



**NETWORK
TECHNOLOGIES
INCORPORATED**

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PRIMUX® Series

PRIMUX KVM SWITCH SYSTEM FIRMWARE UPGRADE PROCEDURE

(For PRIMUX Components upgrading to Firmware Version
2.0 and later)



TRADEMARK

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FIRMWARE VERSION

This upgrade procedure applies to PRIMUX User Station and Host Adapters upgrading to firmware version 2.0 and later.

WARNING: When using this procedure to upgrade a PRIMUX User Station and Host Adapters to Version 2.0 (or later) from any earlier version, it is extremely important to upgrade all Host Adapters before upgrading the User Station. After upgrading the Host Adapters, the User Station will not recognize them until it too has been upgraded. Also, a User Station running version 2.0 will not recognize a Host Adapter programmed with an earlier version.

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INTRODUCTION

Note: It is not necessary to upgrade firmware unless you are experiencing a problem and NTI Technical Support has recommended upgrading.

The PRIMUX CAT5 KVM System is user upgradeable. The user may need to upgrade the firmware to enable a new feature, or to correct some improper behavior. Steps must be followed to successfully upgrade the firmware of the PRIMUX CAT5 KVM System.

1. Download appropriate firmware upgrade package
2. Determine if a firmware upgrade is needed:
 - a. Determine what new firmware is available.
 - b. Determine the current running firmware.
 - c. Determine if upgrade is needed
3. Prepare for PRIMUX firmware upgrade.
4. Upgrade the firmware in each type of Host Adapter (HA-PS2, HA-SUN, HA-USB, HA-RS)
5. Upgrade the User Station firmware
6. Final verification

WARNING: When using this procedure to upgrade a PRIMUX User Station and Host Adapters to Version 2.0 (or later) from version 1.9 (or earlier), it is extremely important to upgrade all Host Adapters before upgrading the User Station. After upgrading the Host Adapters, the User Station will not recognize them until it too has been upgraded to 2.0 (or later). Also, a User Station running version 2.0 will not recognize a Host Adapter programmed with an earlier version.

If the User Station has already been upgraded to firmware version 2.0 before all Host Adapters have been upgraded, simply use the same procedure to downgrade the User Station back to version 1.9, upgrade all Host Adapters, and re-upgrade the User Station to version 2.0.

Note: The HA-RS Host Adapter is only compatible with User Stations running firmware version 2.0 or later.

COMMON NAVIGATION

To display the OSD COMMAND MODE menu on the attached monitor of the User Station

If the User Station is not displaying an OSD screen, using the attached keyboard:

- Press <Ctrl>+<`>

If the User Station is displaying OSD USER/ADMIN LOGIN splash, login as administrator, using the attached keyboard:

For User Station Firmware **Version 1.9** and earlier

- NAME: <ADMINISTRATOR> or <ROOT>
- PASSWORD: <NTI>
(all uppercase letters)

For User Station Firmware **Version 2.0** and later

- NAME: <root>
- PASSWORD: <nti>
(all lowercase letters)

Note: If the administrator has changed the password, only the new password will permit access to the User Station.

If the User Station is displaying any OSD screen other than the COMMAND MODE menu, using the attached keyboard:

- Press <F10>

To display the OSD USER/ADMIN LOGIN splash on the attached monitor of the User Station:

- Display the OSD COMMAND MODE menu.
- From the User Station in OSD COMMAND MODE, using the attached keyboard
- Press <L> - LOGOUT

DOWNLOAD APPROPRIATE FIRMWARE UPGRADE PACKAGE

Download the most current firmware upgrade package from <http://www.networktechinc.com/download/d-kvmswitch-cat5.html> , or receive it directly from NTI.

DETERMINE IF A FIRMWARE UPGRADE IS NEEDED

Determine what new firmware is available

Unzip the firmware upgrade package into an empty folder on the computer that will be used to transfer the firmware to the PRIMUX system.

Refer to the RELEASE.TXT file, which details what firmware is available for upgrade, and note the revisions on the worksheet on page 10 (the underscore '_' is equivalent to the period '.' for revisions).

Latest code revision available for the PRIMUX SYSTEM as of 06/26/08.

```
User Station revision:1_9
Host Adapter PS2 revision:1_6
Host Adapter SUN revision:1_6
Host Adapter USB revision:1_6
```

The versions shown here will be the last version numbers seen before all change to "revision : 2_0".

Determine the current running firmware

Note what revisions are currently running for each PRIMUX device type. (A worksheet to record this is on page 12.) From the User Station, starting from the OSD COMMAND MODE menu.

For Host Adapters running revision 1.6 or earlier:

- Highlight one Host Adapter type USB, PS2, or SUN
- Press <I> - INFO
- From the HOST ADAPTER INFO screen, make note of the "Revision" on the worksheet for Host Adapter type.
- Press <x> - EXIT, to exit this screen
- Repeat for each Host Adapter type.

For User Stations running revision 1.9 or earlier:

- Press <I> - INFO.
- Press <s> - USERSTATION
- Make note of the "Rev" on the worksheet for the User station.
- Press <x> - EXIT, to exit this screen

```

NETWORK TECHNOLOGIES INC
-----
      HOST ADAPTER INFO

      Name:  (NEW USB HA)
      Comment: NTI HOST ADAPTER

UniqueID:      2      (0x0002)
MasterID:     510     (0x01FE)
      Index:      1      (0x0001)
Revision:     1.06    ←
      Type:     USB
CodeCRC:      0x00
HostID:       00000891
USERSTATION                               Esc=EXIT

```

```

NETWORK TECHNOLOGIES INC
-----
      USER STATION INFO

      Name:  NTI USER STA
      Comment: NTI USER STATION

UniqueID:      1      (0x0001)
MasterID:     510     (0x01FE)
AutoLogon:      1
      NEWUSER1
Type/Rev:     USt/1.9 ←
CodeCRC:      0x7FF5FC13
UstatID:       00000A88
Esc=EXIT

```

For Host Adapters running version 2.0 and later:

- Press <A> - <E> - <H>
- Highlight one Host Adapter of Type USB, PS2, or SUN and press <Enter>.
- From the Edit Host Adapter screen, make note of the "Rev" on the worksheet for Host Adapter type.
- Press <Esc> to exit this screen
- Repeat for each Host Adapter type.

For User Stations running version 2.0 and later:

- Press <A> - <F> - <U>
- Make note of the "Revision" on the worksheet for User Station.
- Press <Esc> to exit this screen

**Determine if upgrade is needed**

Before upgrading, you need to determine which, if any, of the current running device firmware needs to be upgraded.

- On the worksheet on page 12 compare **Available revision** and **Current Running revision**, of each device type and check the upgrade box if **Available revision** is newer.

PREPARE FOR PRIMUX FIRMWARE UPGRADE

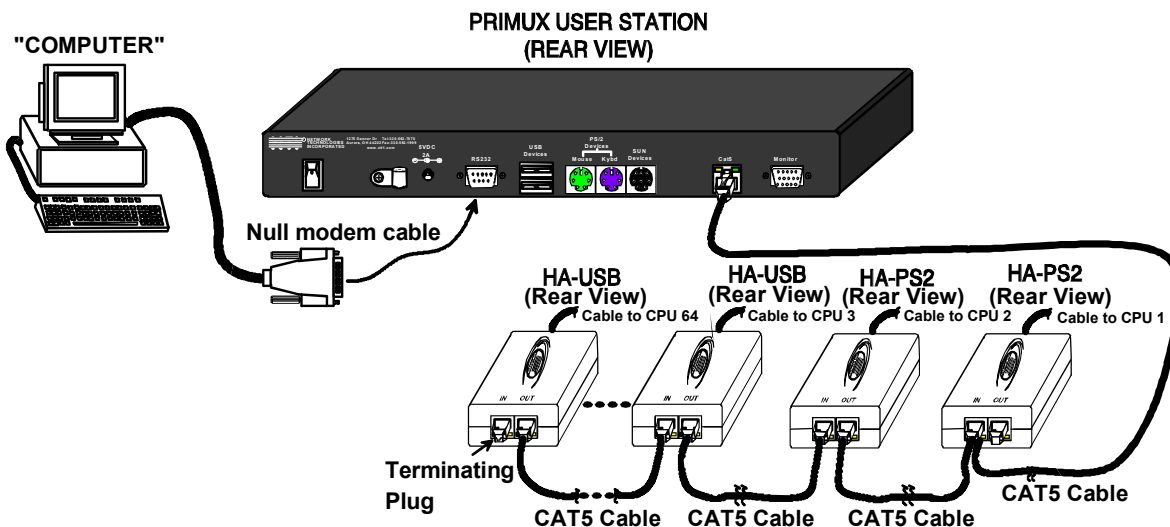
You will need an additional computer with keyboard and monitor (not already connected to the PRIMUX system being updated). The computer must be capable of terminal emulation to include XMODEM file transfer via a serial port (such as Windows HyperTerminal). This is called the COMPUTER. This COMPUTER needs to have the appropriate firmware upgrade package accessible to it.

You will need a 9-pin serial null modem cable (i.e. NTI cable part # DINT-xx-FF), maximum 15 feet long (see page 12 for cable specification).

Note: It is recommended that a UPS be used on all powered CPUs that have Host Adapters being upgraded. It is not necessary that a UPS be used on the COMPUTER or the User Station.

Attach the COMPUTER to the User Station

- Attach a 9-pin serial null modem cable (i.e. NTI cable part # DINT-xx-FF), maximum 15 feet long (see page 12 for cable specification) to the RS232 port of the User Station from the COMPUTER.



- Open the terminal emulation program (HyperTerminal) on the COMPUTER.
- Connect to the User Station through the proper COM port using the following settings: 9600,8,n,1, no flow control.

Put the PRIMUX User Station into Bootloader Mode

For User Stations running firmware version 1.9 or earlier:

From the User Station displaying the OSD USER/ADMIN LOGIN splash, login as the administrator. Using the attached keyboard, hold down the <Shift> key and enter

- NAME: <ADMINISTRATOR> or <ROOT>
- PASSWORD: <NTI>

Note: If the administrator has changed the password, only the new password will permit access to the User Station.

Starting from the OSD command menu,

- Press <A> for ADMINISTRATION,
- Press for BOOTLOADER/UPDATE MENU.
- Press 'GO TO BOOTLOADER'.
- You will be prompted "Are you sure? (Y/N)" Press <Y> to proceed.

The User Station is now in bootloader mode. This is indicated by "88" flashing on the front panel of the User Station. The monitor connected to the "Monitor" port on the User Station will also go blank.

For User Stations running firmware version 2.0 or later:

From the User Station displaying the OSD USER/ADMIN LOGIN splash, login as the administrator. Using the attached keyboard enter

- NAME: <root>
- PASSWORD: <nti>

Note: *If the administrator has changed the password, only the new password will permit access to the User Station.*

Note: *If you have just upgraded an User Station from 1.9 to 2.0, and you have not changed the password from the default password "NTI" (uppercase letters), then the login name to login as the administrator will be "root" (all lowercase), and the password will be "NTI" (all uppercase). The password does not change when firmware is upgraded.*

Starting from the OSD command menu,

- Press <A> for **Administration Menu**,
- Press <F> for **Firmware Configuration**.
- Press for **Go To Bootloader**.
- You will be prompted "Are you sure? (Y/N)" Press <Y> to proceed.

UPGRADING HOST ADAPTERS (HA-PS2, HA-SUN, HA-USB, HA-RS)

Note: *This section for upgrading Host Adapters applies only to Host Adapters that have firmware version 1.9 and earlier. Host Adapters with firmware version 2.0 and later must be upgraded following the procedure documented in the PRIMUX CAT5 KVM System manual for version 2.0 (or later).*

The following steps must be performed in the order indicated. Do not cycle power to any device until the process is complete.

There is only one file that needs to be uploaded per type of Host Adapter (HA).

<u>HA Type</u>	<u>Filename</u>
PS2	PRIMUX_HA_PS2_<revision>.b01
USB	PRIMUX_HA_USB_<revision>.b01
SUN	PRIMUX_HA_SUN_<revision>.b01
SERIAL	PRIMUX_HA_RS_<revision>.b01

for example PRIMUX_HA_PS2_1_6.b01

Take note of the type of Host Adapter being upgraded, PS2, SUN, USB, or SERIAL. An upgrade file for a specific type of Host Adapter can only be applied to a Host Adapter of the same type (PS2 file for HA-PS2, SUN file for HA-SUN, USB file for HA-USB, and SER (RS) file for HA-RS).

Note: *The HA-RS Host Adapter is only compatible with User Stations running firmware version 2.0 or later.*

Prepare to Download Host Adapter code to the User Station

From Bootloader Mode, at the COMPUTER's terminal emulation program (see page 3 "Put the PRIMUX User Station into Bootloader Mode").

- Press <Enter> to establish communications with the User Station.

The following Option Menu should be displayed along with the 'BootLdr User Station:' prompt

```
NETWORK TECHNOLOGIES INC ALL RIGHTS RESERVED COPYRIGHT 2003
Primux User Station Boot Loader      Serial Number: 00000374
```

Option Menu:

```
1: Download Data:
2: Identify Ram Data:
3: Program Flash Device:
4: Identify Flash Device:
0: EXIT and Re-Boot:
?: Option Menu
```

BootLdr User Station:

Download ROM File

Select a ROM File type that will be downloaded.

At the COMPUTER's terminal emulation program and the 'BootLdr User Station:' prompt

- Press <1> 1: Download Data. You will be prompted with the following message:

```
Download deletes old data.      Continue? <Y/N>:
```

- Press <Y> to continue. The User Station is now waiting for a XMODEM file transfer to begin.

From the COMPUTER terminal emulator, download the selected ROM file type using the XMODEM protocol.

- Transfer file *PRIMUX_HA_<type>_<revision>.b01*.

Where <type> is PS2, USB or SUN, and <revision> is the upgrade revision available of the specified type.

When complete, after about 1.5 minutes, the following is displayed at the COMPUTER terminal emulator.

```
Download ok
```

```
BootLdr User Station:
```

Display the Option menu.

- Press <?> ?: Option Menu:

Note: If an error message is displayed, repeat these steps. If error message is displayed the second time, contact NTI technical support.

Downloading of the selected ROM file is complete.

At the COMPUTER's terminal emulation program and the 'BootLdr User Station:' prompt

- Press <0> 0: Exit and Reboot

Upload the ROM File to the Host Adapter

Once the selected ROM file has been downloaded to the User Station, it may be uploaded to any or all of the Host Adapters of the selected type. Ensure that all Host Adapters of the selected type to be uploaded are powered ON and will remain powered ON during the process.

Note: It is recommended that a UPS be used on all powered CPUs that have Host Adapters being upgraded.

Note: If a Host Adapter is powered OFF during the Upload process, the Host Adapter could become unusable and need to be sent to NTI for servicing.

From the User Station displaying the OSD USER/ADMIN LOGIN splash, login as the administrator. Using the attached keyboard, hold the <Shift> key and enter

- NAME: <ADMINISTRATOR> or <ROOT>
- PASSWORD: <NTI>

Note: If the administrator has changed the password, only the new password will permit access to the User Station.

Verify that the proper ROM file code image resides in storage

Starting from the OSD command menu,

- Press <A> for ADMINISTRATION,
 - Press for BOOTLOADER/UPDATE MENU.
 - Press <I> for "USERSTAT.CODE IMAGE".
- Verify the ProdId: is HOST_ADAPTER.
 - Verify the RomFunc is the Type selected. (PS2, SUN or USB)
 - Verify the Revision matches the Revision Device type on the worksheet.
- Press <X> - EXIT "USERSTATION CODE IMAGE INFO"

```

NETWORK TECHNOLOGIES INC
-----
USERSTATION CODE IMAGE INFO

COPYRIGHT 2002-2008 NETWORK T
ECHNOLOGIES INC ALL RIGHTS RES
ERVED
ProdId: HOST_ADAPTER
RomFunc: USB
Date: 2008/06/02 13:55:15
Revision: 1.6 ←
Primux Host Station, Rom File
1
Revision: 1.6

Eec=EXIT

```

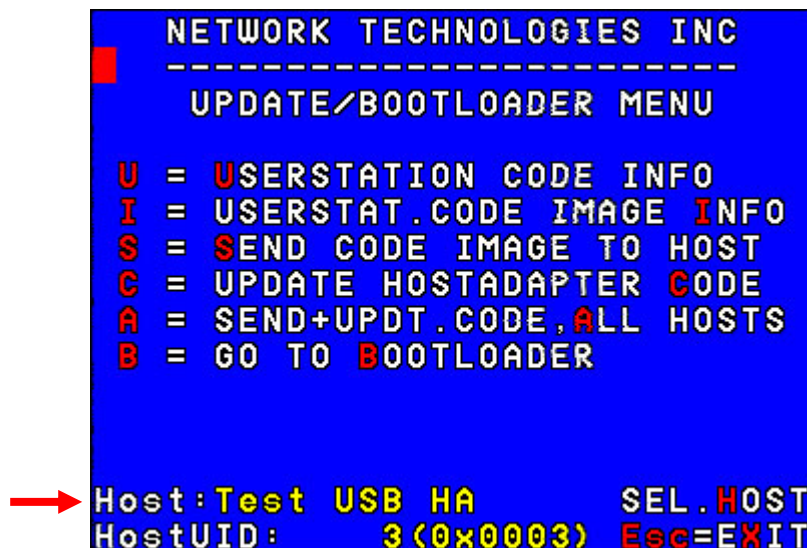
Upload and Update Individual Host Adapters

This section is used to update individual Host Adapters. This is particularly useful if you are adding a new Host Adapter to an existing segment. To upload and update all Host Adapters of the same type in one quick procedure, see "Upload and Update All Host Adapters" on the next page.

From the User Station, starting from the UPDATE/BOOTLOADER MENU using the attached keyboard

- Press <H> for SEL.HOST and select the Host Adapter to be updated. You will immediately be returned to the UPDATE/BOOTLOADER MENU. The selected Host Adapter to be updated will now be indicated.

Note: Be sure to select a Host Adapter of the same type as the code image that has been uploaded (PS2,SUN, USB or SER (RS)).



- Press <S> for **SEND CODE IMAGE TO HOST** to send the code image to the Host Adapter in preparation for update. A Yes/No confirmation will be required. Press <Y> to confirm.

During the transfer, a “Waiting....” message will be displayed and a blinking yellow asterisk will appear next to the “**S**”. Wait for the ‘Waiting...’ message to no longer be displayed.

- Press <C> for **UPDATE HOSTADAPTER CODE** to complete the update for the selected Host Adapter. A Yes/No confirmation will be required. Press <Y> to confirm. The code update will happen quickly, so no “Waiting....” message will appear.

Upload and Update All Host Adapters

This section is used to update all Host Adapters of the same type in one command. This is particularly useful if you have a group of Host Adapters in a segment that all need updating. To upload and update individual Host Adapters, see “Upload and Update Individual Host Adapters” on the previous page.

From the User Station, starting from the UPDATE/BOOTLOADER MENU using the attached keyboard

- Press <A> - **SEND+UPDT.CODE,ALL HOSTS** A Yes/No confirmation will be required.
- Press <Y> to confirm.

During the transfer, a “Waiting....” message will be displayed and a blinking yellow asterisk will appear next to the “**A**”. Wait for the ‘Waiting...’ message to no longer be displayed. This process can take about 1.5 minutes per Host Adapter.

At this point all powered Host Adapters of the selected type have been upgraded. To upgrade other Host Adapter types, return to “Download ROM File” and follow the instructions for a different type.

Note: Flashing many Host Adapters can take a substantial amount of time. For example, 60 Host adapters may take approximately 1.5 hours to flash.

UPGRADE THE USER STATION

The following steps must be performed in the order indicated. Do not cycle power to any device until the process is complete. Be sure to "PREPARE FOR PRIMUX FIRMWARE UPGRADE" (page 3) before starting this procedure.

For the User Station there are four files that need to be downloaded and flashed in any order.

```
PRIMUX_u_sta_<revision>.b01
PRIMUX_u_sta_<revision>.b02
PRIMUX_u_sta_<revision>.b03
PRIMUX_u_sta_<revision>.b04
```

for example *PRIMUX_u_sta_2_0.b01* would be the file name for revision 2.0.

Each file must be individually downloaded to the User Station and flashed before proceeding to the next file. The process is not complete until all four files are flashed.

Prepare for Downloading

From Bootloader Mode, at the COMPUTER's terminal emulation program

- Press **<Enter>** to establish communications with the User Station.

The following Option menu should be displayed along with the 'BootLdr User Station:' prompt

```
NETWORK TECHNOLOGIES INC ALL RIGHTS RESERVED COPYRIGHT 2003
Primux User Station Boot Loader      Serial Number: 00000374
```

Option Menu:

```
1: Download Data:
2: Identify Ram Data:
3: Program Flash Device:
4: Identify Flash Device:
0: EXIT and Re-Boot:
?: Option Menu
```

BootLdr User Station:

Download ROM File

At the COMPUTER's terminal emulation program and the 'BootLdr User Station:' prompt

- Press **<1>** 1: Download Data. The following message and prompt will appear:

```
Download deletes old data.      Continue? <Y/N>:
```

- Press **<Y>** to continue. The User Station is now waiting for a XMODEM file transfer to begin.

From the COMPUTER terminal emulator, download the ROM file using the XMODEM protocol.

- Transfer file *PRIMUX_u_sta_<revision>.b01*.

Where *<revision>* is the upgrade revision available.

When complete, after about 1.5 minutes, the following is displayed at the COMPUTER terminal emulator.

```
Download ok
```

```
BootLdr User Station:
```

Display the Option Menu.

- Press **<?>** ? : Option Menu:

Note: If an error message is displayed, repeat above steps. If error message is displayed the second time, contact NTI technical support.

Flash the Device with the ROM File

At the COMPUTER's terminal emulation program and the 'BootLdr User Station:' prompt

- Press <3> 3: Program Flash Device:

When flashing the device is complete, the following message should be displayed:

```
Rom ID Check: Verifying Source CRC: Flashing: Writing Signature: Passed
```

Note: If anything is not correct contact NTI technical support.

ROM File 1 has now been flashed.

Note: Once the first ROM file is flashed you MUST continue to download and then flash all remaining ROM files.

Upgrade the remaining ROM Files

Repeat the process starting with "Download ROM File" (page 9) to download and flash the remaining ROM Files, 2 through 4.

ROM File 2	PRIMUX_u_sta_<revision>.b02
ROM File 3	PRIMUX_u_sta_<revision>.b03
ROM File 4	PRIMUX_u_sta_<revision>.b04

Verify ROM Files

When all 4 ROM Files are completely downloaded and flashed, verify all 4 ROM files are of the same revision and type and the flash device is useable. All revisions must be the same revision as noted on the worksheet in the **User Station - Available revision** box.

At the COMPUTER's terminal emulation program and the 'BootLdr User Station:' prompt

- Press <4> 4: Identify Flash Device, to display the revisions and types of all ROM files that have been flashed and if the flash device is useable.

The following indicates a successful upgrade has been preformed

All ROM File Revisions are the same and 'Flash Device Is Useable'.

```
COPYRIGHT 2002-2005 NETWORK TECHNOLOGIES INC ALL RIGHTS RESERVED
$ProdId: USER_STATION$
$RomFunc: main
$Date: 2005/09/01 20:40:23 $
$Revision: 2.0 $
Primux User Station, Rom File 1
$Revision: 2.0 $
Primux User Station, Rom File 2
$Revision: 2.0 $
Primux User Station, Rom File 3
$Revision: 2.0 $
Primux User Station, Rom File 4
$Revision: 2.0 $
Flash Device Is Useable
```

If any ROM file revision is not correct, repeat the procedure for the incorrect ROM file.

The User Station is upgraded and must be restarted.

At the COMPUTER's terminal emulation program and the 'BootLdr User Station:' prompt

- Press <0> 0: Exit and Reboot

Note: If any error is detected in the newly flashed User Station, the bootloader program will not allow the User Station to reboot into an operational mode, and will STAY IN Bootloader Mode. All 4 User Station ROM files must be at the same revision level prior to rebooting the User Station into an operational mode. If a reboot to operational mode fails, contact NTI technical support.

FINAL VERIFICATION

With all firmware successfully upgraded, verify the **Current Running revision** are proper, follow the steps on page 2 under "Determine the current running firmware" and compare the results to the **Available revision** shown on the worksheet on page 12.

Test to ensure that PRIMUX CAT5 KVM System is working properly.

Note: A User Station running firmware version 2.0 (or later) will not recognize a Host Adapter running version 1.9 or earlier. If a Host Adapter needs to be upgraded to 2.0 (or later) from 1.9 (or earlier), the User Station must first be running version 1.9 (or earlier) in order to perform the upgrade to the Host Adapter.

Note: The HA-RS Host Adapter is only compatible with User Stations running firmware version 2.0 or later.

NULL MODEM CABLE PINOUTS

PRIMUX to Terminal (9 PIN) null modem cable
(NTI cable part # DINT-xx-FF)

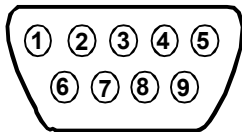
PRIMUX		Signal Direction	TERIMINAL	
Function	Pin #		Pin #	Function
RxD	2	←	3	TxD
TxD	3	→	2	RxD
CTS	8	●	7	RTS
RTS	7	●	8	CTS
DSR	6	●	4	DTR
DTR	4	●	6	DSR
DCD	1	●	1	DCD
SG	5	—	5	SG

N/C= not connected (no cable wire)

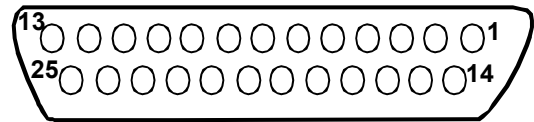
In this cable signals CTS and RTS are connected to each other at the connector ends, and signals DSR, DTR, and DCD are connected to each other at the connector ends.

PRIMUX to Terminal (25 PIN) null modem cable

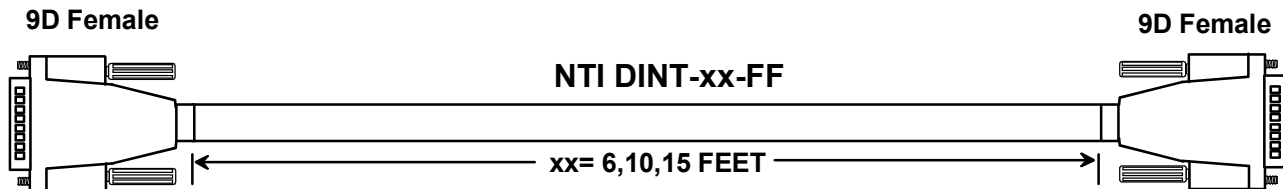
PRIMUX		Signal Direction	TERMINAL	
Function	Pin #		Pin #	Function
RxD	2	←	2	TxD
TxD	3	→	3	RxD
CTS	8	●	4	RTS
RTS	7	●	5	CTS
DSR	6	●	20	DTR
DTR	4	●	6	DSR
DCD	1	●	8	DCD
SG	5	—	7	SG



**Mating Face
of 9D
Male Connector**



**Mating Face
of 25D
Female Connector**



Note: Cable length not to exceed 15ft.

PRIMUX Firmware Upgrade Worksheet

Device type	Available revision (from RELEASE.TXT)	Current Running revision (from OSD menus)	Upgrade needed
User Station			
Host Adapter – PS2			
Host Adapter – USB			
Host Adapter – SUN			
Host Adapter – SER (RS)			