



Nautel Firmware Uploader – Vector Series

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Nautel Limited
10089 Peggy's Cove Road,
Hackett's Cove, NS, Canada B3Z 3J4
T.877 6 nautel (628835) or +1.902.823.2233
F.+1.902.823.3183 info@nautel.com

U.S. customers please contact:
Nautel Inc.
201 Target Industrial Circle, Bangor ME 04401
T.877 6 nautel (628835) or +1.207.947.8200
F.+1.207.947.3693 info@nautel.com

e-mail: support@nautel.com
www.nautel.com

IS05016D Nautel Firmware Uploader–Vector Series INFORMATION SHEET

1 INTRODUCTION

This document describes how to install a firmware update on a Nautel Vector series transmitter.

1.1 Equipment Affected

This procedure involves the Vector transmitter and a Windows-based PC.

1.2 Responsibility for Implementation of Procedure

This procedure should be carried out by suitably qualified station maintenance personnel.

1.3 Scheduling

This procedure may be implemented at the convenience of station maintenance personnel.

1.4 Manpower Requirements

This procedure requires approximately one hour for a technician to complete.

1.5 Parts Required

You will need a null-modem (cross-over) DB9 serial cable that is long enough to connect between the PC and the rear of the Vector transmitter's exciter.

2 PREPARING THE VECTOR TRANSMITTER

Connect the Vector transmitter to a Windows-based PC and configure the transmitter for firmware uploading as follows:

- (a) Connect a null-modem (cross-over) DB9 serial cable from an available COM port on a Windows-based PC to the DB9 **EXTERNAL - RS-232** serial port (J5) on the remote interface PWB. If a connection was previously made to J5, disconnect it first.

- (b) Configure the Vector to operate with Nautel Code Uploader's communication protocol. The procedure differs if the Vector uses the Nautel Remote Control Protocol or the RSIM remote control/monitoring protocol. Use the transmitter's graphic user interface (GUI) to determine which protocol the Vector is using:

NOTE

Refer to Section 3 of the Vector Transmitter's Technical Instructions Manual for detailed GUI information.

- From the **Main Menu**, select **RCMS Settings**.
 - If the selectable options include **Control Points, Monitor Points** and **Change Baud Rate**, the transmitter is using the RSIM protocol and we will connect using the power cycle sequence. Remove all power sources (ac and dc, if used) from the exciter and proceed to paragraph 3 – *Uploading Firmware*.
 - If the selectable options include **Control Points, Monitor Points, Serial Settings** and **Automatic Reporting**, the transmitter is using the Nautel Remote Control Protocol. Proceed to step (c) unless the last program cycle was unsuccessful, in which case we will connect using the power cycle sequence. Remove all power sources (Ac and Dc, if used) from the exciter and proceed to paragraph 3 – *Uploading Firmware*.
- (c) If the transmitter is using the Nautel Remote Control Protocol, configure it for a 'direct connection' (as opposed to a 'modem connection') before performing the firmware upgrade.



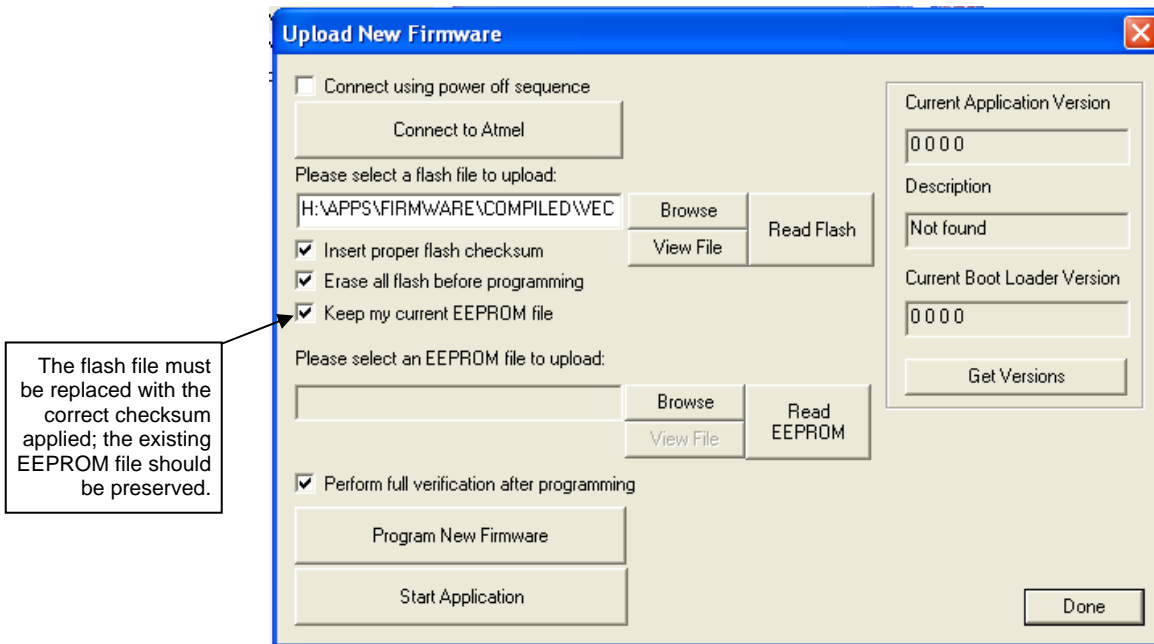


Figure 1: Upload New Firmware Screen

- From the **Main Menu**, select **RCMS Settings**.
- Select **Serial Settings**.
- Highlight the Connection Mode field and verify it is set to **DIRECT**. Modify if necessary.

3 UPLOADING FIRMWARE

From a windows-based PC, install the firmware upgrade on the Vector transmitter as follows:

- Using the PC, open the Nautel Code Uploader application by running `NcodeUploader.exe`.
- Open the **Settings** dialog box. Ensure that the correct COM port is selected for use with the programmer. High-speed programming is optional; if a programming attempt is made with High-speed programming enabled, and it fails, try again with High-speed programming disabled. The **Additional Timeout** setting should be set to 100 ms. Click **OK** when done.

NOTE

High-speed programming will not function if a firmware upgrade is attempted over a modem connection.

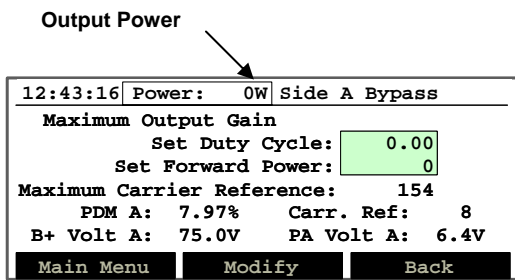
- Open the **Upload Atmel Firmware** dialog box. A popup window will indicate the status of establishing a connection to the transmitter. A message will indicate if the connection was successful.
- If you are connecting with a power cycle sequence, **Failed to establish communications. Please check your connections and try again** will appear. Proceed to step (d).
 - If the failure message appears when you are not connecting with a power cycle sequence, check your COM port connection and null modem and return to step (b).
 - Upon a successful indication proceed to step (e).



- (d) Acknowledge this pop-up and the **Upload New Firmware** dialog box in Figure 1 will appear.
- In the **Upload New Firmware** dialog box, check the **Connect using power off sequence** checkbox.
 - Select **Connect to Atmel**.
 - Restore all power sources (Ac and Dc, if used) to the exciter. A pop-up window should appear indicating that communications are OK.
- (e) Check the **Insert proper flash checksum**, the **Erase all flash before programming**, the **Keep my current EEPROM file**, and the **Perform full verification after programming** checkboxes.
- (f) Load the flash file containing the firmware update.
- Press the upper-most **Browse** button to locate the file.
 - The file name is VECTOR_xxxxx_mmmm_rrrr_NAPC147_2_V#_#_#_#.hex
 - xxxxx (used only for Vector-LP transmitters) can be LP125, LP250 or LP500 for NDB transmitters or LP200, LP375 or LP750 for DGPS transmitters
 - mmmm can be NDB or DGPS depending on the type of Vector transmitter
 - rrrr can be NAUT or RSIM depending on the remote control protocol embedded in the firmware.
 - V#_#_#_# indicates the version of the firmware.
- (g) Click on the **Read EEPROM** button (see Figure 1) to save the EEPROM to a local folder. Note the location of the saved file for future reference.
- (h) Ncode Uploader will verify the integrity of the flash file and a pop-up will indicate success or failure.
- (i) Click on the **Program New Firmware** button to begin the update process.
- (j) A pop-up will appear indicating the progress of the update. When the upgrade finishes, a second pop-up will appear to indicate whether the update failed or succeeded.
- (k) If the update was successful, click on the **Read Flash** button to begin a verify cycle. Place a radial beside *verify against existing file* and press OK. The dialogue *reading firmware from device* will appear. After reading is complete, a new dialogue to select the file to compare to will open. Browse to the file that was programmed and press open.
- (l) If the response is *Verified Flash File Successfully* press OK, otherwise repeat paragraph 3.
- (m) Press the **Start Application** button to re-boot the Vector transmitter. Close NcodeUploader and disconnect the serial cable.
- If the transmitter is used in conjunction with a modem, re-attach the modem to the **EXTERNAL - RS-232** port on the rear of the exciter.
 - If the transmitter is used with Nautel's Remote Control Protocol, return to the **Serial Settings** screen and ensure that the desired configuration is restored.
- (n) Press **RF On** and return the transmitter to operating power.
- (o) Refer to [“Changing Factory Calibrated Settings”](#) in section 3 of the Vector Transmitter's Technical Instructions Manual to navigate to the **Maximum Output Gain** screen found in **Factory Settings** on the Vector GUI.



- (p) Refer to “[Setting Maximum Output Limitations](#)” in section 3 of Vector Transmitter’s Technical Instructions Manual to adjust the values in the **Maximum Output Gain** screen.
- Press **Modify** and then **Next** to select **Set Forward Power**
- Using the up/down arrows increase the **Set Forward Power** value until it matches the output power level displayed in the top line of the GUI.



- (q) Press **Done** then **Main Menu**.
- (r) Turn off RF power.
- (s) After a software upgrade it is possible that some alarms may be present in the **Status** screen. The alarms will not effect the transmitters operation. Enter the **Status** screen and press **Reset**. Verify if any alarms are remaining and, if necessary, follow the steps below to remove them.

- EEP Fail: Auto Reset

On the GUI go to:

- **Settings**
- **Monitor Setting**
- **Automatic Reset** – Under **Automatic Reset** make a change and leave screen
- **Automatic Reset** – Undo the change made above

- EEP Fail: Modem Init

Connect the PC to the transmitter using a null modem serial cable

- Run NCode Uploader

- Cycle (turn off, then on) the transmitter’s ac power
- Select **Vector Modem Initialization** from the NCode Uploader menu
- The modem initialization strings should fill in. If not, press **Retrieve**. Press **Send, OK**, and then close the window
- Disconnect the serial cable

- EEP Fail: Settings

On the GUI go to:

- **Peripherals**
- **Select Peripherals** - Select Overmod Alarm and exit the menu
- **Select Peripherals** – Deselect Overmod Alarm and exit the menu

- (t) Return to the **Status** screen and verify that the alarms have cleared.

- (u) Verify the transmitter’s settings are correct, such as; tone frequency, ident code, modulation percentage, and that modulation, tone generator and keying are set to ON.

- (v) Verify low modulation thresholds are set correctly.

- From the **Main Menu**, select **Settings**.
- Select **Monitor Settings**.
- Select **Mod % Thresholds**.



```

12:43:16 Power: 0W Side A Bypass
-Before proceeding, make sure that you
  have set the ident tone to the minimum
  acceptable modulation depth with PTT
  inactive, and again with PTT active.
-If this is a dual system, ensure tone
  has been set correctly on both sides.
Continue Back

```

Side A Side B

```

12:43:16 Power: 0W Side A Bypass
Mod % Thresholds
Minimum Allowable Tone Modulation Depth:
...PTT Inactive:      164      153
...PTT Active:       1023     1023
                     63.8     63.8
                     35.4     35.4
Compute New  Rf Mon: CURR
Thresholds   Toggle      Back

```

- Select **Continue**.
- Ensure the low modulation threshold for side A and side B if installed, see figure above, is set to approximately 60%, or the desired low modulation.
- If this number is set to 0, re-compute the low modulation threshold. Refer to [“Setting Changeover Mode and RF Monitor Thresholds”](#) in section 4.3.5.5.



