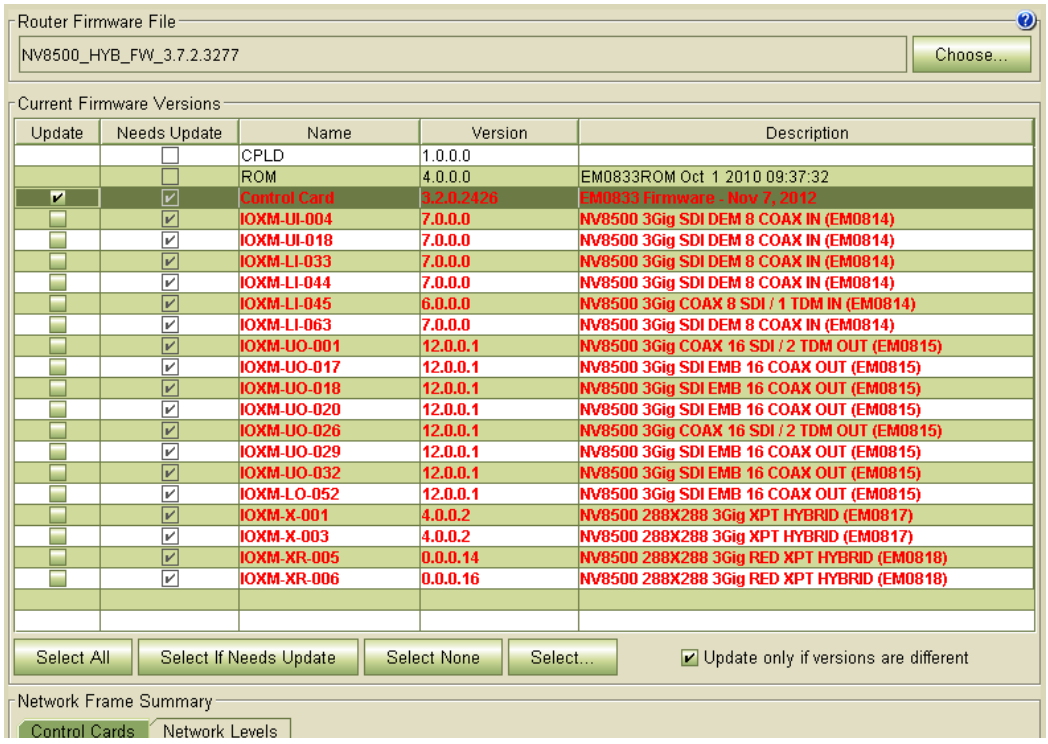
Because you are installing new firmware, click 'Browse for RF File'.

The ‘Select Router Firmware’ dialog appears:



Here, navigate to a folder that contains the firmware file you want. At this revision, the file is **`NV8500_HYB_FW_3.8.0.3306.RF`**. Highlight the file and click ‘Select’.

The ‘Firmware’ page changes to highlight all cards in need of updating (in red):



Frame1 Frame2

☑ ☑

5 Click ‘Select None’ to deselect all cards. Then select the control card by marking its check box in the ‘Update’ column.

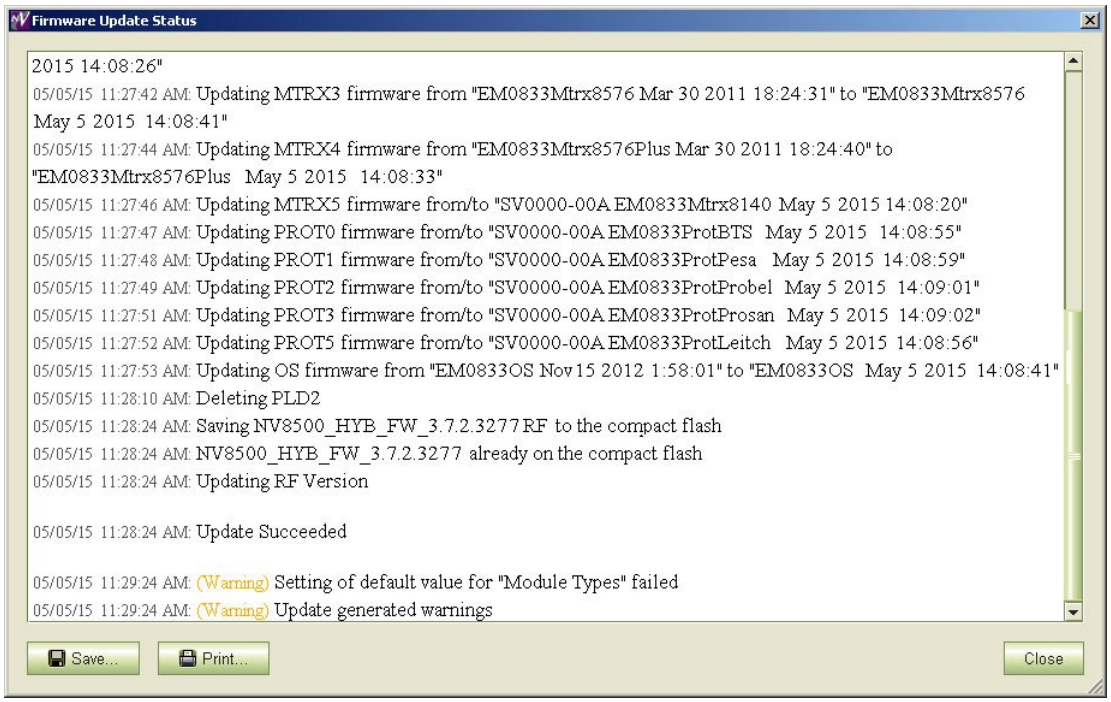
Make sure that this is the only card that has a check mark.

Frame1 Frame2

☐ ☐ 6 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning message.

☐ ☐ 7 When the update has finished, MRC displays a log of the updates. It should normally say “All updates were successful” at the end.



If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

Because you have updated the firmware, but have not yet updated the IOXM cards, you might see a message such as “Setting of default values for module types failed” as shown in the illustration above.

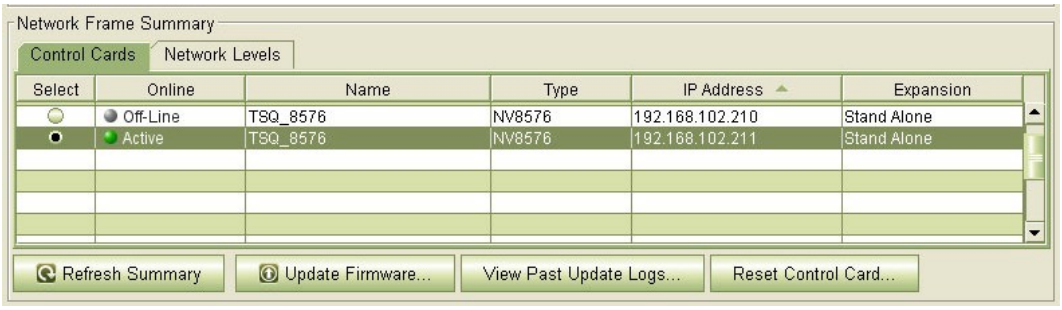
You can safely ignore that message.

6 Firmware Updates for IOXM[2] Cards

Frame1 Frame2

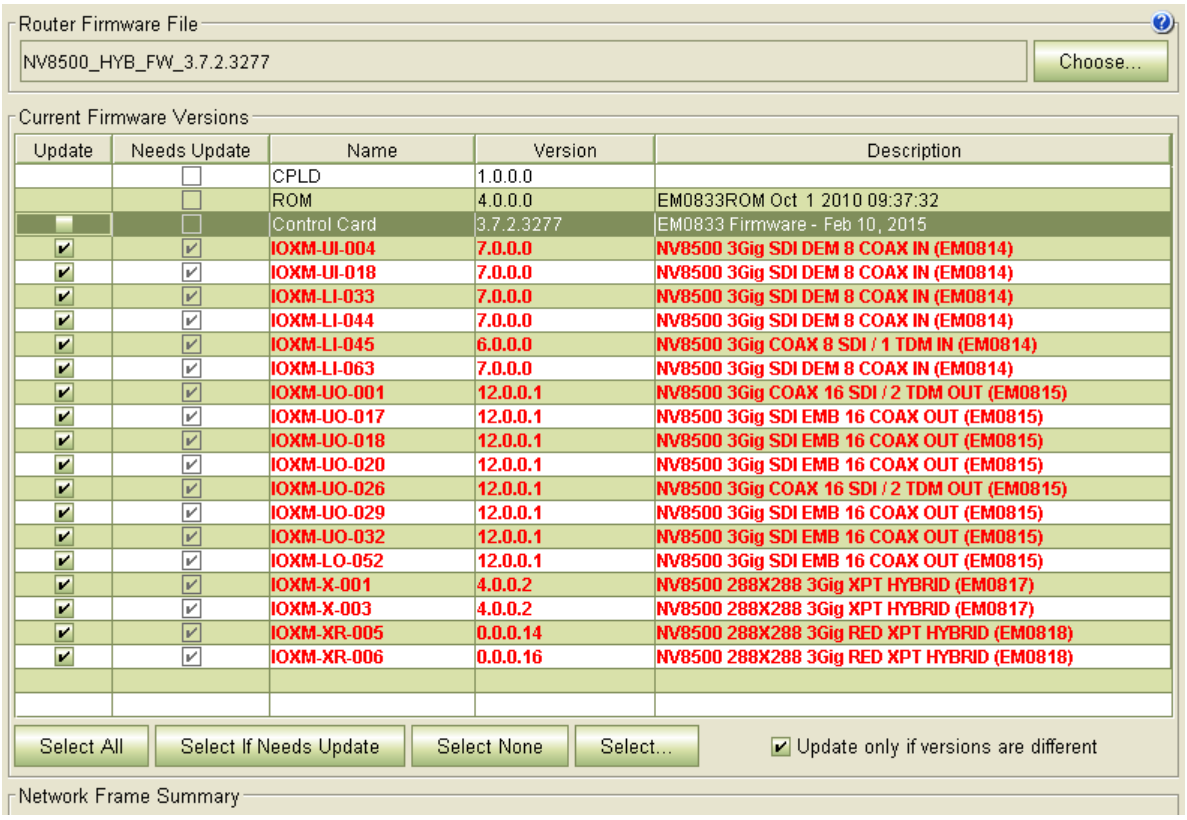
Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☑ ☑ 1 Remain in the 'Firmware' page in MRC. Ensure that **Card A** at the bottom of the page is selected.



☑ ☑ 2 The 'Firmware' page should report the same firmware file you used to update the control card. If it does not, locate and select the firmware file as you did in step 5.4. At this revision, the firmware file name is **`NV8500_HYB_FW_3.8.0.3306.RF`**.

The 'Update Firmware' page highlights all cards in need of updating (in red):



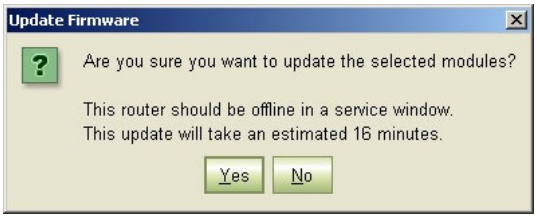
☑ ☑ 3 Click the 'Selected if Needs Update' button.

☑ ☑ 4 Make sure that the control card is unselected.

2. IOXM cards include Input, Output, XPT (crosspoint), and Monitor cards.

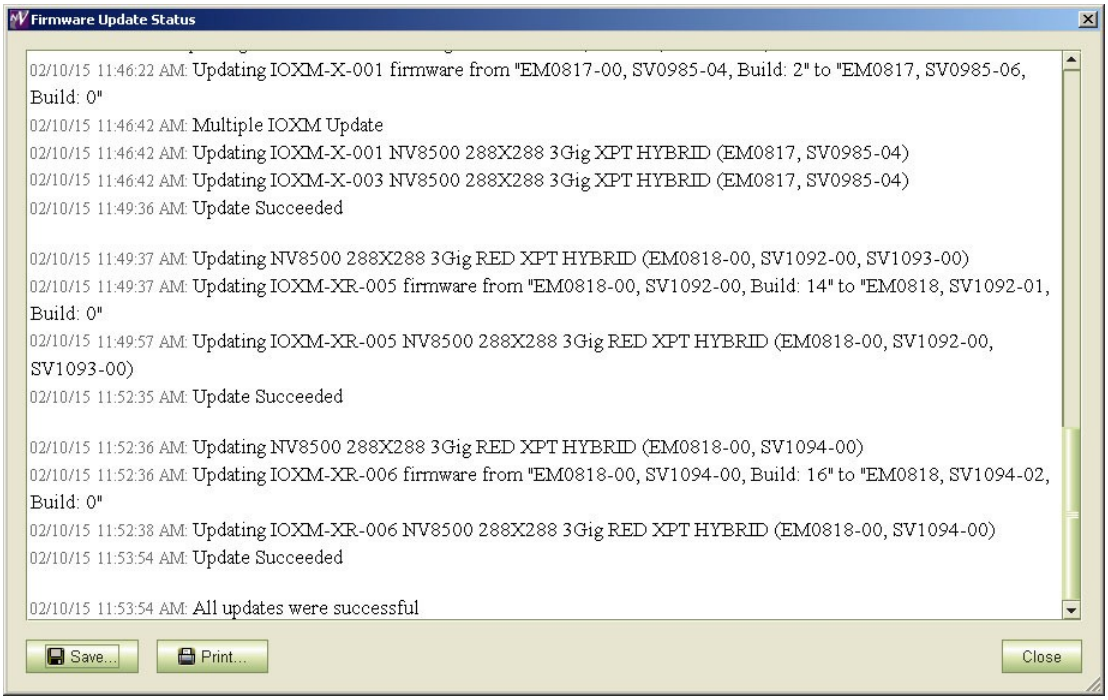
☑ ☑ 5 Click ‘Update Firmware’ (at the bottom of the page).

Click ‘Yes’ in the confirmation dialog that appears:



Frame1 Frame2 MRC proceeds to update all selected cards in order of card type. It updates all input TDM (MADI) cards, in parallel, then all disembedder cards, also, in parallel, and so on, until all selected cards are updated.

☑ ☑ 6 When the update is complete, MRC displays a log of the updates. It should normally say “All updates were successful.”



Examine the update log. If it reports any failure, retry the update for the failed card.

▲ If the update for an individual card fails, respond ‘Skip’ to the Retry message that appears. Perform all retry attempts after the update finishes and produces its report.

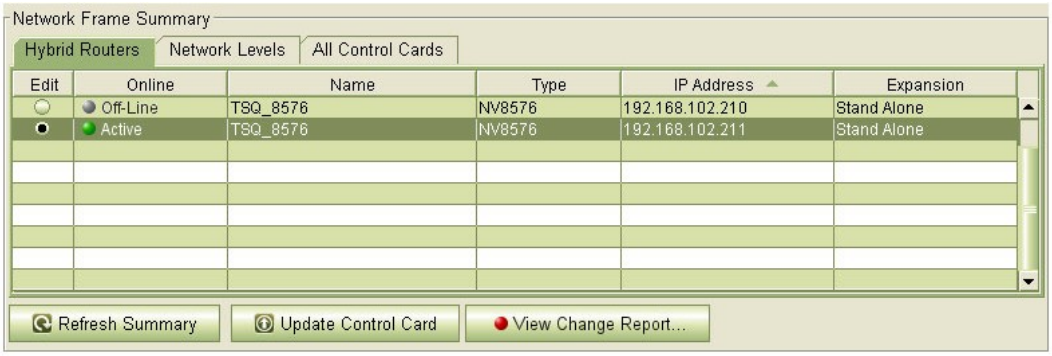
Cards for which the update failed will remain red in the table. Make sure that these are selected and click ‘Update Firmware’ again. Again, observe whether the update report says ‘All updates were successful’.

None of the cards listed in the ‘Firmware’ page should be red.

7 Redefine the I/O Card Types (for Card A)

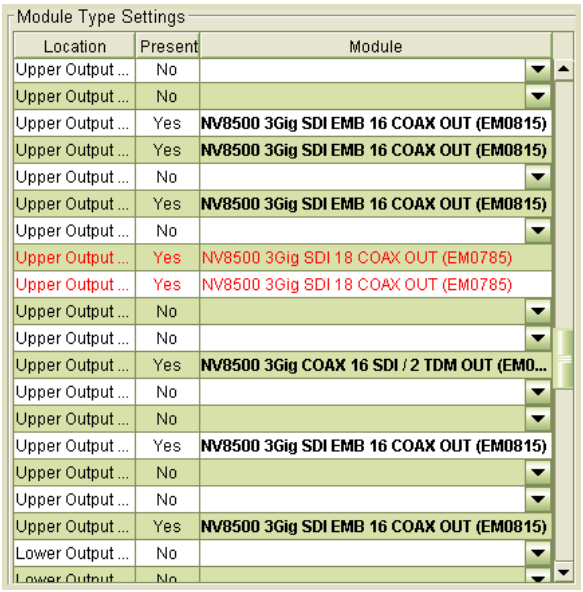
☑ 1 Go to the 'Module Types' page of MRC.

☑ 2 Choose **Card A** of the router you are updating:



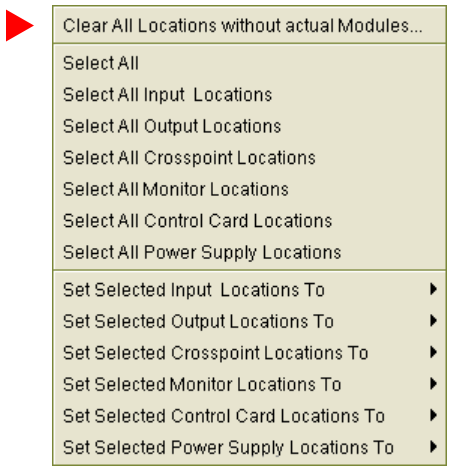
If you are updating an expanded NV8576-Plus, you must select **Card A** of the master frame. MRC will present a dialog asking you to identify the slave frame. Choose the slave frame in this dialog. (But do ***not*** select the slave frame in the 'Control Cards' tab at the bottom of the 'Module Types' page!)

☑ ☑ 3 It is possible that, after you perform step 6 (Firmware Updates for IOXM Cards) the 'Module Types' page reports errors—with red text—for some or all of your modules:

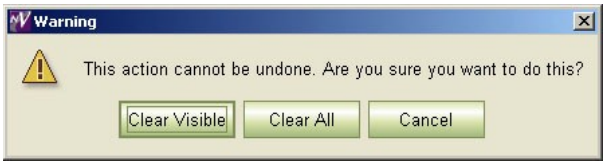


This is not an immediate cause for alarm. It can occur because of differences in configuration requirements between your old system and the new firmware and software.

Right-click the module list anywhere to display the page's context menu:



Click the 'Clear All Locations without Actual Modules' command. A warning appears:



Choose 'Clear All'.

MRC will do just that: all rows of the table for which there is no card in the corresponding slot become blank. Red text for the slots that do have cards will remain red. However, clicking the 'Update Control Card' button in the next step will eliminate the red text and complete the redefinition step.

☑ 4 Click the 'Update Control Card' button. MRC repopulates the list of modules according the card types known to control card. (Because you are upgrading, there should be no unknown card types.)

If you are updating an expanded NV8576-Plus, MRC displays all the modules of the entire router (both frames).

8 Set Input Attributes (for Card A)

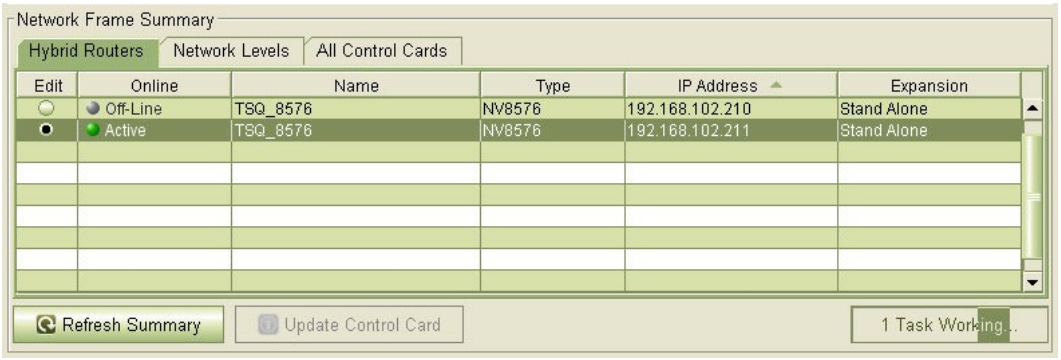
Skip this step if you have no input attributes to set.

If you are upgrading from firmware version 2.2.2, you will not need to change any input attributes.

At present, there is a single input attribute (applicable to any input) and that is the “force embedder ON” attribute. When this attribute is set, the router forces the output embedder involving this input to be used. Otherwise, the output embedder’s state (either used or bypassed) is determined by a routing logic sometimes called “switching rules.”

☑ 1 Go to the ‘Input Attributes’ page of MRC.

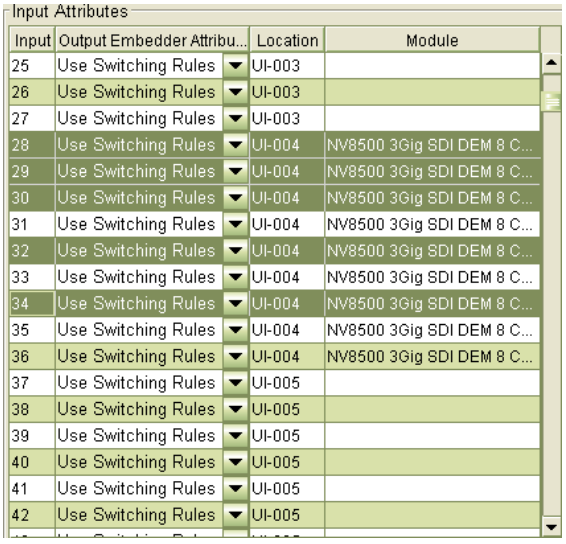
☑ 2 Choose **Card A** of the router you are updating:



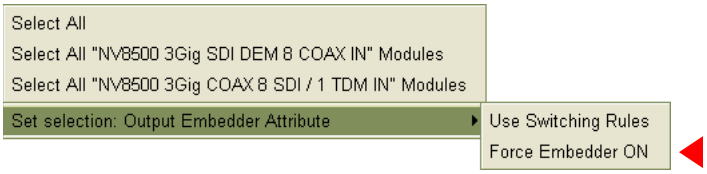
If you are updating an expanded NV8576-Plus, you must select **Card A** of the master frame. MRC will present a dialog asking you to identify the slave frame. Choose the slave frame in this dialog.

If you are updating an expanded NV8576-Plus, MRC displays all the modules of the entire router (both frames).

☑ 3 Select any required input cards. You can select multiple cards using click, shift-click, and control-click methods. Selected cards are highlighted in dark green:



☑ 4 Right-click anywhere in the list to display the context menu. In the context menu, choose the attribute for the selected input card:



☑ 5 Click 'Update Control Card' at the bottom of the page:

MRC sets the input attributes according to your select and writes the data to the control card.

9 Firmware Update for Card B

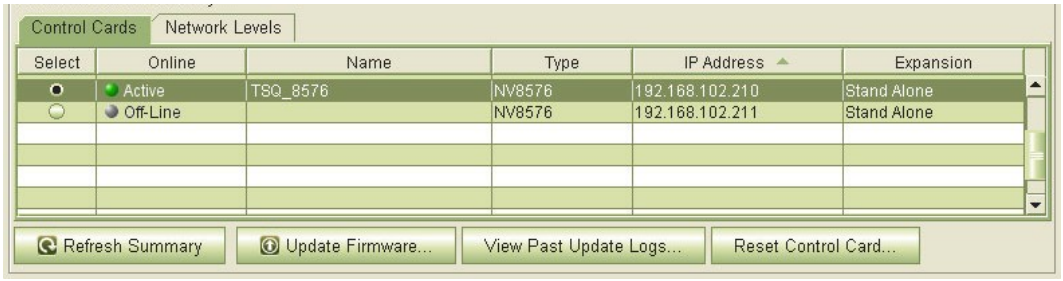
Skip this step if there is no standby control card (**Card B**).

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☑ ☑ 1 Completely remove **Card A**.

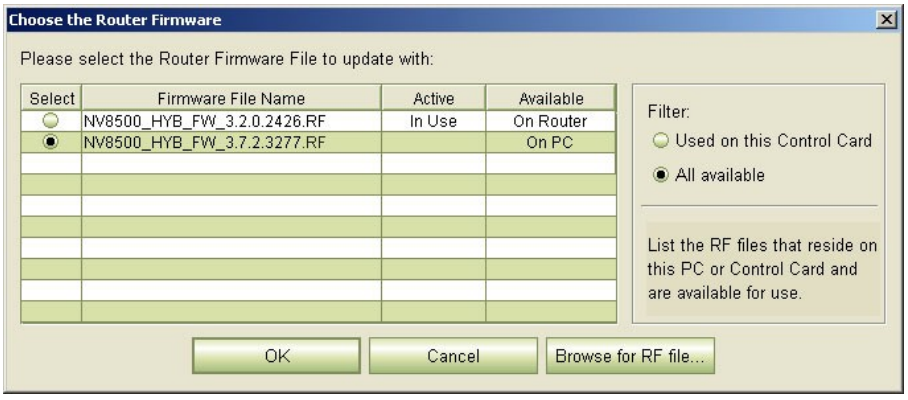
☑ ☑ 2 Reinsert the **Card B** in the slot from which it came. Close the router door. Wait for **Card B** to boot up. It becomes the active control card. It takes a few seconds.

☑ ☑ 3 Go to the 'Firmware' page in MRC. Select **Card B** at the bottom of that page.



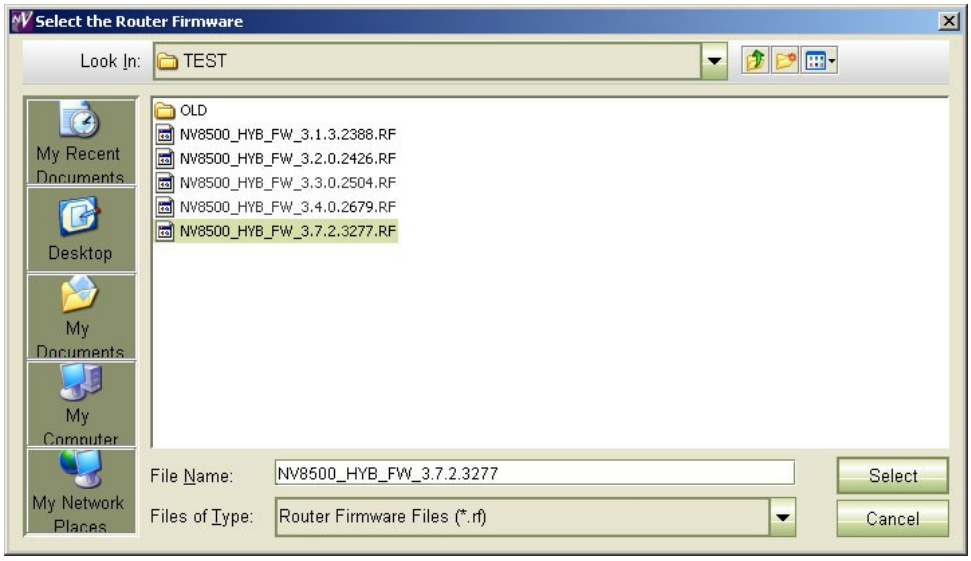
☑ ☑ 4 Click the 'Choose' button, at the top of the page.

The 'Choose Router Firmware' dialog appears:



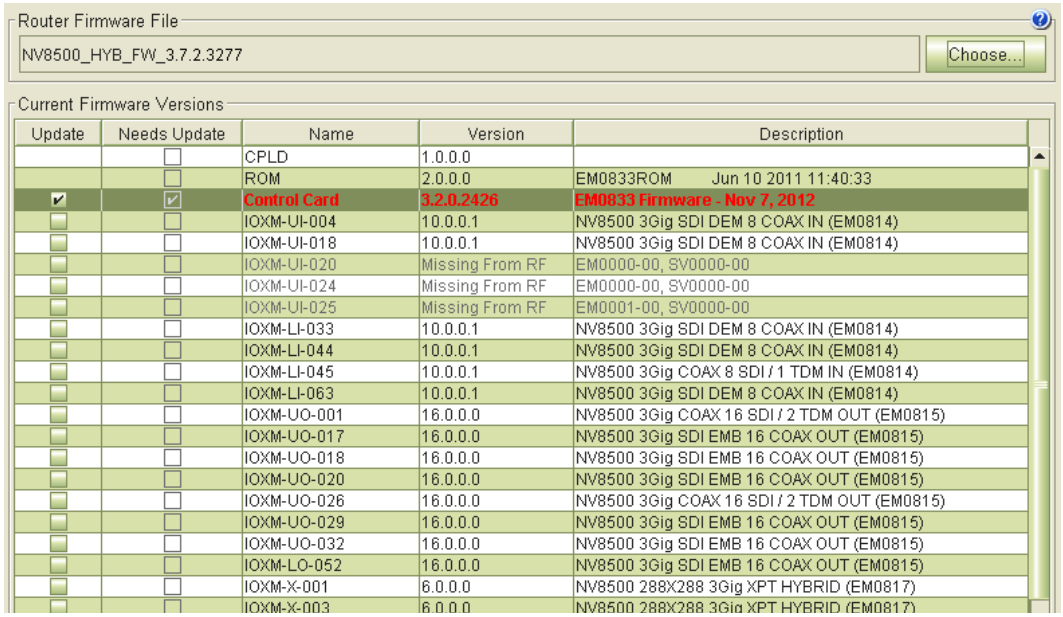
Because you are installing new firmware, choose ‘All Available’ at the right side of the dialog and click ‘Browse for RF File’.

The ‘Select Router Firmware’ dialog appears:



Here, navigate to a folder that contains the firmware file you want. Use the same file you used to update **Card A**. Highlight the file and click ‘Select’.

The ‘Firmware’ page changes to highlight the control card (in red):



Ignore any messages such as “Missing from RF” in the illustration above.

Frame1 Frame2

☑ ☑ 5 Click ‘Select None’ to deselect all cards.

☑ ☑ 6 Check the check box in the ‘Update’ column to select the control card.

Make sure that this is the only card that has a check mark.

☐ ☐ 7 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning messages.

☐ ☐ 8 When the update has finished, MRC displays a report of the updates. It should normally say “All updates were successful” at the end.
If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

*(**Card A** now has both new firmware and a correct configuration.)*

10 Reinsert Card A and Make it Active

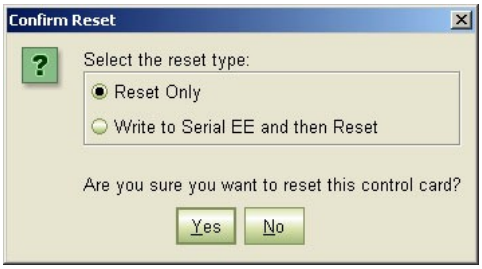
Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Re-insert **Card A**.

Either press the (physical) reset button on **Card B** or, while **Card B** is still selected in MRC, right-click in the ‘Network Frame Summary’ section of the ‘Firmware’ page and choose ‘Reset Control Card’ from the global context menu:

This context menu is also available in the ‘From Device’ section of the ‘Copy Settings’ page.

Respond ‘Yes’ in the confirmation dialog:



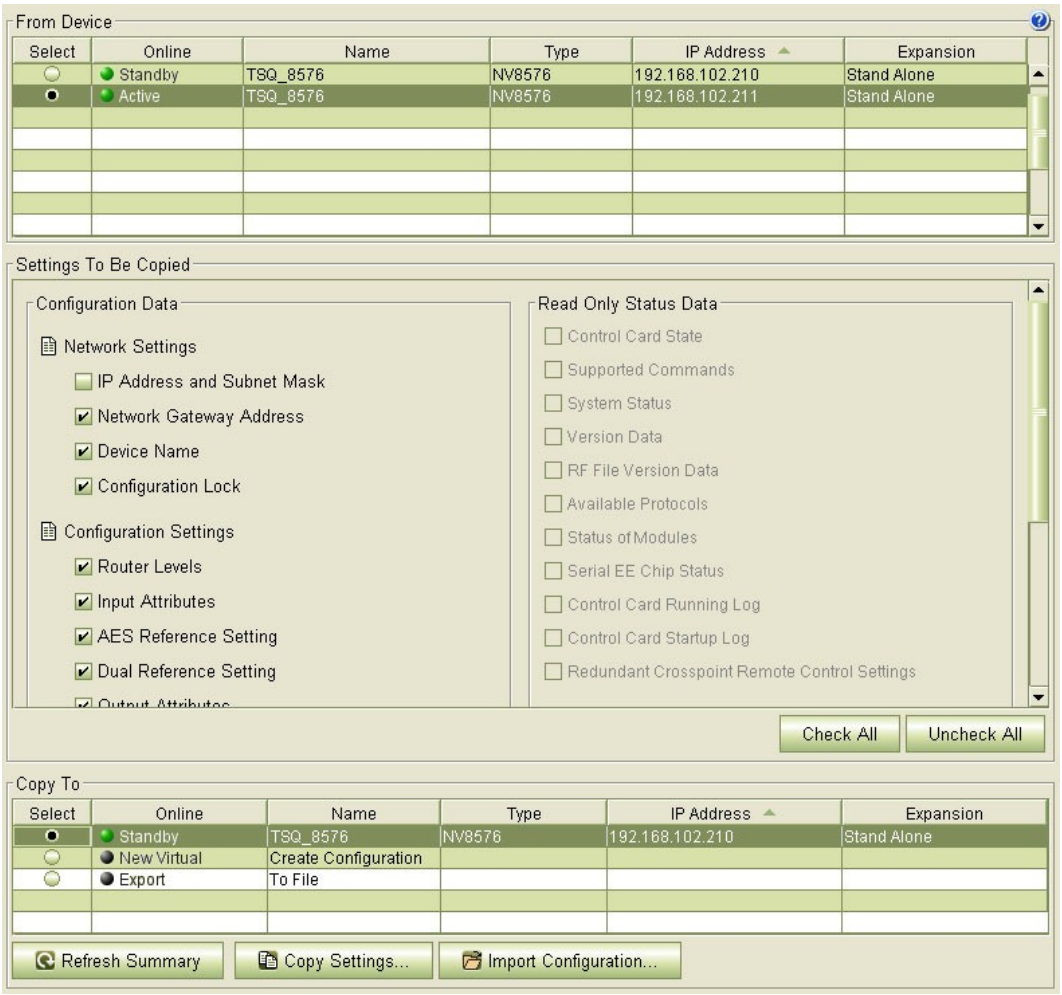
Card A becomes active and **Card B** becomes standby (as they were before you started).

11 Copy the Configuration from Card A to Card B

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Go to the 'Copy Settings' page of MRC.

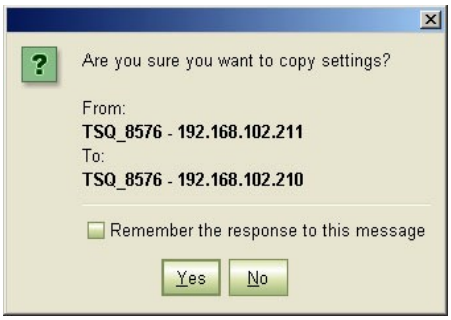
2 Select **Card A** in the 'From Device' table at the top of the page. The 'To Device' table, at the bottom of the page, will redisplay according to your selection. Select **Card B** in the 'To Device' table.



3 Leave the entries in the 'Settings to Be Copied' section, in the middle of the page, at their defaults.

4 Click the 'Copy Settings' button.

Respond 'Yes' to the confirmation message:



5 MRC copies the configuration from **Card A** to **Card B**. At the end of the copy, MRC asks you whether you want to reset the control card:

Respond 'Yes'.

6 After the reset, MRC displays a completion message:

12 Completion

If the copy in step 11 reported success, your upgrade is finished.

If there were unresolved failures, contact Grass Valley customer service.

Create another snapshot—as you did in step 3 on page 6—of the router in MRC, especially if there were failures. In the event of failures, you will be asked to send both snapshots—this one and the one you made in step 3—to Grass Valley customer service.

☑ 1 If you disconnected your control system, reconnect it, disconnecting any temporary Ethernet connections you might have made between your PC and the router. However, if you stopped the NV9000, you may now restart it.

13 Testing

You can perform these quick tests to determine whether the firmware upgrade was successful.

These tests are discretionary and not part of the procedure itself.

1 Observe the LEDs on the control cards, crosspoint cards, I/O cards, and monitor cards.

I/O and monitor cards should all have their amber 'FPGA loaded' LED on (and steady) and they should have their green 'Good COM' LEDs on. No card should have its red 'Bad COM' LED on.

Each crosspoint card will have a green "health" LED on.

Each control card will also green health LED on. The active control card will have its amber LED on.

2 Examine the I/O cards in the 'Module Status' page of MRC. Modules with problems are highlighted in the table with red circles. Good modules have green circles.

3 In the 'Crosspoints' page of MRC, perform a few takes. (This is minimally helpful, but it will show whether the router is functioning.

More extensive testing is beyond the scope of this document.

The Upgrade Procedure for Routers with Firmware prior to Version 2.2.0

Most of this procedure is order-dependent. Do not deviate from the procedure.

Upgrade Summary

This is a summary of the upgrade procedure. Details follow after the summary.

1 Install the latest version of MRC.

2 Disconnect (or stop) the NV9000 (or third-party) control system.

3 Create a router configuration "snapshot."

4 Update the boot ROMs in control cards (if yours are -03 or earlier).

*Let the active control card be called **Card A** and the standby control card be called **Card B**.*

5 Remove **Card B**. Then update to newer firmware in **Card A**.

6 Remove all monitor cards, from the frame, that do not report in the MRC firmware page or that have SV0872-10 or older code. A Grass Valley service technician must JTAG these cards at this step.

7 Reinsert all monitor cards that have been JTAG'd.

8 Update to newer firmware for all IOXM[3] cards.

9 Redefine the I/O card types, using the 'Module Types' page of MRC, for **Card A**.

10 Set input attributes (if needed) for **Card A**.

***Card A** now has new firmware and a correct configuration.*

11 Remove **Card A.** Reinsert **Card B**. Then update to newer firmware in the **Card B** (which is now active).

12 Reinsert **Card A**. Reset **Card B** (currently active). **Card A** becomes active and **Card B** becomes standby (as they were before you started)

13 Copy the control card configuration from **Card A** to **Card B** using the 'Copy Settings' page of MRC.

Card B** now has new firmware and the same configuration as **Card A.

14 Create another snapshot of the router in MRC. Reconnect (or restart) the NV9000 (or third-party) control system.

1 MRC

☑ 1 Install the latest version of MRC. The installation is quick.

You contacted Grass Valley customer service either to obtain an upgrade for your NV8500 router or because Grass Valley recommended an upgrade. A Grass Valley customer service technician will have sent you (1) a copy of the MRC software installer, (2) the (.rf) firmware file you need to perform the upgrade, (3) the .rf firmware file for the system you have presently in case you need to revert to your old firmware, and (4) this technical note that you are reading.

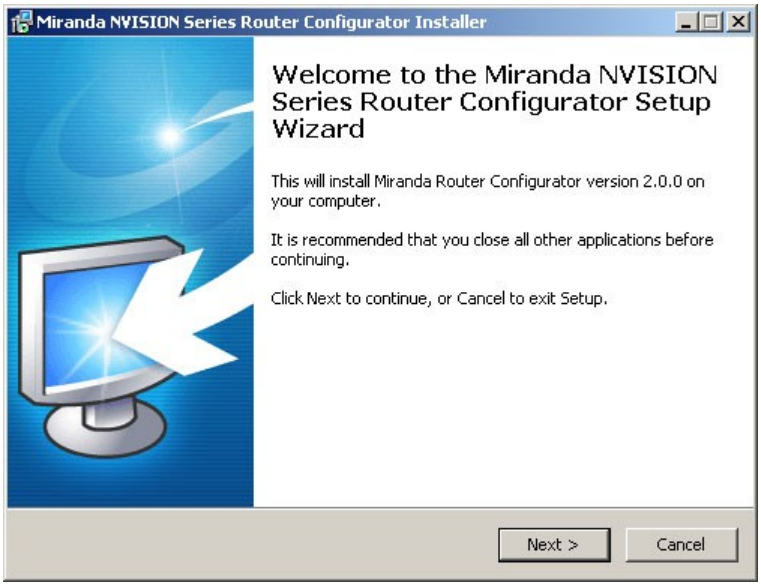
The means by which you receive the upgrade materials depends on an agreement between you and the Grass Valley technician. You might receive the materials through an FTP site, through the mail, or by courier. A technician might visit your site and bring the materials to your site.

To install MRC. . . .

3. IOXM is a term that means input, output, crosspoint (XPT) and monitor cards.

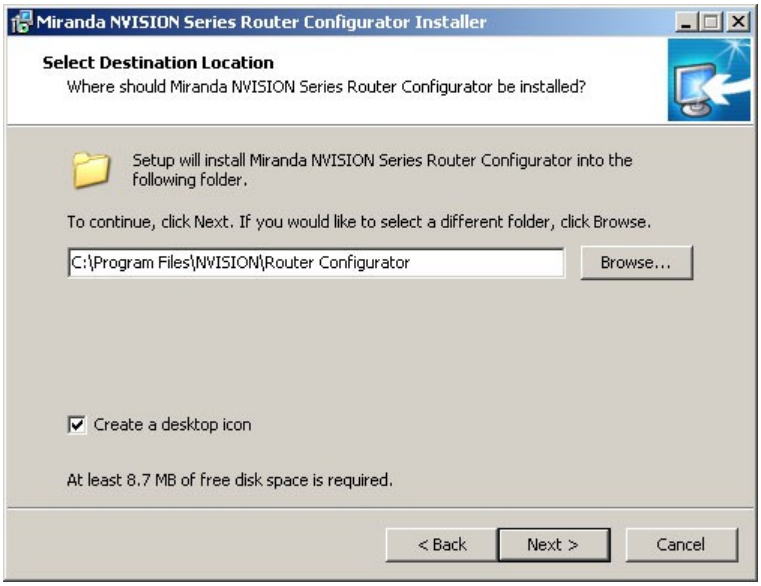
Copy the MRC installer and the .rf file(s) (either from an FTP site or from the USB device you received, as the case may be) to a folder in the PC that you use for configuring the router.

Double-click the installer file to launch the installer. The initial installer window appears:



Click ‘Next’.

A window appears in which you can designate the location on the PC in which to install MRC:

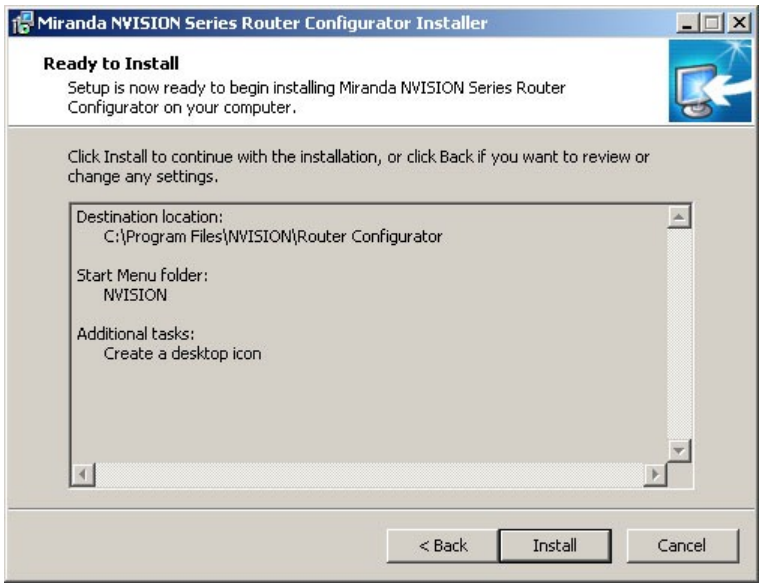


The window presents the default location. If you prefer another location, click ‘Browse . . .’ to navigate to a different folder.

Uncheck ‘Create a desktop icon’ if you do not want an MRC shortcut to appear on your PC desktop.

The window tells you the disk space needed for the installation. If you do not have that much space, the installation will fail.

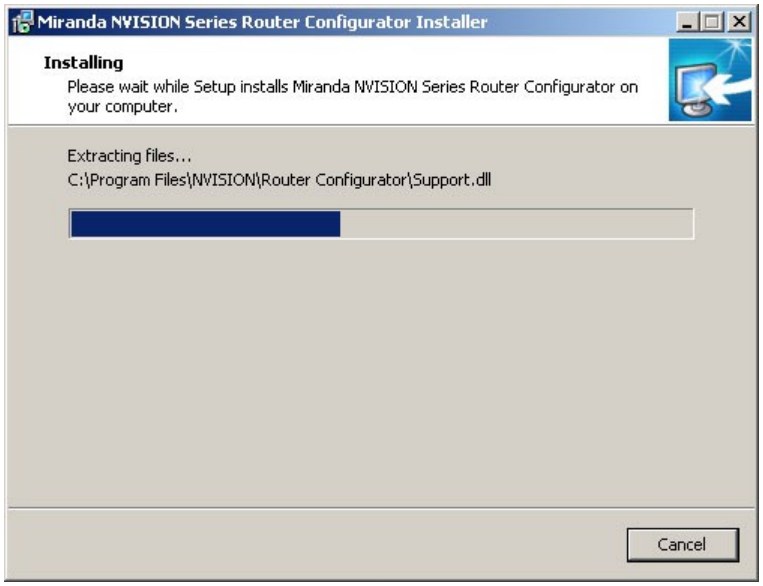
When you are satisfied with the pathname and options, click ‘Next’. A confirmation window appears:



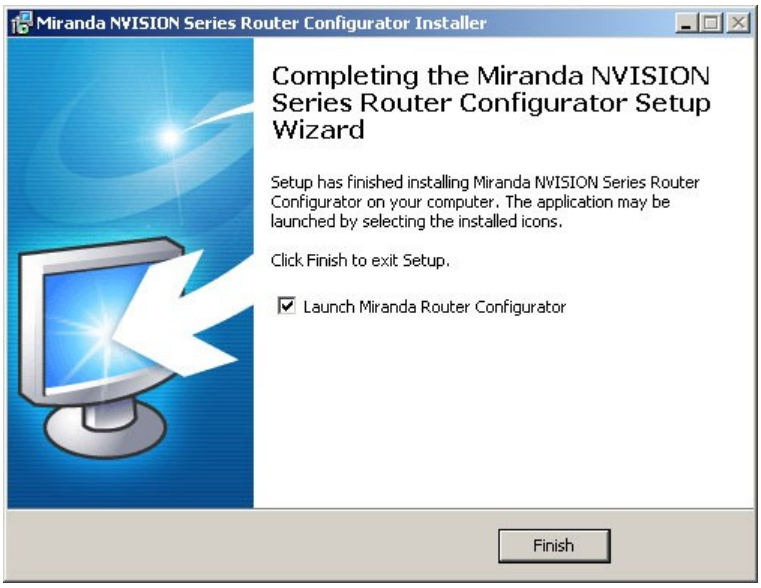
If the options presented are not correct, click ‘Back’ to go back to the previous window and re-enter a pathname or change options.

Otherwise, click ‘Next’ to start the installation or click ‘Cancel’ to stop the installer.

When you start the installation, a progress window appears:



After several seconds, the installation will complete. The completion window appears:



Uncheck ‘Launch Grass Valley Router Configurator’ if you do not want to run MRC immediately.

Click ‘Finish’.

2 Control System

Disconnect the NV9000 (or third-party) control system from the router.

☑ ***Preferred Method:*** Use this method if you have an NV9000 control system and you can stop the NV9000 without disrupting your entire system.

1 Stop the NV9000. To stop the NV9000, launch NV9000-SE Utilities. Go to the ‘System Management’ page and click the ‘Stop Controller 2’ button and the ‘Stop Controller 1’ button.

It is recommended that you stop the inactive controller before you stop the active controller.

☑ Alternate Method: Use this method if you cannot stop the NV9000 or if you have a third-party control system.

1 Remove the cables (whether serial or Ethernet) from the control ports of the router. (Doing this will cause alarms in the NV9000 system. You can safely ignore the alarms.)

If you have MRC running, removing Ethernet cables from the router’s control cards will cause MRC to lose contact with the router.

2 Connect your PC (that is running MRC) to the router’s control ports via a small Ethernet switch.

3 Router Snapshot

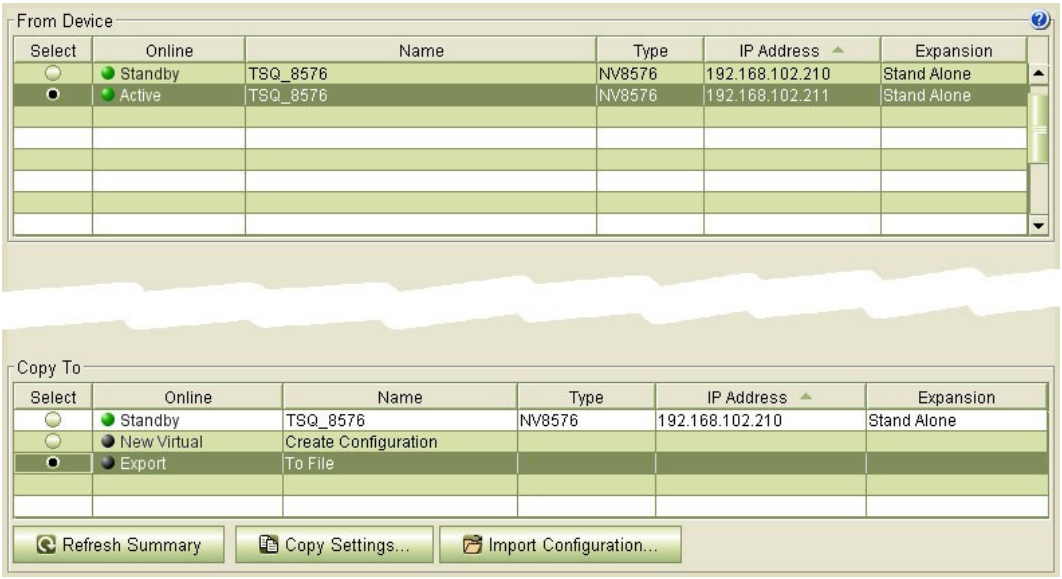
These steps create a file that records all the router settings. It is important to have this file, which you can send to Grass Valley, if your upgrade does not succeed. Make this file before doing anything else.

☑ 1 Launch MRC. Go to its 'Copy Settings' page.

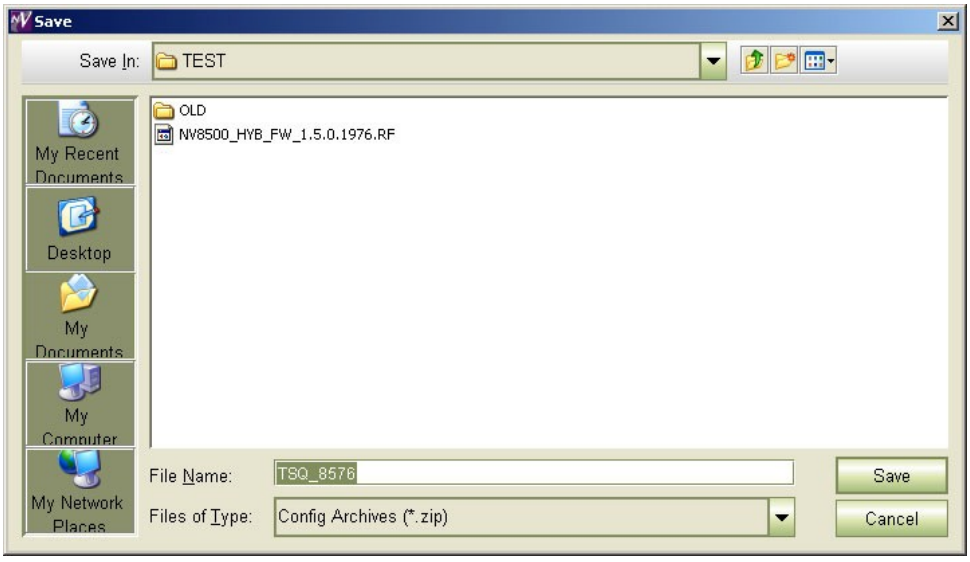
☑ 2 Select the active control card in the upper section of the page.

☑ 3 Choose 'Export' in the lower section of the page.

☑ 4 Click 'Copy Settings'



☑ 5 A dialog appears in which you can browse to name a file and location in which to store the settings:



Choose a folder and a file name. The saved file will be a .zip file.

☑ 6 Click ‘Save’ and wait for the confirmation notice:

4 Boot ROM

For each EM0833 control card, ensure that the boot ROM is up-to-date. You need a -04 or -05 boot ROM. The -05 boot ROM is a requirement only for expanded NV8576-Plus frames.

The boot ROM is in the same location (U10) on all revisions of the EM0833 control cards. The part number for the ROM is UZ0453-00. Its code is SV1038-05. The label for the -05 version reads:

MIRANDA © 11
SV1038-05,A
V 2.0.0.0
CS=0x2625

To change the boot ROM, remove the old boot ROM from its socket. Note the orientation of the ROM IC. Insert a new boot ROM in the socket with the same orientation.

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

Frame1 Frame2 ▲ Keep the router door closed as much as possible when you are doing this.

☑ ☑ 1 Remove the standby control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Follow the instructions under Replacing the Boot ROM on page 40. Then replace the standby card in the frame.

☑ ☑ 2 Switch control to the standby card. To do that, press the reset button on the active control card. Wait for the standby card to become the active card. (When a control card is active, its amber LED is on.)

☑ ☑ 3 Remove the formerly active control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Follow the instructions under Replacing the Boot ROM on page 40. Then replace that control card in the frame.

☑ ☑ 4 Switch control back to the formerly active control card.

*(In the following steps, call the presently active control card **Card A** and the standby control card **Card B.**)*

5 Firmware Update for Card A

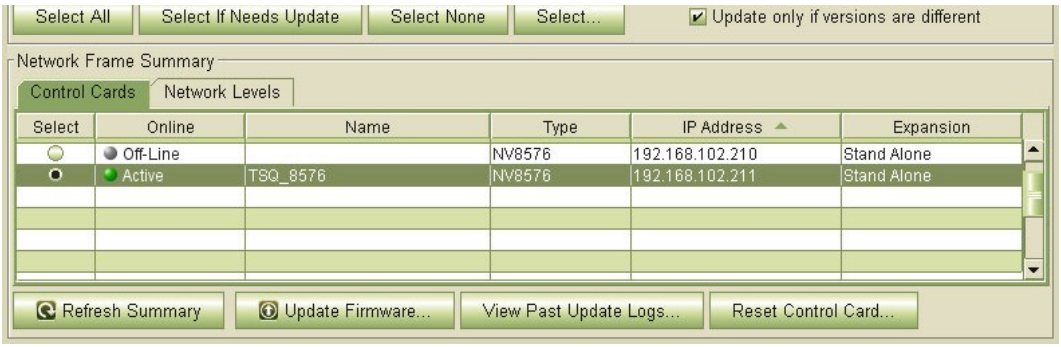
Frame1 Frame2

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Completely remove **Card B** (the standby control card, assuming there is one). Close the router door.

☐ ☐ 2 Go to the 'Firmware' page in MRC. Click 'Refresh Summary'.

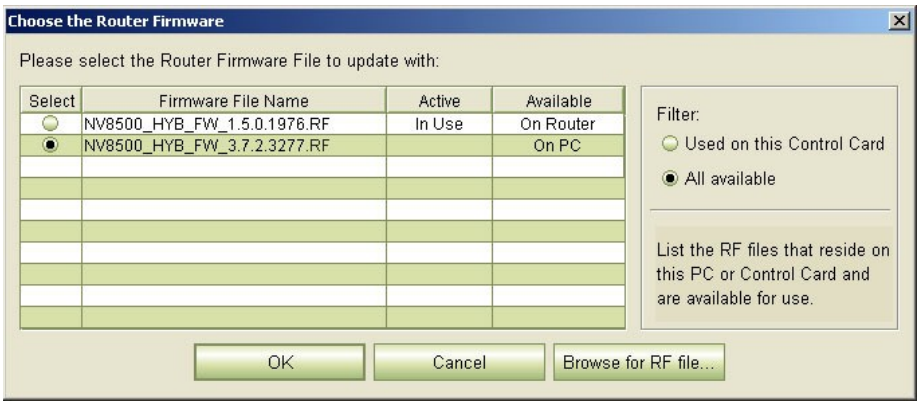
3 Select **Card A** at the bottom of that page.



The stand-by card (**Card B**) should read 'Off-Line'.

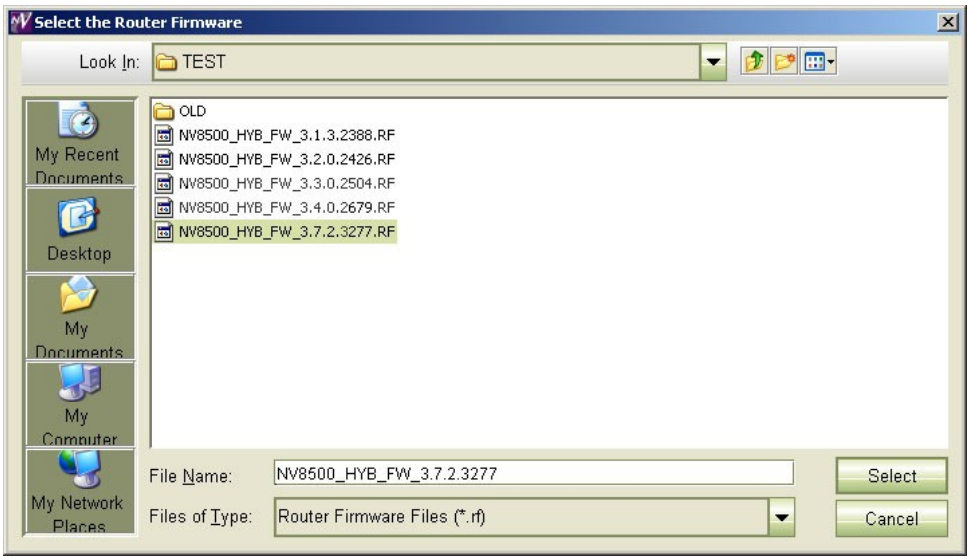
☐ ☐ 4 Click the 'Choose' button, at the top of the page, to locate the firmware file. At this revision, that is **`NV8500_HYB_FW_3.8.0.3306.RF`**.

The 'Choose Router Firmware' dialog appears:



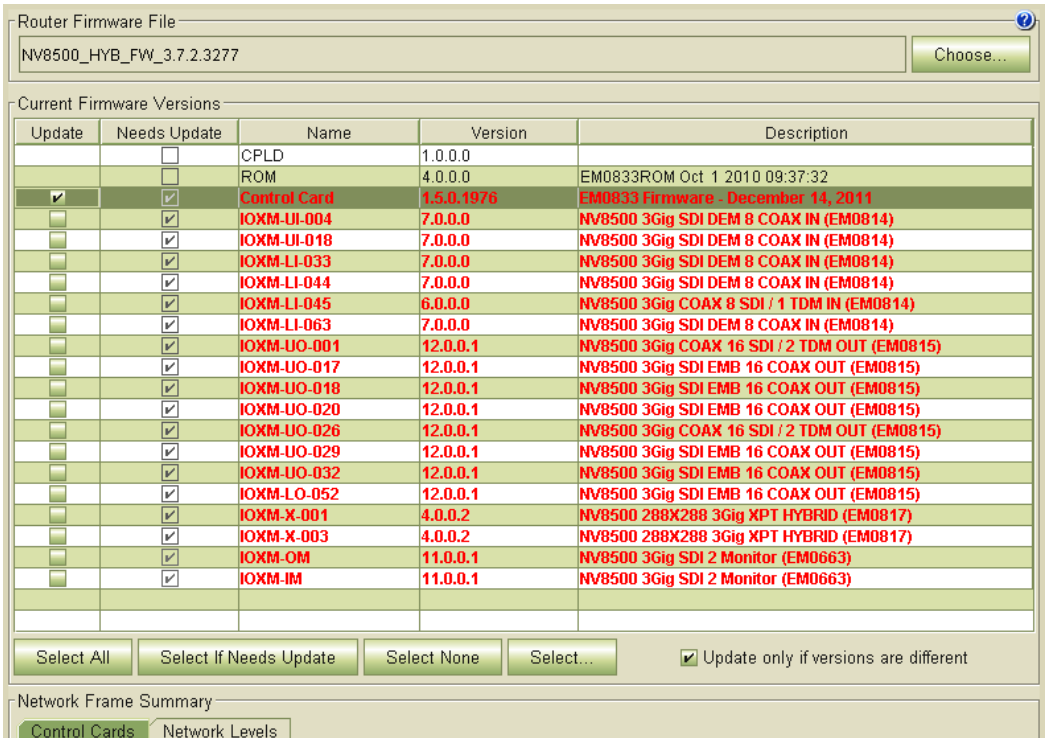
Because you are installing new firmware, click 'Browse for RF File'.

The ‘Select Router Firmware’ dialog appears:



Here, navigate to a folder that contains the firmware file you want. At this revision, the file is **`NV8500_HYB_FW_3.8.0.3306.RF`**. Highlight the file and click ‘Select’.

The ‘Firmware’ page changes to highlight all cards in need of updating (in red):



Frame1 Frame2

☑ ☑ 5 Click ‘Select None’ to deselect all cards. Then select the control card by marking its check box in the ‘Update’ column.

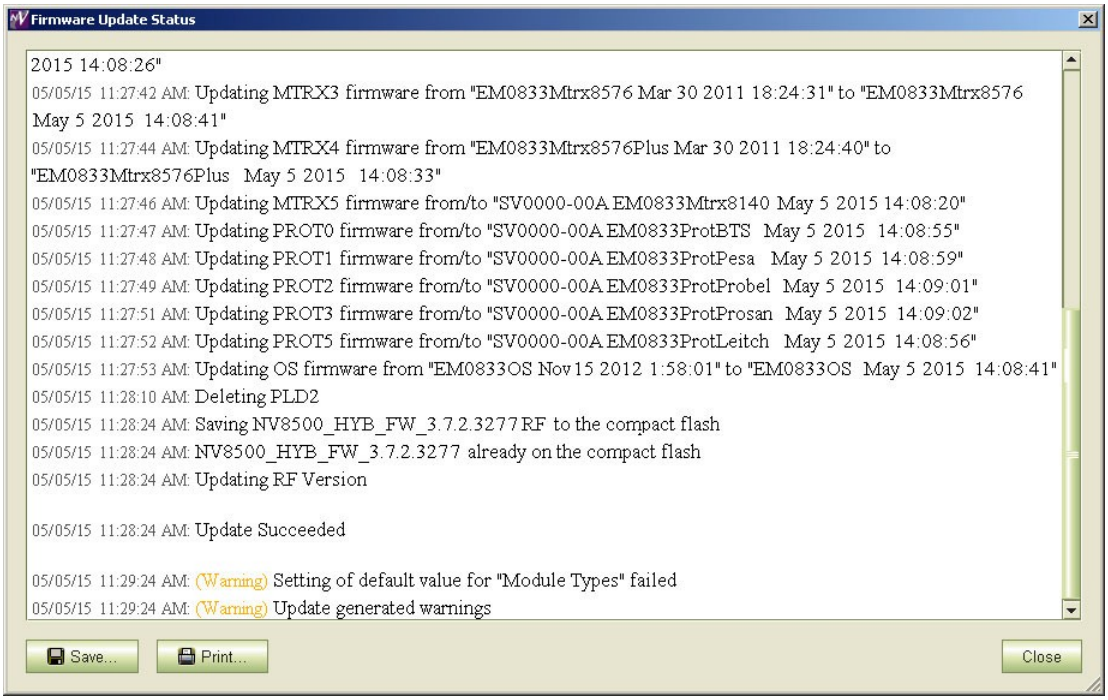
Make sure that this is the only card that has a check mark.

Frame1 Frame2

☐ ☐ 6 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning message.

☐ ☐ 7 When the update has finished, MRC displays a log of the updates. It should normally say “All updates were successful” at the end.



If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

Because you have updated the firmware, but have not yet updated the IOXM cards, you might see a message such as “Setting of default values for module types failed” as shown in the illustration above.

You can safely ignore that message.

6 JTAG Out-of-Date Monitor Cards

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Remain in the firmware page in MRC.

2 Remove any monitor cards that do not report in the MRC firmware page or that do not have SV0872-11 firmware or newer.

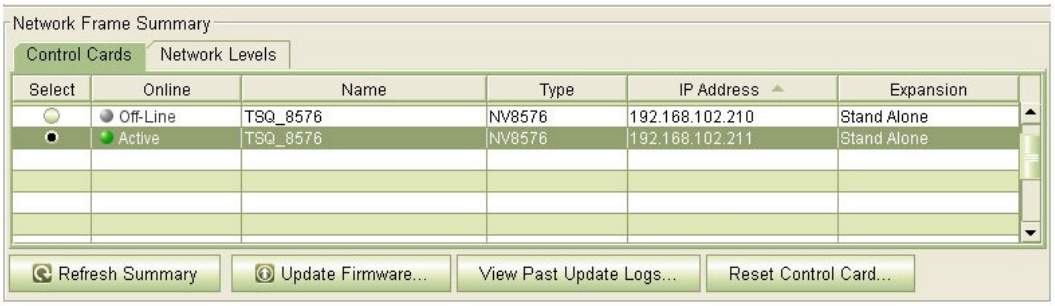
3 JTAG each monitor card that you removed. (A Grass Valley service technician must perform this step.)

4 Replace the JTAG’d monitor cards in the frame.

7 Firmware Updates for IOXM[4] Cards

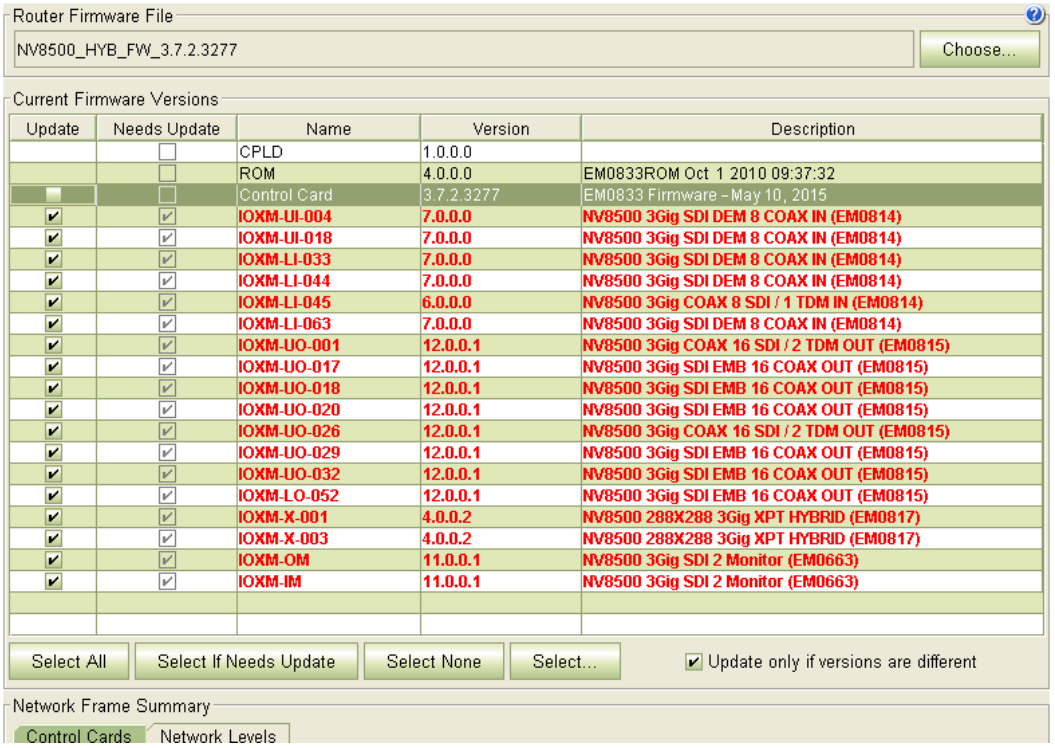
Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Remain in the 'Firmware' page in MRC. Ensure that **Card A** at the bottom of the page is selected.



☐ ☐ 2 The 'Firmware' page should report the same firmware file you used to update the control card. If it does not, locate and select the firmware file as you did in step 5.4. At this revision, the firmware file name is **`NV8500_HYB_FW_3.8.0.3306.RF`**.

The 'Update Firmware' page highlights all cards in need of updating (in red):



☐ ☐ 3 Click the 'Selected if Needs Update' button.

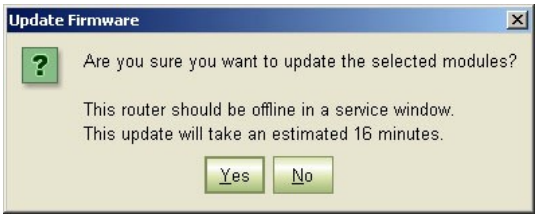
☐ ☐ 4 Make sure that the control card is unselected . You are updating only IOXM cards in this step.

4. IOXM cards include Input, Output, XPT (crosspoint), and Monitor cards.

Frame1 Frame2

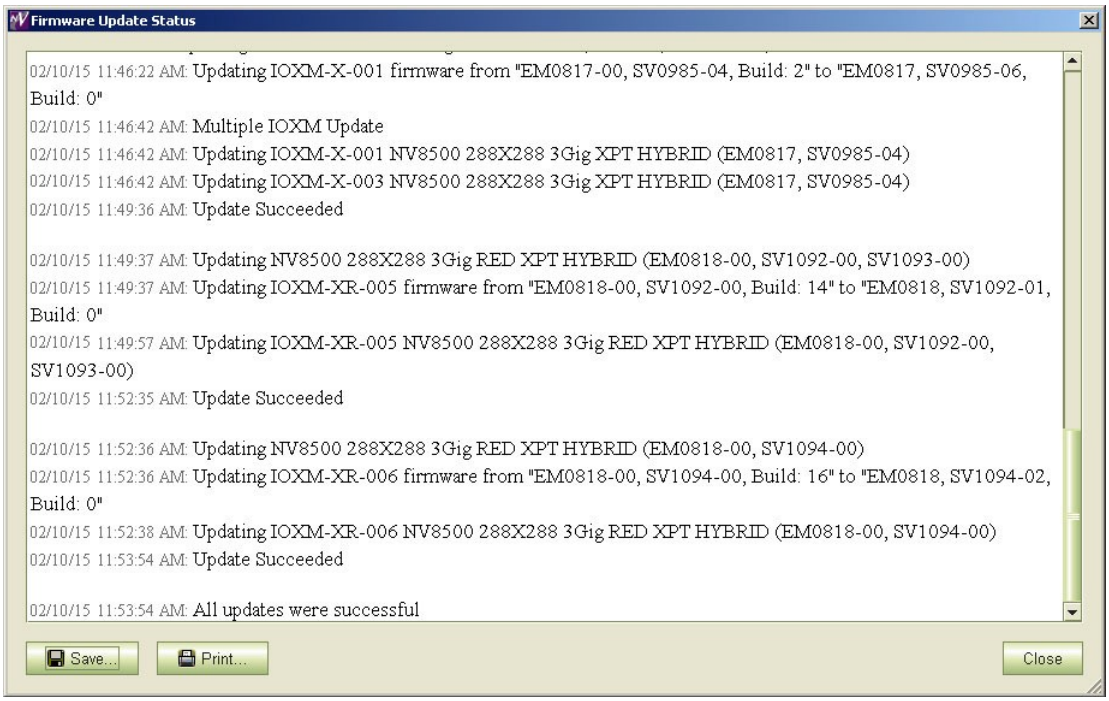
☐ ☐ 5 Click ‘Update Firmware’ (at the bottom of the page).

Click ‘Yes’ in the confirmation dialog that appears:



MRC proceeds to update all selected cards in order of card type. It updates all input TDM (MADI) cards, in parallel, then all disembedder cards, also, in parallel, and so on, until all selected cards are updated.

☐ ☐ 6 When the update is complete, MRC displays a log of the updates. It should normally say “All updates were successful.”



Examine the update log. If it reports any failure, retry the update for the failed card.

▲ If the update for an individual card fails, respond ‘Skip’ to the Retry message that appears. Perform all retry attempts after the update finishes and produces its report.

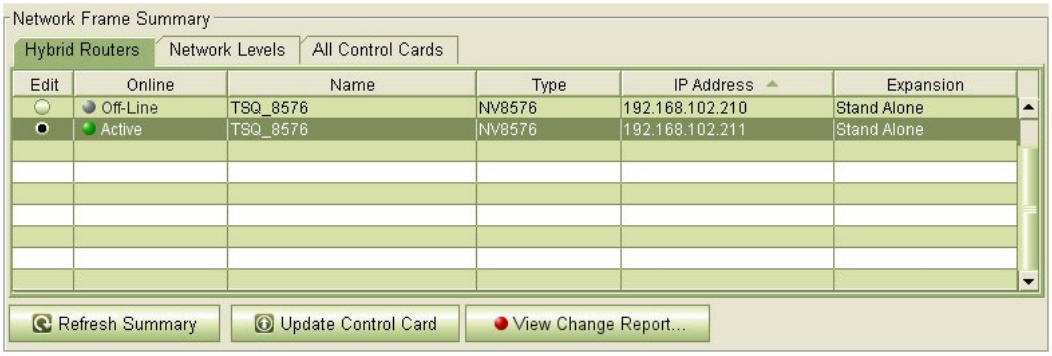
Cards for which the update failed will remain red in the table. Make sure that these are selected and click ‘Update Firmware’ again. Again, observe whether the update report says ‘All updates were successful’.

None of the cards listed in the ‘Firmware’ page should be red.

8 Redefine the I/O Card Types (for Card A)

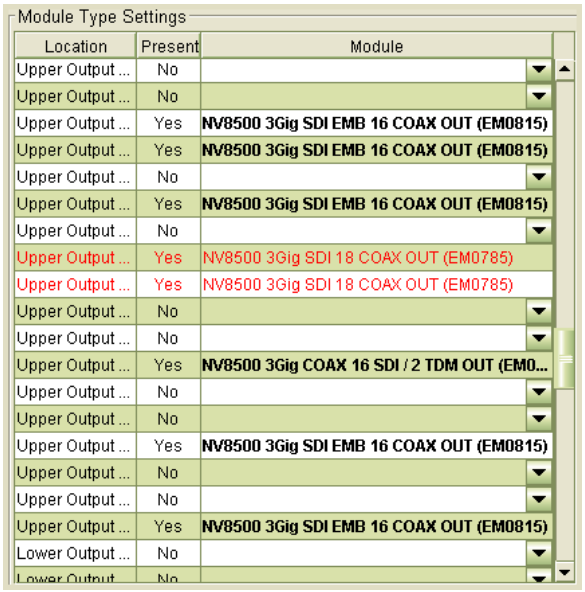
☑ 1 Go to the 'Module Types' page of MRC.

☑ 2 Choose **Card A** of the router you are updating:



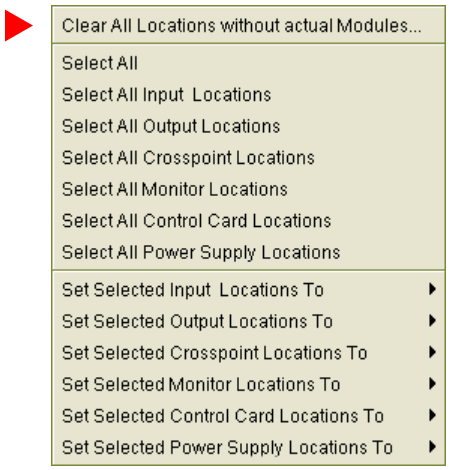
If you are updating an expanded NV8576-Plus, you must select **Card A** of the master frame. MRC will present a dialog asking you to identify the slave frame. Choose the slave frame in this dialog. (But do ***not*** select the slave frame in the 'Control Cards' tab at the bottom of the 'Module Types' page!)

☑ ☑ 3 It is possible that, after you perform step 6 (Firmware Updates for IOXM Cards) the 'Module Types' page reports errors — with red text — for some or all of your modules:

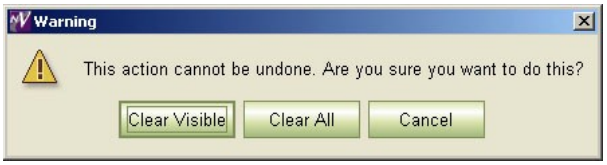


This is not an immediate cause for alarm. It can occur because of differences in configuration requirements between your old system and the new firmware and software.

Right-click the module list anywhere to display the page's context menu:



Click the 'Clear All Locations without Actual Modules' command. A warning appears:



Choose 'Clear All'.

MRC will do just that: all rows of the table for which there is no card in the corresponding slot become blank. Red text for the slots that do have cards will remain red. However, clicking the 'Update Control Card' button in the next step will eliminate the red text and complete the redefinition step.

4 Click the 'Update Control Card' button. MRC repopulates the list of modules according the card types known to control card. (Because you are upgrading, there should be no unknown card types.)

If you are updating an expanded NV8576-Plus, MRC displays all the modules of the entire router (both frames).

9 Set Input Attributes (for Card A)

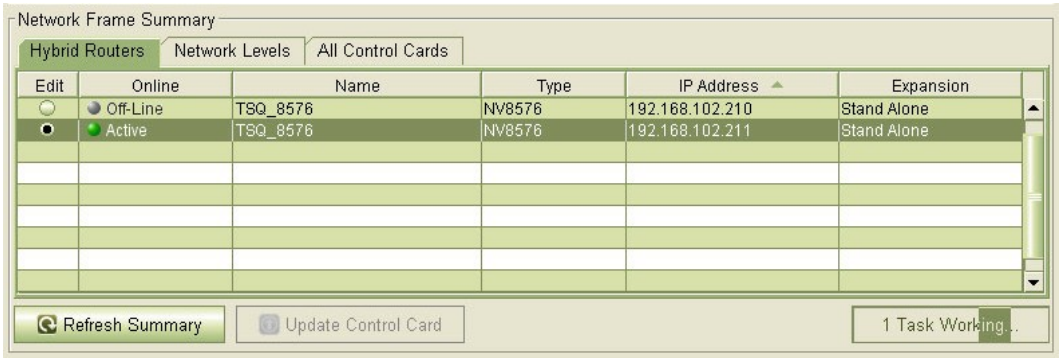
Skip this step if you have no input attributes to set.

If you are upgrading from firmware version 2.2.2, you will not need to change any input attributes.

At present, there is a single input attribute (applicable to any input) and that is the “force embedder ON” attribute. When this attribute is set, the router forces the output embedder involving this input to be used. Otherwise, the output embedder’s state (either used or bypassed) is determined by a routing logic sometimes called “switching rules.”

☑ 1 Go to the ‘Input Attributes’ page of MRC.

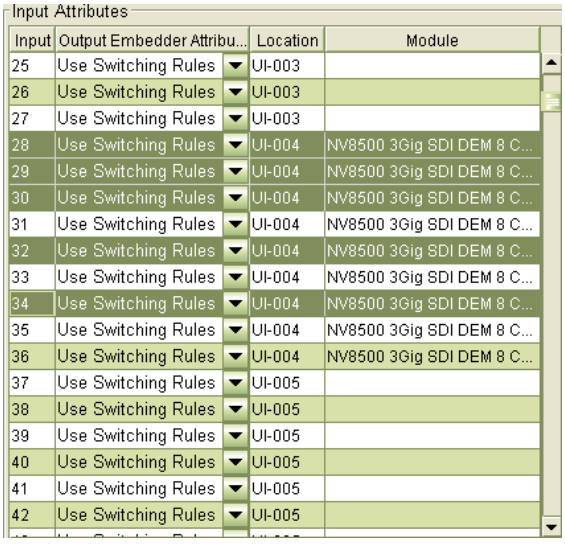
☑ 2 Choose **Card A** of the router you are updating:



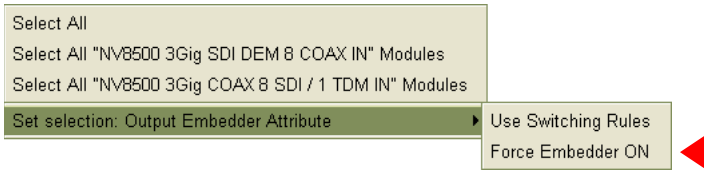
If you are updating an expanded NV8576-Plus, you must select **Card A** of the master frame. MRC will present a dialog asking you to identify the slave frame. Choose the slave frame in this dialog.

If you are updating an expanded NV8576-Plus, MRC displays all the modules of the entire router (both frames).

☑ 3 Select any required input cards. You can select multiple cards using click, shift-click, and control-click methods. Selected cards are highlighted in dark green:



☑ 4 Right-click anywhere in the list to display the context menu. In the context menu, choose the attribute for the selected input card:



☑ 5 Click 'Update Control Card' at the bottom of the page:

MRC sets the input attributes according to your select and writes the data to the control card.

10 Firmware Update for Card B

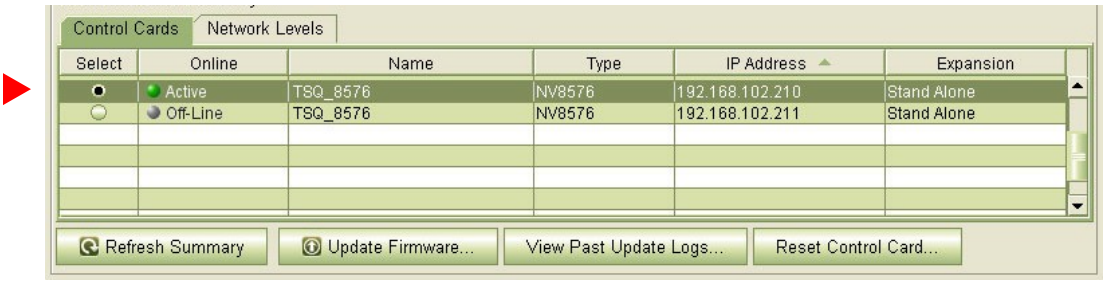
Skip this step if there is no standby control card (**Card B**).

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☑ ☑ 1 Completely remove **Card A**.

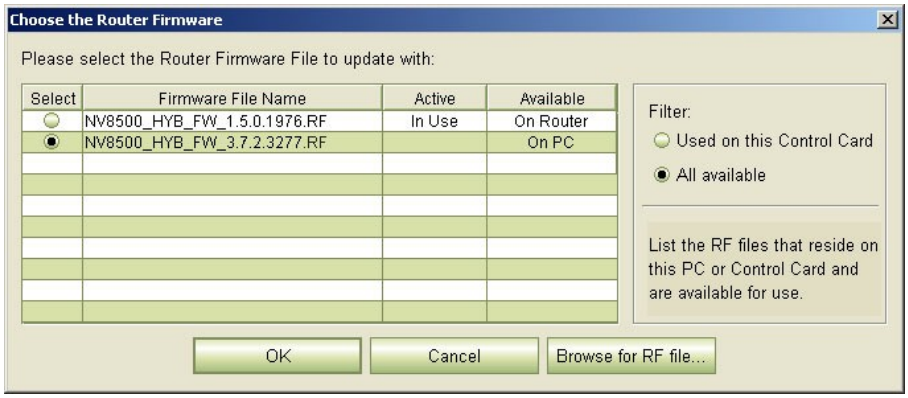
☑ ☑ 2 Reinsert the **Card B** in the slot from which it came. Close the router door. Wait for **Card B** to boot up. It becomes the active control card. It takes a few seconds.

☑ ☑ 3 Go to the 'Firmware' page in MRC. Select **Card B** at the bottom of that page.



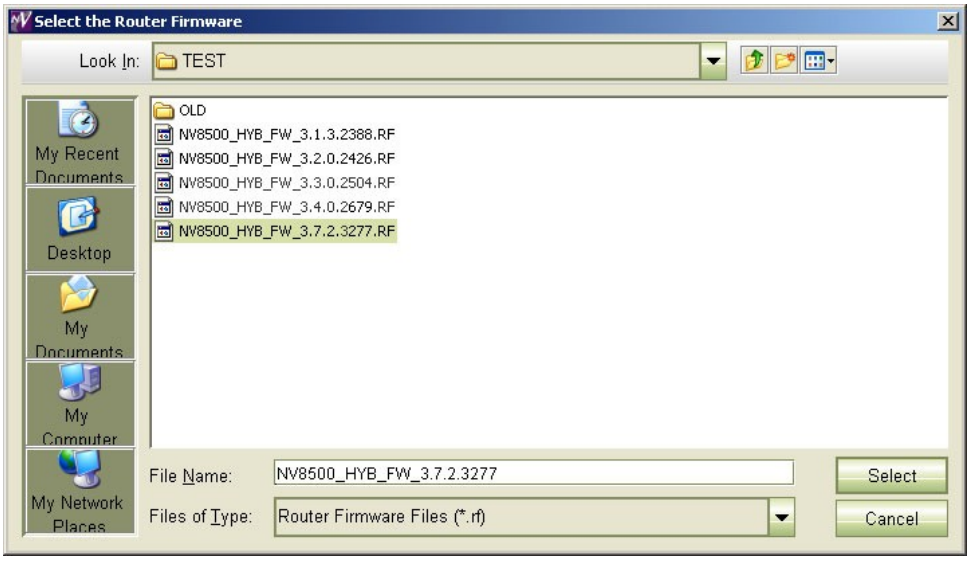
☑ ☑ 4 Click the 'Choose' button, at the top of the page.

The 'Choose Router Firmware' dialog appears:



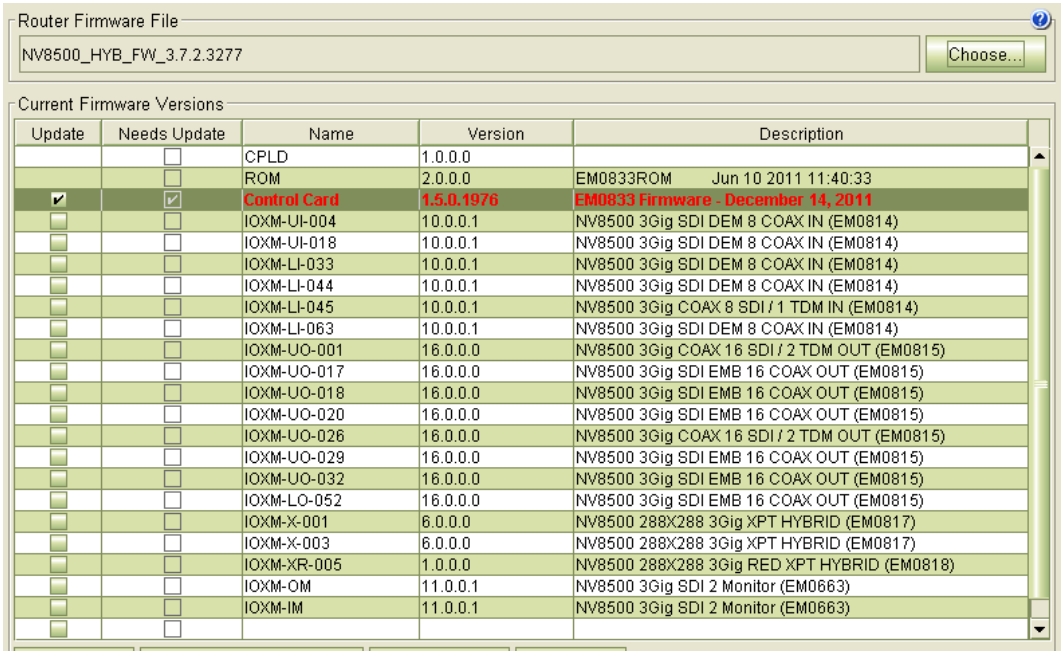
Because you are installing new firmware, choose ‘All Available’ at the right side of the dialog and click ‘Browse for RF File’.

The ‘Select Router Firmware’ dialog appears:



Here, navigate to a folder that contains the firmware file you want. Use the same file you used to update **Card A**. Highlight the file and click ‘Select’.

The ‘Firmware’ page changes to highlight the control card (in red):



Ignore any messages such as “Missing from RF” in the illustration above.

Frame1 Frame2

☑ ☑ 5 Click ‘Select None’ to deselect all cards.

☑ ☑ 6 Check the check box in the ‘Update’ column to select the control card.

Make sure that this is the only card that has a check mark.

☐ ☐ 7 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning messages.

☐ ☐ 8 When the update has finished, MRC displays a report of the updates. It should normally say “All updates were successful” at the end.
If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

*(**Card A** now has both new firmware and a correct configuration.)*

11 Reinsert Card A and Make it Active

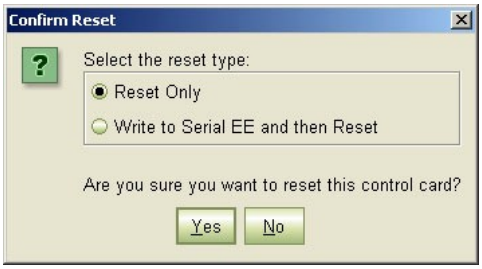
Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Re-insert **Card A**.

Either press the (physical) reset button on **Card B** or, while **Card B** is still selected in MRC, right-click in the ‘Network Frame Summary’ section of the ‘Firmware’ page and choose ‘Reset Control Card’ from the global context menu:

This context menu is also available in the ‘From Device’ section of the ‘Copy Settings’ page.

Respond ‘Yes’ in the confirmation dialog:



Card A becomes active and **Card B** becomes standby (as they were before you started).

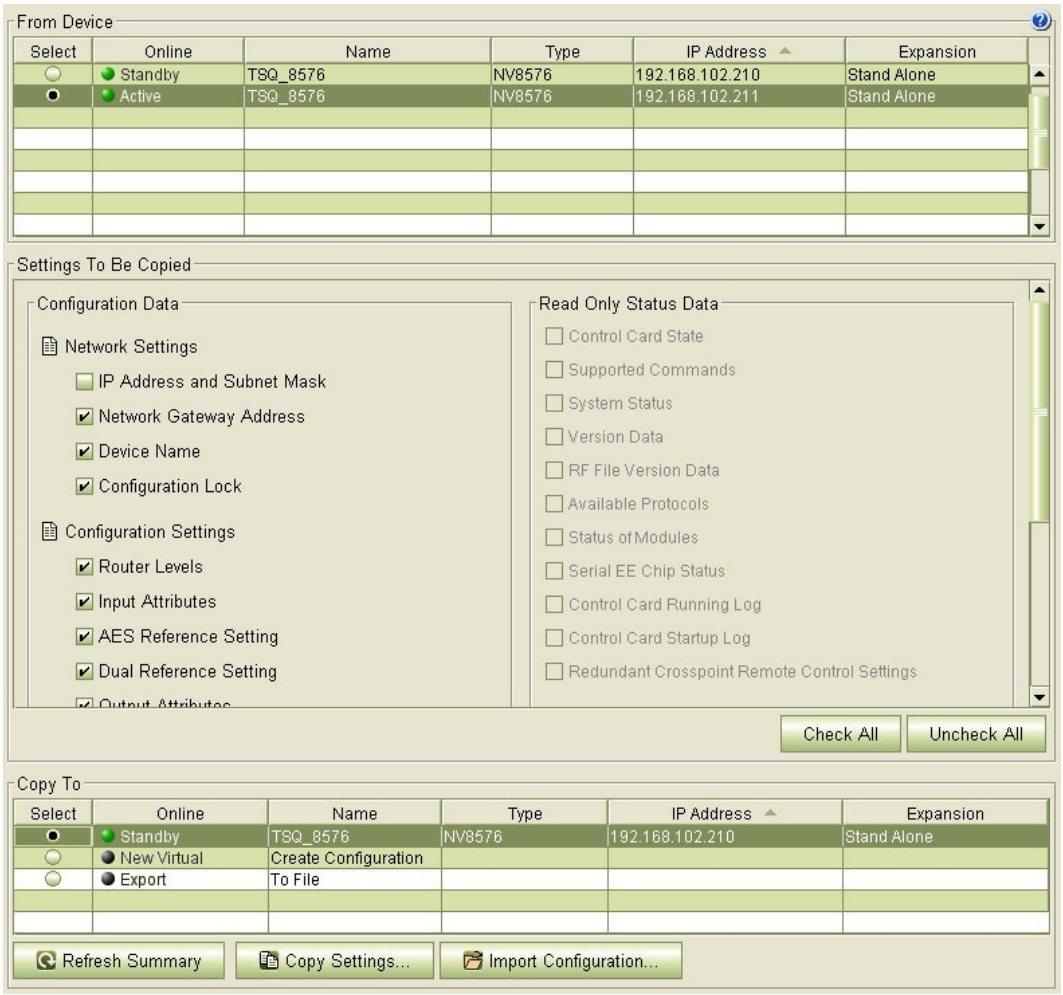
12 Copy the Configuration from Card A to Card B

Frame1 Frame2

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Go to the 'Copy Settings' page of MRC.

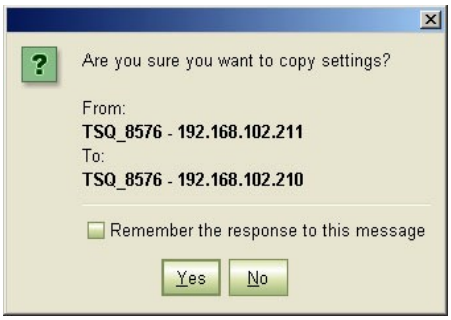
2 Select **Card A** in the 'From Device' table at the top of the page. The 'To Device' table, at the bottom of the page, will redisplay according to your selection. Select **Card B** in the 'To Device' table.



3 Leave the entries in the 'Settings to Be Copied' section, in the middle of the page, at their defaults.

4 Click the 'Copy Settings' button.

Respond 'Yes' to the confirmation message:



5 MRC copies the configuration from **Card A** to **Card B**. At the end of the copy, MRC asks you whether you want to reset the control card:

Respond 'Yes'.

6 After the reset, MRC displays a completion message:

13 Completion

If the copy in step 11 reported success, your upgrade is finished.

If there were unresolved failures, contact Grass Valley customer service.

Create another snapshot—as you did in step 3 on page 6—of the router in MRC, especially if there were failures. In the event of failures, you will be asked to send both snapshots—this one and the one you made in step 3—to Grass Valley customer service.

☑ 1 If you disconnected your control system, reconnect it, disconnecting any temporary Ethernet connections you might have made between your PC and the router. However, if you stopped the NV9000, you may now restart it.

14 Testing

You can perform these quick tests to determine whether the firmware upgrade was successful.

These tests are discretionary and not part of the procedure itself.

1 Observe the LEDs on the control cards, crosspoint cards, I/O cards, and monitor cards.

I/O and monitor cards should all have their amber 'FPGA loaded' LED on (and steady) and they should have their green 'Good COM' LEDs on. No card should have its red 'Bad COM' LED on.

Each crosspoint card will have a green "health" LED on.

Each control card will also green health LED on. The active control card will have its amber LED on.

2 Examine the I/O cards in the 'Module Status' page of MRC. Modules with problems are highlighted in the table with red circles. Good modules have green circles.

3 In the 'Crosspoints' page of MRC, perform a few takes. (This is minimally helpful, but it will show whether the router is functioning.

More extensive testing is beyond the scope of this document.

Replacing the Boot ROM

- Care must be taken regarding ESD (electrostatic discharge).
- Use caution when extracting ROMs from their sockets. Damaging the socket will render the circuit board inoperable. Use a chip extraction tool, such as the one shown here, to prevent breakage.

1 Remove the control card from the frame.

2 Place it in an ESD bag.

3 Take it to an ESD lab bench. Use a wrist strap to ground yourself to the ESD mat of the bench while you're working on the ROM.

- If you do not have an ESD lab bench, handle the control card very carefully, touching only non-metal parts. (You can touch the aluminum front plate.)

4 Replace its boot ROM.

a Carefully note the orientation of the old ROM chip in the socket. (On the NV8500 control card, the socket is labeled U10.)

b Place the prongs of the extraction tool at the corners of the old chip in the socket.

c Squeeze the handles of the extraction tool and pull upwards. The prongs grip the ROM chip and hold the chip against the body of the tool as you squeeze. Pulling upwards frees the chip from the socket without damage.

d Place the new chip in the socket in the same orientation as the old chip. Use gentle finger pressure to seat the new chip in the socket.

5 Return the control card to its ESD bag. Replace the card in the frame, removing it from the ESD bag just prior to replacement in the router frame.

The Procedure for Downgrading to V2.2.2 or Newer

It is anticipated that you will perform the downgrade procedure only if the upgrade procedure fails.

The assumption in this procedure is that you have performed the *entire* upgrade procedure. If you have not completed the entire upgrade procedure, contact Grass Valley customer service before proceeding.

This downgrade (or reversion) procedure is similar to the upgrade procedure, but differs in 2 ways:

- You will revert the IOXM cards before reverting the control cards.
- You will use a .rf file for the earlier version (2.2.2 or newer) of the firmware.

This is a summary of the downgrade procedure.

1 Continue to use the latest version of MRC.

2 Disconnect (or stop) the NV9000 (or third-party) control system.

3 Make another snapshot of the router. This is the router in a (presumably) failed state.

*Let the active control card be called **Card A** and the standby control card be called **Card B**.*

4 Remove the standby control card (**Card B**).

5 Revert to older firmware for all IOXM[5] cards.

Important: if you are reverting to a firmware version earlier than v3.4.0, change the firmware in the IOXM cards one-by-one. Do ***not*** change the firmware in those cards all at once.

6 Then revert to older firmware in **Card A**.

7 Redefine the I/O card types, using the ‘Module Types’ page of MRC, for **Card A**.

***Card A** now has old firmware and a correct old configuration.*

8 Remove **Card A** and reinsert the **Card B**. Revert to older firmware in **Card B** (which has now become active).

9 Reinsert **Card A**. Reset **Card B** (currently active). **Card A** becomes active and **Card B** becomes standby (as they were before you started).

10 Copy the control card configuration from **Card A** to **Card B** using the ‘Copy Settings’ page of MRC.

Card B** now has the reverted firmware and the same configuration as **Card A.

11 Revert to the old boot ROMs (if yours were -03 or earlier).

12 Reconnect (or restart) the NV9000 (or third-party) control system.

5. IOXM is a term that means input, output, crosspoint (XPT) and monitor cards.

1 MRC

It is advisable ***not*** to revert to an older version of MRC. Continue to use the new version.

▲ The downgrade procedure described here does not work with earlier versions of MRC.

If you do want to revert to an older version of MRC, follow the steps given in step 1 on page 2, but using the MRC installer appropriate for the older version.

2 Control System

Disconnect the NV9000 (or third-party) control system from the router.

☑ ***Preferred Method:*** Use this method if you have an NV9000 control system and you can stop the NV9000 without disrupting your entire system.

1 Stop the NV9000. To stop the NV9000, launch NV9000-SE Utilities. Go to the 'System Management' page and click the 'Stop Controller 2' button and the 'Stop Controller 1' button.

It is recommended that you stop the inactive controller before you stop the active controller.

☑ Alternate Method: Use this method if you cannot stop the NV9000 or if you have a third-party control system.

1 Remove the cables (whether serial or Ethernet) from the control ports of the router. (Doing this will cause alarms in the NV9000 system. You can safely ignore the alarms.)

If you have MRC running, removing Ethernet cables from the router's control cards will cause MRC to lose contact with the router.

2 Connect your PC (that is running MRC) to the router's control ports via a small Ethernet switch.

3 Router Snapshot

These steps create a file that records all the router settings. You are probably downgrading because an upgrade failed. It is *very important* to create a snapshot of the failed router to send to your Grass Valley customer service technician for diagnosis.

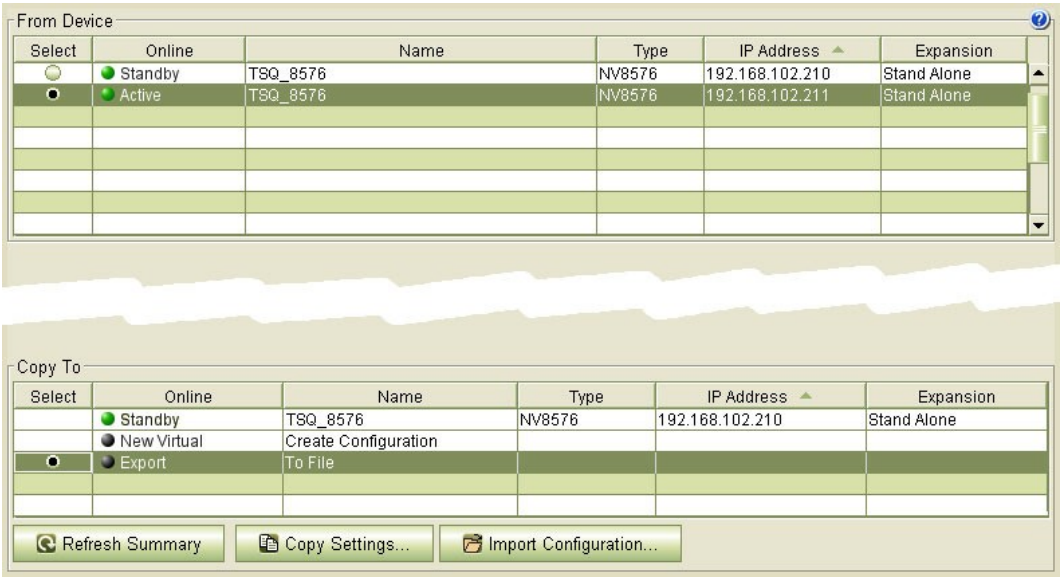
▲ If you have done no configuration since the final snapshot of your upgrade, it is sufficient to use that snapshot and you do not need to perform these steps.

☑ 1 Launch MRC. Go to its 'Copy Settings' page.

☑ 2 Select the active control card in the upper section of the page.

☑ 3 Choose 'Export' in the lower section of the page.

☑ 4 Click 'Copy Settings'.



☑ 5 A dialog appears in which you can browse to name a file and location in which to store the settings. In this dialog, choose a folder and a file name. The saved file will be a .zip file.

Then click 'Save' and wait for the confirmation notice.

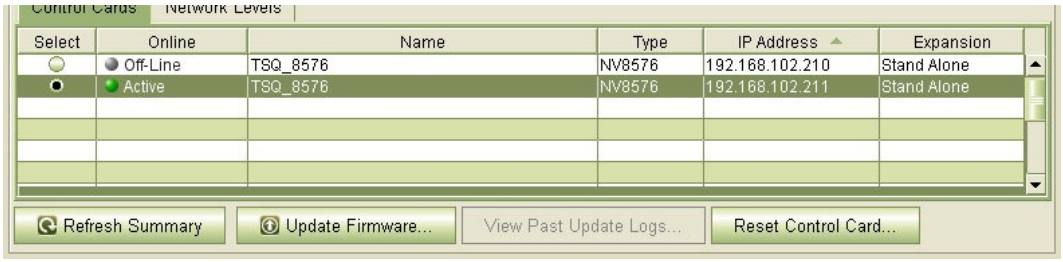
4 Remove the Standby Card

Completely remove **Card B** (the standby control card, assuming there is one). Close the router door.

5 Revert to Older Firmware for IOXM[6] Cards

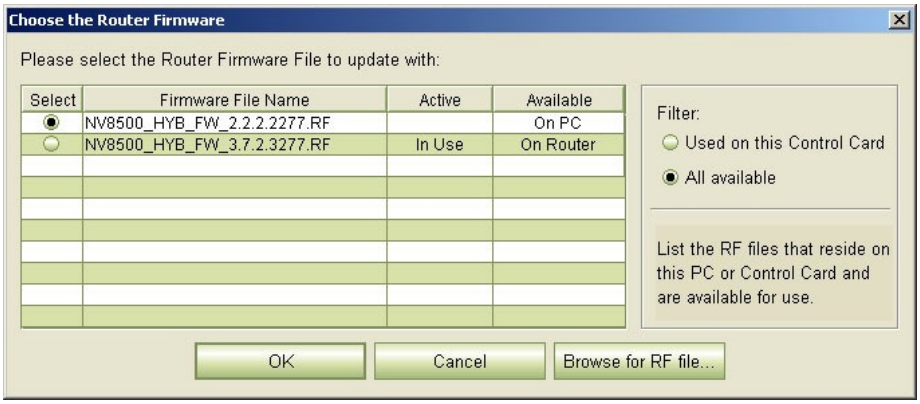
Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Go to ‘Firmware’ page in MRC. Select the active control card at the bottom of that page.



☐ ☐ 2 Click the ‘Choose’ button, at the top of the page, to locate the firmware file.

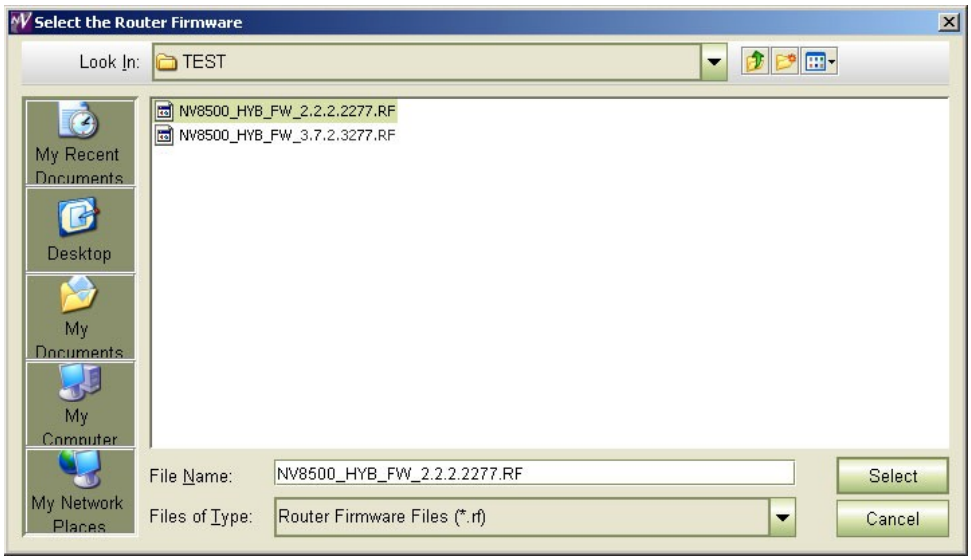
The ‘Choose Router Firmware’ dialog appears:



Because you are reverting to older firmware, choose ‘All Available’ at the right side of the dialog and click ‘Browse for RF File’.

6. IOXM cards include Input, Output, XPT (crosspoint), and Monitor cards

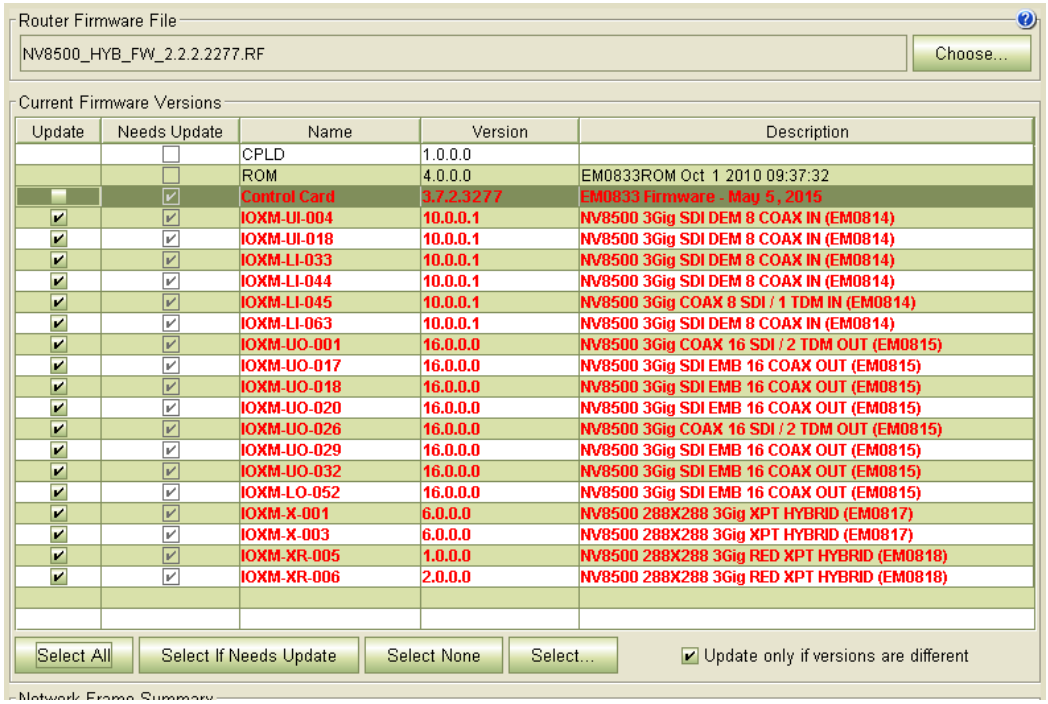
The ‘Select Router Firmware’ dialog appears:



Here, navigate to a folder that contains the firmware file you want. The firmware file is named something like **`NV8500_HYB_FW_2.2.2.2277.RF`**. Highlight the file and click ‘Select’.

▲ You should have been given this file. If you do not have this file, contact Grass Valley customer support.

The ‘Firmware’ page changes to highlight ***all*** cards in need of updating (in red):



Frame1 Frame2

☑ ☑ 3 Select one or more IOXM cards. (Make sure that no control card is selected.)

If you are reverting to a firmware version earlier than v3.4.0, revert the firmware in the IOXM cards one at a time. Do ***not*** change the firmware in those cards all at once.

Frame1 Frame2

☐ ☐ 4 Click ‘Update Firmware’ (at the bottom of the page).

Click ‘Yes’ in response to any confirmation messages that appear.

MRC proceeds to update (in this case, revert) all selected cards in order of card type. It processes all input TDM (MADI) cards, in parallel, then all disembedder cards, also, in parallel, and so on, until all selected cards are updated.

Depending on the number and type of I/O cards in your router, the IOXM update can take a significant amount of time, probably 15 minutes or more.

5 Repeat steps 3 and 4 as often as you need to process all the IOXM cards.

☐ ☐ 6 When the update is complete, MRC displays a log of the updates. It should normally say “All updates were successful.” Examine the update log. If it reports any failure, retry the update for the failed card.

- If, during the update, an individual card fails, respond ‘Skip’ to the Retry message that appears. Perform all retry attempts after the update finishes and produces its report.

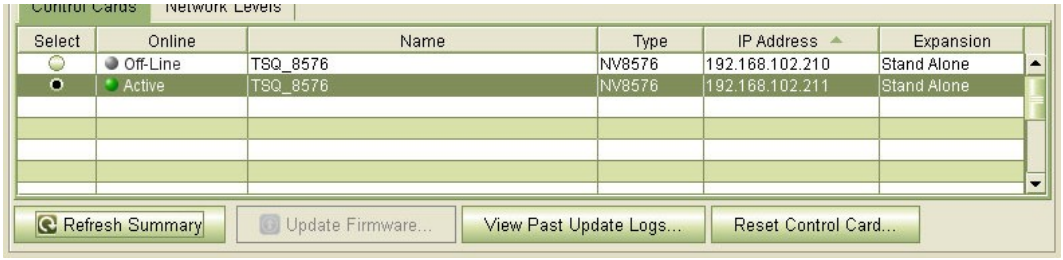
  Cards for which the update failed will remain red in the table. Make sure that these are selected and click ‘Update Firmware’ again. Again, observe whether the update report says ‘All Updates Successful’.

Ideally, none of the cards in the ‘Firmware’ page should be red ***except*** the control card.

6 Revert to Old Firmware for the Active Control Card

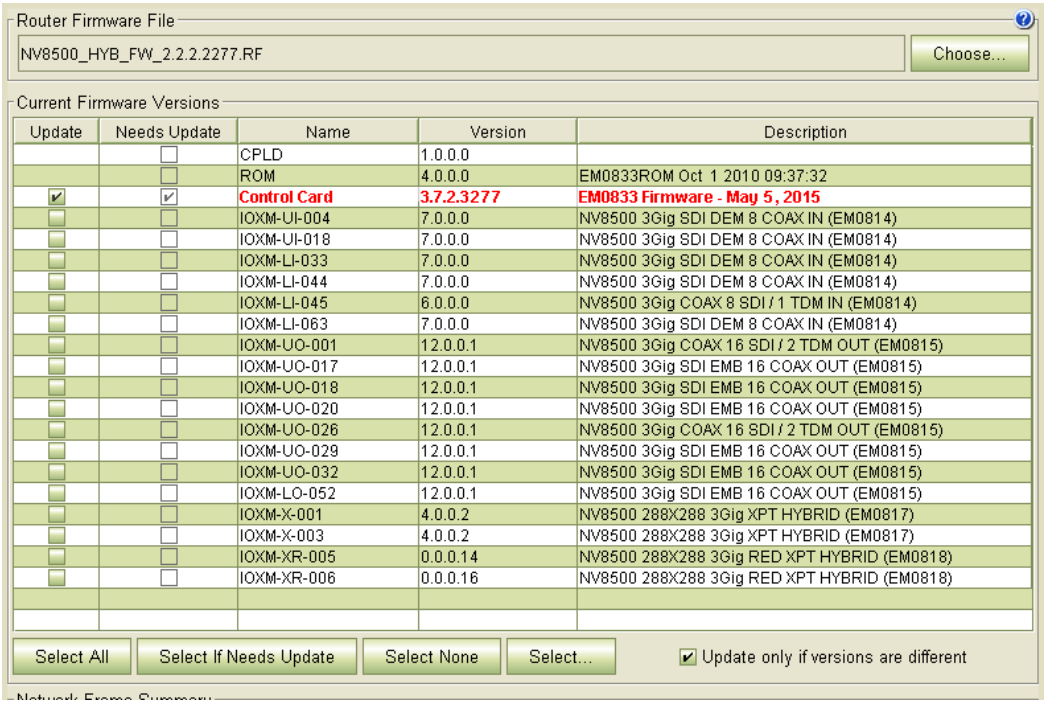
Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Remain in the ‘Firmware’ page in MRC. Ensure that **Card A** is selected at the bottom of the page.



☐ ☐ 2 The ‘Firmware’ page should report, at the top of the page, the same firmware file you used to revert the IOXM cards. If it does not, locate and select the firmware file as you used for the IOXM cards. The firmware file name is something like **`NV8500_HYB_FW_2.2.2.2277.RF`**.

The ‘Update Firmware’ page changes to highlight all cards in need of updating (in red). At this step, the only card to update is the control card:



Frame1 Frame2

3 Click ‘Select None’ to deselect all cards.

4 Check the check box in the ‘Update’ column to select the control card.

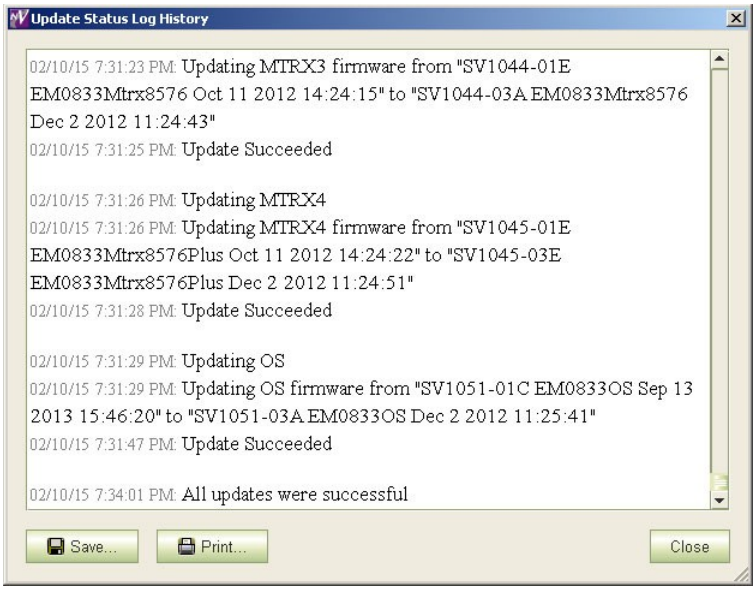
Make sure that this is the only card that has a check mark.

5 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning messages.

Frame1 Frame2

☑ ☑ 6 When the update has finished, MRC displays a log of the updates. It should normally say “All updates were successful” at the end.

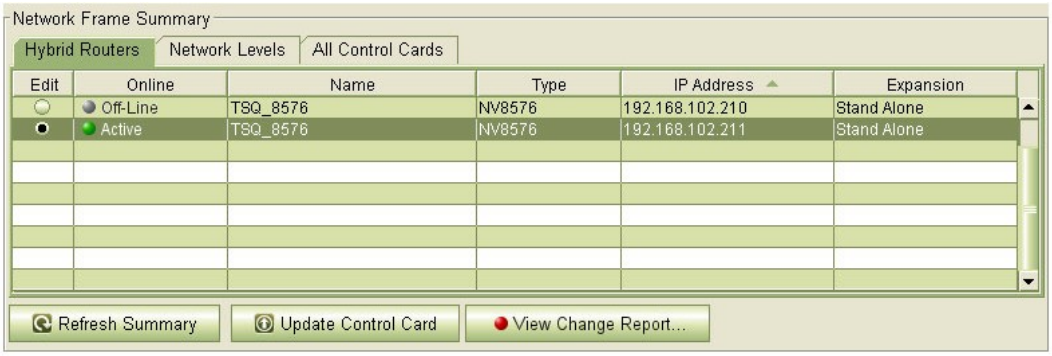


If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

7 Redefine the I/O Card Types (for Card A)

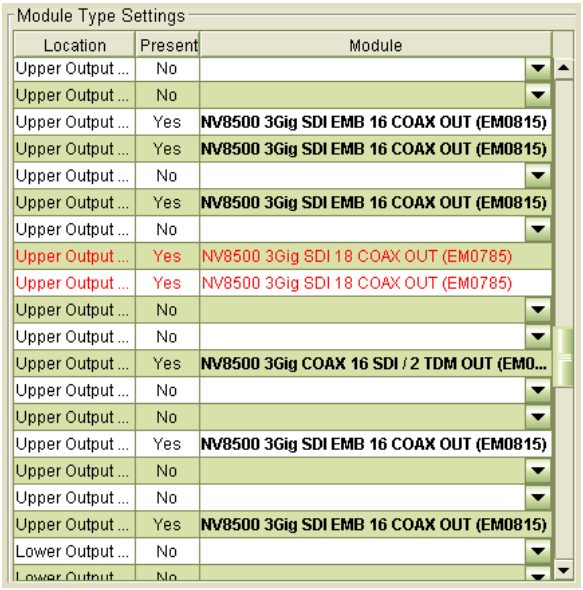
☑ 1 Go to the ‘Module Types’ page of MRC.

☑ 2 Choose **Card A** of the router you are updating:



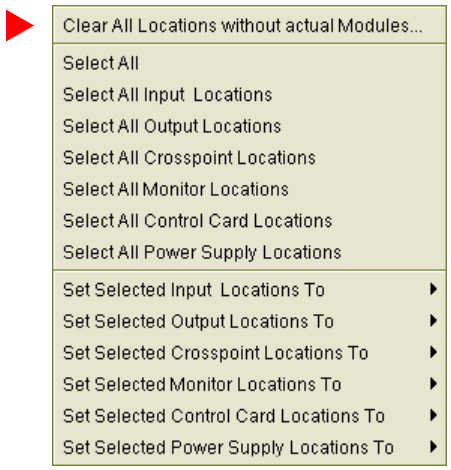
If you are updating an expanded NV8576-Plus, you must select **Card A** of the master frame. MRC will present a dialog asking you to identify the slave frame. Choose the slave frame in this dialog. (But do ***not*** select the slave frame in the ‘Control Cards’ tab at the bottom of the ‘Module Types’ page!)

3 It is possible that, after you perform step 6 (Firmware Updates for IOXM Cards) the ‘Module Types’ page reports errors—with red text—for some or all of your modules:

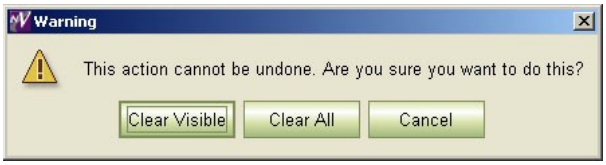


This is not an immediate cause for alarm. It can occur because of differences in configuration requirements between your old system and the new firmware and software.

Right-click the module list anywhere to display the page's context menu:



Click the 'Clear All Locations without Actual Modules' command. A warning appears:



Choose 'Clear All'.

MRC will do just that: all rows of the table for which there is no card in the corresponding slot become blank. Red text for the slots that do have cards will remain red. However, clicking the 'Update Control Card' button in the next step will eliminate the red text and complete the redefinition step.

☑ 4 Click the 'Update Control Card' button. MRC repopulates the list of modules according the card types known to control card. (Because you are upgrading, there should be no unknown card types.)

If you are updating an expanded NV8576-Plus, MRC displays all the modules of the entire router (both frames).

8 Revert to Old Firmware for Card B

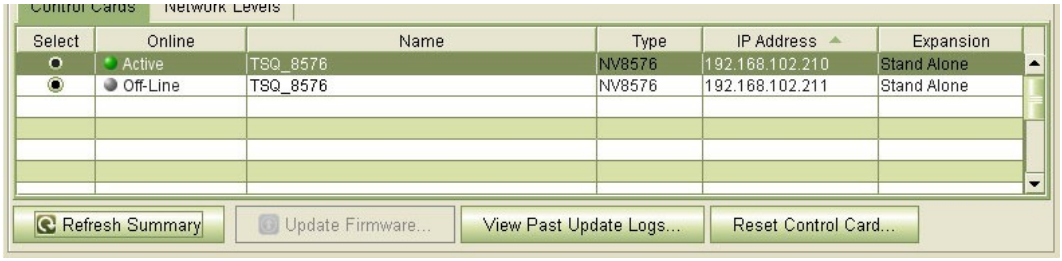
Skip this step if there is no standby control card (**Card B**).

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Completely remove **Card A**.

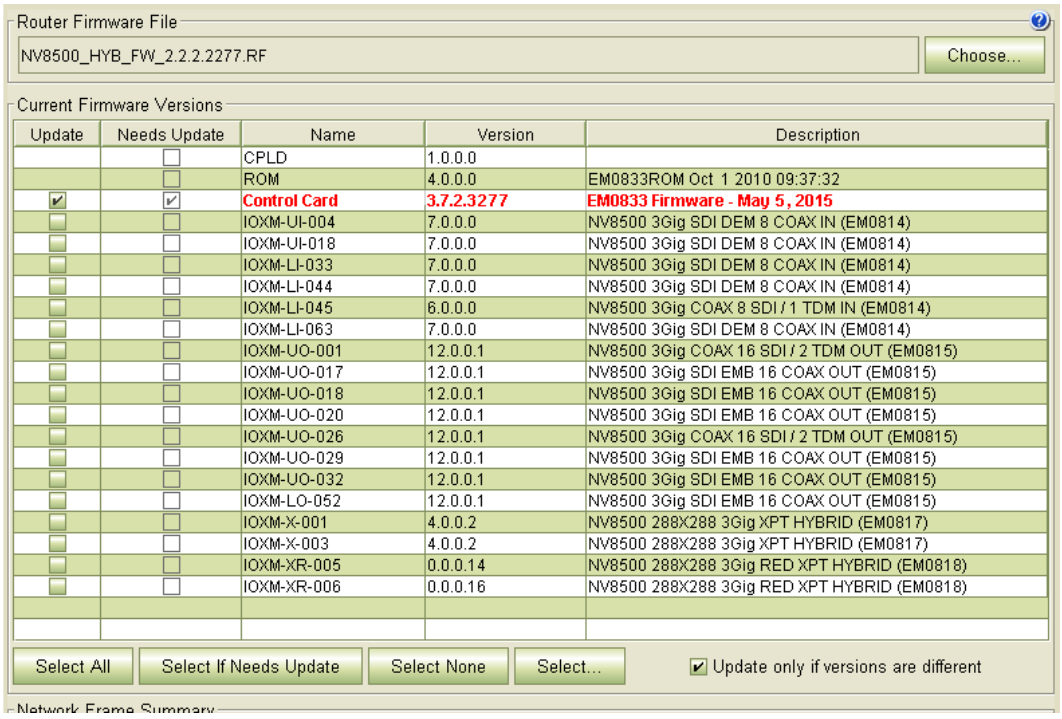
☐ ☐ 2 Reinsert **Card B** in the slot from which it came. Close the router door. Wait for **Card B** to boot up. It becomes the active control card. It takes a few seconds.

☐ ☐ 3 Go to 'Firmware' page in MRC. Select the active control card at the bottom of that page.



☐ ☐ 4 The 'Firmware' page should report the same firmware file you used to revert the IOXM cards and **Card A.** If it does not, locate and select the firmware file as you did for **Card A**. The firmware file name is named something like **`NV8500_HYB_FW_2.2.2.2277.RF`**.

The 'Firmware' page changes to highlight all cards in need of updating (in red):



☐ ☐ 5 Click 'Select None' to deselect all cards.

☐ ☐ 6 Check the check box in the 'Update' column to select the control card.

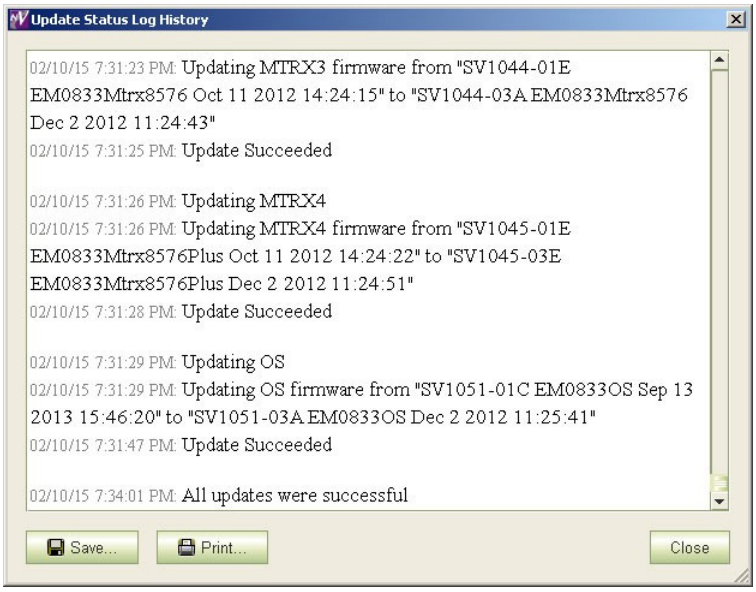
Make sure that this is the only card that has a check mark.

☐ ☐ 7 Click 'Update Firmware' (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning messages.

Frame1 Frame2

☑ ☑ 8 When the update has finished, MRC displays a log of the updates. It should normally say “All updates were successful” at the end.



If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

9 Reinsert Card A and Make it Active

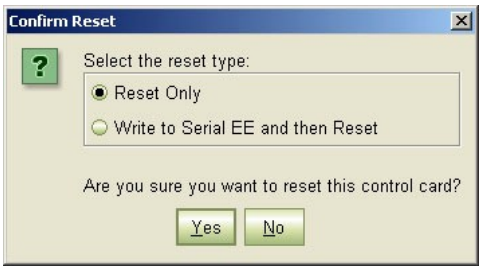
Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Re-insert **Card A**.

Either press the (physical) reset button on **Card B** or, while **Card B** is still selected in MRC, right-click in the 'Network Frame Summary' section of the 'Firmware' page and choose 'Reset Control Card' from the global context menu:

This context menu is also available in the 'From Device' section of the 'Copy Settings' page.

Respond 'Yes' in the confirmation dialog:



Card A becomes active and **Card B** becomes standby (as they were before you started).

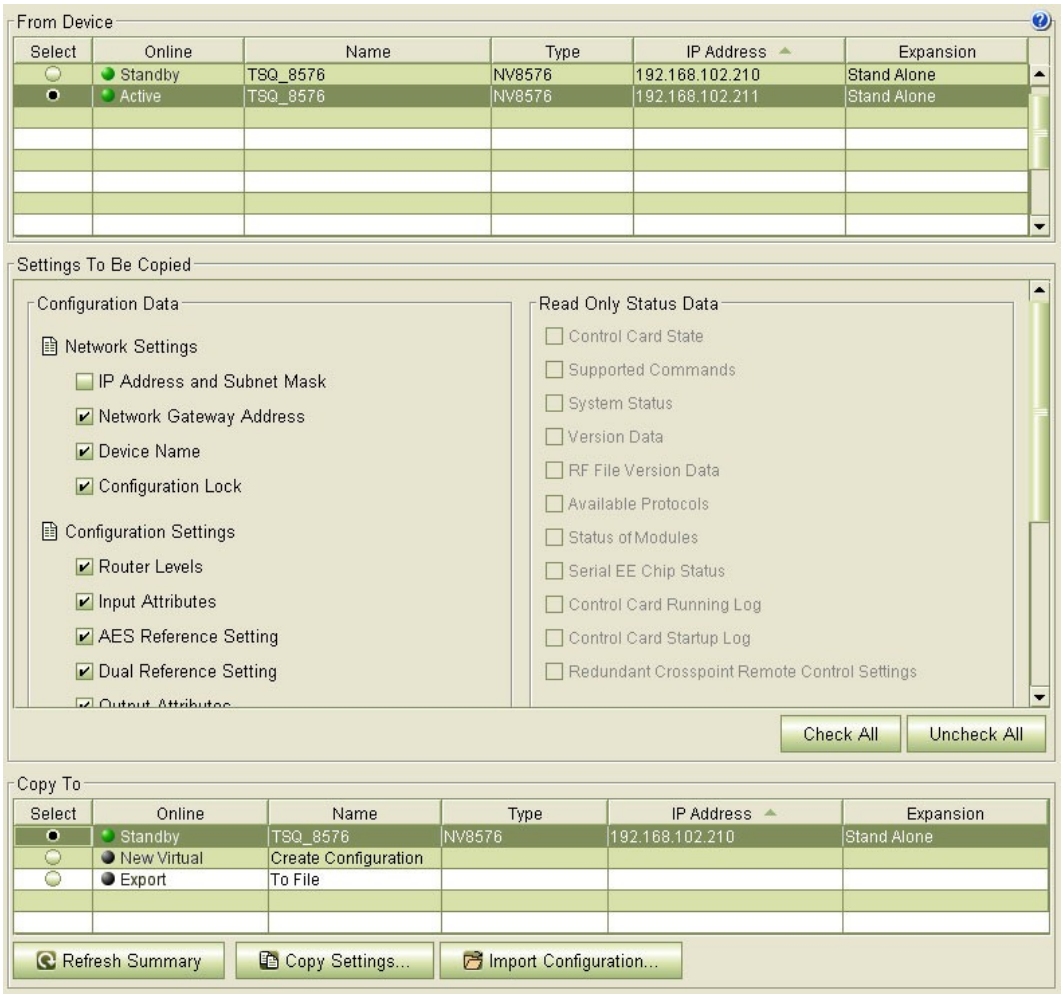
10 Copy the Configuration from Card A to Card B

Frame1 Frame2

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Go to the 'Copy Settings' page of MRC.

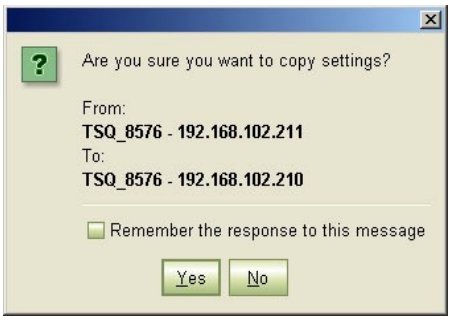
2 Select **Card A** in the 'From Device' table at the top of the page. The 'To Device' table, at the bottom of the page, will redisplay according to your selection. Select **Card B** in the 'To Device' table.



3 Leave the entries in the 'Settings to Be Copied' section, in the middle of the page, at their defaults.

4 Click the 'Copy Settings' button.

Respond 'Yes' to the confirmation message:



5 MRC copies the configuration from **Card A** to **Card B**. At the end of the copy, MRC asks you whether you want to reset the control card:

Respond 'Yes'.

6 After the reset, MRC displays a completion message:

11 Revert to the Old Boot ROM(s)

You should not need to revert to old boot ROMs. If you want to do so, find your -03 boot ROMs and reinsert these in the ROM sockets on the control cards of your router. Refer to Replacing the Boot ROM on page 40.

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Remove the standby control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Then replace the standby card in the frame.

☐ ☐ 2 Switch control to the standby card. To do that, press the reset button on the active control card. Wait for the standby card to become the active card. (When a control card is active, its amber LED is on.)

☐ ☐ 3 Remove the formerly active control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Then replace that control card in the frame.

☐ ☐ 4 Switch control back to the formerly active control card.

▲ Keep the router door closed as much as possible when you are doing this.

12 Completion

The downgrade is finished.

If there were unresolved failures, contact Grass Valley customer service.

Create another snapshot of the router in MRC, especially if there were failures. In the event of failures, you will be asked to send all snapshots to Grass Valley customer service.

☑ 1 If you disconnected your control system, reconnect it, disconnecting any temporary Ethernet connections you might have made between your PC and the router. However, if you stopped the NV9000, restart it.

13 Testing

You can perform these quick tests to determine whether the firmware upgrade was successful.

These tests are discretionary and not part of the procedure itself.

1 Observe the LEDs on the control cards, crosspoint cards, I/O cards, and monitor cards.

I/O and monitor cards should all have their amber ‘FPGA loaded’ LED on (and steady) and they should have their green ‘Good COM’ LEDs on. No card should have its red ‘Bad COM’ LED on.

Each crosspoint card will have a green “health” LED on.

Each control card will also green health LED on. The active control card will have its amber LED on.

2 Examine the I/O cards in the ‘Module Status’ page of MRC. Modules with problems are highlighted in the table with red circles. Good modules have green circles.

3 In the ‘Crosspoints’ page of MRC, perform a few takes. (This is minimally helpful, but it will show whether the router is functioning.

More extensive testing is beyond the scope of this document.

The Procedure for Downgrading to V1.1 or V1.5

It is anticipated that you will perform the downgrade procedure only if the upgrade procedure fails.

The assumption in this procedure is that you have performed the *entire* upgrade procedure. If you have not completed the entire upgrade procedure, contact Grass Valley customer service before proceeding.

This downgrade (or reversion) procedure is similar to the upgrade procedure, but differs in 3 ways:

- You will revert the IOXM cards before reverting the control cards.
- You will use a.rf file for the earlier version (1.1 or 1.5) of the firmware.
- Setting the I/O card types requires the use of the router's console commands.

This is a summary of the downgrade procedure.

1 Continue to use the latest version of MRC.

2 Disconnect (or stop) the NV9000 (or third-party) control system.

3 Make another snapshot of the router. This is the router in a (presumably) failed state.

*Let the active control card be called **Card A** and the standby control card be called **Card B**.*

4 Remove the standby control card (**Card B**).

5 Revert to older firmware for all IOXM[7] cards.

6 Then revert to older firmware in **Card A**.

7 Redefine the I/O cards, using console commands.

***Card A** now has old firmware and a correct old configuration.*

8 Remove **Card A** and reinsert the **Card B**. Revert to older firmware in **Card B** (which has now become active).

9 Reinsert **Card A**. Reset **Card B** (currently active). **Card A** becomes active and **Card B** becomes standby (as they were before you started).

10 Copy the control card configuration from **Card A** to **Card B** using the 'Copy Settings' page of MRC.

Card B** now has the reverted firmware and the same configuration as **Card A.

11 Revert to the old boot ROMs (if yours were -03 or earlier).

12 Reconnect (or restart) the NV9000 (or third-party) control system.

7. IOXM is a term that means input, output, crosspoint (XPT) and monitor cards.

1 MRC

It is advisable ***not*** to revert to an older version of MRC. Continue to use the new version.

▲ The downgrade procedure described here does not work with earlier versions of MRC.

If you do want to revert to an older version of MRC, follow the steps given in step 1 on page 2, but using the MRC installer appropriate for the older version.

2 Control System

Disconnect the NV9000 (or third-party) control system from the router.

☑ ***Preferred Method:*** Use this method if you have an NV9000 control system and you can stop the NV9000 without disrupting your entire system.

1 Stop the NV9000. To stop the NV9000, launch NV9000-SE Utilities. Go to the 'System Management' page and click the 'Stop Controller 2' button and the 'Stop Controller 1' button.

It is recommended that you stop the inactive controller before you stop the active controller.

☑ Alternate Method: Use this method if you cannot stop the NV9000 or if you have a third-party control system.

1 Remove the cables (whether serial or Ethernet) from the control ports of the router. (Doing this will cause alarms in the NV9000 system. You can safely ignore the alarms.)

If you have MRC running, removing Ethernet cables from the router's control cards will cause MRC to lose contact with the router.

2 Connect your PC (that is running MRC) to the router's control ports via a small Ethernet switch.

3 Router Snapshot

These steps create a file that records all the router settings. You are probably downgrading because an upgrade failed. It is *very important* to create a snapshot of the failed router to send to your Grass Valley customer service technician for diagnosis.

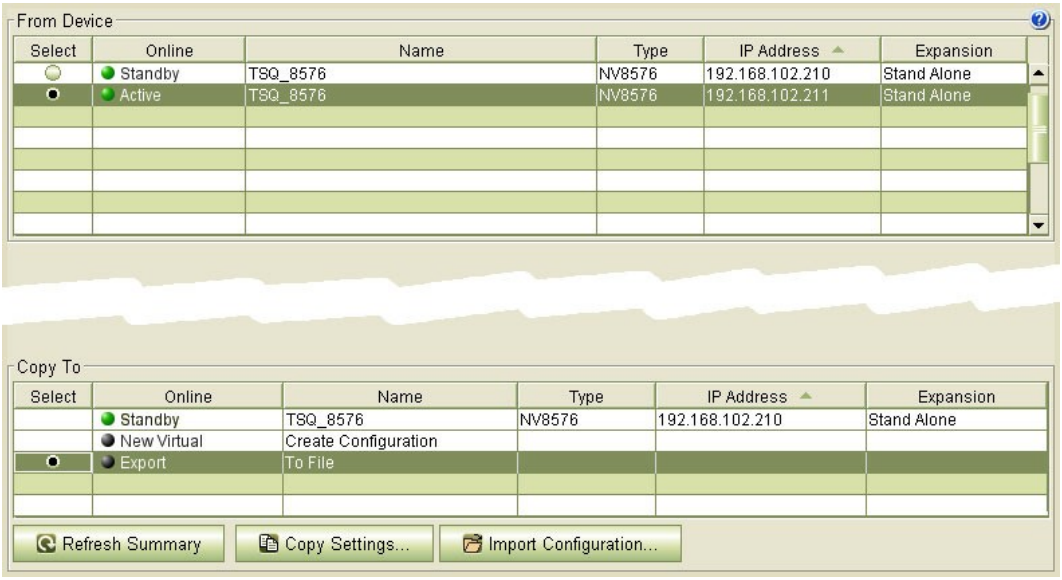
▲ If you have done no configuration since the final snapshot of your upgrade, it is sufficient to use that snapshot and you do not need to perform these steps.

☑ 1 Launch MRC. Go to its 'Copy Settings' page.

☑ 2 Select the active control card in the upper section of the page.

☑ 3 Choose 'Export' in the lower section of the page.

☑ 4 Click 'Copy Settings'.



☑ 5 A dialog appears in which you can browse to name a file and location in which to store the settings. In this dialog, choose a folder and a file name. The saved file will be a.zip file.

Then click 'Save' and wait for the confirmation notice.

4 Remove the Standby Card

Completely remove **Card B** (the standby control card, assuming there is one). Close the router door.

5 Revert to Older Firmware for IOXM[8] Cards

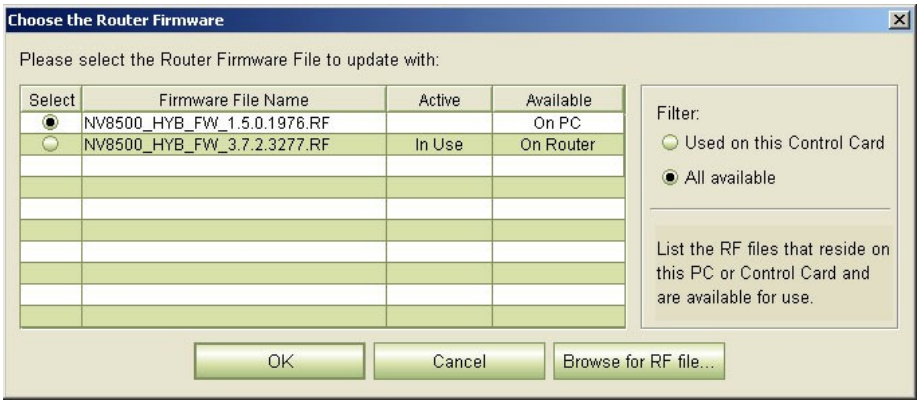
Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Go to ‘Firmware’ page in MRC. Click ‘Refresh Summary’.

2 Select the active control card at the bottom of that page.

☐ ☐ 3 Click the ‘Choose’ button, at the top of the page, to locate the firmware file.

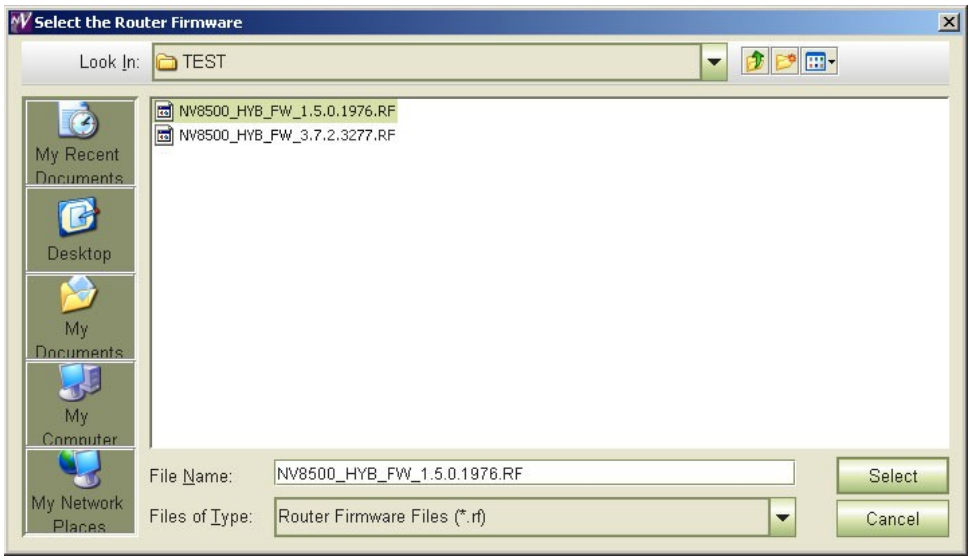
The ‘Choose Router Firmware’ dialog appears:



Because you are reverting to older firmware, choose ‘All Available’ at the right side of the dialog and click ‘Browse for RF File’.

8. IOXM cards include Input, Output, XPT (crosspoint), and Monitor cards

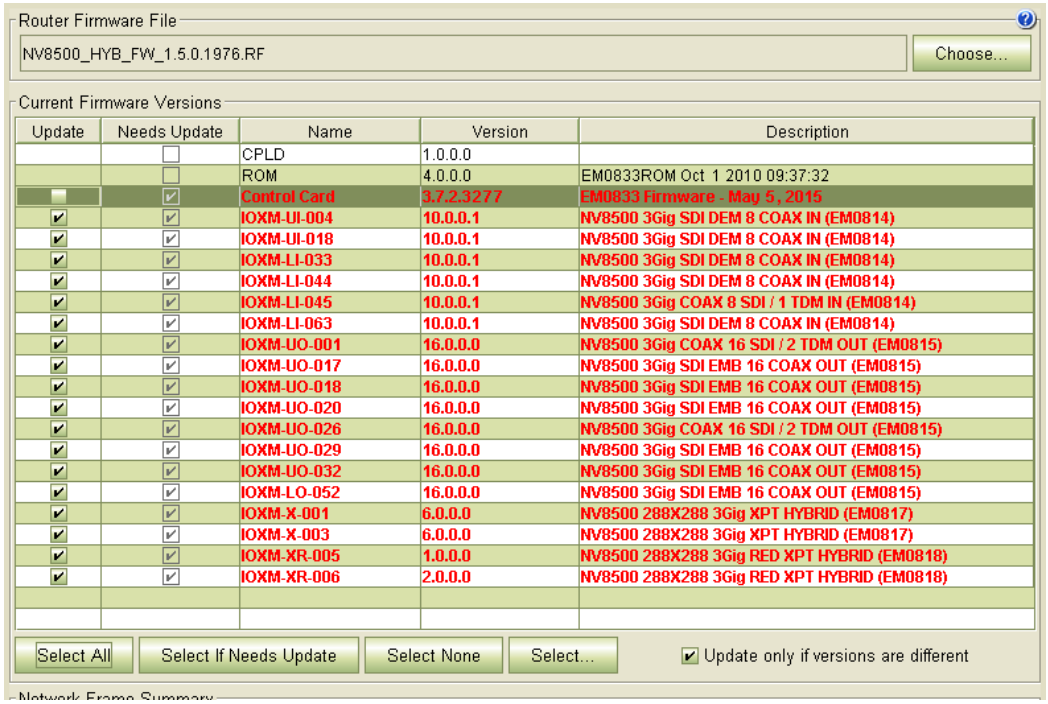
The ‘Select Router Firmware’ dialog appears:



Here, navigate to a folder that contains the firmware file you want. The firmware file is named something like **`NV8500_HYB_FW_1.5.0.1976.RF`**. Highlight the file and click ‘Select’.

▲ You should have been given this file. If you do not have this file, contact Grass Valley customer support.

The ‘Firmware’ page changes to highlight ***all*** cards in need of updating (in red):



Frame1 Frame2

☑ ☑ 4 Make sure that no control card is selected.

☑ ☑ 5 Click ‘Update Firmware’ (at the bottom of the page).

Click ‘Yes’ in response to any confirmation messages that appear.

MRC proceeds to update (in this case, revert) all selected cards in order of card type. It processes all input TDM (MADI) cards, in parallel, then all disembedder cards, also, in parallel, and so on, until all selected cards are updated.

Frame1 Frame2 Depending on the number and type of I/O cards in your router, the IOXM update can take a significant amount of time, probably 15 minutes or more.

☑ ☑ 6 When the update is complete, MRC displays a log of the updates. It should normally say “All updates were successful.” Examine the update log. If it reports any failure, retry the update for the failed card.

▲ If, during the update, an individual card fails, respond ‘Skip’ to the Retry message that appears. Perform all retry attempts after the update finishes and produces its report.

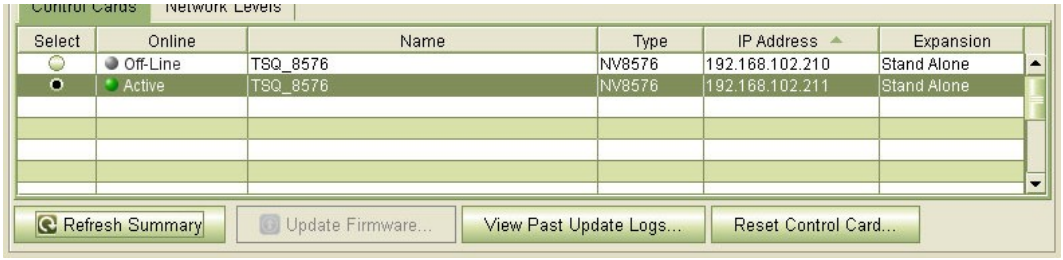
Cards for which the update failed will remain red in the table. Make sure that these are selected and click ‘Update Firmware’ again. Again, observe whether the update report says ‘All Updates Successful’.

Ideally, none of the cards in the ‘Firmware’ page should be red ***except*** the control card.

6 Revert to Old Firmware for the Active Control Card

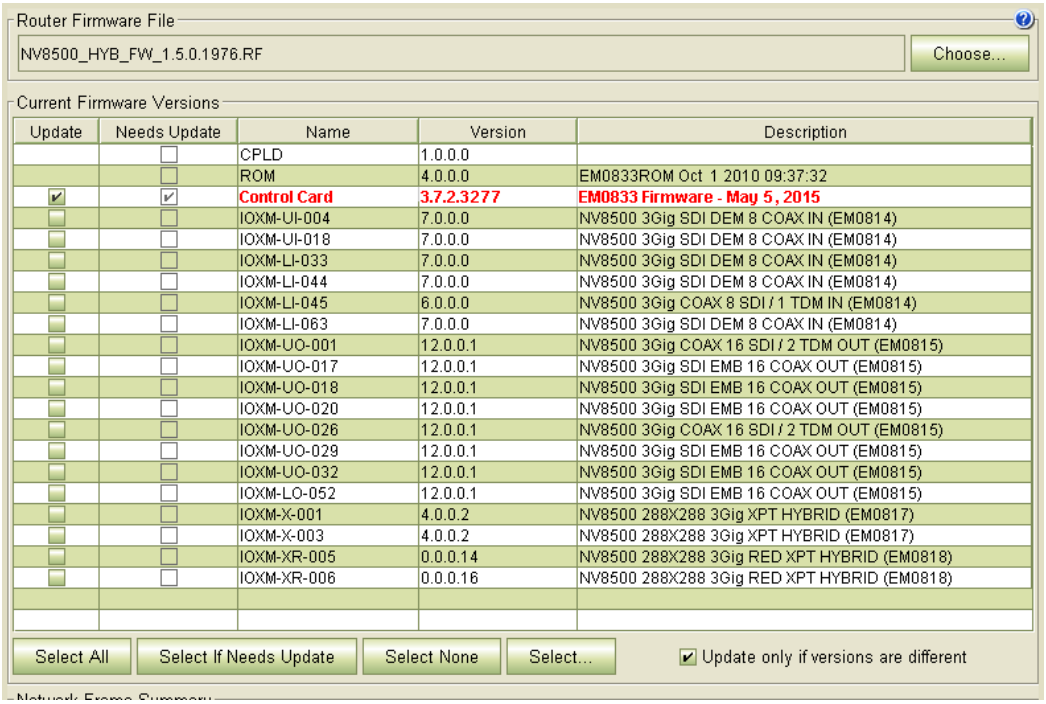
Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☑ ☑ 1 Remain in the ‘Firmware’ page in MRC. Ensure that **Card A** is selected at the bottom of the page.



☑ ☑ 2 The ‘Firmware’ page should report, at the top of the page, the same firmware file you used to revert the IOXM cards. If it does not, locate and select the firmware file as you used for the IOXM cards. The firmware file name is something like **`NV8500_HYB_FW_1.5.0.1976.RF`**.

The ‘Update Firmware’ page changes to highlight all cards in need of updating (in red). At this step, the only card to update is the control card:



Frame1 Frame2

3 Click ‘Select None’ to deselect all cards.

4 Check the checkbox in the ‘Update’ column to select the control card.

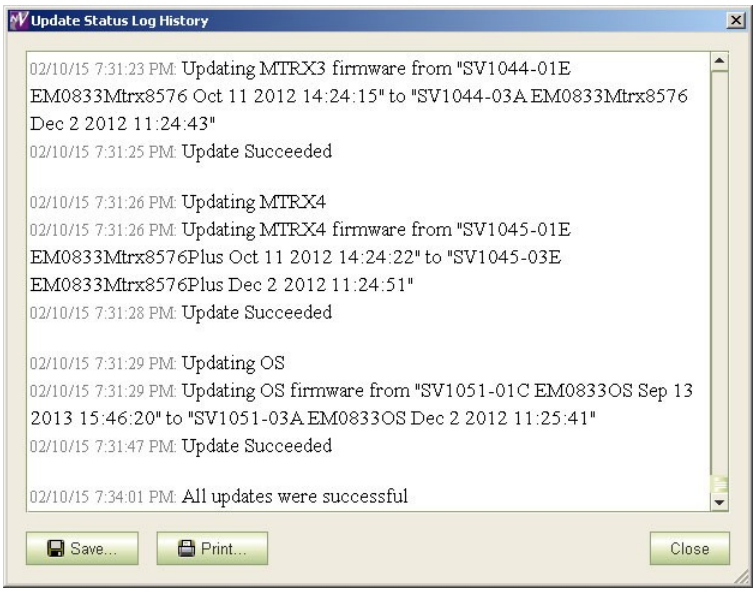
Make sure that this is the only card that has a check mark.

5 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning messages.

Frame1 Frame2

☐ ☐ 6 When the update has finished, MRC displays a log of the updates. It should normally say “All updates were successful” at the end.



If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

7 Redefine the I/O Card Types (for the Active Control Card)

▲ This a complex and important step, requiring detailed knowledge of the card types in your router. But, because customer configurations differ, we cannot describe this step in detail.

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ Updating a control card erases the I/O card type definitions stored in the control card. The card type information must be regenerated.

Use console commands to respecify the I/O card types of your router.

See Redefining the I/O Card Types on page 70 for general instructions.

8 Revert to Old Firmware for Card B

Skip this step if there is no standby control card (**Card B**).

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

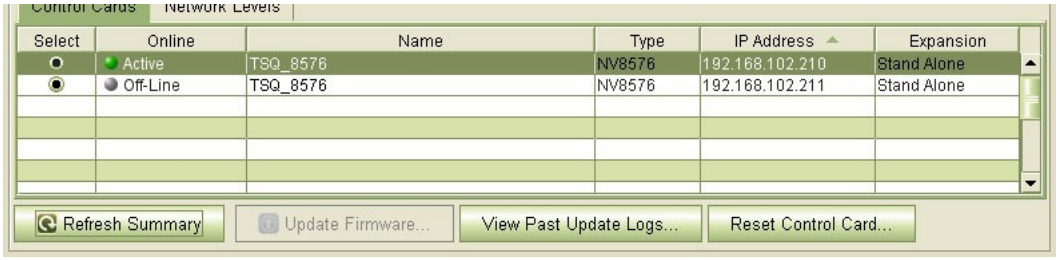
☐ ☐ 1 Completely remove **Card A**.

☐ ☐ 2 Reinsert **Card B** in the slot from which it came. Close the router door. Wait for **Card B** to boot up. It becomes the active control card. It takes a few seconds.

Frame1 Frame2

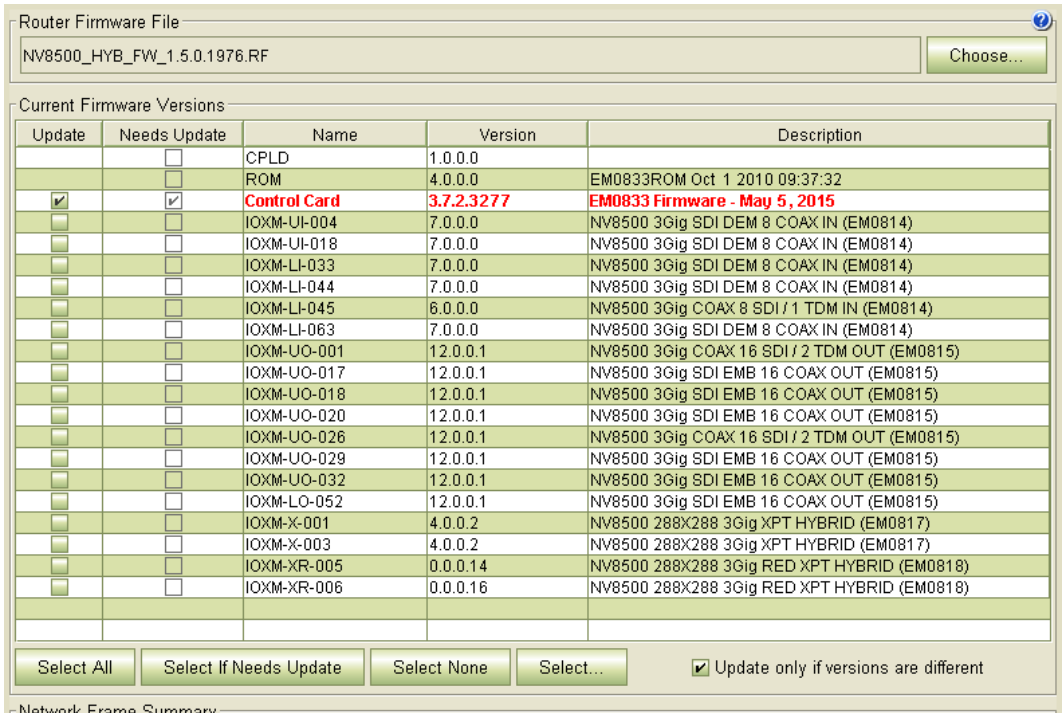
☐ ☐ 3 Go to ‘Firmware’ page in MRC. Click ‘Refresh Summary’.

4 Select the active control card at the bottom of that page.



☐ ☐ 5 The ‘Firmware’ page should report the same firmware file you used to revert the IOXM cards and **Card A.** If it does not, locate and select the firmware file as you did for **Card A**. The firmware file name is named something like **`NV8500_HYB_FW_1.5.0.1976.RF`**.

The ‘Firmware’ page changes to highlight all cards in need of updating (in red):



☐ ☐ 6 Click ‘Select None’ to deselect all cards.

☐ ☐ 7 Check the checkbox in the ‘Update’ column to select the control card.

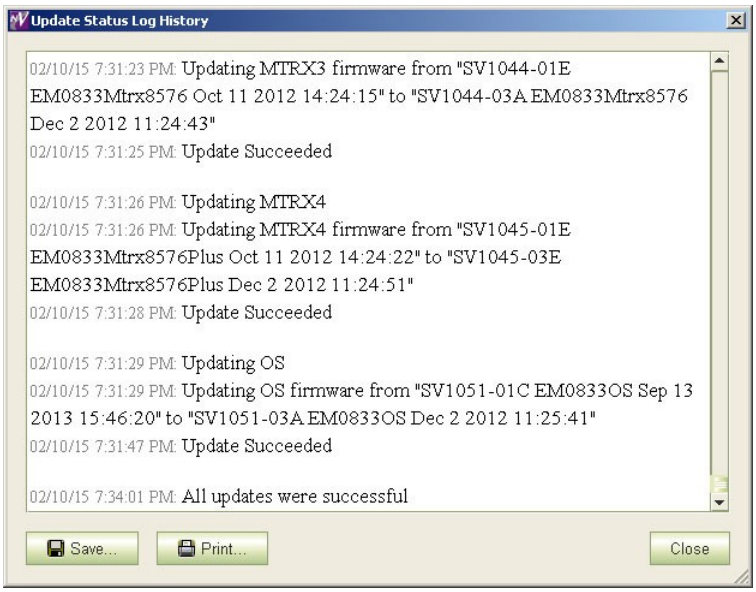
Make sure that this is the only card that has a check mark.

☐ ☐ 8 Click ‘Update Firmware’ (at the bottom of the page).

The update takes about 5 minutes. Click ‘Yes’ in response to any confirmation or warning messages.

Frame1 Frame2

☑ ☑ 9 When the update has finished, MRC displays a log of the updates. It should normally say “All updates were successful” at the end.



If the update was not successful, try the update again, once or twice. If the update continues to fail, try resetting the control card and try the update again. If the update fails after that, contact Grass Valley customer service.

9 Reinsert Card A and Make it Active

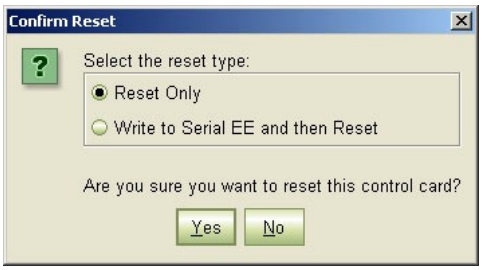
Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☑ ☑ 1 Re-insert **Card A**.

Either press the (physical) reset button on **Card B** or, while **Card B** is still selected in MRC, right-click in the ‘Network Frame Summary’ section of the ‘Firmware’ page and choose ‘Reset Control Card’ from the global context menu:

This context menu is also available in the ‘From Device’ section of the ‘Copy Settings’ page.

Respond ‘Yes’ in the confirmation dialog:



Card A becomes active and **Card B** becomes standby (as they were before you started).

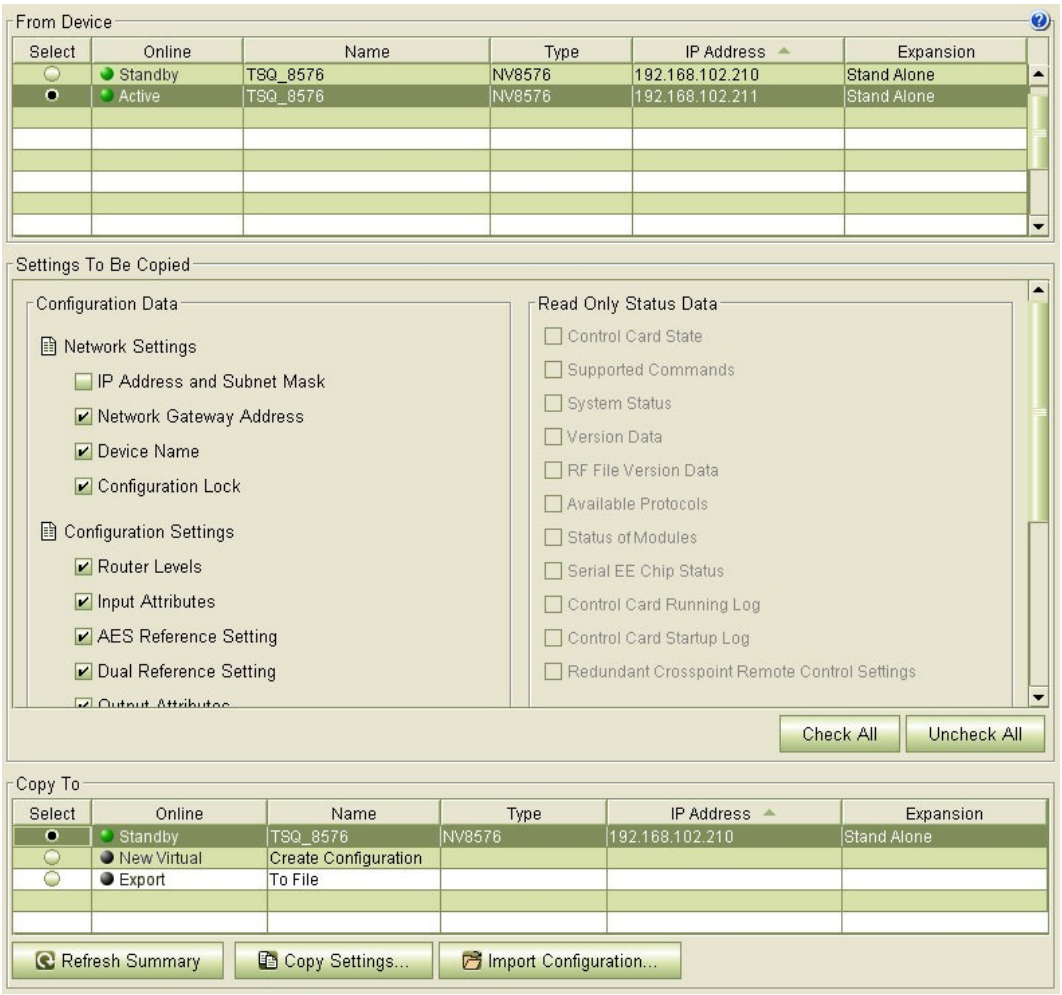
10 Copy the Configuration from Card A to Card B

Frame1 Frame2

Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Go to the 'Copy Settings' page of MRC.

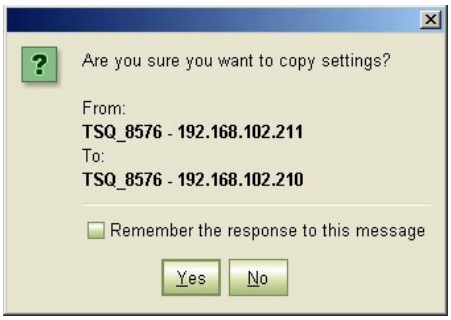
2 Select **Card A** in the 'From Device' table at the top of the page. The 'To Device' table, at the bottom of the page, will redisplay according to your selection. Select **Card B** in the 'To Device' table.



3 Leave the entries in the 'Settings to Be Copied' section, in the middle of the page, at their defaults.

4 Click the 'Copy Settings' button.

Respond 'Yes' to the confirmation message:



5 MRC copies the configuration from **Card A** to **Card B**. At the end of the copy, MRC asks you whether you want to reset the control card:

Respond 'Yes'.

6 After the reset, MRC displays a completion message:

11 Revert to the Old Boot ROM(s)

You should not need to revert to old boot ROMs. If you want to do so, find your -03 boot ROMs and reinsert these in the ROM sockets on the control cards of your router. Refer to Replacing the Boot ROM on page 40.

Frame1 Frame2 Do this for both frames if you are updating firmware of an expanded NV8576-Plus.

☐ ☐ 1 Remove the standby control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Then replace the standby card in the frame.

☐ ☐ 2 Switch control to the standby card. To do that, press the reset button on the active control card. Wait for the standby card to become the active card. (When a control card is active, its amber LED is on.)

☐ ☐ 3 Remove the formerly active control card. Place it in an ESD bag. Take it to an ESD lab bench. Replace its boot ROM. Then replace that control card in the frame.

☐ ☐ 4 Switch control back to the formerly active control card.

▲ Keep the router door closed as much as possible when you are doing this.

12 Completion

The downgrade is finished.

If there were unresolved failures, contact Grass Valley customer service.

Create another snapshot of the router in MRC, especially if there were failures. In the event of failures, you will be asked to send all snapshots to Grass Valley customer service.

☑ 1 If you disconnected your control system, reconnect it, disconnecting any temporary Ethernet connections you might have made between your PC and the router. However, if you stopped the NV9000, restart it.

13 Testing

You can perform these quick tests to determine whether the firmware upgrade was successful.

These tests are discretionary and not part of the procedure itself.

1 Observe the LEDs on the control cards, crosspoint cards, I/O cards, and monitor cards.

I/O and monitor cards should all have their amber ‘FPGA loaded’ LED on (and steady) and they should have their green ‘Good COM’ LEDs on. No card should have its red ‘Bad COM’ LED on.

Each crosspoint card will have a green “health” LED on.

Each control card will also green health LED on. The active control card will have its amber LED on.

2 Examine the I/O cards in the ‘Module Status’ page of MRC. Modules with problems are highlighted in the table with red circles. Good modules have green circles.

3 In the ‘Crosspoints’ page of MRC, perform a few takes. (This is minimally helpful, but it will show whether the router is functioning.

More extensive testing is beyond the scope of this document.

Redefining the I/O Card Types

You must use the console application (described in the next section) to redefine card types. The redefinition must be performed for every control card that is updated to new firmware (or reverted to old firmware).

There are 6 applicable console commands. Two of the commands are simple:

`cnfgOcTypeUpdate` Configures all output card types to match the currently installed output cards. The command takes no parameters.

`cnfgIcTypeUpdate` Configures all input card types to match the currently installed input cards. The command takes no parameters.

Issue both of these commands first.

Then check the results by issuing the following commands:

`cnfgOcType 1, ‹n›, ‹f›` This produces a list of all the *output* cards from 1 to *n* for frame *f*. The frame parameter is optional and needed only for an expanded NV8576-Plus. The value of *n* should be 8 for the NV8144, 32 for the NV8280, and 64 for NV8576 and NV8576-Plus routers.

`cnfgIcType 1, ‹n›, ‹f›` This produces a list of all the *input* cards from 1 to *n* for frame *f*. The frame parameter is optional and needed only for an expanded NV8576-Plus. The value of *n* should be 16 for the NV8144, 32 for the NV8280, and 64 for NV8576 and NV8576-Plus routers.

These commands produce a list of numbers identifying the types of all I/O cards. Review the lists carefully. The numbers used are as follows:

0	standard input card	or	standard output card
1	disembedder (input) card	or	embedder (output) card
2	MADI input card	or	MADI output card

If you need to change the type of any particular input or output card, use one of the following commands:

`cnfgOcTypeSet`

`cnfgIcTypeSet`

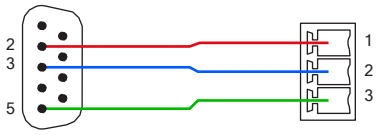
- Refer to The Console Application, next, for details and syntax of the commands.
- The console commands have changed in firmware revisions later than v1.5.
- The console commands are not needed in v2.2.2, v3.1.0, or v3.1.1.

The Console Application

You will need to use the console application if you wish to perform a firmware downgrade.

Using a Serial Connection

The port is physically a 3-pin Phoenix connector located at the front edge of Unicon controllers. You will need a serial cable that makes these connections:



3-pin Phoenix connector	9-pin serial connector
1 (Tx, top)	2 (Rx)
2 (Rx, middle)	3 (Tx)
3 (Gnd, bottom)	5 (Gnd)

The port operates at 9600 Baud, 8 data bits, no parity, and one stop bit and must be connected to your PC running a terminal emulator such as Hyper-Terminal or ProComm Plus. (ProComm Plus is preferred.)

- There is a small chance that pins 2 and 3 of the DE9 are Tx and Rx, respectively. If that is the case, Phoenix pin 1 must connect to DE9 pin 3 and Phoenix pin 2 must connect to DE9 pin 2.

Follow these steps to start the console application:

1. Launch ProComm (or your preferred terminal emulator).
2. Type '**`console`**' (all lower-case letters).
3. At the prompt, begin issuing commands. You can type '**`appHelp`**' to see a list of available commands.

Using an Ethernet Connection

No special equipment or software is required, but your PC must be on the same Ethernet subnet as the router.

In your PC's Command Prompt window (i.e., "DOS box"), type

```
telnet ‹ip›
```

where **`‹ip›`** is the IP address of one of the router's control cards. Then you can issue console commands as you would with a serial connection.

Console Commands for Slot Types

There are 6 console commands that relate to card type. In the following descriptions, the characters '[' and ']' indicate the enclosed item or group of items is optional. The characters '‹' and '›' indicate that the enclosed term is something for which you substitute a value. *You should not type the characters '[', ']', '‹', or '›'.*

[1] **`cnfgOcTypeUpdate`**

Configures all output card types to match the currently installed output cards. The command takes no parameters.

[2] **`cnfgOcTypeSet ‹type›, ‹os›, ‹endOs› [, ‹frm›]`**

Configures the specified range of output cards to the given type.

Param	Desc	Attribute(s)
`‹type›`	Card type	0 = standard; 1 = embedder; 2 = MADI
`‹os›`	First output card slot #	See note 1, following
`‹endOs›`	Last output card slot #	See note 1, following
`‹frm›`	frame	See note 2, following

[3] **`cnfgOcType [‹os› [, ‹num› [, ‹frm› ]]]`** Tallies the specified range of output cards.

Param	Desc	Attribute(s)
`‹os›`	First output card slot #	See note 1, following
`‹num›`	Number of slots to tally	
`‹frm›`	frame	See note 2, following

The **`cnfgOcType`** command returns output card type: 0 = standard; 1 = embedder; 2 = MADI. The parameters are optional. If you omit the parameters from the command, the console application will print the first 16 values.

[4] **`cnfgIcTypeUpdate`** Configures all input card types to match the currently installed input cards. The command takes no parameters.

[5] **`cnfgIcTypeSet ‹type›, ‹is›, ‹endIs› [, ‹frm›]`** Configures the specified range of input cards to the given type.

Param	Desc	Attribute(s)
`‹type›`	Card type	0 = standard; 1 = disembedder; 2 = MADI
`‹is›`	First input card slot #	See note 1, following
`‹endIs›`	Last input card slot #	See note 1, following
`‹frm›`	frame	See note 2, following

[6] **`cnfgIcType [‹is› [, ‹num› [, ‹frm› ]]]`** Tallies the specified range of input cards.

Param	Desc	Attribute(s)
`‹is›`	First input card slot #	See note 1, following
`‹num›`	Number of slots to tally	
`‹frm›`	frame	See note 2, following

The **`cnfgIcType`** command returns output card type: 0 = standard; 1 = embedder; 2 = MADI. The parameters are optional. If you omit the parameters from the command, the console application will print the first 16 values.

Note 1: The input and output slot numbering matches the labeling of slots at the rear of the router.

Note 2: An NV8576-Plus router has two frames. The **`‹frm›`** parameter identifies the frame with which you are communicating: a value of 0 means frame 1 and a value of 1 means frame 2. Sometimes frame 1 is called the master frame, or the primary frame, and frame 2 is called the slave frame or the secondary frame. If you are not communicating with an NV8576-Plus, the commands do not require a frame number.

Examples

Set input cards 2 through 7 to use (dis)embedder cards:

```
-> cnfgIcTypeSet 1,2,7
```

Set output cards 17 through 19 to use standard cards:

```
-> cnfgOcTypeSet 0,17,19
```

Tally the 5 output cards beginning at card 3, for the *slave* frame (or frame 2) of an NV8576-Plus router:

```
-> cnfgOcType 3,5, 1
out cards: ..... types (0 = STD, 1 = EMB, 2 = MADI) .....
        1:        1 0 1 1 2
```

The results indicate that output cards 3, 5, and 6 are embedder cards. Card 4 is a standard card and card 7 is a MADI card.

Updating Frame Sync Card Application Software

(The procedure described here works for both upgrades and downgrades.)

Each frame sync input card has an internal browser application through which you can update its application software, among other things.

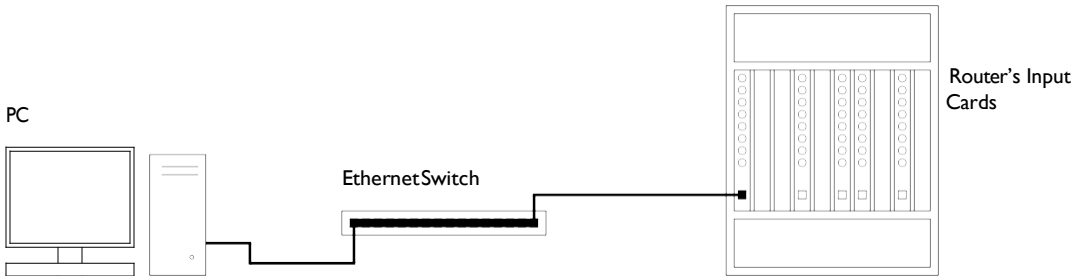
To use the application, enter the IP address of the frame sync card in the address field of your browser (Internet Explorer, Firefox, Chrome, Safari, etc.)

If you do not know the IP address of the frame sync card, you will need to look it up (or assign it) in the 'Ethernet Settings' page of MRC. See the *MRC Users Guide* for further information.

You will have to update the firmware in each frame sync input card individually.

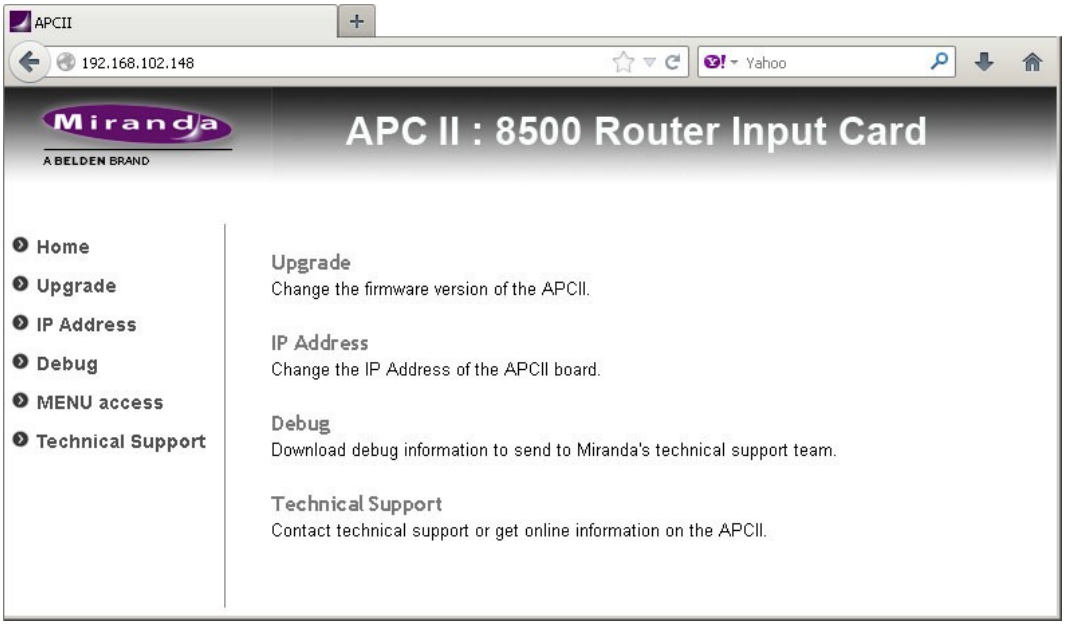
To update frame sync *software*, follow these steps:

1 Make an Ethernet connection between the configuration port of the frame sync input card and your PC:



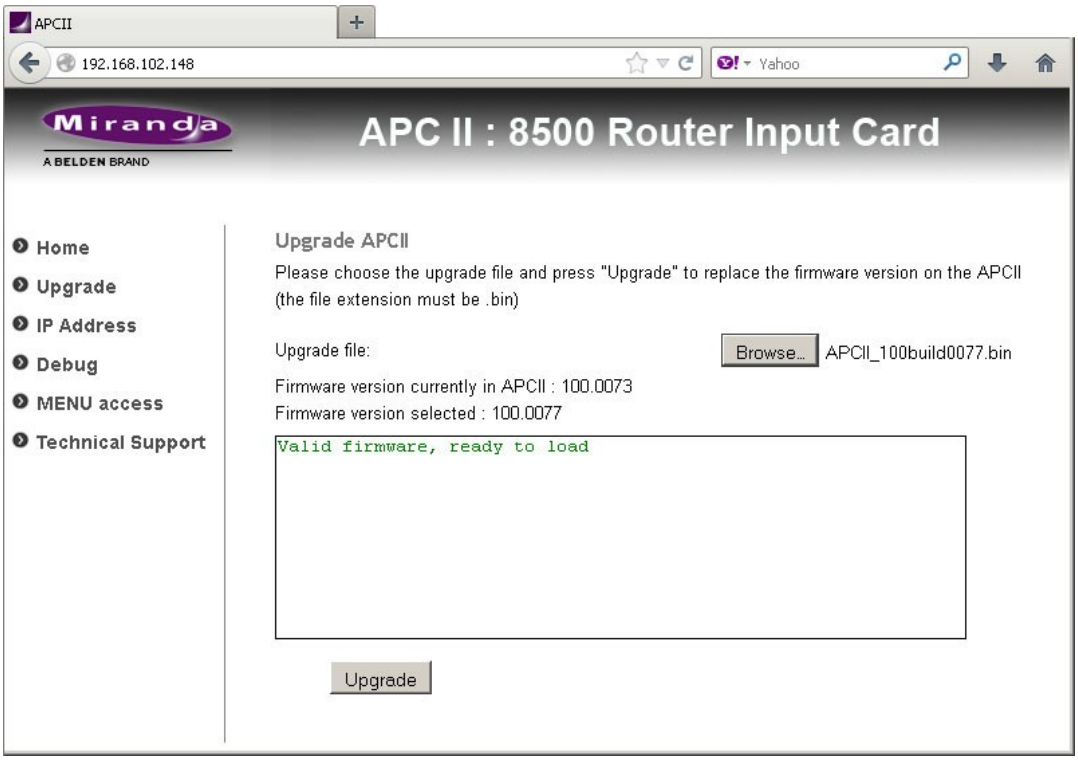
2 In your browser, enter the IP address of the frame sync input card.

The application initially displays its main page or home page:



Note that the term "APC II" represents the frame sync input card.

3 Click ‘Upgrade’ in the navigation pane (at the left). The ‘Upgrade’ page appears:



To update the frame sync software:

a Click the ‘Browse’ button. In the dialog that appears, navigate to select a .bin file for the card.

If you choose a valid .bin file, the message area tells you so, as shown above. If you choose file that has older software, the message informs you:

The selected version is anterior to the current version

Nevertheless, you will be able to upload the software.

If the file you choose is not an appropriate .bin file, the message will be ‘Version cannot be retrieved’:

Firmware version currently in APCII : 100.0073
Firmware version selected : Version cannot be retrieved

b When you have chosen a valid file, click the ‘Upgrade’ button.

The upgrade (or downgrade if that is the case) proceeds automatically to completion.

The process takes about a minute. During that time, the application presents a series of progress messages. When the upgrade is complete, the application gives you a “successful completion” message and returns to its normal state.

4 Repeat these steps for other frame sync input cards.

Updating IP Gateway Card Application Software

(The procedure described here works for both upgrades and downgrades.)

Each IP gateway card (input or output) has an internal browser application through which you can update its application software, among other things.

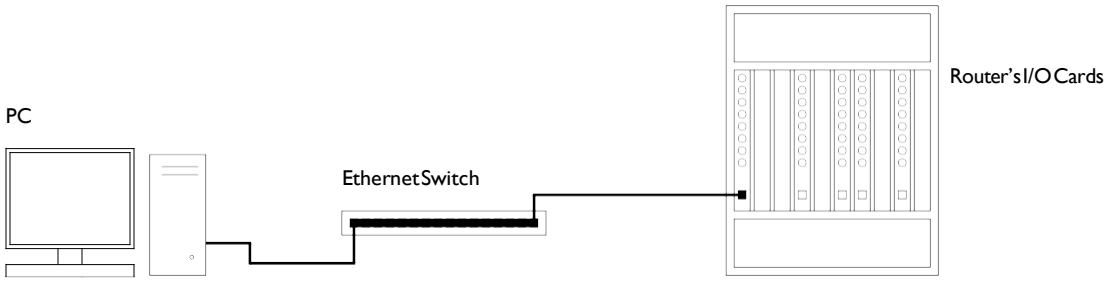
To use the application, enter the IP address of the IP gateway card in the address field of your browser (Internet Explorer, Firefox, Chrome, Safari, etc.)

If you do not know the IP address of the frame sync card, you will need to look it up (or assign it) in the 'Ethernet Settings' page of MRC. See the *MRC Users Guide* for further information.

You will have to update the firmware in each IP gateway input card individually.

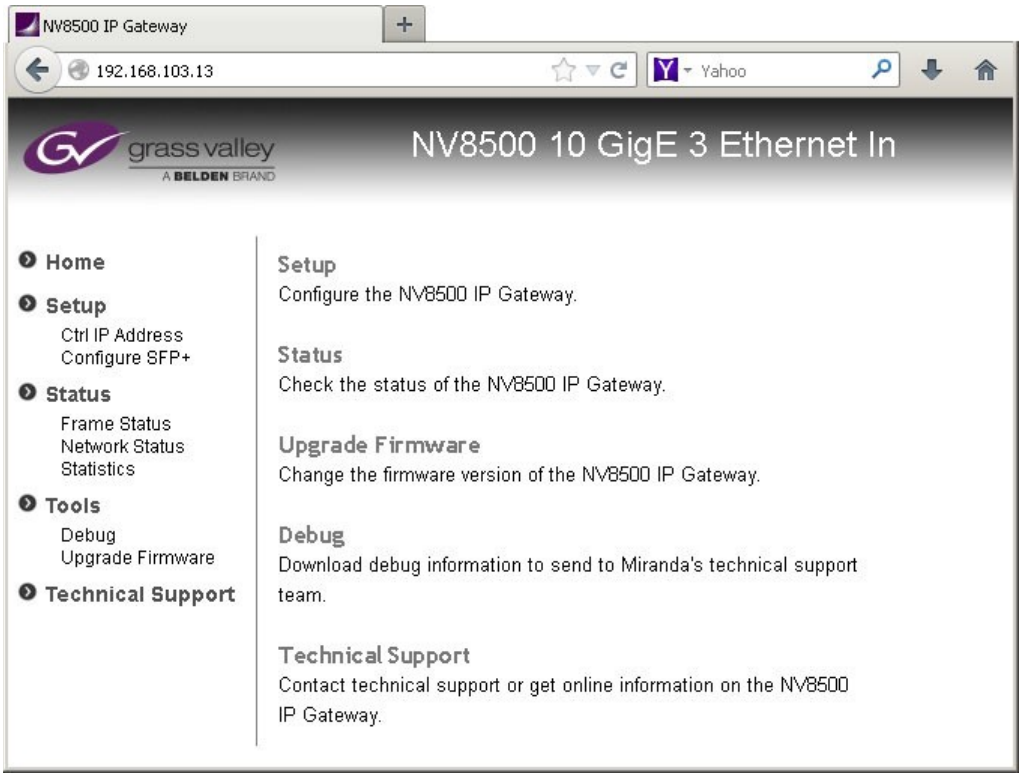
To update IP gateway s*oftware*, follow these steps:

1 Make an Ethernet connection between the configuration port of an IP gateway card and your PC:

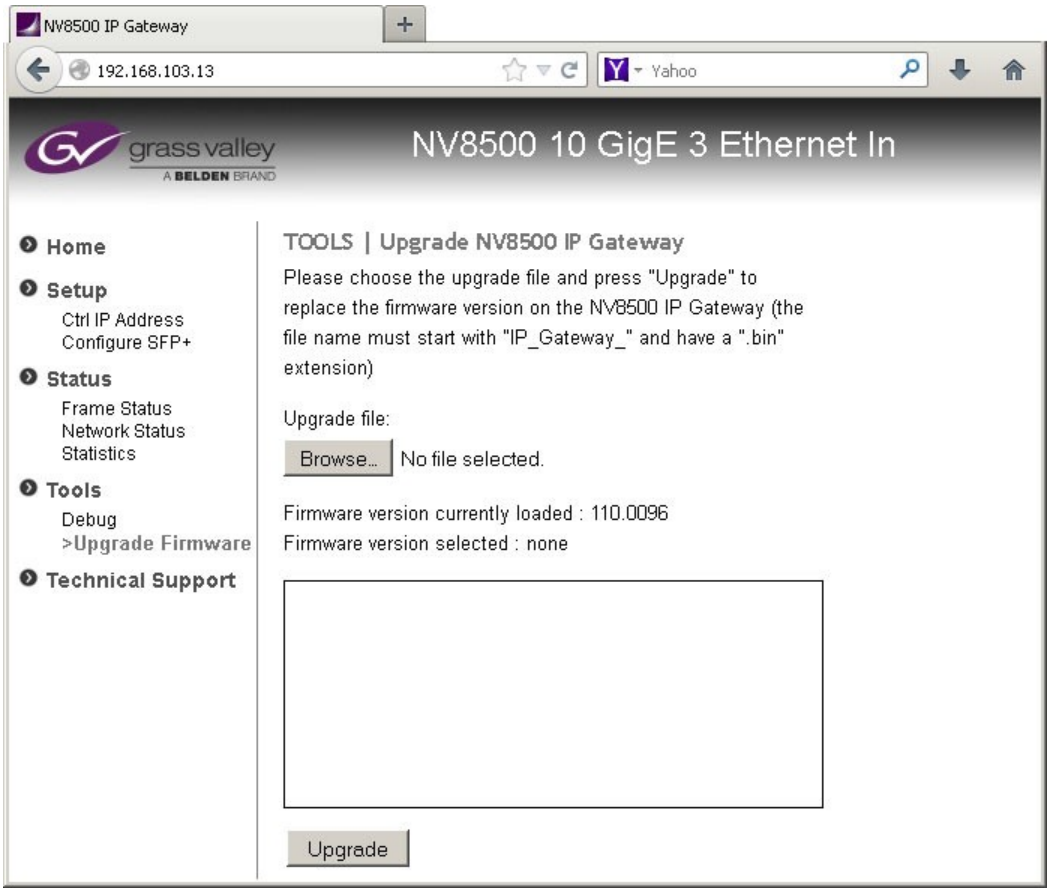


2 In your browser, enter the IP address of the IP gateway card.

The application initially displays its main page or home page:



3 Click ‘Upgrade Firmware’ in the navigation pane (at the left). The upgrade page appears:



To update the IP gateway software:

a Click the ‘Browse’ button. In the dialog that appears, navigate to select a .bin file for the card.

If you choose a valid .bin file, the message area tells you so, as shown above. If you choose file that has older software, the message informs you:

```
The selected version is anterior to the current version
```

Nevertheless, you will be able to upload the software.

If the file you choose is not an appropriate .bin file, the message will be ‘Version cannot be retrieved’:

Firmware version currently loaded : 110.0124
Firmware version selected : Version cannot be retrieved

b When you have chosen a valid file, click the ‘Upgrade’ button.

The upgrade (or downgrade if that is the case) proceeds automatically to completion.

The process takes about a minute. During that time, the application presents a series of progress messages. When the upgrade is complete, the application gives you a “successful completion” message and returns to its normal state.

4 Repeat these steps for other IP gateway cards. (The illustrations show input cards. The procedure applies to output cards as well.)

Updating NV8900 Firmware

The process of upgrading (or downgrading) firmware in NV8900 modules is the same as updating firmware in any router module.

Updating NV8900 modules is not order-dependent in any way. You can update an NV8900 at any time, before, or after, the updates to your router modules.

Follow these guidelines:

1 Go to the ‘Ethernet Settings’ page in MRC.

2 Locate and place a check mark on all the NV8900 modules that you want to update.

3 Choose NV8500_HYB_FW_3.8.0.3306.RF for the firmware file.

4 Click the ‘Update Firmware’ button at the bottom of the page.

The firmware page will generate a status report when the update is complete.