# Information Sheet IS16009

# NX10 and lower – Recovering/Installing the Operating System

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# IS16009: NX10 and lower – Recovering/Installing the Operating System
## INFORMATION SHEET

### 1  INTRODUCTION

This document describes how to recover / install the operating system (OS) of a low power NX series AM transmitter (10 kW and lower).

#### 1.1  Reason for Modification
This procedure may be performed as part of an upgrade or in the event that corruption of the OS has occurred.

#### 1.2  Equipment Affected
This procedure applies to NX3 through NX10 transmitters.

#### 1.3  Responsibility for Implementation of Procedure
This procedure should be carried out by qualified station maintenance personnel who are familiar with NX series transmitters.

#### 1.4  Scheduling
This procedure should be performed only when directed by a software upgrade procedure or when corruption of the OS has occurred. The transmitter will need to be "off air" during this procedure.

#### 1.5  Manpower Requirements
Implementing these instructions will require approximately 60 minutes.

#### 1.6  Special Tools/Test Equipment
- USB flash drive, 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)

#### 1.7  Publications Affected
This modification does not affect the NX series documentation.

#### NOTE
*This procedure will erase the user database. Only the default "Nautel" user will be valid with no password required. Before proceeding, record user settings such as 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.*

### 2  RECOVERING THE OS

#### NOTE
*Ensure adequate internet connection is available for steps 2 (a) to 2 (e) or download the appropriate OS recovery file and PuTTY prior to arriving at the transmitter site.*

(a)  Using a PC or laptop with a web browser, go to www3.nautel.com.

(b)  Select the directory called **NX_Series.**

(c)  Choose the applicable version directory which normally contains the latest/highest OS recovery files. There may be sub directories. Consult with Customer Service if unsure. Download the zip file and this Information Sheet to your laptop. Unzip the image file into its sub-component and copy these to the root directory of a USB memory stick that was previously formatted to FAT32. Refer to Figures 1 and 2.
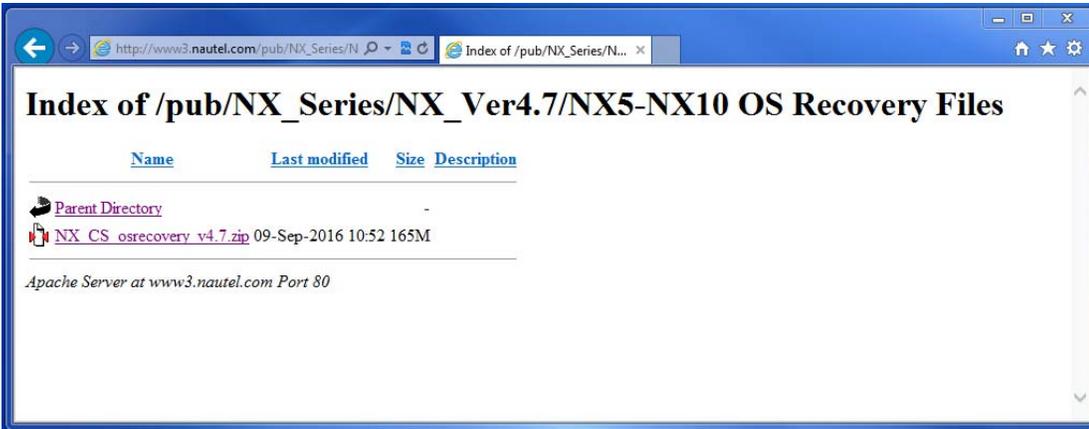


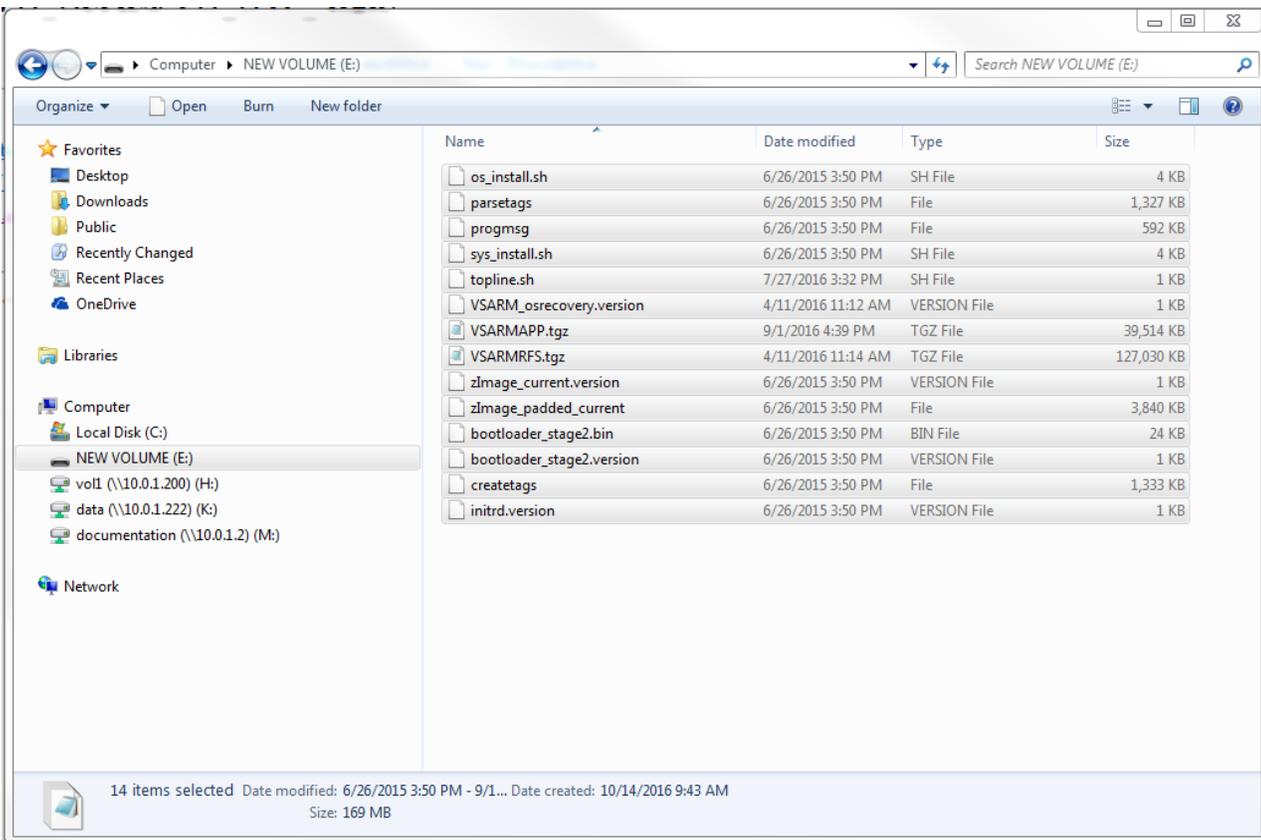**Figure 1: Selecting the latest OS recovery files**



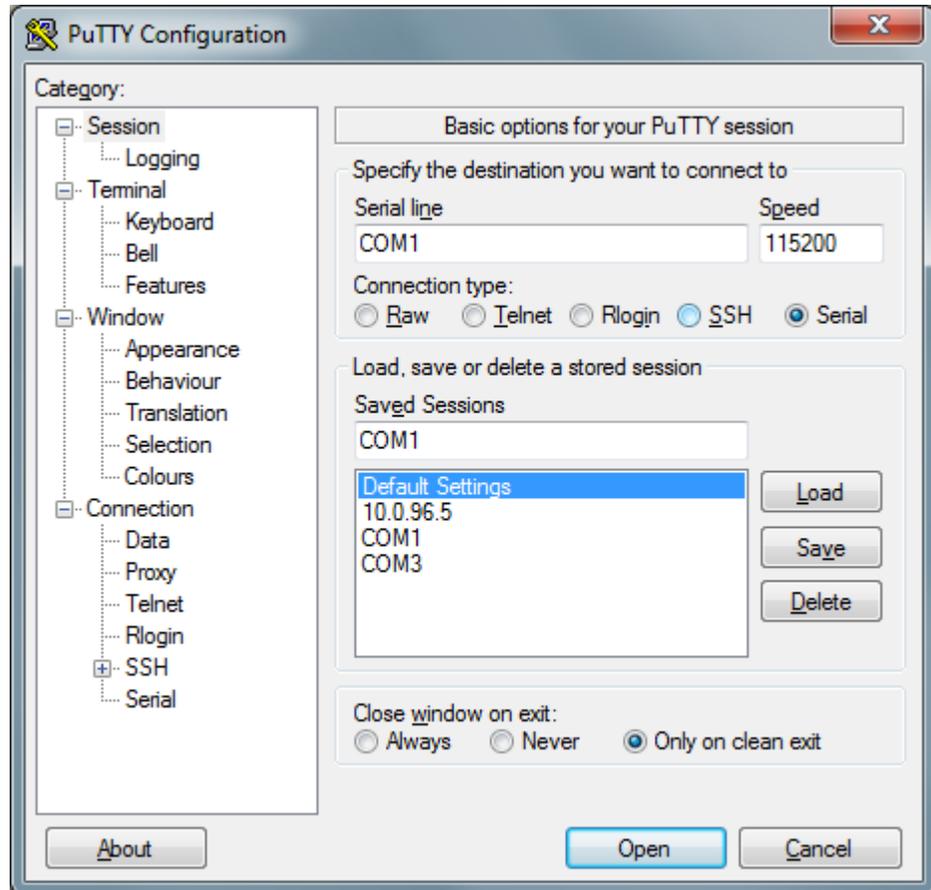**Figure 2: List of NX OS recovery files (example)**

**Figure 3: PuTTY configuration settings**

(d) After successfully downloading the files to the root directory of the flash drive, connect a PC or laptop 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.

(e) Using your PC or laptop, 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.

<u>NOTE</u>

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

(f) 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.

(g) 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.

(h) 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.
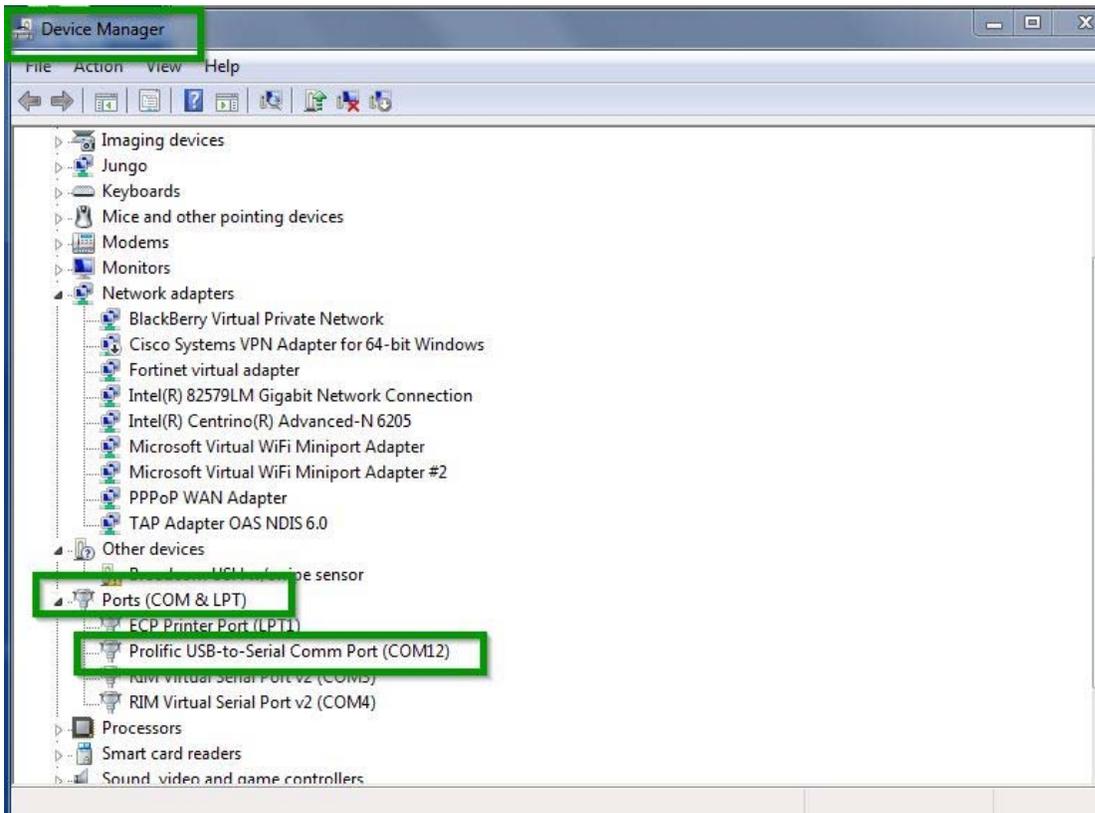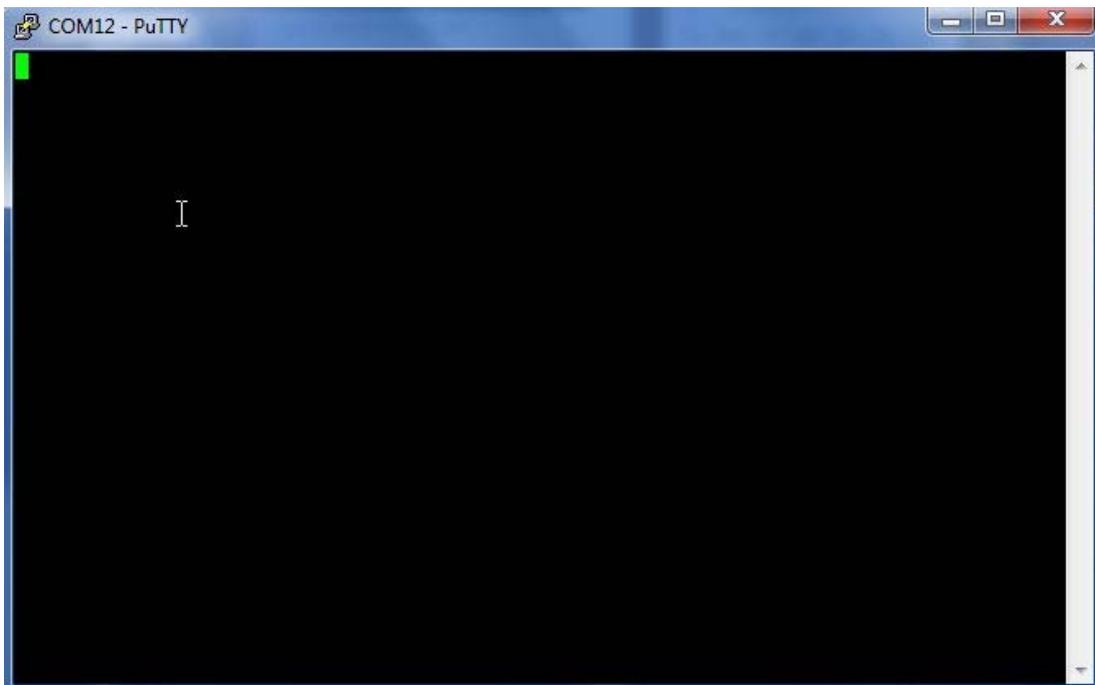
**Figure 4: Device Manager**



**Figure 5: Terminal Screenshot**

(i)     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.

(j)     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 =~=~=~=~=~=~=~=~=~=~=~=
°.,ŠjŠr'Òᴖr•Ýfull 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**

(k)     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.

(l)     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

Nautel 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**

(m)  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.*

(n)  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
ÿ
```

**Figure 9: OS recovery completion screen**

(o)  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 30 seconds.

## 3  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/nx.4.7.0.12.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**.

(e)  This completes the OS Recovery procedure. Return the transmitter to operation and desired control status (local/remote).

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

*Refer to the transmitter's Operations and Maintenance Manual to re-establish lost user settings including: network settings, user accounts, logs, SNMP configuration, email configuration, time zone, notifications and playlists.*

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

## 4  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.


**If you have any questions or require additional assistance, please contact Nautel's Customer Service Department at:**
**Telephone: 1-902-823-5100**
**Email: support@nautel.com**