



NxLink

ETHERNET INTERFACE MODULE

Technical Instruction Manual

Issue 1.3 19 December 2007

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

Warranty

by Nautel Limited/Nautel Inc. (herein after referred to as Nautel)

Nautel Limited/Nautel Incorporated, hereinafter referred to as Nautel, guarantees all mechanical and electrical parts of the equipment for a period of thirteen months from date of shipment.

1. A "Part Failure" shall be deemed to have occurred when the part has become defective, or does not have the characteristics required for the specified equipment performance:
 - (a) When the equipment is operated within the design parameters, and
 - (b) When the equipment is installed and adjusted according to Nautel's prescribed procedures as stated in the instruction manual.
2. Nautel shall provide replacements for all "Parts" at no cost to the Customer when they become defective during the warranty period, and upon the return of the defective part.
3. In the event that a "Part" fails during the warranty period and causes damage to a sub-assembly that cannot be readily repaired in the field, the entire sub-assembly so damaged may be returned to Nautel for repair. The repairs will be made without charge to the Customer.
4. Where warranty replacements or repair are provided under items 2 or 3, Nautel will pay that part of the shipping costs incurred in returning the part/assembly to the Customer.
5. Warranty replacement parts and repair, which are provided under items 2 or 3, shall be guaranteed for a period of ninety days from date of shipment or until the end of the original warranty period, whichever occurs later.
6. Nautel will not assume responsibility for any charges incurred by other than Nautel employees.
7. Nautel shall have the privilege of investigating whether failures have been caused by factors beyond its control.
8. Nautel shall in no event be liable for any consequential damages arising from the use of this equipment.
9. When requesting a warranty repair/replacement, please provide complete and accurate information. Observe the instructions regarding 'Equipment Being Returned to Nautel' on page two of this warranty and provide the information requested.
10. When ordering spare/replacement parts, please provide complete and accurate information. Refer to the parts list of the Repair manual for ordering information. Provide as much of the information requested for 'Equipment Being Returned to Nautel' on page two of this warranty as is practical. The information identified by an asterisk is the minimum required.

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
24hr. Answering Service 1.902.823.3900

Nautel Inc.
201 Target Industrial Circle
Bangor ME USA 04401
T. 877 6 nautel (628835) or 1.207.947.8200
F. 1.207.947.3693

Customer Service Notice

A 'Technical Assistance' and 'Plug-in Module Exchange' service is available to Nautel users.



Factory Support

TECHNICAL ASSISTANCE

Nautel's field service department provides telephone technical assistance on a 24 hour, seven days a week basis.

Requests by other media (facsimile or e-mail) will be responded to the next working day if received after Nautel's normal working hours. Contact the appropriate field service centre from the following:

U.S.A. customers use:	Nautel Inc. 201 Target Industrial Circle Bangor, Maine 04401	T. +1.207.947.8200 (24 hours) or 877 6 nautel (628835) F. +1.207.947.3693
All other customers use:	Nautel Limited 10089 Peggy's Cove Road, Hackett's Cove, NS, Canada B3Z 3J4	T. +1.902.823.3900 (24 hours) or 877 6 nautel (628835) F. +1.902.823.3183 E-Mail support@nautel.com Web www.nautel.com

MODULE REPAIR SERVICE

During the transmitter's warranty period, repair of modules is performed at no charge to the customer. Once the warranty period has expired, module repairs will be invoiced based on material and labour costs.

MODULE EXCHANGE SERVICE (*North American Customers Only*)

North American customers can take advantage of Nautel's module exchange service. This service gives customers a fast and efficient solution in the event of a hardware problem. When a customer's transmitter experiences a failure, Nautel can send out a factory rebuilt module to replace the faulty module. Nautel's two locations, Canada and the United States, provide quick turn around times, keeping our customers on the air.

During the transmitter's warranty period, exchange of modules is performed at no charge to the customer. Once the warranty has expired, the cost of a module exchange is only 40% of the list price for the module, provided the faulty module is returned to Nautel within 30 days and can be rebuilt; should the module not be returned an additional invoice for 40% of the list price will be issued.

MODULE RETURN INSTRUCTIONS

All equipment being returned to Nautel for repair or replacement should be marked with a Nautel provided RMA number and addressed to the appropriate Nautel facility.

Complete and accurate information regarding the equipment will expedite shipment of replacement(s). Refer to the name plate on the transmitter and the appropriate module assembly and include with the shipment:

- Transmitter model number
- Transmitter serial number
- Module name
- Module serial number
- Return shipping address

RETURN FACILITIES

U.S.A. customers:	RMA # Nautel Inc. 201 Target Industrial Circle Bangor, Maine 04401 USA	Telephone: (207) 947-8200 x 109 Fax: (207) 947-3693
Canadian customers:	RMA # Nautel Limited. Attention: Field Return 10089 Peggy's Cove Road Hackett's Cove, NS B3Z 3J4 Canada	Telephone: (902) 823-3900 x 100 Fax: (902) 823-3183



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Release Control Record

Issue	Date	Reason
1.0	11 May 2007	New product; approved release
1.1	16 July 2007	Added NOTE after 2.2 (a) re. changing password after logging in
1.2	31 October 2007	Expanded information in paragraph 2.1 – Initial Setup; Added reference to terminal settings in section 4 – Software Upgrade; Updated menu display pictures.
1.3	19 November 2007	Replaced Figure 2-3 and edited associated text.



NxLink

TECHNICAL INSTRUCTION MANUAL

Section 1 OVERVIEW

The NxLink provides remote access to Nautel transmitters over an IP network. A web browser is required to view status and modify transmitter operation. The NxLink can be used with a variety of Nautel transmitter systems.

NxLink is a serial to LAN adapter that uses Nautel developed software to convert the remote serial protocol of the equipment to information on web pages.

The features of NxLink include:

- Remote monitoring and control of Nautel equipment with a web browser
- Remote access to alarm and event logs (retrieval of event logs is not available for all Nautel products; contact Nautel for more detail)
- Configurable Email reporting of critical alarms

- Ability to Save or Email equipment status for later review
- Two browser modes: Normal and single column (suitable for PDAs). To use single column, simply append '\pda' to the NxLink IP address.

The NxLink has an RJ45 connector with two indicators. The speed indicator is lit when connected to a 100 Mb LAN. The link indicator flashes with LAN activity. Port 0 is used for device configuration (network parameters). Port 1 is used for equipment communication.

The NxLink software can be easily upgraded over the LAN using an FTP client, or with a direct serial connection to the device (using a terminal program).

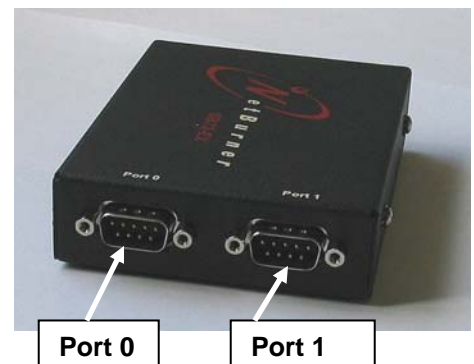
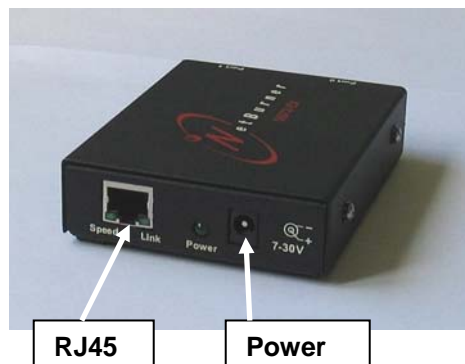


Figure 1: NxLink Hardware



NxLink

TECHNICAL INSTRUCTION MANUAL

Section 2 INITIAL SETUP AND CONFIGURATION

2.1 INITIAL SETUP

- (a) Obtain an IP address, Gateway address, Netmask and DNS Server address from your LAN administrator.

Some Nautel equipment allows you to configure these settings directly from the GUI. See the associated transmitter manual for NxLink Configuration instructions.

For transmitters that do not contain an NxLink configuration screen, proceed as follows:

If the network is configured for DHCP, the IP address will be automatically assigned by the network. To assign a static IP address or retrieve the DHCP assigned IP address, use the method outline below.

- (b) Using a PC, start up a terminal program such as Hyperterminal. Set the COM settings to:

Bits per second: 115200
Data bits: 8
Parity: None
Stop bits: 1
Flow Control: None

NOTE

For DHCP networks do not press 'A' in step (c). After 20 s, the DHCP defined IP address should appear on the terminal screen, and should repeat every 10 s thereafter.

- (c) Plug the serial port of the PC into Port 0 of the NxLink using a 9-pin serial cable of sufficient length. Ensure the NxLink is connected to the LAN via its RJ45 connector and a Cat5e cable of sufficient length. Apply power (between 7 and 30 V dc) to the NxLink using the transmitter supplied connector or an ac-dc adapter. For DHCP networks; see the previous NOTE. To proceed with assigning a static IP address, from the PC terminal program, press 'A' when the message "Waiting 10 seconds to start 'A' to abort" appears. A message similar to the following should appear:

```
Netburner SB72EX Monitor Vx.x date
time
HELP for help
nb>
```

- (d) Type "setup" at the nb> prompt. The setup menu should appear. Type "7" and press Enter. When the message "Wait?" appears, type "10" and press Enter. Ensure the following settings are displayed:

```
IP Address: 0.0.0.0
IP Mask: 255.255.255.0
IP Gateway: 0.0.0.0
Wait: 10
DNS Server: 0.0.0.0
```



- Enter “1” to set the IP Address.
 - Enter “2” to set the IP Mask.
 - Enter “3” to set the IP Gateway.
 - Enter “A” to set the DNS server address.
 - Enter “S” to save.
 - Enter “X” to exit.
- (d) Connect the PC to the LAN, ensuring that the IP address and mask are appropriate.
- (e) Open a web browser and enter the URL of the NxLink. For example if the IP address was 123.456.7.89 then use http://123.456.7.89 for the NxLink address in the browser. To use single column, simply append ‘pda’ to the NxLink IP address.
- (f) Verify that the page in Figure 2-1 appears. Proceed to paragraph 2.2 – Configuration.

2.2 CONFIGURATION

- (a) Click on the Login link and use a username/password that provides full control of the NxLink. If this is the first time that the NxLink is being configured, use the default username/ password of “root/nautel”. This account has full permissions and can be used for initial setup.

NOTE

For security purposes, Nautel strongly recommends you change your password (see paragraph 2.4 - Users Link).

- (b) Once logged in (see Figure 2-2), the left hand side of the screen will change to show administrative links. Click on the Site Configuration link to select and set up the connected equipment (see 2.3.1) and also to set up the outgoing email parameters (see 2.3.2). Click on the User Administration link to add users and to modify user properties (see 2.4).

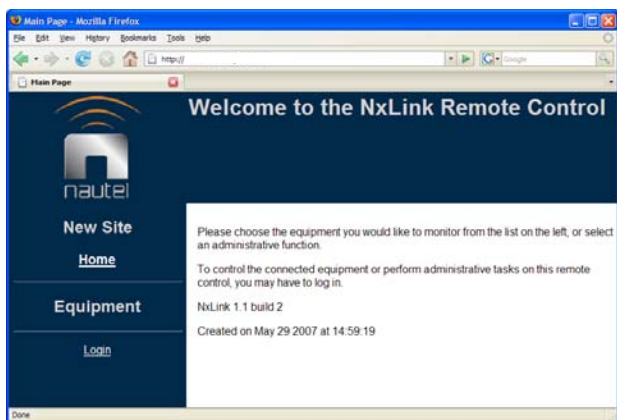


Figure 2-1: NxLink Main Page

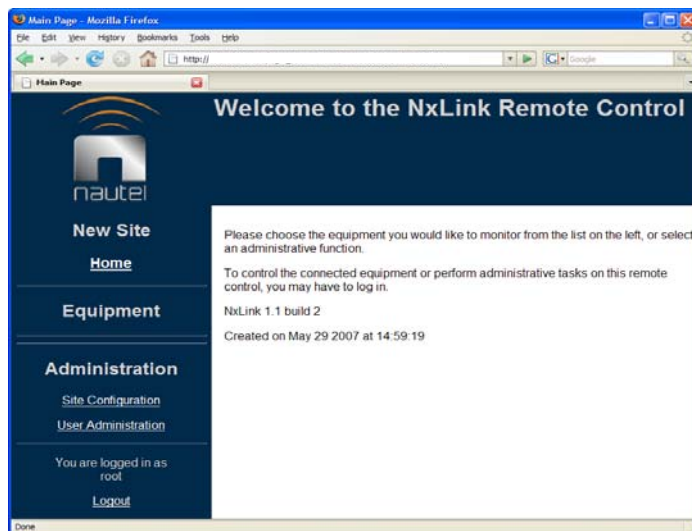


Figure 2-2: NxLink Main Page – Logged In



2.3 SETUP LINK

2.3.1 Connected Equipment Settings

All equipment which is to be controlled and monitored by the NxLink must be set up in this dialog. The primary device **MUST** be the transmitter or system controller that the NxLink is serially connected to. Devices further down in the equipment hierarchy are selected as sub-devices. The dropdown box shows all supported equipment.

The supported equipment is listed by common name (e.g., V5) and Nautel type (e.g., NARF45). There can be several versions of supported equipment, as indicated with unique type; therefore it is important that the correct type be selected. You can check the equipment label (on the back) for equipment type, or contact Nautel if you cannot identify your equipment.

Each piece of equipment that is added is assigned a tab in the navigation bar and a hyperlink under Equipment on the left side of the page. The device tabs will appear in the same order as they appear in the sub-device list. Clicking on the device's assigned tab will allow it to be configured using the dialog illustrated in Figure 2-4.

NOTE

In a combined system with two V10s, the primary device would be an SC1 System Controller and each V10 would be listed as sub-devices.

Site Configuration - Windows Internet Explorer

http://192.168.1.9/setup_conn.htm?user=root&session=1273435260

File Edit View Favorites Tools Help

Site Configuration

Site Configuration

Remote Panels Email Server **New Device**

Name New Site

Primary Device V5 (TYPE: NARF45) New Device

Sub-device 1 None

Sub-device 2 None

Sub-device 3 None

Sub-device 4 None

Sub-device 5 None

Sub-device 6 None

Submit Reset

DEVICE TAB

Figure 2-3: Device Setup Page



There are eight configurable information pages available for each device, and each page can contain up to 16 channels of equipment data. As shown in Figure 2-4, selecting the Equipment tab displays a page listing the data assigned to the eight available pages (scroll down to see all pages).

Selecting the Customize link on any page in the list allows modification of the channel data, as shown in Figure 2-5.

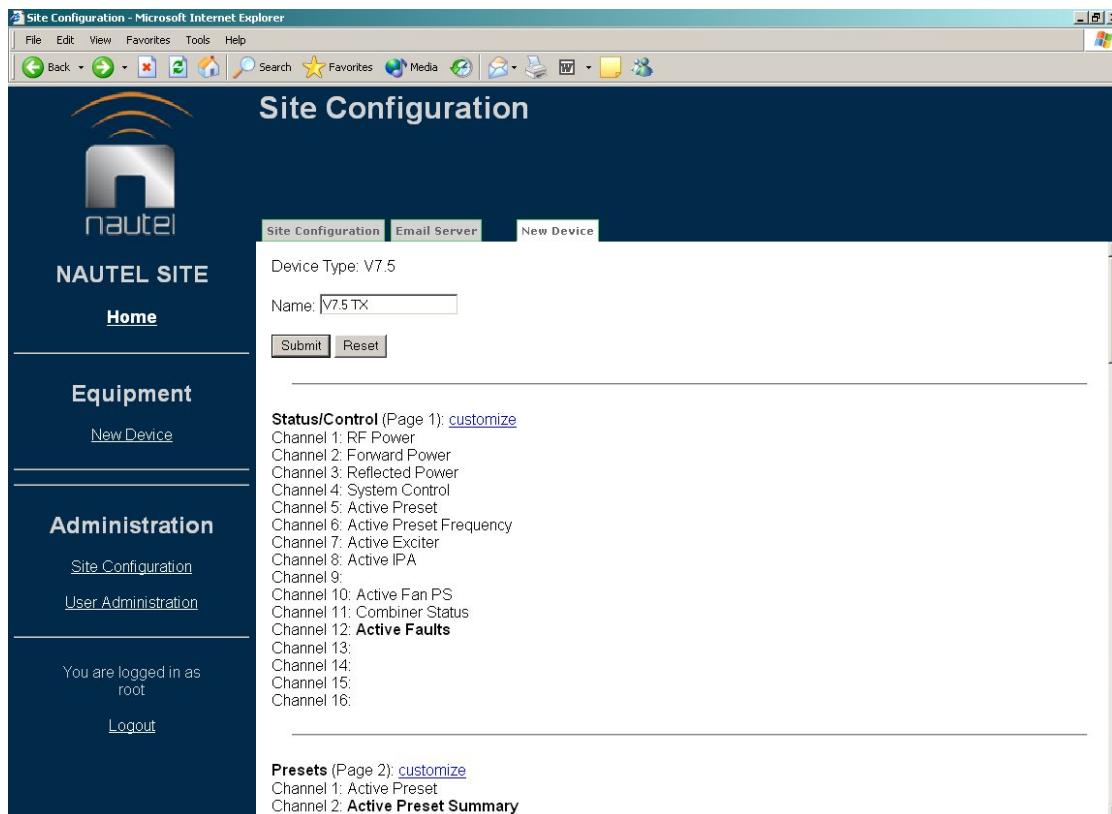


Figure 2-4: Setup Equipment Page - Configure



Each page of equipment data can be named and any available equipment data can be assigned to any channel. There are factory default page names (e.g., System Summary, Presets, Meters, Alarms, etc.), that are linked to tabs, and channel names (e.g., RF Power, System Control, Active Faults).

Choose the drop down box on any channel to see the list of available equipment data. Some data are complex (indicated in bold text) in that they can be selected as a single type but will show as multiple data. An example is **Active Faults**, which will show any and all faults.

Click on **Submit** (bottom of screen) to save changes, or **Reset** (bottom of screen) to restore previously saved settings.

Figure 2-5: Setup Equipment Page – Configure, Customize



2.3.2 Email Configuration

The dialog in Figure 2-6 is accessed by selecting the Email Server tab at the top of the page. Use it to set up the outgoing email parameters.

In order to use the feature (discussed later) of the NxLink, whereby it can send emails when events occur in the equipment, the email server must be configured. Enter the server

name and an email address (which will appear in emails from the NxLink as the sender). If the email server requires login, check the Login Required box and enter a username and password to the email server.

Click **Submit** (bottom of screen) to save any changes. Click **Reset** (bottom of screen) to restore original settings.

Site Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Site Configuration

NAUTEL SITE

[Home](#)

Equipment

[V7.5 TX](#)

Administration

[Site Configuration](#)

[User Administration](#)

You are logged in as root

[Logout](#)

Site Configuration Email Server V7.5 TX

SMTP Server:

Return Address:

Login Required? ☐

Mail Server Username:

Mail Server Password: (Unassigned)

Figure 2-6: Device Setup Page – Email Configuration



2.4 USERS LINK

Selecting the User Administration link will bring up a page that displays, as a minimum, the registered users. Depending on permissions assigned to the logged on user, other information may be presented. As shown in Figure 2-7, the logged in user is 'root', who has full permissions. As a result, this user is allowed to add new users. Adding a new user requires entering username, password and permissions.

There are four levels of permissions, each with their own specific function: User Administration, Site Configuration, Equipment Control and none. They can be selected in any combination. If none are selected, no permission is granted. Any user, regardless of permission level, can change their own password and email parameters.

User Administration: Only level that can add, remove and modify other users. No site configuration or equipment control functions.

Site Configuration: Allowed to do all Setup link functions (see 2.3). No administrative or equipment control functions.

Equipment Control: Equipment can be monitored and controlled. No administrative or site configuration functions.

None (no permission boxes checked): Only allowed to monitor equipment data.

NOTE

*In order to perform software upgrades (see section 4), a user must have **both** User Administration and Site Configuration permissions checked.*

With User Administration permissions, all registered users will show as an active hyperlink. Any other permission level will only show the logged in user as an active hyperlink. Clicking on a user hyperlink allows user configuration to be modified as shown in Figure 2-8 and 2-9.

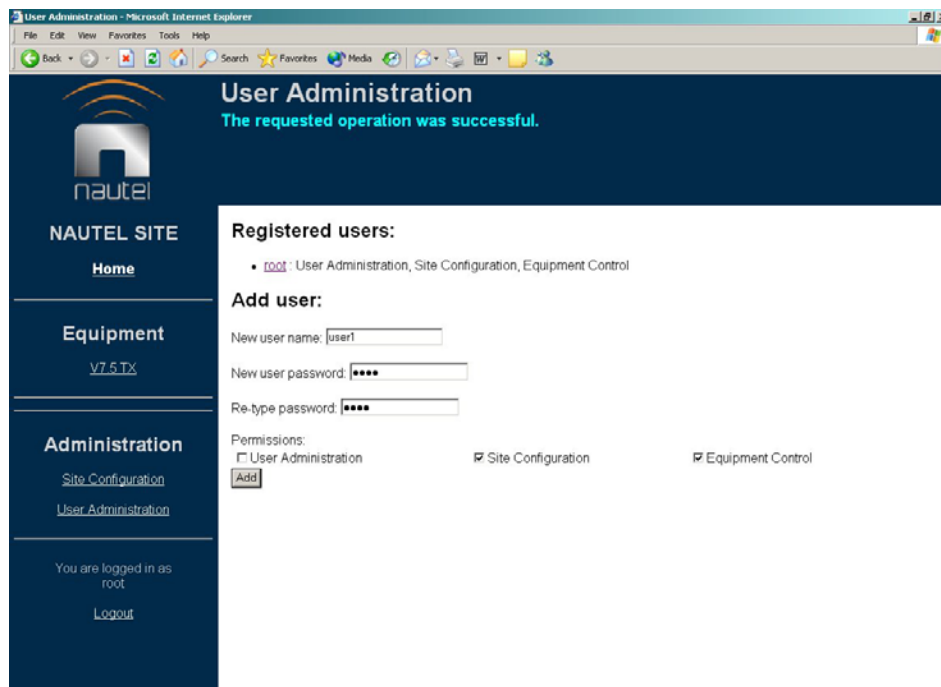


Figure 2-7: User Administration Page



A logged in user without User Administration permission will see a page similar to that shown in Figure 2-8. The user may change their own password, email address and email alert settings. There are three levels of email alert: Off-Air, Reduced Power and Maintenance Required, as well as four levels of information: None, Minimal, Summary and Full.

- A Minimal email only contains the event type and time.
- A Summary email contains event type and time, plus a collection of important meters (equipment type dependent), and a list of active faults.
- A Full email includes all available equipment data.

Each equipment event is categorized into one of the three alert levels, so if an alert level is selected for either Minimal, Summary or Full, an email will be sent to the user whenever an event with the specified alert level occurs.

User Administration
root

Change Password

New Password:
 Re-type Password:

Change Email Settings

Email Address:

Automatic Notification
V7.5 TX

Condition	Don't Send	Send Minimal	Send Summary	Send Full
Off Air	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduced Power	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance Required	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2-8: User Administration Page – Registered User Settings (Minimum)



A user logged in with Administration permission, who selects another user, will see the information described previously, plus options to change the selected user's password or to remove the selected user.

In the example shown in Figure 2-9, user1 has been selected. All functions (Remove User, Set Permissions, Change Password and Change Email Settings) would apply to user1.

User Administration
user1

NAUTEL SITE
[Home](#)

Equipment
[V7.5 TX](#)

Administration
[Site Configuration](#)
[User Administration](#)

You are logged in as root
[Logout](#)

Remove User
[Remove User](#)

Set Permissions
☐ User administration ☒ Site administration ☒ Equipment control
[Set Permissions](#)

Change Password
New Password:
Re-type Password:
[Change Password](#)

Change Email Settings
Email Address:

Automatic Notification
V7.5 TX
[Condition](#) [Don't Send](#) [Send Minimal](#) [Send Summary](#) [Send Full](#)

Figure 2-9: User Administration Page – Registered User Settings (Full)



NxLink

TECHNICAL INSTRUCTION MANUAL

Section 3 OPERATION

Click the link to the equipment from the list on the left side of the page to view its information. If you are not logged in, or do not have sufficient account privileges, then it is only possible to view information.

Figure 3-1 shows the first page of status as a logged in user with privileges to control the equipment. The page to be viewed is chosen by selecting the appropriate tab at the top of the page. Any equipment information that may be modified (i.e. controlled) is shown with a drop box, buttons or a data entry box on the right side of the page. If you are not logged in or have insufficient privilege, then the status information is shown but controls are not.

It is possible to customize the information and title of each page as illustrated in Figure 2-5.

The information line shows the time that the data shown was collected from the equipment. Whenever a control is attempted, the information line will indicate success or failure (and why it failed). For example, if the equipment is in Local mode, some controls will not be allowed.

When viewing any of the Status pages, the NxLink will automatically refresh them every two minutes. Pages are also refreshed when a control is selected (ie On, Off, or when the browser refresh is selected).

The automatic refresh on status pages means that a user will only be logged off by selecting the Logout link on the left side of the page. On any other page, lack of user activity of 30 minutes will cause an automatic logout.

The screenshot displays the NxLink web interface for a device named 'YOUR-FM'. The left sidebar contains navigation links: 'New Site', 'Home', 'Equipment' (with 'YOUR-FM' selected), and 'Administration' (with 'Site Configuration' and 'User Administration' sub-links). The main content area has tabs for 'System Summary', 'Presets', 'Meters', 'Alarms', 'Module Status', 'Main/Standby Config', and 'About this equipment'. Below the tabs, a table lists various parameters and their current values, with controls on the right for each row:

Parameter	Value	Control
RF Power	On	Off / On
Forward Power	5.023 kW	Increase / Decrease
Reflected Power	11 W	
System Control	Remote	
Active Preset	2	2 (dropdown) / Submit
Active Preset Frequency	98.10 MHz	98.10 (text box) / Submit
Active Exciter	A	
Active IPA PA	A	
Active IPA PS	A	
Active Fan PS	A	
Combiner Status	Stand alone	Reset

Figure 3-1: Device Status Page



Selecting the “Event Log” tab displays the event logs in the equipment. Each log in the list shows the timestamp and type. Clicking on a log will change all of the data on the status pages to show logged data instead of live data. The “Event Log” tab is not available for all transmitters.

When viewing log data, another tab will appear, labelled ‘Live Status’. Clicking this

tab will change the data in the status pages to live data.

The information line above the status page tabs will indicate that logged data is being shown along with log timestamp and type.

NOTE

Controls cannot be used when logged data is shown.



Figure 3-2: Event Log Page

Selecting the “Save” tab allows a snapshot of the event log, at its current state, to be saved. The file may be saved as plain text

on the disk of the machine being used to browse the device, or alternatively, be sent to an Email recipient.



Figure 3-3: Save Page



Selecting “About this equipment” displays information about the device being monitored. Information includes equipment type and software version(s).

The screenshot shows the Nautel web interface. On the left is a navigation menu with the Nautel logo, 'New Site', 'Home', 'Equipment' (with a sub-link 'YOUR-FM'), and 'Administration' (with sub-links 'Site Configuration' and 'User Administration'). The main content area is titled 'Device: YOUR-FM' with a timestamp 'Data retrieved 2007-11-01T11:18:51'. Below this is a tabbed interface with tabs for 'System Summary', 'Presets', 'Meters', 'Alarms', 'Module Status', 'Main/Standby Config', and 'About this equipment' (which is selected). Under the 'About this equipment' tab, it shows 'Type: V5 (TYPE: NARF45)' and a table with device details: 'Virtuoso V5 FM Transmitter', 'V5 2.0 Release 3 Build 3', 'Sept 12 200', and 'Nautel Limited'. Below this is a 'Calibration Data' table with two columns of meter coefficients.

Meter	Coefficient	Meter	Coefficient
0	0.274000	18	0.223001
1	0.163000	19	0.736000
2	0.208000	20	1.574998
3	1.000000	21	0.567000
4	1.001000	22	0.682957
5	1.000000	23	0.188516
6	1.000999	24	0.183595
7	1.574998	25	0.316796
8	0.223001	26	1.000000

Figure 3-4 About This Equipment



NxLink

TECHNICAL INSTRUCTION MANUAL

Section 4 SOFTWARE UPGRADE

The NxLink software is upgradeable using the following procedure:

NOTE

*The logged in user must have **both** Administration and Site permissions to perform a software upgrade.*

- Obtain the appropriate software upgrade file from Nautel.
- Open an FTP session between the computer with the upgrade file and the Nxlink. Terminal settings are listed in 2.1 step (b). Follow the steps shown in the typical FTP session (see Figure 4-1, use the IP address programmed into the NxLink).

- Upload the file to the NxLink.
- Close the FTP session.

Figure 4-1 illustrates a typical FTP session run from the Windows command line.

Other FTP clients such as Ipswitch WSFTP (see Figure 4-2) may be used instead of the command line type FTP application.

The NxLink will re-boot upon closing the FTP session and will restart running the upgraded software.

Unless specifically mentioned in Nautel's release notes, a software upgrade will not result in the loss of any previously entered equipment or user information.

Figure 4-1: Typical FTP Session



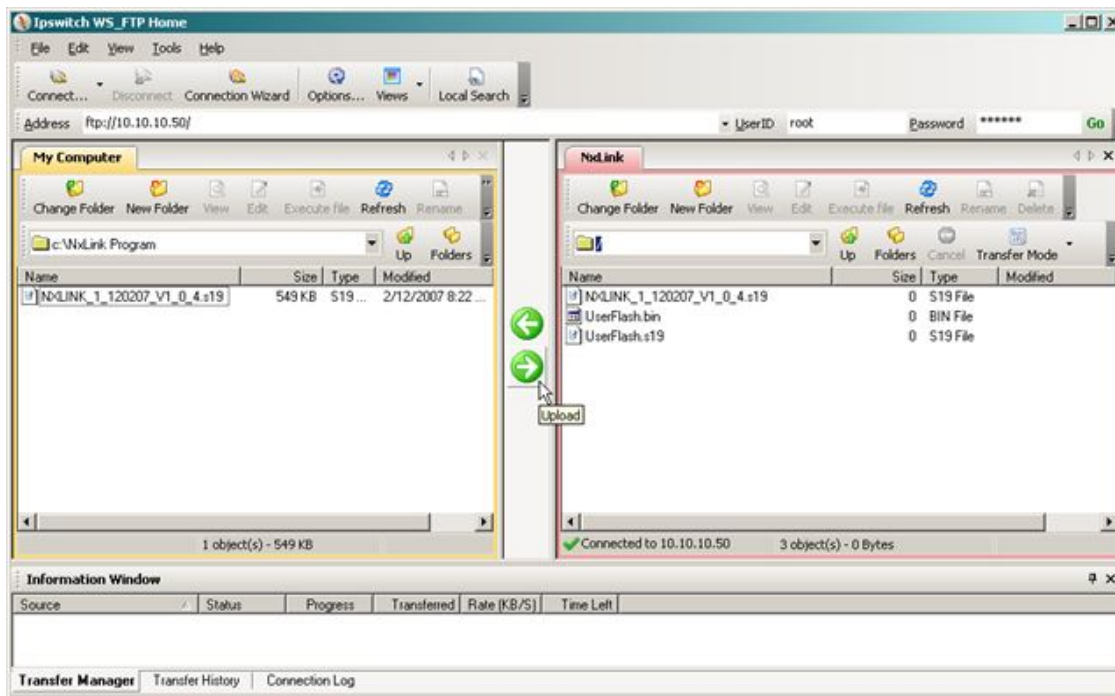


Figure 4-2: Ipswitch WSFTP Client

