



Information Sheet IS16009A

NX3 / NX5 / NX10 – Updating to 5.x Software and OS Recovery

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INFORMATION SHEET

1 INTRODUCTION

The NX Series AM transmitter is a microprocessor-controlled unit. Periodically, enhancements or improvements to the system are identified and made available. Implementation of these improvements requires a software upgrade. This document describes how to update transmitter software from 4.4 (or higher) to 5.x and how to re-install the Operating System (OS) in the event corruption has occurred.

NOTE

Minor software updates that are released within the same overall number (i.e, SW 5.x.y to SW 5.y.z) can be performed using the Upgrading Software procedure found in section 3 of the Operations and Maintenance manual.

1.1 Equipment Affected

This procedure applies to NX3, NX5 and NX10 transmitters running software 4.4 or later.

1.2 Responsibility for Implementation of Procedure

This procedure should be carried out by qualified station maintenance personnel who are familiar with NX series transmitters.

1.3 Scheduling

This procedure should be performed only when the initial software upgrade from 4.x to 5.y is desired or when corruption of the OS has occurred. The transmitter will need to be “off air” during this procedure.

1.4 Manpower Requirements

Implementing these instructions will require approximately 75 minutes.

1.5 Special Tools/Test Equipment

- USB flash drive, freshly partitioned and formatted to FAT32, to download latest OS recovery files
- PC or laptop to serially connect to the transmitter
- DB9 straight-through serial cable with a male connection for the transmitter end
- USB to Serial adapter cable (dependent on PC / laptop capabilities)
- CAT5 Ethernet cable (needed if internet connection for PC or laptop is not available at transmitter site)

NOTE

Use a web search tool to find a procedure specific to your PC operating system for clearing all partitions and formatting USBs to FAT32.

1.6 Publications Affected

This modification does not affect the NX series documentation.



2 PRELIMINARY REQUIREMENTS

This procedure will erase many user settings that have to be re-entered after the upgrade is complete. Only the default "Nautel" user will be valid with no password required. Before proceeding, record network settings, user accounts, logs, SNMP configuration, email configuration, time zone, notifications and playlists to ensure they can be restored after the procedure is complete. Refer to the transmitter's Operations and Maintenance Manual to locate these settings. Presets (power, audio selections, etc) are not affected.

3 RECOVERING THE OS

NOTE

Ensure adequate internet connection is available for steps 3 (a) to 3 (d) or download the appropriate OS recovery file and PuTTY prior to arriving at the transmitter site.

- (a) Ensure PuTTY is installed on the PC or laptop used for the upgrade. If not, download PuTTY.exe from <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>. Choose the first download in the list and save it to your desktop.
- (b) Using a PC or laptop with a web browser, go to <http://www3.nautel.com/pub/>. Select the directory called **NX_Series**.
- (c) Select the latest 5.x software version available.
- (d) Choose the **NX3-NX10 OS Recovery Files/** folder, download the zip file and this Information Sheet to your laptop. See Figure 1 as an example, noting it shows the latest software version at the time of publishing.

Index of /pub/NX_Series/NX_SW_5.0/NX3-NX10 OS Recovery Files

Name	Last modified	Size	Description
Parent Directory	-	-	-
IS16009A - NX3_NX5_NX10 - Updating to 5.x Software and OS Recovery.pdf	2019-05-15 14:35	384K	
NX_CS_osrecovery_v5.0.zip	2019-04-30 13:28	161M	

Figure 1: Selecting the latest OS recovery files

- (e) Unzip the image file into its sub-component and copy these to the root directory of a USB memory stick that was previously partitioned and formatted to FAT32. See Figure 2.

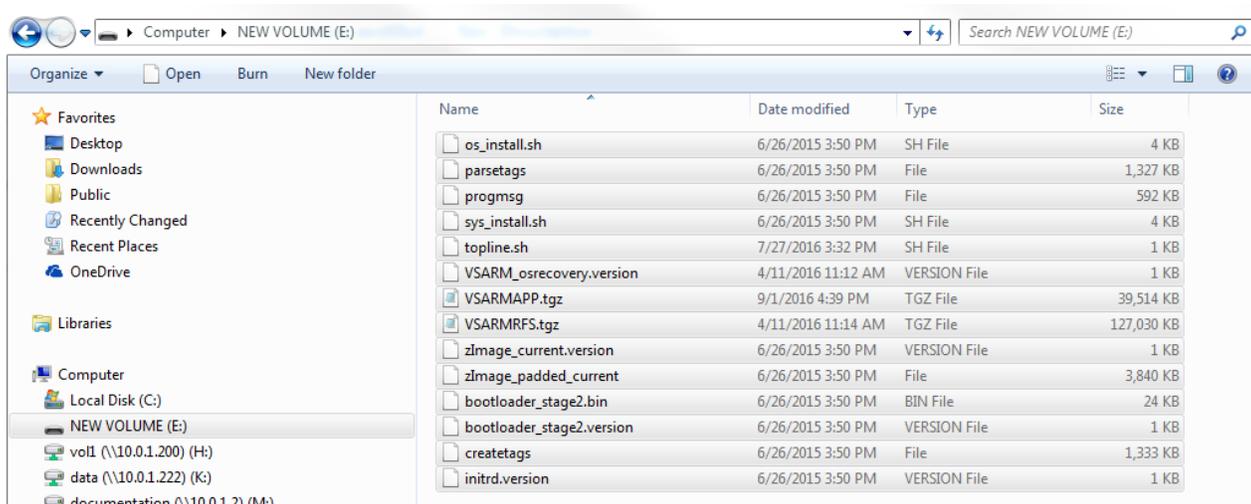


Figure 2: List of NX OS recovery files (example)



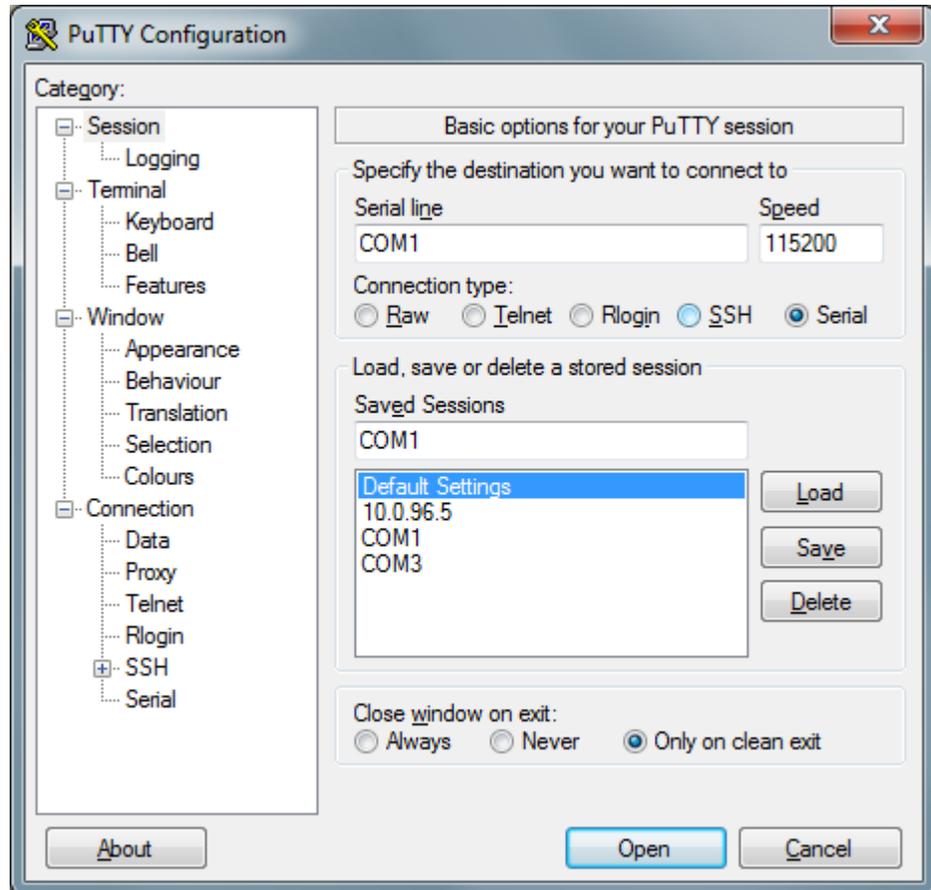


Figure 3: PuTTY configuration settings

- (f) After successfully downloading the files to the root directory of the flash drive, open the transmitter front door to access the control/exciter panel. Connect the PC or laptop (with PuTTY installed) via the serial port to J2 Debug jack on the transmitter's NAPC168* Control/Interface PWB. Modern laptops may require a USB to Serial adapter cable.

NOTE

Correct COM port can be confirmed through the use of Device Manager. See Figure 4.

- (g) Double click the PuTTY.exe icon and configure for the settings shown in Figure 3. Select Serial for Connection type. Enter the appropriate COM port in the Serial line field. Enter 115200 in the Speed field. Click **Open**. See Figure 5.
- (h) Using the transmitter's front control panel, press the **RF OFF** button. Open the door and remove any USB devices that may be installed in the J3 Ethernet / USB connector in the NAPC168* Control / Interface PWB.
- (i) Using the transmitter's front panel UI, navigate to the **Main Menu ► System Settings ► Host Watchdog** screen. Use the right arrow then up arrow. Select **OFF** and press the check mark.

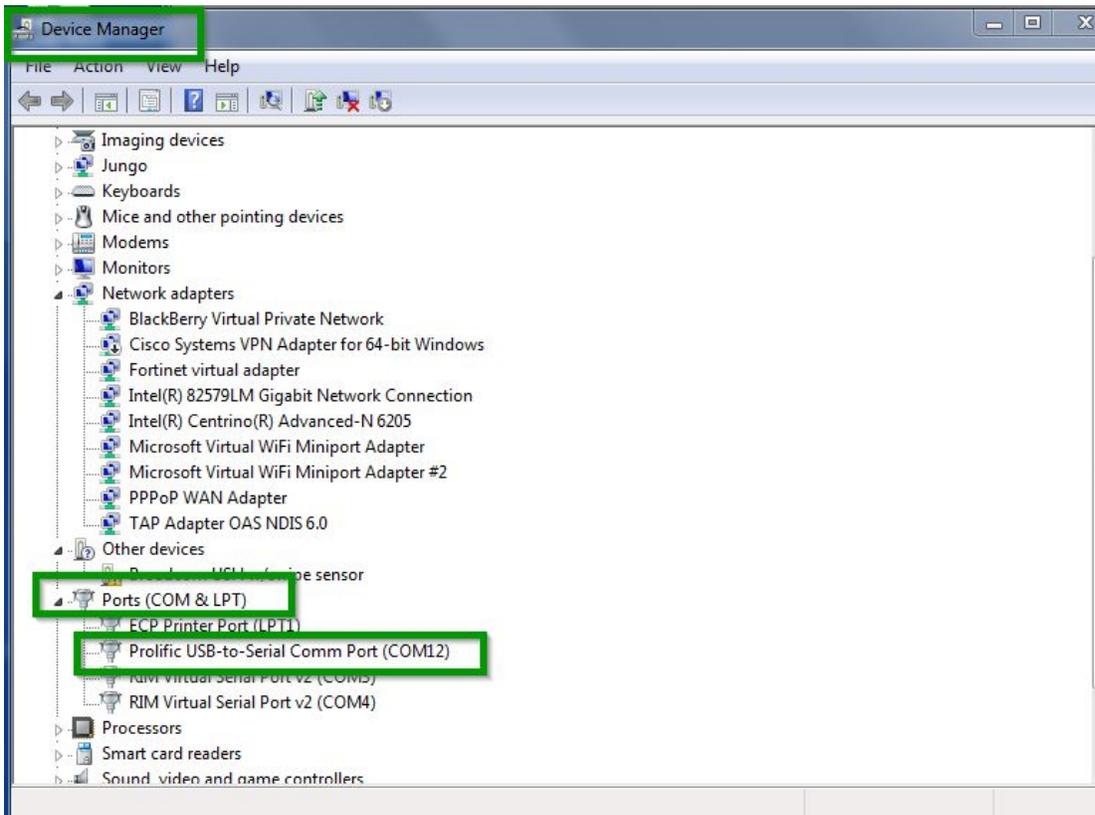


Figure 4: Device Manager

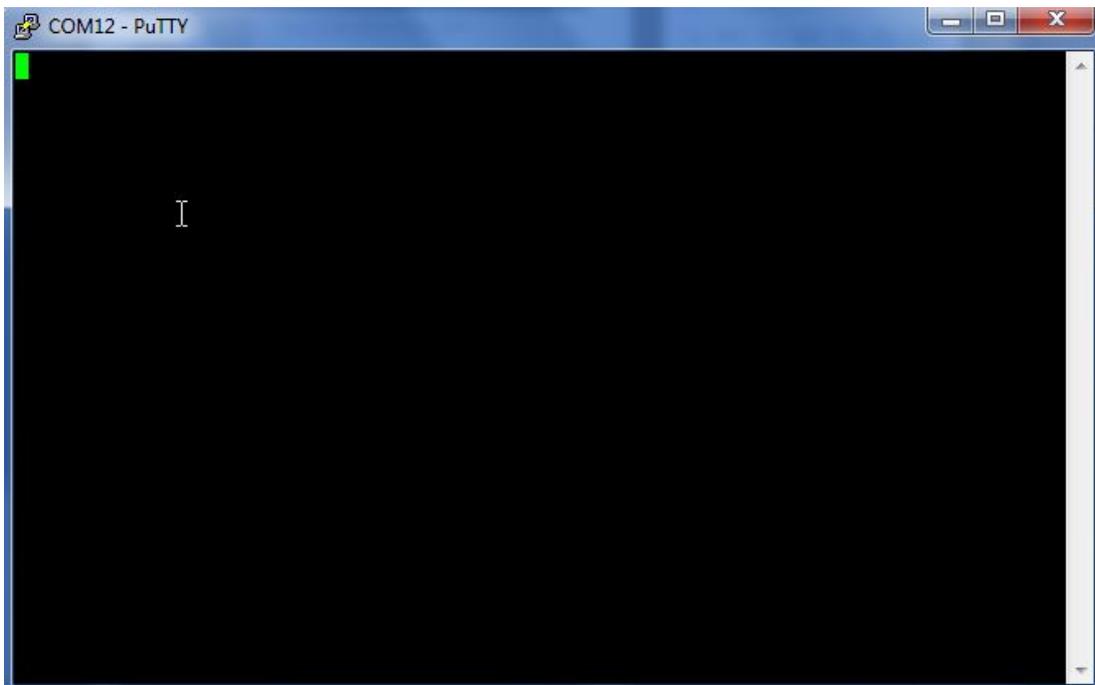


Figure 5: Terminal Screenshot

- (j) Using the transmitter's front panel UI, navigate to the **Main Menu ► System Settings ► Console Select** screen. Use the right arrow then up arrow. Select **Host Console** and press the check mark.
- (k) Plug your USB flash drive into either of USB ports (J3 Ethernet / USB) on the transmitter's NAPC168* Controller / Interface PWB. The PuTTY terminal screen should indicate the detection of the USB drive (see Figure 6).

```

===== PuTTY log 2016.10.19 14:01:05 =====
%. ,Sj5r'0jr•Yfull speed USB device using usb-ohci and address 3
usb 1-1.2: configuration #1 chosen from 1 choice
scsi0 : SCSI emulation for USB Mass Storage devices
scsi 0:0:0:0: Direct-Access          General   UDisk             5.00 PQ: 0 ANSI: 2
sd 0:0:0:0: [sda] 3891200 512-byte hardware sectors (1992 MB)
sd 0:0:0:0: [sda] write Protect is off
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] 3891200 512-byte hardware sectors (1992 MB)
sd 0:0:0:0: [sda] write Protect is off
sd 0:0:0:0: [sda] Assuming drive cache: write through
sda: sda1
sd 0:0:0:0: [sda] Attached SCSI removable disk

```

Figure 6: PuTTY terminal screen – USB drive detection

- (l) Using the transmitter's front panel UI, navigate to the **Main Menu ► System Settings ► OS Recovery** screen, which should display the word **Cancel**. Press the UI's up arrow key to change the selection to **Force OS Recovery**. Press the center checkmark button to initiate the process.
- (m) PuTTY.exe allows observation of the process and provides notification when the process is complete. See Figures 7, 8 and 9. The transmitter's LCD does not indicate it is in an OS Recovery process.

```

NAND ID: 9590DC01

Naute1 ARM Bootloader Version 1.10
(Sep 11 2013 - 11:40:39)

Current PC is at 0x080216CC (second stage)
Hit a key to enter menu (3s timeout).....
Starting NAND FALLBACK boot ...
NAND copy zImage to 0x80080000 ...
NAND copy initrd to 0x80800000 ...
NAND copy ATAGS to 0x80002000 ...

Starting kernel ...
Uncompressing Linux.... done, booting the kernel.Linux version 2.6.27.8 (pschmid@linuxdev)
(gcc version 4.3.2 (Sourcery G++ Lite 2008q3-72) ) #70 PREEMPT wed Mar 31 15:18:06 ADT 2010

```

Figure 7: PuTTY terminal screen – recovery process initiated

```

EXT4-fs: ram0: not marked OK to use with test code.
VFS: Mounted root (ext2 filesystem).
Freeing init memory: 124K
Mount proc
Mount sys
Export PATH:/usr/sbin
Found /dev/sda1
Mounting USB Device
mount: /dev/sda1 is not a valid block device
USB not mounted sleeping for 5 seconds ...
scsi 0:0:0:0: Direct-Access          General   UDisk             5.00 PQ: 0 ANSI: 2
sd 0:0:0:0: [sda] 3891200 512-byte hardware sectors (1992 MB)
sd 0:0:0:0: [sda] write Protect is off
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] 3891200 512-byte hardware sectors (1992 MB)
sd 0:0:0:0: [sda] write Protect is off
sd 0:0:0:0: [sda] Assuming drive cache: write through
sda: sda1
sd 0:0:0:0: [sda] Attached SCSI removable disk
Found /dev/sda1
Mounting USB Device
Successfully mounted usb.

*****
*          sys_install.sh          *
*****

==> VSARM_osrecovery.version <==
4.3

==> bootloader_stage2.version <==
VSARM Bootloader Stage2 Version 1.10

```

Figure 8: PuTTY terminal screen – USB drive mounting

(n) Once the USB drive is mounted (see Figure 8), the extraction process should commence (see Figure 9).

NOTE

If the USB drive fails to mount (indicated by PuTTY syntax “USB drive failed to mount, sleeping for 5 sec...”), unplug the USB drive and then plug it in again; the process should continue automatically.

(o) The OS recovery process will take approximately 20 minutes. The OS recovery process is complete when “**Finished Installation**” appears on the screen (see Figure 9).

```

Extracted 91.467 % (30932992/40461824)
Extracted 91.710 % (31588352/40461824)
Extracted 91.929 % (32178176/40461824)
Extracted 92.172 % (32833536/40461824)
Extracted 92.391 % (33423360/40461824)
Extracted 92.634 % (34078720/40461824)
Extracted 92.877 % (34734080/40461824)
Extracted 93.120 % (35389440/40461824)
Extracted 93.363 % (36044800/40461824)
Extracted 93.581 % (36634624/40461824)
Extracted 93.800 % (37224448/40461824)
Extracted 94.043 % (37879808/40461824)
Extracted 94.286 % (38535168/40461824)
Extracted 94.504 % (39124992/40461824)
Extracted 94.723 % (39714816/40461824)
Extracted 94.845 % (40042496/40461824)
Extracted 94.966 % (40370176/40461824)
UBIFS: un-mount UBI device 1, volume 0
UBIFS: un-mount UBI device 0, volume 0

os installation complete.
Finished installation.

BusyBox v1.01 (2010.02.12-18:03+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

/bin/sh: can't access tty; job control turned off
/ # usb 1-1.2: USB disconnect, address 3
y

```

Figure 9: OS recovery completion screen

(p) Turn AC power off to the transmitter. Remove the USB flash drive, close PuTTY window and disconnect the serial port connection. Turn AC power on. Wait two minutes.



4 SOFTWARE UPGRADE

NOTE

The transmitter will reboot as part of the upgrade process.

- (a) Using the transmitter's front panel UI, navigate to the **Main Menu ► System Settings ► Firmware ► Update FW** screen. Press the right arrow. Use the latest software available. A file name similar to nx.5.0.0.44.tgz should be present. If not, press the up arrow. It may take a few seconds for the file name to appear after an AC power recovery. Press the center checkmark button to initiate the process.
- (b) The UI will display a series of messages as the upgrade process occurs. This will take approximately 30 minutes.
- (c) Upon completion, turn AC power off and on to allow a fresh boot up.
- (d) Using the transmitter's front panel UI, navigate to the **Main Menu ► System Settings ► Host Watchdog** screen and select **ON**.

NOTE

Once the OS Recovery is complete, the user database is reset, therefore only the default "Nautel" user is valid with no password required.

Before connecting remotely via the AUI, clear your web browser's cache to remove any obsolete AUI files.

4.1 Verify Component Software

- (a) Go to the network setting page using the local front panel UI (Main Menu > User Settings > Network Settings).
- (b) Record your current network settings (IP Address, Subnet Mask, Default Gateway).
- (c) If internet connection is available to both the transmitter and the PC or laptop used on site, skip to step 4.1 (h).
- (d) Change the IP configuration of the transmitter for a direct connection to the laptop:
 - Enter the DHCP sub-menu and set to DISABLE.
 - Set the IP Address: 10.10.10.2
 - Set the Netmask: 255.255.255.0
- (e) Set the transmitter for Remote enabled control (i.e. local plus remote).
- (f) Update the laptop network settings to match the transmitter network settings. This step assumes system is Windows 7 – adapt as required for computers with different operating systems:
 - On the laptop, go to Start Menu / Control Panel / Network and Sharing Center / Local Area Connection.
 - In the Local Area Connection Status window on the General tab select Properties. Scroll down and highlight Internet Protocol Version 4 (TCP/IPv4). Choose Properties.
 - In the Internet Protocol Version 4 (TCP/IPv4) Properties window, select Use the following IP address.



- Enter the IP Address as 10.10.10.1
 - Enter the Subnet Mask as 255.255.255.0
 - Enter the Default Gateway as 192.168.1.2
 - In the Internet Protocol Version 4 (TCP/IPv4) Properties window, select OK.
 - In the Local Area Connection Properties window, select OK.
 - In the Local Area Connection Status window, select Close.
 - Close the Network and Sharing Center window.
- (g) Connect the laptop network interface card to J3A of the control/interface PWB (A4) on the exciter panel using a CAT5 Ethernet cable.
- (h) Open a web browser on the PC or laptop and enter the transmitter's network IP address in the Address Bar. The transmitter login screen should appear.
- (i) Enter "Nautel" as the User and leave the Password blank. Click Submit.
- (j) Navigate through the remote AUI to Menu > System Settings > Upgrade Software and select the .tgz file in the "Select Upgrade File" window so that it is highlighted. Click Details.
- (k) The Software Versions window will open to compare the installed version of each component against the version that is contained in the .tgz file. It may take a few minutes for the Selected Upgrade information to load.
- (l) Confirm that all components were upgraded successfully. If any rows are highlighted in red, the software upgrade was not completely successful. Close the window and choose Start Upgrade to run the upgrade again. Repeat steps 4.1 (h) to 4.1 (l) until there are no discrepancies.

5 CHANGING THE OS PASSWORD

After completing an OS install or recovery, the OS password must be changed for security purposes. To do this, you will need a way to remotely connect to a Linux computer using SSH and PuTTY. Change the password as follows:

- (a) Connect to the transmitter IP address using your selected SSH client.
- (b) Login with username **root** and password **gckTZbiMEq**
- (c) At the prompt, type the command **passwd**. This is the Linux command to change your password.
- (d) Enter and confirm your new password.
- (e) Record your new password on the Proof of Performance document provided with the transmitter. If you would like Nautel to track your password for support purposes, please email support@nautel.com with your new information.
- (f) Close the console window.



6 RETURNING TRANSMITTER TO SERVICE

- (a) Re-establish user settings that were lost during the upgrade. Refer to step 2, Preliminary Requirements, of this document.
- (b) Restore the former network settings on the transmitter and laptop as required (if steps 4.1 (d) through 4.1 (g) were previously followed) and disconnect the CAT5 Ethernet cable.
- (c) Return the transmitter to operation and desired control status (local/remote). The upgrade procedure is now complete.

