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# **BriLAN NMS**

**Network Management System**

## **Reference Guide**

**January 9, 2002**

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## **SALES**

**Address:**

SoftHill Technologies Ltd.  
1329 UnaWay  
Vancouver, V3C 2V1, BC  
CANADA

**Phone:** +1 604 710 8089

**Fax:** +1 208 379 8913

**e-mail:** [sales@softhill.com](mailto:sales@softhill.com)

## **TECHNICAL SUPPORT**

**Address:**

SoftHill Technologies Ltd.  
1329 UnaWay  
Vancouver, V3C 2V1, BC  
CANADA

**Phone:** +1 604 710 8089

**Fax:** +1 208 379 8913

**e-mail:** [support@softhill.com](mailto:support@softhill.com)

## **INTERNET**

**Web:**

[www.softhill.com](http://www.softhill.com)  
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## PREFACE



This Installation Guide provides instructions on how to install and configure devices using SoftHill's BriLAN Network Operating System.

### Dear Customer,

Thank you for purchasing BriLAN - the most effective last-mile revolutionary One-Box solution in the entire fixed wireless broadband industry.

Through a combination of **BriLAN** Network Operating System (**BriLAN NOS**) and standard “off the shelf” components based on Ix86 architecture, you can build a multifunctional network device. BriLAN is designed for wired (Ethernet, FastEthernet) or wireless transmission (using unlicensed 2.4 GHz ISM and 5.8 GHz ISM bands) of data and analog information as well as digital voice. BriLAN enables high-performance and cost effective **LAN-to-LAN**, **LAN-to-WAN** and **PBX-to-PBX** or **Phone-to-Phone** connectivity.

The BriLAN package contains two main components: network operation system (**BriLAN NOS**) and the management software (**BriLAN NMS**).

**BriLAN NOS** comes in two versions:

- ❖ **BriLAN PRO** –a software package for handling different types of network data, combining multiple functions: Bridge, Multiplexer, Router, Hub, Switch, and Active Repeater.
- ❖ **BriLAN VOX** –a software package that interconnects the world of telecommunications with the world of information technologies. It provides all the data communication functionality of BriLAN PRO but also includes Voice communication features.

**BriLAN NMS** – is a sophisticated management system for managing BriLAN controlled devices. It combines a complete set of network performance, planning and analysis tools in a single program running under Windows 95/98/NT/2000/XP OS.

To learn more about networking using the **Device**, you can also visit our web site at: [www.softhill.com](http://www.softhill.com) or [www.brikan.com](http://www.brikan.com).

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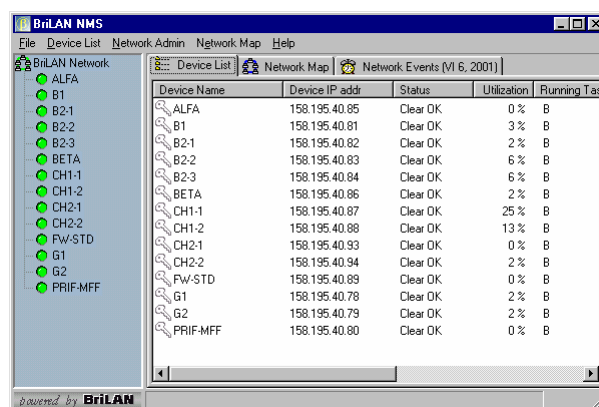
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## THE BRILAN NMS WINDOW

 This chapter provides information on the Main Menu of BriLAN NMS.

When you start the BriLAN NMS application the BriLAN NMS main program window is displayed.



The BriLAN NMS window is divided into two main panes. You can find the short list of **Devices** available in your **BriLAN Network** in the left **BriLAN Network Activity** pane. The right pane holds navigating tabs for quick access to your devices, statistics or network events.

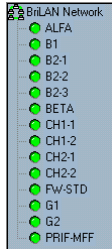
The main menu of the BriLAN NMS program window contains commands for configuring, tuning and managing your Devices.

File Device List Network Admin Network Map Help

- ❖ **File menu** – The File menu collects commands to provide basic configuration of your Devices.
- ❖ **Device List menu** – The Device List menu contains commands to add and remove Devices from the list of managed Devices.
- ❖ **Network Admin menu** – The Network Admin menu contains commands to undertake common administration tasks with your BriLAN Network.
- ❖ **Network Map menu** – The Network Map menu collects commands to customize the BriLAN Network Map.

- ❖ **Help menu** – The Help menu provides on-line assistance to specific queries.

The **BriLAN Network Activity** pane contains the list of your Devices added to the BriLAN Network.



You can easily determine the status of your Devices listed in the BriLAN Network Activity Pane using the color-code LED diodes.

**Green** – The services running on your Device are in 100 per cent state.

**Yellow** – Some problems were experienced with one or more services, ports or configuration of your Device.

**Red** – One or more services, ports or configuration of your Device experiencing critical errors without possibility of automatic recovery.

**Gray** – There is no access to your Device for serious network connectivity reasons (no route or Device is down).

The navigation pane of the BriLAN NMS window contains tabs for quick access to your **Device List**, **Network Map**, and **Network Events**.



- ❖ **Device List** – The Device List tab contains the list of basic information about the status, and loading of services currently running on your Devices connected to the BriLAN network.
- ❖ **Network Map** – The Network Map tab contains your Devices organized by connections into a network map.
- ❖ **Network Events** – The Network Events tab contains the logs of registered network events on your Devices.

## The Device List tab

In the details pane of **Device List** of the BriLAN NMS you will find information on the status and loading of currently running services on your Devices.

Use the following buttons for easier navigation in your Device List:

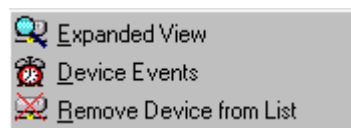
Device Name	Device IP addr	Status	Utilization	Running Tasks	TimeSync Master	S/N
-------------	----------------	--------	-------------	---------------	-----------------	-----

- ❖ **Device Name** – The Device Name is a unique text variable of a particular Device with maximum length of 20 characters.

- ❖ **Device IP Addr.** – The Device IP Addr. is a unique IP address reserved for a particular Device.
- ❖ **Status** – The Status variable informs you about the overall operational status of a particular Device.
- ❖ **Utilization** – The Utilization variable displays the CPU performance graphs of a particular Device.
- ❖ **TimeSync. Master** – The TimeSync. Master variable contains IP address of the Time Synchronization Master computer, which is required for synchronization of time and date for management purposes.
- ❖ **Running Tasks** - The Running Tasks variable displays one-character codes of the currently active services on a particular Device: (B – for bridging, R – for routing, S – for traffic shaping, BSP-broadcast storm protection)
- ❖ **S/N** – The S/N variable displays the serial number of BriLAN NOS running on a particular Device.
- ❖ **SW ver.** – The SW ver. variable displays the version of BriLAN NOS running on a particular Device.
- ❖ **UpTime** – The UpTime variable displays the elapsed time from the last restart of a selected Device.

### *The Device List popup menu*

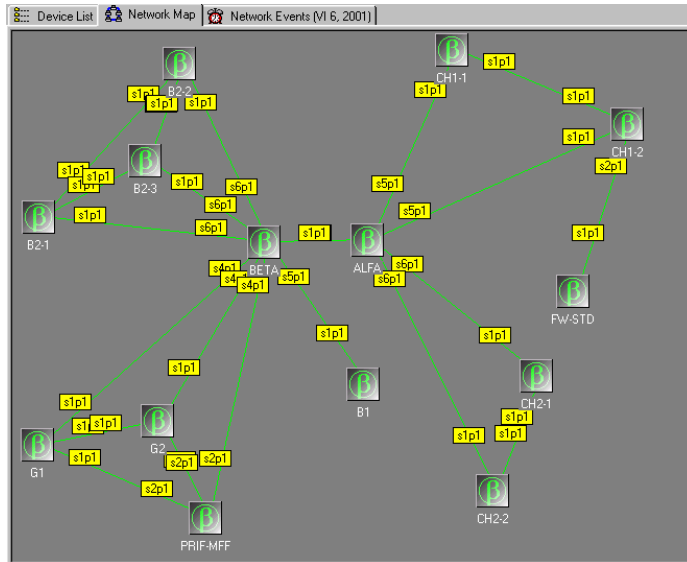
To access the *Device* properties listed in the details pane of the Device List tab, right click the record of a selected *Device*.



- ❖ **Expanded View** – Each *Device*, listed on your *BriLAN Network* can be simultaneously displayed in details in it's own **Expanded View** window.
- ❖ **Device Events** – Each *Device* records actions, events, warnings related to it's operational status or accessibility of your **BriLAN Network**.
- ❖ **Remove Device form List** – Use the Remove Device form List command to remove the entry of a selected Device from the **Device List**.

## The Network Map tab

The **Network Map** tab contains your *Devices* organized by connections into a network map. You can easily determine the ways your *Devices* are connected. This Network Map is generated automatically when you add a *Device* to your BriLAN Network.



The Device icons are color-coded:

**Green** – The services running on your Device are in 100 per cent operational state.

**Yellow** – Some problems were experienced with one or more services, ports or configuration of your Device.

**Red** – One or more services, ports or configuration of your Device is experiencing critical errors without possibility of automatic recovery.

**Gray** – There is no access to your Device for serious network connectivity reasons (no route or Device is down).

## The Network Events tab

The **Network Events** tab contains records about the actions, events and warnings related to the operational status of your **Devices** or accessibility of your **BriLAN Network**.

Severity	Received at	Sent by	Event Message
Clear	VI 6, 2001 08:37:38	BETA	Port status changed to "CLEAR OK" on port s2p1 [Ethernet]
Clear	VI 6, 2001 08:37:38	BETA	Port status changed to "CLEAR OK" on port s1p1 [Ethernet]
Clear	VI 6, 2001 10:44:09	CH1-2	Port status changed to "CLEAR OK" on port s3p1 [Ethernet]
Clear	VI 6, 2001 08:37:38	BETA	Port status changed to "CLEAR OK" on port s3p1 [Ethernet]
Clear	VI 6, 2001 12:00:33	CH2-2	Port status changed to "CLEAR OK" on port s4p1 [Ethernet]
Clear	VI 6, 2001 14:03:26	G1	Port status changed to "CLEAR OK" on port s5p1 [Ethernet]
Warning	VI 6, 2001 10:44:04	CH1-2	Port status changed to "LINK DOWN" on port s3p1 [Ethernet]
Warning	VI 6, 2001 14:03:16	G1	Port status changed to "LINK DOWN" on port s5p1 [Ethernet]
Warning	VI 6, 2001 12:00:18	CH2-2	Port status changed to "LINK DOWN" on port s4p1 [Ethernet]
Info	VI 6, 2001 08:14:41	CH1-2	NMS logged in (from IP address 158.195.43.27)
Info	VI 6, 2001 08:14:25	CH1-2	Device started
Info	VI 6, 2001 09:52:50	FW-STD	NMS logged in (from IP address 158.195.64.118)
Info	VI 6, 2001 09:52:40	CH1-2	NMS logged in (from IP address 158.195.64.118)
Info	VI 6, 2001 09:52:30	CH1-1	NMS logged in (from IP address 158.195.64.118)
Info	VI 6, 2001 09:50:35	PRIF-MFF	NMS logged in (from IP address 158.195.64.118)
Info	VI 6, 2001 08:54:34	PRIF-MFF	Device restarted (by NMS 158.195.43.27)
Info	VI 6, 2001 08:07:25	CH1-1	NMS logged in (from IP address 158.195.43.27)
Info	VI 6, 2001 08:07:05	CH1-1	Device started
Info	VI 6, 2001 09:54:39	G2	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:40	B1	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	CH1-2	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	B2-1	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	CH1-1	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	B2-3	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	PRIF-MFF	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	G1	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	FW-STD	NMS logged in (from IP address 195.168.130.228)
Info	VI 6, 2001 09:54:39	BETA	NMS logged in (from IP address 195.168.130.228)

You can easily determine the operation status of your **BriLAN Network** using color-coded event logs:

**Blue** – This log record only contains data of an informative nature? *Not sure what you are trying to say here*

**Green** – This log record informs you about the 100 per cent operational state of a service, port or configuration running on your **Device**.

**Yellow** – This log record

informs you about some problems experienced with one or more services, ports or configuration of your *Device*.

**Red** – This log record informs you about critical problems (non-recoverable) experienced with one or more services, ports or configuration of your *Device*.

## File menu

The **File** menu of the BriLAN NMS program window contains commands for basically configuring your Devices using the **Serial Line Console**.

## Device menu

The **Device** menu of the BriLAN NMS program window contains commands for adding and removing your Devices in the BriLAN Network.

## Network Admin menu

The **Network Admin** menu of the BriLAN NMS program window contains commands to provide common administration tasks with your BriLAN Network.

## Network Map menu

The Network Map menu of the BriLAN NMS program window contains commands to customize the BriLAN Network Map.

## Help Menu

The **Help** menu of the BriLAN NMS program window contains commands for searching and browsing BriLAN on-line help file.

## THE FILE MENU



This chapter provides information on the File menu of BriLAN NMS.

The **File** menu of the BriLAN NMS program window contains commands for working with your *Devices* using **Serial Line Console**.

You can access the following menu items in the **File** menu of the **BriLAN NMS** program window:



### Serial Line Console

To open the **Serial Line Console** window, click the **Serial Line Console** command.

The **Serial Line Console** is used for setting up initial operating parameters of the **BriLAN NOS** software. The basic set up of *BriLAN NOS* requires a temporary serial cable connection between *BriLAN NMS* and the **Device**.

For more information refer to the appropriate chapter in this Guide or refer to the BriLAN Installation Guide.

### Exit

Click this command to quit the **BriLAN NMS** application.



## THE DEVICE LIST MENU

 This chapter provides information on the Device List menu of BriLAN NMS.

The **Device List** menu of the BriLAN NMS program window contains commands for adding, removing and managing *Devices* from your BriLAN Network.

You can access the following menu items in the **Device List** menu of the **BriLAN NMS** program window:



### Add Device to List

To add a new *Device* to the *BriLAN Network*, click the **Add Device to List** command.

Your *BriLAN Network* contains the *Devices* you may access. These *Devices* are available in **Device List** and **Network Map**. The **Device List** contains the list of basic information about the status, and loading of currently running services on your Devices connected to the *BriLAN Network*. The **Network Map** contains your Devices organized by connections into a network map. You can select the Device to add to your **Network Map** by entering IP address of your **Device** in the **Add Device** dialog.

Each *Device* listed on your *BriLAN Network* can be simultaneously displayed in detail in it's own **Expanded View** window (see the Expanded View section).

### Remove Device from List

To remove a selected *Device* from *BriLAN Network*, click the **Remove Device from List** command.

Your *BriLAN Network* contains the *Devices* you may access. These *Devices* are available in the **Device List** and in the **Network Map**. The **Device List** contains the list of basic information about the status, and loading of currently running services on your Devices connected to the *BriLAN Network*. The **Network Map** contains your *Devices* organized by connections into a network map.

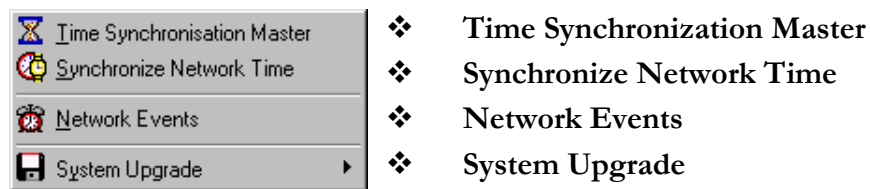
Each **Device**, listed on your **BriLAN Network**, can be simultaneously displayed in detail in it's own **Expanded View** window (see the Expanded View section).

## THE NETWORK ADMIN MENU

 This chapter provides information on the Network Admin menu of BriLAN NMS.

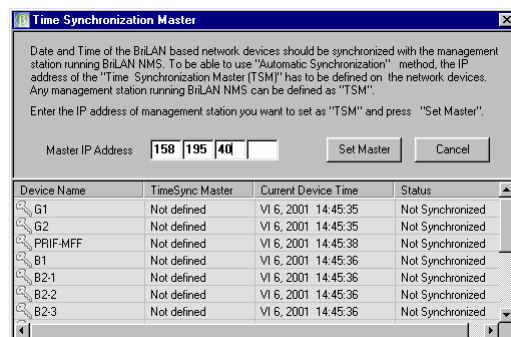
The **Network Admin** menu of the BriLAN NMS program window contains commands for synchronizing the BriLAN NOS time, viewing network events and upgrading BriLAN NOS on the Devices.

You can access the following menu items in the **Network Admin** menu of the **BriLAN NMS** program window:



## Time Synchronization Master

Date and time of your **Devices** connected to the **BriLAN Network** should be synchronized with the local system date and time on the computer running the BriLAN NMS program. The time synchronization procedure works in automatic and manual mode. To use the automatic time synchronization method, one of your computers running BriLAN NMS should be defined as Time Synchronization Master (TSM).

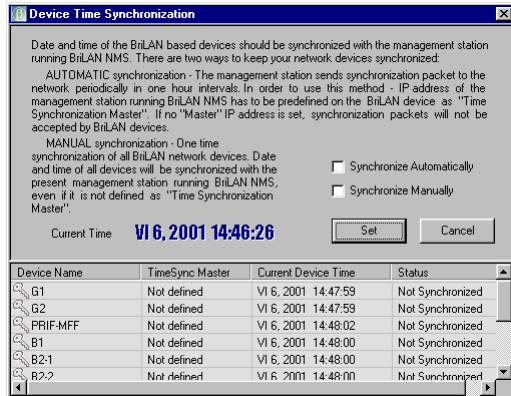


To define the computer as Time Synchronization Master for your **BriLAN Network** enter a valid IP address for the PC running **BriLAN NMS**.

You can check the current assignment of TSM of your **BriLAN Network** in the **Time Synchronization Master** window.

## Synchronize Network Time

Date and time of your *Devices* connected to the *BriLAN Network* should be synchronized with the local system date and time on the computer running *BriLAN NMS* program. To synchronize time and date on your *Devices* you should be logged onto the *Device* with system administrator rights (with opened SysAdmin level).



There are two methods to keep your *Devices* synchronized:

**Automatic Synchronization** – TSM broadcasts time synchronization packets in your *BriLAN Network* (1 packet per hour), which are accepted by the *Devices* with selected Automatic Synchronization method.

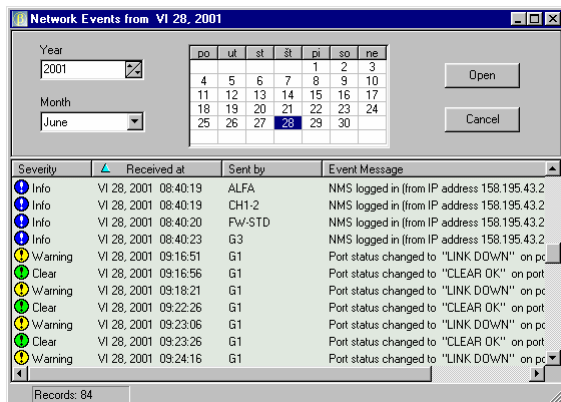
**Manual synchronization** – Requests immediate single-shot time synchronization for your *Devices* with the TSM.

**Current Time** – The Current Time variable informs you about the local system time.

## Network Events

*Devices* connected to your *BriLAN Network* record actions, accessibility and warnings related to operational status.

To preview events registered in your *BriLAN Network*, first select month, year and date in the upper pane and then click **Open** button to display network events for a selected day. The **Network Events** window contains logged event records on all *Devices* in your *BriLAN Network* for a selected date. You can sort listed event records by clicking on the column headers.



❖ **Severity** – The Severity variable is used for grouping events by authority categories.

❖ **Received at** – The Received at variable contains time and date information, when the event was received.

❖ **Sent by** – The Sent by variable contains the **Device name**, which sent the event.

❖ **Event Message** – The Event

Message variable contains detailed description of the given event

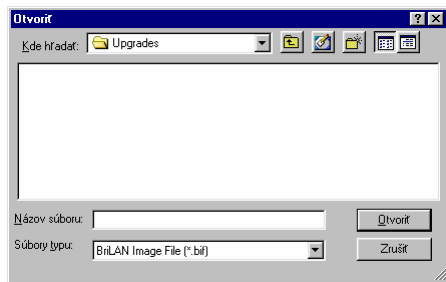
## System Upgrade

The **System Upgrade** command of the **Network Admin** menu is used for remote upgrades of BriLAN NOS on your **Devices** connected to the **BriLAN Network**.

BriLAN Image File  
BriLAN Configuration Utility


- ❖ The **BriLAN Image File** command is used for remote upgrade of a previous version of BriLAN Image File over the network from **BriLAN NMS** to all **Devices**.
- ❖ The **BriLAN Configuration Utility** command is used for remote upgrade of a previous version of BriLAN Configuration Utility over the network from **BriLAN NMS** to all **Devices**.

The **Enter file name** box is used for entering the name of an appropriate BriLAN NOS file for upgrade.



Use the **Browse** button to select an appropriate BriLAN NOS file for upgrade in the **Open** dialog.

## THE NETWORK MAP MENU

 This chapter provides information on the Network Map menu of BriLAN NMS.

The **Network Map** menu of the *BriLAN NMS* program window contains commands to customize the appearance of the **Network Map**.

You can access the following menu items in the **Network Map** menu of the **BriLAN NMS** program window:



- ❖ **Show Port Labels** – The Show Port Labels command changes the visibility of port labeling information.
- ❖ **Wireless Link Information** – The Wireless Link Information command changes the visibility of wireless link quality information.
- ❖ **Rebuild Connections** – The Rebuild Connections command rebuilds the connection map.

### Show Port Labels

The **Network Map** can be displayed with or without information about the ports, which are used to connect your *Devices*. Ports are labeled with the **sXpX** nomenclature. The **sXpX** nomenclature designates particular physical interfaces available on your Device (e.g. s2p1 means physical Port 1 on the Interface Card 2).

### wireless Link Information

The **Network Map** may contain additional information on the quality of wireless links established between your *Devices*.



- ❖ **Signal Levels** – The Signal Levels option changes the visibility of the signal level information for wireless links between your *Devices*.
- ❖ **DS Channels** – The DS Channels option changes the visibility of information about the used DS channels for wireless links between your *Devices*.

- ❖ **DS Frequencies** – The DS Frequencies option changes the visibility of information about the used DS frequencies for wireless links between your *Devices*.
- ❖ **Link Utilization** – The Link Utilization option changes the visibility of information about the utilization of wireless links between your *Devices*.

## Rebuild Connections

The **Rebuild Connections** command rebuilds immediately the connection map between your Devices displayed on the Network Map tab. You may need this command after changing the topology of your BriLAN Network.

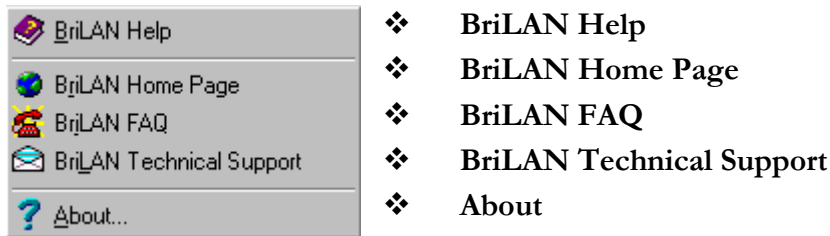
## THE HELP MENU



This chapter provides information on the Help menu of BriLAN NMS.

The **Help** menu of the BriLAN NMS program window contains commands for searching and browsing BriLAN on-line help file.

You can access the following menu items in the **Help** menu of the **BriLAN NMS** program window:



### BriLAN Help

Use the **BriLAN Help** command to get the list of available on-line help topics in alphabetical order.

### BriLAN Home Page

Use the **BriLAN Home Page** command to open the BriLAN home pages in your default browser.

### BriLAN FAQ

Use the **BriLAN FAQ** command to open the BriLAN web pages about the frequently asked questions in your default browser.

### BriLAN Technical Support

Use the **BriLAN FAQ** command create a mail message addressed to BriLAN Technical Support with your default mail client.



## About

Use the **About** command to determine the current version of your BriLAN NMS software.



The **About** command opens the a window containing information on the current version and build number. It also provides information about the BriLAN copyright. Press the ESC button to close the about window.

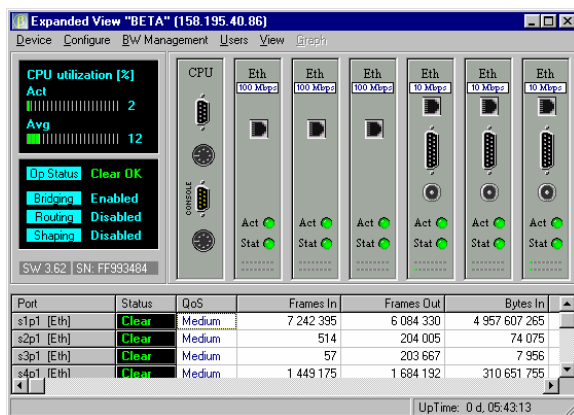
## THE EXPANDED VIEW WINDOW



This chapter provides information on the main menu of Expanded View window of BriLAN NMS.

To perform network management tasks with a selected Device, continue in the **Expanded View** window.

**BriLAN NMS** performs all remote control functions for management, forwarding, filtering, and monitoring of available network services (bridging, routing traffic shaping, virtual channeling), as well as traffic analysis and billing, built-in triggers and event logging in the one management system. Applied forwarding, filtering, and monitoring rules on selected BriLAN network services define your customized **BriLAN Policies**.



There are several ways to open an **Expanded View** window for the **Device**:

- ❖ Double-click the LED icon of the **Device**.
- ❖ Double-click the icon of the **Device** on **Network Map** tab.
- ❖ Double-click on the record of the **Device** on **Device List** tab and then click the **Expanded View** command.
- ❖ Right-click on the icon of the **Device** on the **Network Map** tab and then click the **Expanded View** command.
- ❖ Right-click on the record of the **Device** on **Device List** tab and then click **Expanded View** command.

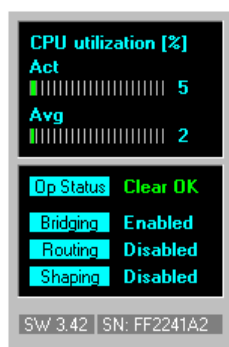
The **Expanded View's** main menu of the **BriLAN NMS** program contains the following menu items:

Device Configure BW Management Users View Graph

- ❖ Device
- ❖ Configure
- ❖ BW Management
- ❖ Users
- ❖ View
- ❖ Graph

## The Device status

The Device status indicator pane informs you about the status and loading of currently running services on a selected Device.



- ❖ **CPU utilization** - The CPU utilization variable displays the CPU performance graphs
- ❖ **Op Status** - The Op Status variable provides information about the overall operation status of the selected Device: Clear OK means normal operation,
- ❖ **Bridging** - The Bridging variable is set to “Enabled”, when the bridging service is enabled, and set to “Disabled”, when the bridging service is disabled.
- ❖ **Routing** - The Routing variable is set to “Enabled” when the routing service is enabled, and is set to “Disabled” when the routing service is disabled.
- ❖ **Shaping** - The Shaping variable is set to “Enabled” when the traffic shaping service is enabled, set to “Disabled” when the traffic shaping service is disabled.
- ❖ **Software Version** - The Software Version identifier box gives you information about the version number of running BriLAN NOS (**SW**) and about its unique serial number (**SN**).

## Uptime counter

UpTime: 21 d, 02:54:20

The **UpTime** variable informs you about the elapsed time from the last restart of a selected Device.

## Device

The **Device** command of the Expanded View main menu provides accessibility to commands used for maintaining BriLAN NOS on a selected Device.

## Configure

The **Configure** command of the Expanded View main menu provides accessibility to the configuration commands of available services on a selected *Device*.

## BW Management

The **BW Management** command of the **Expanded View** main menu provides accessibility to commands for applying the bandwidth management policy on a selected *Device*.

## Users

The **Users** command of the **Expanded View** main menu provides accessibility to the database Network nodes on a selected *Device*.

## View

The **View** command of the **Expanded View** main menu allows you to change the Network Traffic activity pane on a selected *Device*.

## Graph








The **Graph** command of the **Expanded View** main menu allows you to work with Network Traffic activity data on a selected *Device* in graphical form.

## THE EXPANDED VIEW MENU

 This chapter provides information on the Device menu of the Expanded View window of BriLAN NMS.

The **Device** command of the Expanded View main menu provides accessibility to commands used for maintaining BriLAN NOS on a selected **Device**.

Basic system maintenance operations include changing command accessibility, system upgrades and remote restarts. The **Device** popup menu of the **Expanded View** window contains the following menu items:



 SysAdmin Level	❖	SysAdmin Level
 Device Admin Properties	❖	Device Admin Properties
 System Upgrade	❖	System Upgrade
 Time Synchronization Master	❖	Time Synchronization Master
 Synchronize Device Time	❖	Synchronize Device Time
 Device Events	❖	Device Events
Rebuild Connection Table	❖	System Upgrade
 Device Restart	❖	Rebuild Connection Table
Close	❖	Device Restart
	❖	Close

### SysAdmin Level

The **Open SysAdmin Level** command of the **SysAdmin Level** popup menu enables access to the management features of your Device.

When the remote management console communicates with your **Device** it checks the password of the System Administrator. Authorized users work in so called **SysAdmin Level** mode. After completing installation a new BriLAN Network Device the default password is set to “SysAdmin”.

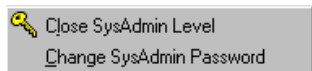
#### *Open SysAdmin Level*

 Open SysAdmin Level	Use of the remote management commands is password dependent. When passing to SysAdmin Level mode you
 Change SysAdmin Password	

should enter the SysAdmin password. Valid passwords have a length between 6 and 20 characters and differentiate between upper and lower case letters. If you forget your SysAdmin password, establish a direct cable connection and enter a NEW password!

## Close SysAdmin Level

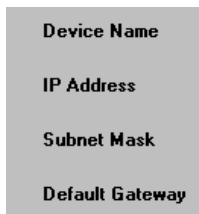
The **Close SysAdmin Level** command of the **SysAdmin Level** popup menu disables the use of management features of your Device.



- ❖ **Close SysAdmin Level** - The yellow colored key on the left side to the Close SysAdmin Level command indicates that SysAdmin Level commands are enabled. For security reason it is recommended that SysAdmin commands are disabled by closing the **SysAdmin Level** mode when closing your BriLAN NMS session.
- ❖ **Change SysAdmin Password** - The Change SysAdmin Password command of the **SysAdmin Level** popup menu changes the SysAdmin Level password.

## Device Admin Properties

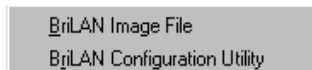
The **Device Admin Properties** command of the **Device** menu is used to set basic identity and accessibility parameters of your **Device** like name, network address, etc.



- ❖ **Device Name** – The Device Name box should contain a unique text identifier for your Device.
- ❖ **IP Address** – The IP Address box should contain a unique **IP Address** reserved for your Device.
- ❖ **Subnet Mask** – The Subnet Mask box should contain a network masquerading variable (e.g. 255.255.255.0 for C-class networks).
- ❖ **Default Gateway** – The **Default Gateway** box should contain a IP address of the gateway.

## System Upgrade

The **System Upgrade** command of the Device menu is used for remote upgrades of BriLAN NOS (Image File, and Configuration Utility).



- ❖ The **BriLAN Image File** command is used for remote upgrade of a previous version of BriLAN Image File over the network from BriLAN NMS to

the Device.

- ❖ The **BriLAN Configuration Utility** command is used for remote upgrade of a previous version of BriLAN Configuration Utility over the network from BriLAN NMS to the Device.

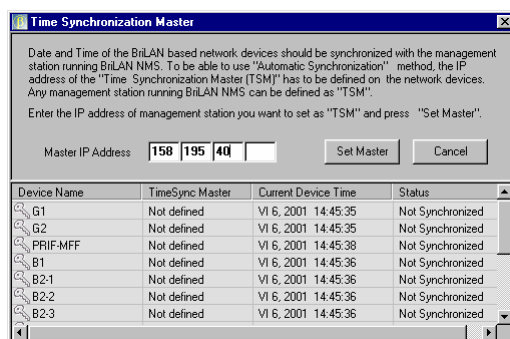
The **Enter file name** box is used for entering the name of an appropriate BriLAN NOS file for upgrade.



Use the **Browse** button to select an appropriate BriLAN NOS file for upgrade.

## Time Synchronization Master

Date and time of your *Devices* connected to the *BriLAN Network* should be synchronized with the local system date and time on the computer running BriLAN NMS program. The time synchronization procedure works in automatic or manual mode. To use the automatic time synchronization method, one of your computers running BriLAN NMS should be defined as Time Synchronization Master (TSM).

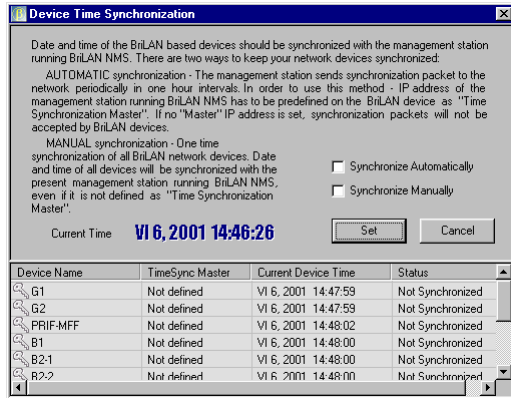


To define a PC as Time Synchronization Master for your *BriLAN Network* enter a valid IP address of the PC running *BriLAN NMS*.

You can check the current assignment of TSM of your *BriLAN Network* in the **Time Synchronization Master** window.

## Synchronize Network Time

Date and time of your *Devices* connected to the *BriLAN Network* should be synchronized with the local system date and time on the computer running *BriLAN NMS* program. To synchronize time and date on your Devices you should be logged on to the Device with system administrator rights (with opened SysAdmin level).



There are two methods to keep your **Devices** synchronized:

**Automatic Synchronization** – TSM broadcasts time synchronization packets in your BriLAN Network (1 packet per hour), which are accepted by the Devices with selected Automatic Synchronization method.

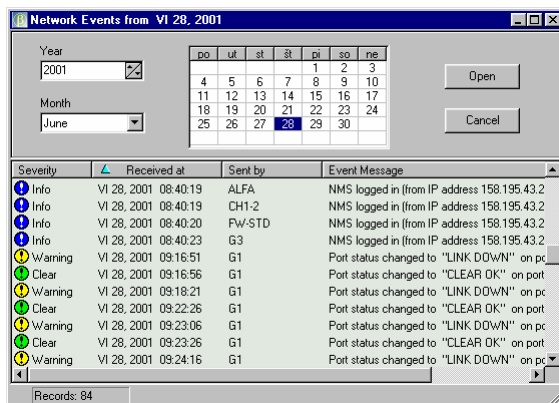
**Manual synchronization** – Requests immediate single-shot time synchronization for your **Devices** with the TSM.

**Current Time** – The Current Time variable informs you about the local system time.

## Device Events

A **Device** connected to your **BriLAN Network** records actions, accessibility, warnings related to its operational status.

To preview events registered in your **Device**, first select month, year and date in the upper pane, and then click **Open** button to display network events for a selected day. The **Device Events** window contains logged event records for the selected **Device** for a selected date. You can sort event records for a selected **Device** by clicking on the column headers.



- ❖ **Severity** – The Severity variable is used for grouping events by authority categories.
- ❖ **Received at** – The Received at variable contains time and date information, when the event was received.
- ❖ **Sent by** – The Sent by variable contains the **Device name**, which sent the event.
- ❖ **Event Message** – The Event Message variable contains detailed description of the given event

## Rebuild Connection Table

Use the **Rebuild Connection Table** command of the Device menu to create a new connection map of your Devices (e.g. after adding a new Device).



## Device Restart

Use the **Device Restart** command of the Device menu to provide restart your Device remotely (e.g. after upgrading BriLAN NOS files).

## Close

The **Close** command of the Device menu is used for closing a session with a selected Device.

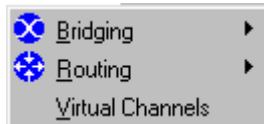
## THE EXPANDED VIEW CONFIGURE MENU



This chapter provides information on the Configure menu of the Expanded View window of BriLAN NMS.

The **Configure** command of the Expanded View main menu provides accessibility to the configuration commands of available services on a selected Device.

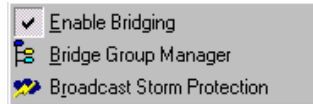
Using **BriLAN NOS** you can run the following network services (or any appropriate combination of them) on your Device: **Bridge**, **Router**, **Virtual Channels** which are available through the **Configure** popup menu. The **Expanded View's Configure** menu of the **BriLAN NMS** program contains the following menu items:



- ❖ **Bridging** - The checkmark on the left side to the Bridging command indicates that the bridging service was started.
- ❖ **Routing** - The checkmark on the left side to the Routing command indicates that the routing service was started.
- ❖ **Virtual Channels** - The checkmark on the left side to the Virtual Channels command indicates that the Virtual Channels service was started.

### Bridging

Your BriLAN Device may operate as a MAC-layer multiport learning bridge. Your BriLAN bridge works on level 2 of reference OSI model with store and forward method of packet handling. It works with a maximum of 2048 learned nodes. Expired MAC addresses are flushed from the address table every 10 minutes. You can configure your bridge for packet filtering on MAC address level in following compatibility modes of IEEE standards: IEEE 802.3 Ethernet, IEEE 802.3u FastEthernet, and IEEE 802.1d Transparent learning bridge. Using BriLAN bridge you can create up to 8 logical groups per port (VLAN).



- ❖ **Enable Bridging** – Click the Enable Bridging command, to change the status of the bridging service.
- ❖ **Bridge Group Manager** – Click the Bridge Group Manager command, to create your filtering rules to be applied to the bridging service.
- ❖ **Broadcast Storm Protection** – Click the Broadcast/Multicast threshold command to set a limit number of Broadcast/Multicast packets processed with the Device Interfaces.

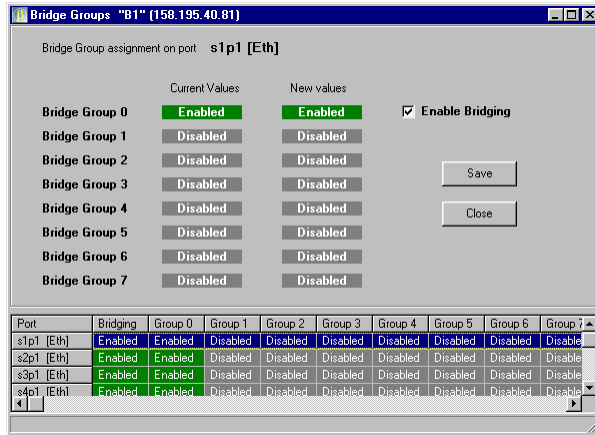
### ***Enable Bridging***

The checkmark on the left side to the Enable Bridging command indicates that the bridging service was started. Please note that the bridging service on a Device is started by default. When bridging is enabled, the Device works transparently to higher level protocols and defines the boundary of the collision domain. This feature means that your Device filters collisions and transfers only the packets coming from a port which is addressed to a network node connected to other ports. Because the remaining traffic is kept on the segment connected to a particular port your Device lowers the overall network traffic in your collision domain.

### ***Bridge Group Manager***

Using the Device you can group Interface ports to create your virtual network groups (proprietary VLAN).

When the bridging service is started for the Device, there are eight separate Bridge Groups available for aggregating individual Interface ports. This feature enables use of the Device as a “port-selective” packet filter, which controls the packet traffic between particular network segments. Packets directed between different Bridging Groups (coming from/to Ports in different Bridging Groups) are stopped on the Device. Packets are forwarded between the Interface Ports, which belong to the same Bridge Group, so end-nodes belonging to different Bridge Groups can't access each-other. Please note that all ports belong by default to the Bridge Group 0.



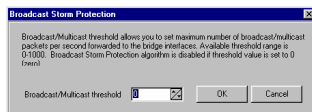
The details pane of the **Bridge Group Manager** window contains the list of all Interface Ports (in the **Port** column) available for the Device with the current Bridge Group assignment. If the Interface Port is a member of a given Bridge Group the **Enabled** status-indicator displays this fact in the **Group N** column (where  $N=0..7$ ). When the Interface Port is not a member of a Bridge Group you will find the Disabled status-indicator under Current Values.

Bridging over a Port can be individually started or stopped. Use the Enable Bridging checkmark to change the status of the bridging service over the selected Port. Changing the Port bridging status does not affect the Port's membership in a particular Bridging Group. If the Bridge Group is active, the Enabled status-indicator displays this fact under Current Values.

## Broadcast Storm Protection

The Broadcast Storm Protection command allows you to set a limit value of the number of Broadcast/Multicast packets processed with the Interfaces of your **Device**.

Broadcasts and multicasts are natural part of Ethernet networks. However, if they overrun a certain limit they can significantly lower the network throughput. It is therefore a good idea to set a limit value of the number of Broadcast/Multicast packets which are transferred by your Device.

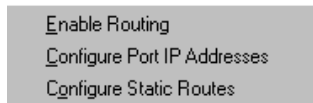


You can set this limit in range 0-1000 pps. The Broadcast Storm Protection option is **disabled** when the threshold number is set to 0.

## Routing

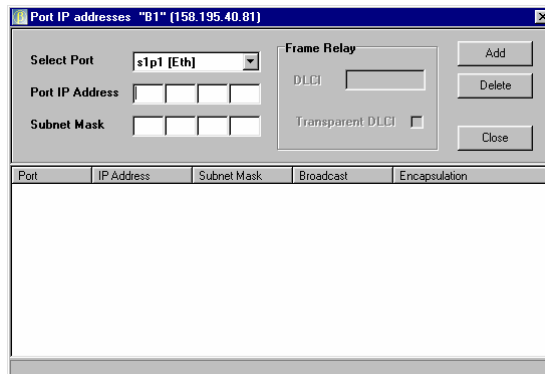
You can set up your Device to provide IP-routing based on static routing tables.

The routing feature enables your Device to work at the network level of the OSI/ISO model, where packets are filtered by network node IP addresses and operate transparently to the application-level protocols. In this operating mode the Device defines the boundary of your multicast domain. When Routing is enabled you can configure a static table of IP routes for each Device, including the definition of individual Port IP addresses to be used to route designated packets. The routing table of your Device can contain up to 64 routing records (128 optional). Your BriLAN router supports TCP/IP, Frame Relay and PPP protocols. All Ports on your Device can be associated with a unique IP address.



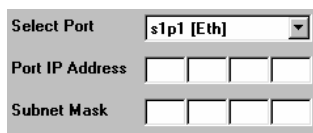
- ❖ **Enable Routing** – Click the Enable Routing command, to change the status of the routing service. The checkmark on the left side to the Enable Routing command indicates that the bridging service was started.
- ❖ **Configure Port IP Addresses** – Click the Configure Port IP Addresses command to associate a router port with an IP address.
- ❖ **Configure Static Routes** – Click the Configure Static Routes command, to create valid static IP routes for your BriLAN router.

Use the **Configure Port IP Addresses** window to configure IP-specific properties of the selected physical Port.



All Ports on your Device can be associated with a unique IP address. Provide this task BEFORE you create your IP routes.

Use the IP properties pane of the **Configure Port IP Addresses** window to completely define an IP address of the selected Port.



- ❖ **Select Port** – Select an available physical port in the Select Port drop down list to associate it with an IP address.
- ❖ **Port IP Address** – Use a 4-byte valid IP address to associate it with a selected physical port. This IP address should be set on your network nodes as a

gateway address to communicate with the rest of your IP network or Internet.

- ❖ **Subnet Mask** – Use a 4-byte network mask to masquerade your subnet connected to the selected physical port (e.g. Create a C-class network with 255.255.255.0 mask).

The **Frame Relay** pane of the Configure Port IP Addresses window is used to enter Frame Relay specific information.

- ❖ **DLCI** – The DLCI edit box is used to set the DLCI service of your frame relay connection.
- ❖ **Transparent DLCI** – Select the checkmark to create a transparent DLCI connection.

Use the **Static IP Routes** window to define the routing table of your Device.

Target Network	Network Mask	Gateway Address	Port	Metric	Status	Encapsulation
196.168.2.0	255.255.255.0	196.167.2.2	s2p1	1	Closed	Ethernet
196.168.1.0	255.255.255.0	196.167.1.2	s1p1	1	Closed	Ethernet
196.167.4.0	255.255.255.0	196.167.4.1	s3p1	0	Closed	Ethernet
196.167.3.0	255.255.255.0	196.167.3.1	s2p1	0	Closed	Ethernet
196.167.2.0	255.255.255.0	196.167.2.1	s2p1	0	Closed	Ethernet
196.167.1.0	255.255.255.0	196.167.1.1	s1p1	0	Closed	Ethernet

The **Static IP Routes** window contains two main parts. In the upper portion you can define a new static route. In the detailed pane in the bottom part you can preview the configuration and status of all previously defined routes.

Use the IP properties pane of the **Static IP Routes** window to define TCP/IP properties of your routes.

- ❖ **Target Network** – Type a valid IP address of your subnet accessing via BriLAN router.
- ❖ **Network Mask** – Use a 4-byte network mask to masquerade your subnet connected to the selected physical port (e.g. Create a C-class network with 255.255.255.0 mask).
- ❖ **Gateway Address** – Type a valid IP address to the Gateway Address edit box of a port which is used as a gateway to an accessed subnet.
- ❖ **Metric** – Type a number to identify characteristic Metric of your subnet.

## Virtual Channels

Virtual channels work as IP tunnels between two *Devices*. They allow you to connect your Voice devices over data networks (proprietary VoIP) and to transmit terminal data or integrate your distant subnets over the Internet. Data directed to your virtual channel on the selected *Device* is encapsulated to IP packets and forwarded to the next *Device*.

Virtual channels work only with properly configured IP networking. Because you can create a Virtual Channel only if the second Device is accessible Your Device Map should contain at least two Devices.

## THE EXPANDED VIEW BANDWIDTH MANAGEMENT MENU



This chapter provides information on the Bandwidth Management menu of the Expanded View window of BriLAN NMS.

The **BW Management** command of the Expanded View main menu provides accessibility to the commands of available bandwidth management policy on a selected Device.

Speed limit and queue membership are customizable rules within the **Bandwidth Management** policy of your Device. The Expanded View's **BW Management** menu of the **BriLAN NMS** program contains the following menu items:



### Traffic Shaping

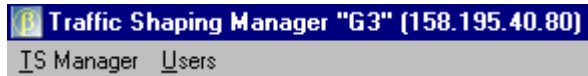
You can set up your *Device* to regulate packet transfer rate on ports or network nodes meeting your specific demands on the network throughput. Use this feature when your setup requires limited data flow on a physical Port or logical group of Network Nodes.

Without limiting the packet transfer rate you can achieve traffic performance up to maximum Ethernet/FastEthernet speed (depending on the hardware used) or up to 22 Mbps when using radio. Use this feature when your setup requires limited data flow on a physical Port or logical group of Network Nodes.

You can include your bridging or routing Ports or your Network Nodes defined by MAC or IP addresses in 128 independent Traffic Shaping Queues. Traffic queues with 512 Kb shared software data buffer, working at user defined data speed limit within speed range 32-4049 Kbps, can be independently started or stopped.

Speed limit and queue membership are customizable rules, available in **Traffic Shaping Manager**.

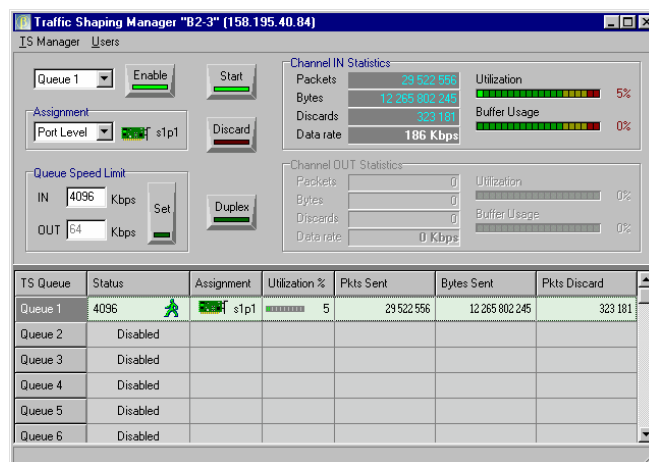




**TS Manager** – Use **Enable Traffic Shaping** command in the TS Manager menu to activate the traffic shaping service on your Device. Please note that the traffic limiting rules should have been set previously (by means of Enabled and Started queues).

**Users** – Use the **Users** command to set network node assignment within individual traffic shaping queues in cases where your queues are defined at Node level.

To bring the **Traffic Shaping Service** to operational state please ensure the following: Enable at least one queue, set the level of the queue assignment, select assigned ports or Network Nodes, set the speed limit and speed limiting mode, and finally activate the Traffic Shaping as a service on your **Device**. You can use **Named Queues** for easier orientation in your traffic shaping rules.



❖ **Enable** – The pushed (green lighting) button indicates, that the selected traffic shaping queue in the drop-down list was enabled (please note that it does not mean that the queue was **Started**).

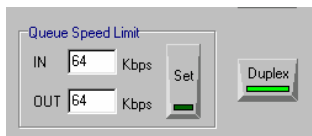
❖ **Start** – The pushed (green lighting) button indicates that the queue was started, with the selected speed limits. By default your queue works in **Bypass** mode unless you push the start button.

Use the **Queue Assignment** pane to set the type of queue membership. Traffic Shaping Queues may contain Ports or Network Nodes. The appropriate Network Node assignment may be controlled in the **Users** menu of the Traffic Shaping main menu at MAC or IP addresses mode.



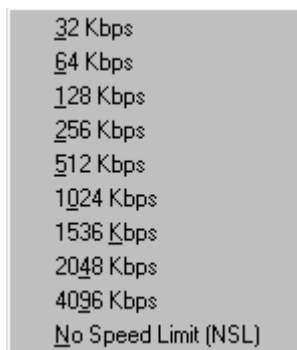
- ❖ **Users Level** – Use the Users Level option to define the queue membership per network node level (by MAC or IP addresses)
- ❖ **Port Level**– Use the Port Level option to define the queue membership per physical port level.
- ❖ **Discard** – Use the Discard button to completely delete packets in a selected queue.

**Queue Speed Limit** – Use the Queue Speed Limit pane to set the speed limitation mode and threshold parameters for a selected queue. You can define limits for incoming and outgoing packets in Duplex Speed Limiting mode or you can set the overall amount of transferred packets if the Duplex Speed Limiting mode is off.



- ❖ **IN** – Defines the incoming speed limit in kilobits per second (per port in port assignment mode or per network node group in user level mode)
- ❖ **OUT** – Defines the outgoing speed limit in kilobits per second (per port in port assignment mode or per network node group in user level mode)
- ❖ **Set** – Use the Queue Speed Limit text box to set the speed limit for a selected queue.
- ❖ **Duplex** – You can split each queue into two portions for incoming and outgoing data. Select the Duplex mode to define speed limits separately for each portion. If Duplex is off, you can set the overall amount of transferred packets over the queue.

The **Queue Speed Limit** popup menu contains 10 different pre-defined levels of traffic speed limit.



- ❖ **32 Kbps** – Traffic speed limit is set to 32 kilobits per second
- ❖ **64 Kbps** – Traffic speed limit is set to 64 kilobits per second
- ❖ **128 Kbps** – Traffic speed limit is set to 128 kilobits per second
- ❖ **256 Kbps** – Traffic speed limit is set to 256 kilobits per second
- ❖ **1024 Kbps** – Traffic speed limit is set to 1024 kilobits per second
- ❖ **1536 Kbps** – Traffic speed limit is set to 1536 kilobits per second
- ❖ **2048 Kbps** – Traffic speed limit is set to 2048 kilobits per second

per second

- ❖ **4096 Kbps** – Traffic speed limit is set to 4096 kilobits per second
- ❖ **No Speed Limit** – No traffic speed limit is applied.

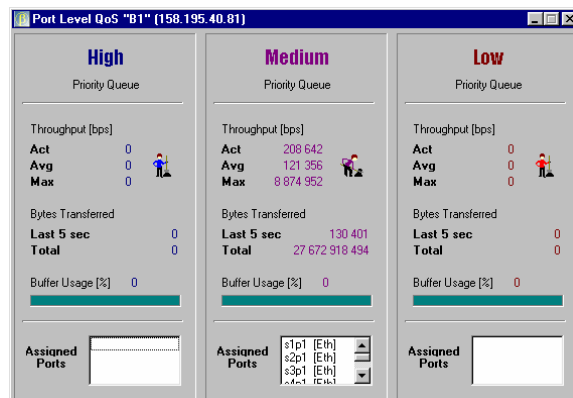
## Queue execution rules

Traffic shaping rules defined on MAC Address Level have higher execution priority level than traffic shaping rules defined on IP MAC Address Level. Traffic shaping rules defined on User Level have higher execution priority level than traffic shaping rules defined on Port Level.

## Packet Queue Priority

The **QoS** command of the Expanded View main menu provides accessibility to commands for tuning Quality of Services on a selected Device.

Your network setup may contain requirements on guaranteed network throughput which is achievable using packet priority rules. Data in each priority queue is handled by independent 512 kB buffers.



The Port Level QoS window is divided into 3 panes. Each portion contains data counters for network throughput in the particular queue.

**Act** – shows the current throughput measured in bytes per second.

**Avg** – shows the average throughput measured in bytes per second.

**Max** – shows the highest throughput measured in bytes per second.

The amount of data transferred is displayed for the **Last 5 seconds** and as **Total amount**. Current **Buffer Usage** is given as a percentage.

Your Device has 3 different level of packet priority queues implemented: **High**, **Medium**, and **Low**.



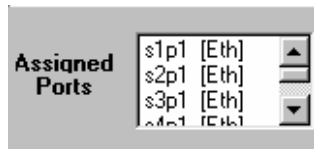
**High** packet priority queue – packets are transmitted immediately – should be allocated to your Voice data or media streams.

**Medium** packet priority queue – packets are transmitted

with lower priority compared to the High packet queue.

**Low** packet priority queue – packets are transmitted with the lowest priority.

The **Assigned Ports** pane contains the list of each assigned port with the selected packet priority queue.



To change the packet priority queue assignment use the **Packet Queue Priority** command in the Expanded View window.

## THE EXPANDED VIEW USERS MENU

 This chapter provides information on the Users menu of the Expanded View window of BriLAN NMS.

The **Users** command of the Expanded View main menu provides accessibility to the database Network nodes on a selected Device.

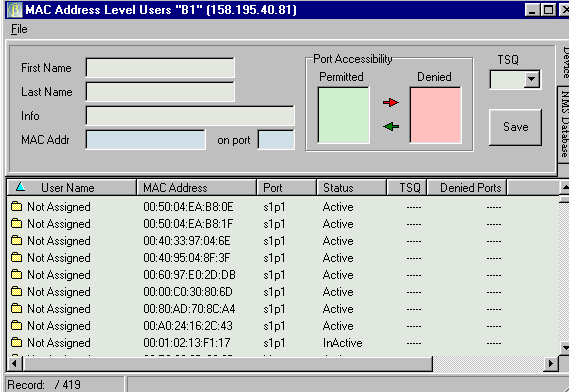
To make it easier to work with MAC and IP addresses within your Device, you can provide additional information to the built-in network node database. You can use this data if the Device is used for billing of your users (e.g. you are using it as a connection point for providing Internet Services). You can browse and sort your database using clickable table headers in the details pane (**User Name, MAC Address, IP Address, Port, Net Mask, Status, TSQ, and Denied Ports**).

The **Expanded View Users** menu of the **BriLAN NMS** program contains the following menu items:

-  **MAC Address Level** ❖ **Mac Address Level**
-  **IP Address Level** ❖ **IP Address Level**

### MAC Address Level

The **MAC Address Level Users** command provides accessibility to the built-in network node database on stored MAC addresses.



User Name	MAC Address	Port	Status	TSQ	Denied Ports
Not Assigned	00:50:04:EA:B8:0E	s1p1	Active	.....	.....
Not Assigned	00:50:04:EA:B8:1F	s1p1	Active	.....	.....
Not Assigned	00:40:33:97:04:6E	s1p1	Active	.....	.....
Not Assigned	00:40:95:04:8F:3F	s1p1	Active	.....	.....
Not Assigned	00:60:97:E0:2D:DB	s1p1	Active	.....	.....
Not Assigned	00:00:C0:30:80:6D	s1p1	Active	.....	.....
Not Assigned	00:80:AD:70:8C:A4	s1p1	Active	.....	.....
Not Assigned	00:AD:24:16:2C:43	s1p1	Active	.....	.....
Not Assigned	00:01:02:13:F1:17	s1p1	InActive	.....	.....

The MAC Address database is used for evaluating forwarding rules when your Device is working in level 2 mode (MAC Address Tables). MAC addresses are added automatically (learning bridge). When the node is inactive for more than 10 minutes MAC addresses are removed automatically (flushed) if no additional information is provided for that address manually (**User Name, TSQ assignment...**).

**MAC Address Level Users** edit boxes allows you to identify your network nodes (Network Node Identifiers) by First and Last Name (usually of characteristic user) and with additional information (usually address, room or phone number, e-mail of users).

- ❖ **Not Assigned** – This MAC Address record has empty First Name / Last Name boxes.
- ❖ **First Name** – The First Name box usually contains the First Name of a user.
- ❖ **Last Name** – The Last Name box usually contains the Last Name of a user.
- ❖ **Info** – The Info box usually contains address, room or phone number, e-mail of a user.
- ❖ **MAC Address** – The MAC Address box holds the physical address of the selected network node (determined by the Device).
- ❖ **On Port** – The On Port box contain the physical location of the selected network node (determined by the Device).

The **TSQ (Traffic Shaping Queue)** assignment drop-down window allows you to individually assign any listed MAC Address record to an appropriate traffic-limiting queue.

You can assign any MAC Address record to 64 TSQ numbered from 1 up to 64. To remove the TSQ assignment select the NOT option. Please note that to properly configure the traffic shaping queue, you should enable the selected queue, set an appropriate traffic speed limit (in range 32 - 2048 kilobytes per second) and start the Traffic Shaping Service on the Device.

The **Port Accessibility** pane of the **MAC Address Level Users** window allows you to set **Port Accessibility** for a selected MAC Address record.

When the Port is **Permitted** for a selected MAC Address record packets containing this source MAC address are transferred (if necessary) through the port (the port is working in transparent mode for that address).

When the Port is **Denied** for a selected MAC Address record packets containing this source MAC address are blocked on the port (No traffic containing this source address goes through the port).

**MAC Address Record counter** displays information about the record position.

Record: / 419

This counter, located in the down-left corner of the **MAC Address Level Users** window, displays your current position in the MAC Address database of the Selected Device. It also gives the current size of the **MAC Address** database.

**Device/NMS Database** tabs allow you to select the displayed database.



Because the network node database is stored on each individual Device, you can use both the Device (local) and NMS Database (Distributed). Each Device can store up to 2048 record in it's own local **MAC Address Level Users** database.

Using these buttons you can sort the displayed database records.

 User Name	MAC Address	Port	Status	TSQ	Denied Ports
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**User Name** The User Name button sorts the records of selected MAC Address database by user names.

**MAC Address** The MAC Address button sorts the records of selected MAC Address database by contained MAC Address codes.

**Port** The Port button sorts the records of selected MAC Address database by Port codes (Port means the Port where the segment containing the MAC address is connected). The SxPx nomenclature is used.

**Status** The Status button sorts the records of selected MAC Address database by Activity status (The network node is regarded to be active when your Device received a packet coming from that node in the last 10 minutes) The status defined are: Active, Inactive, NotInTable.

**TSQ** The TSQ button sorts the records of selected MAC Address database by Traffic Shaping Queue status

**Denied Ports** The Denied Ports button sorts the records of selected MAC Address database by Port Accessibility status

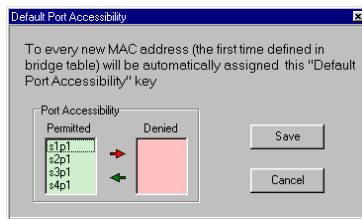
### ***File menu of MAC Address Level***

You can define the default **Port Accessibility Policy** using the File menu of MAC Address Level window.



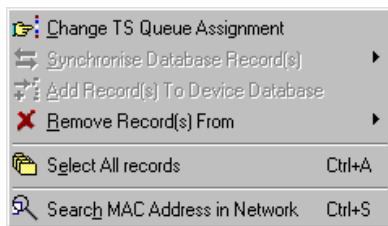
The MAC address table is a dynamic database of “known” MAC addresses of Network Nodes. When your BriLAN bridge learns a MAC address of a new Network Node, it stores some information about that Network Node to its MAC address table. By default Network Nodes have no accessibility restrictions on the local Ports of your Device.

**Port Accessibility Policy** is a set of rules which controls forwarding packets over a selected Port or Ports on your *Devices*.



Using the **Default Port Accessibility** option you can block “piracy” connections to your network, because Denying the Port Accessibility causes that traffic from/to any newly learned Network Node to be stopped on selected ports. This means you can manually control and then authorize all Network Nodes in your BriLAN Network.

### *Popup menu of details pane of the MAC Address Level*

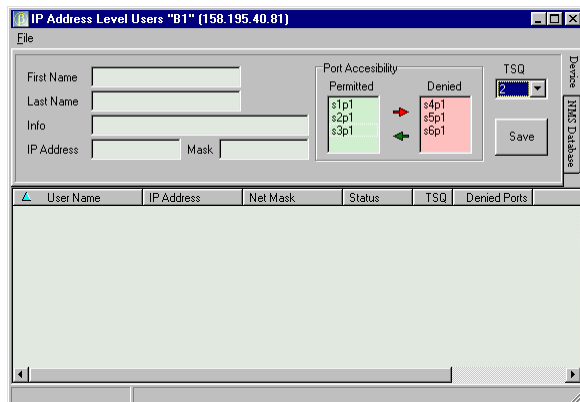


- ❖ **Change TS Queue Assignment** – Use this command, to individually change the assignment of a selected Network Node with traffic shaping queues.
- ❖ **Synchronize Database Record** – Synchronizes the content of a selected record.
- ❖ **Add Record to Device Database** – Adds selected records with Status **NotInTable** to the Device database.
- ❖ **Remove Record(s) From** – Removes selected entries from a specified Device Database (local or distributed).
- ❖ **Select All Records** – Selects all database records listed in details pane.
- ❖ **Search MAC Address in Network** – Use this command to search for specific MAC addresses using the whole distributed BriLAN Device Database.



## IP Address Level

The **IP Address Level Users** command provides accessibility to the built-in network node database based on stored IP addresses.



The IP Address database used for evaluating forwarding rules when your Device is working in level 3 mode (Routing Tables). IP addresses are added automatically. When the node is inactive for more than 10 minutes IP addresses are removed automatically (flushed) if no additional information has been provided for that address manually (**User Name, TSQ assignment...**).

**IP Address Level Users** edit boxes allows you to identify your network nodes (Network Node Identifiers) by First and Last Name (usually of characteristic user) and with additional information (usually address, room or phone number and e-mail of users).

- ❖ **Not Assigned** – This IP Address record has empty First Name / Last Name boxes.
- ❖ **First Name** – The First Name box usually contains the First Name of a user.
- ❖ **Last Name** – The Last Name box usually contains the Last Name of a user.
- ❖ **Info** – The Info box usually contains address, room or phone number and e-mail of a user.
- ❖ **IP Address** – The IP Address box contains the logical address of a network node determined by the Device.
- ❖ **Mask** – The Mask box contains Network masquerading associated with a network node.

User Name	IP Address	Net Mask	Status	TSQ	Denied Ports
-----------	------------	----------	--------	-----	--------------

- User Name** The User Name button sorts the records of selected IP Address database by user names.
- IP Address** The IP Address button sorts the records of selected IP Address database by contained IP Address codes.
- Net Mask** The Net Mask button sorts the records of selected IP Address database by Net Mask codes.

- Status** The Status button sorts the records of selected IP Address database by Activity status (The network node is regarded to be active when your Device has received a packet coming from that node within the last 10 minutes)
- TSQ** The TSQ button sorts the records of selected IP Address database by Traffic Shaping Queue status
- Denied Ports** The Denied Ports button sorts the records of selected IP Address database by Port Accessibility status

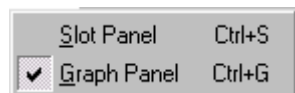
## THE EXPANDED VIEW VIEW MENU



This chapter provides information on the View menu of the Expanded View window of BriLAN NMS.

The **View** command of the Expanded View main menu allows you to change the Network Traffic activity pane on a selected Device.

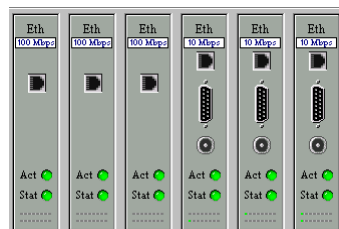
The Expanded View window displays information about the installed Interfaces both in graphical and in tabular form. You can switch the view of a selected Device's Interfaces between the Slot Panel display mode and the Graph Panel display mode. If the Slot Panel display mode is active you can check the overall Interface activity visually – using the LED diodes. If the Graph Panel display mode is active you can use the network traffic diagrams for viewing the time-dependence of your particular Interface cards.



- ❖ Slot Panel
- ❖ Graph Panel

### Slot Panel

The **Slot Panel** pane of the **Expanded View** window contains Interfaces installed in your Device.



**Eth** – Ethernet interface

**Wls** – Wireless interface

**Act** – The LED is on when the Port is active

**Stat** – The LED is on when the Port is active

The **CPU Slot** provides accessibility to system specific information.

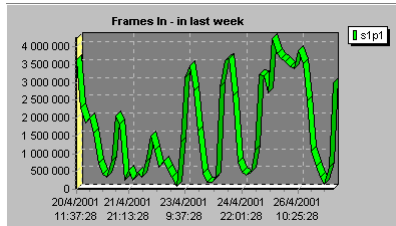


The overall performance of your Device depends mainly on the CPU performance. Higher frequency of the CPU gives better data throughput on your Device. Your Device should be equipped at least with 4 MB of RAM.

## Graph Panel

The **Graph Panel** pane of the Expanded View window contains time dependent diagrams of your Interface activities installed in your Device.

Type CTRL+G to display the Graph Panel.



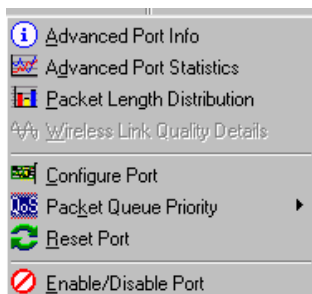
The independent axis contains the time window you want to display. You can change the displayed Collection Period from the last 5 minutes (shortest time slot) to last week data (the maximum extent of historical data stored).

The dependent axis may contain any characteristics describing the network activity measured on the selected Interface. You may combine multiple data series using drag and drop technique for selecting traffic data. You can combine **ONLY** the same type of data series coming from different Ports. Each data series is displayed with a unique color-code.

## Expanded view Port popup menu

By right clicking any Interface in the Slot Panel you can display the appropriate popup menu.

You can access additional information on port settings, traffic statistics, packet distribution, link quality or you can change the port configuration, queue assignment or port accessibility.



- ❖ **Advanced Port Info**
- ❖ **Advanced Port Statistics**
- ❖ **Packet Length Distribution**
- ❖ **Wireless Link Quality Details**
- ❖ **Configure Port**
- ❖ **Packet Queue Priority**
- ❖ **Reset Port**
- ❖ **Enable/Disable Port**

### ***Advanced Port Info***

The **Advanced Port Info** command provides information on the Interface card hardware. The displayed information may vary depending on the examined Interface type.

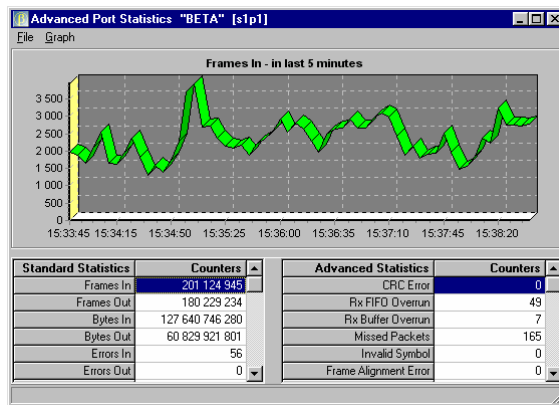
Advanced Port Info "BETA" [s1p1]	
Operational Status	Clear OK, Running
Hardware	RealTek 8139
Driver Name	NE2K-100
HW Address	00:E0:4C:49:86:77
HW Interrupt	12
I/O Address	0x6000
Memory Address	N/A
Port Speed	100 Mbps
Duplex	Full
Tx Buffer Size	8 192 Bytes
Rx Buffer Size	65 536 Bytes
Connector Type	TP

- ❖ Operational status
- ❖ Hardware
- ❖ Driver Name
- ❖ HW Address
- ❖ HW Interrupt
- ❖ I/O Address
- ❖ Memory Address
- ❖ Port Speed
- ❖ Duplex
- ❖ TX Buffer Size
- ❖ RX Buffer Size
- ❖ Connector Type

What are the functions of each the above? Do they need to be explained or are they self evident?

## Advanced Port Statistics

The **Advanced Port Statistics** command provides information on basic and additional network traffic information.



You can access any traffic counter available for that Interface:

**Standard statistics**

**Advanced Statistics**

Use the rulers to get access to hidden statistics counters. To create a time-dependent diagrams of a selected counter drag and drop the appropriate cell under the **Counter** column.

**Standard statistics pane** provides access to standard statistics counters (common for all interfaces)

Standard Statistics	Counters
Frames In	267 261 553
Frames Out	255 808 091
Bytes In	186 536 198 244
Bytes Out	84 310 073 748
Errors In	82
Errors Out	0
Dropped In	0
Dropped Out	4
ActUtil In [%]	3
ActUtil Out [%]	0
ActBitRate In [bps]	3 014 816
ActBitRate Out [bps]	333 787

- ❖ Frames in/out
- ❖ Bytes in/out
- ❖ Errors in/out
- ❖ Dropped in/out
- ❖ ActUtil in/out
- ❖ ActBitRate in/out

**Advanced Statistics pane** provides access to advanced statistics counters (specific for each interfaces)

Advanced Statistics	Counters
CRC Error	0
Rx FIFO Overrun	72
Rx Buffer Overrun	10
Missed Packets	260
Invalid Symbol	0
Frame Alignment Error	0
Rx Frame Short	0
Rx Frame Long	0
Tx Buffer Underrun	487
Transmit Abort	0
Number of Collisions	0
Excessive Collisions	0
Carrier Sense Lost	0
CD Heart Beat	0
Interface Reset	569
PCI Bus Error	0

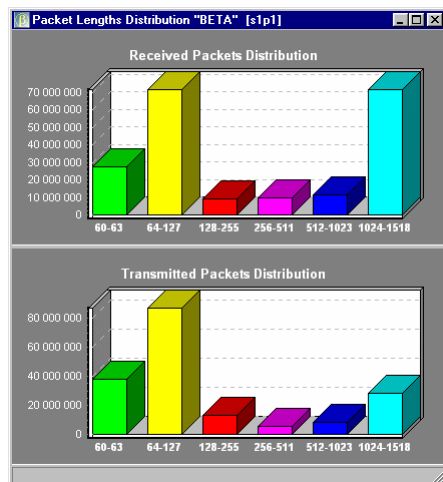
  

Advanced Statistics	Counters
CRC Error	0
Rx Overrun	15
Dribble Bit	0
Abort End Detected	0
Rx Frame Short	0
Rx Frame Long	0
Tx Buffer Underrun	1
Tx Jabber Error	0
Excessive Collisions	0
Multiple Collisions	853 363
Single Collisions	0
Carrier sense lost	0
Tx Deferred	1 116 675

- ❖ CRC Error
- ❖ RX FIFO Overrun
- ❖ RX Buffer Overrun
- ❖ Invalid Symbol
- ❖ Frame Alignment Error
- ❖ RX Frame Short
- ❖ RX Frame Long
- ❖ TX Buffer Underrun
- ❖ Transmit Abort
- ❖ Number of Collisions
- ❖ Excessive Collisions
- ❖ Carrier Sense Lost
- ❖ CD Heart Beat
- ❖ Interface Reset
- ❖ PCI Bus Error
- ❖ CRC Error
- ❖ RX Overrun
- ❖ Dribble Bit
- ❖ Abort End Detected
- ❖ RX Frame Short
- ❖ RX Frame Long
- ❖ TX Buffer Underrun
- ❖ TX Jabber Error
- ❖ Excessive Collisions
- ❖ Multiple Collisions
- ❖ Single Collisions
- ❖ Carrier Sense Lost
- ❖ TX Deferred.

## Packet Length Distribution

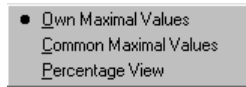
The **Packet Length Distribution** command provides information on the length distribution of packets in your network.



The information is displayed using distribution diagrams of 6 predefined characteristic packet size intervals given in bytes for Received and Transmitted packets respectively:

- 60-63 bytes
- 64-127 bytes
- 128-255 bytes
- 256-511 bytes
- 512-1023 bytes
- 1024-1518 bytes

To change interdependent scaling of the displayed diagrams right-click the graph areas.



You can change the displaying mode of your diagrams between **Own Maximal Values**, **Common Maximal Values** and **Percentage View** when you right-click the graph area.

## *Wireless Link Quality Details*

The **Wireless Link Quality Details** command allows you to tune the quality of your wireless links in real-time directly from BriLAN NMS application.

This command helps you to find the best position and direction of your antenna mountings.

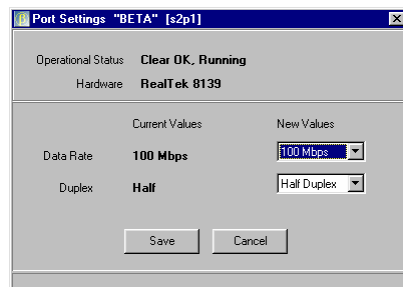
## *Reset Port*

Use the **Reset Port** command to reset a selected port without resetting the whole Device.

## *Configure Port*

The **Configure Port** command allows you to change the Port-operating parameters remotely.

The displayed information may vary depending on the examined Interface type.



Select this command to change **Data Rate**, **Duplex mode** or other applicable hardware settings. This command is available if there is any hardware parameter to change.

To change settings select a new value from the appropriate drop-down menu under **New Values**.

## *Packet Queue Priority*

The **Packet Queue Priority** command allows you to change the Packet Queue assignment for the Selected Port.



Your network setup may contain requirements on guaranteed network throughput (e.g. voice/video streams) achievable using packet priority rules. Your Device has three different level of packet priority queues implemented:

- ❖ **High** packet priority queue – packets are transmitted immediately. Allocate your Voice data or media streams to this queue..
- ❖ **Medium** packet priority queue – packets are transmitted with lower priority compared to the High packet queue.
- ❖ **Low** packet priority queue – packets are transmitted with the lowest priority.

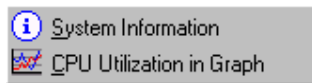
To view the assignment of the Quality of Services priority Queues, click the QoS menu item in the Expanded View main menu.

## ***Enable/Disable Port***

The **Enable/Disable Port** command allows you to change the port operation status. If the Port is disabled, **ALL** network traffic is completely stopped over this Port. Use this command when you need to disable the traffic (bridging and routing) immediately on a selected port, regardless of the Queue or Bridge Group assignment or port configuration.

## **Expanded view CPU popup menu**

By right clicking on the CPU slot you can display the appropriate CPU popup menu. You can access additional information on the System Main Board or you can get the CPU utilization diagram. Using this command you can check remotely RAM availability on your Devices.



- ❖ **System Information**
- ❖ **CPU Utilization in Graph**

## ***System Information***

The **System Information** command provides information on the System MainBoard, like CPU type, and RAM assignment.

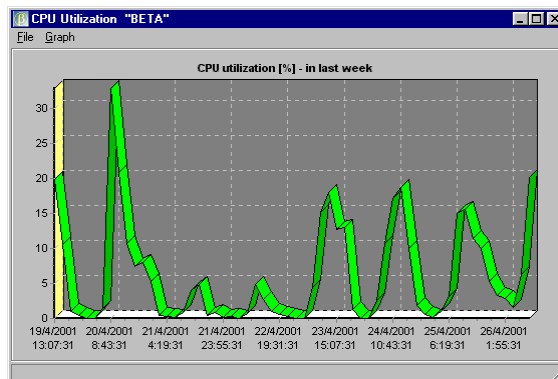


System Information		
<i>CPU Type</i>	486, 133 MHz	
<i>Device S/N</i>	FF93484	
<i>BriLAN NOS</i>	ver. 3.42	
	Available	Allocated
Main Memory	640 KB	319 KB
High Memory Block	64 KB	61 KB
Extended Memory	31744 KB	3281 KB

- ❖ **CPU Type** – provides information about the installed CPU.
- ❖ **Device S/N** – provides information about the Device's serial number
- ❖ **BriLAN NOS** – provides information about the serial number.
- ❖ **Main Memory** – provides information about the total RAM capacity.
- ❖ **High Memory Block** – provides information about the installed HMB memory.
- ❖ **Extended Memory**– provides information about the installed EMB memory.

### *CPU Utilization in Graph*

The **CPU Utilization in Graph** displays the CPU performance graphs on the selected time-scales from the **last 5 minutes** up to **last week**.



The independent axis contains the time window you want to display. You can change the displayed Collection Period from the last 5 minutes (shortest time slot) to last week data (the maximum extent of historical data stored).

The dependent axis contains the CPU performance of a selected *Device*.

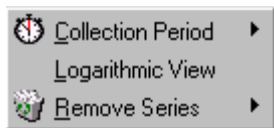
## THE EXPANDED VIEW GRAPH MENU



This chapter provides information on the Graph menu of the Expanded View window of BriLAN NMS.

The **Graph** command of the Expanded View main menu allows you to work with Network Traffic activity data on a selected Device in graphical form.

Knowing the exact status of your network may help to better understand current network requirements of your users. It can also assist in planning future development of your network infrastructure. The **Device** works as a continuous network traffic monitor constantly keeping an eye on your network. Using the **Graph** menu you can easily find all network load statistics in various time-scales, zoom in on specific information, locate your top-talker network nodes or error generating items.

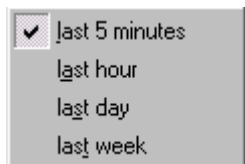


- ❖ **Collection Period**
- ❖ **Logarithmic View**
- ❖ **Remove Series**

The **Graph** menu enables the following tasks: selecting information to display, configuring graph scaling, zooming in/out of a particular graph area, selecting normal or logarithmic scaling and displaying multiple data series.

### Collection Period

The **Collection Period** command displays the selected time period of the traffic data series.



You can choose from several types of data collection periods, ranging from a very short time (5 minutes) up to the last week. By choosing a time interval you can change the current time-focus.

- ❖ **Last 5 minutes**
- ❖ **Last Hour**
- ❖ **Last Day**
- ❖ **Last Week**

By default the **Last 5 minutes** period is selected.

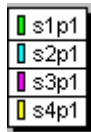
## Logarithmic View

The **Logarithmic View** command switches the displaying mode of the selected traffic data series between normal and logarithmic view.

When you switch to logarithmic view all network traffic data is transformed with Decadical (???) Logarithmic function before plotting the graph. You may have traffic data with various amplitudes ranging from very small values up to very high ones. In such cases it is useful to display your graphs in logarithmic scaling. The default view is “**normal**” display mode.


## Remove Series

The **Remove Series** command removes the selected data series from the Graph Area.



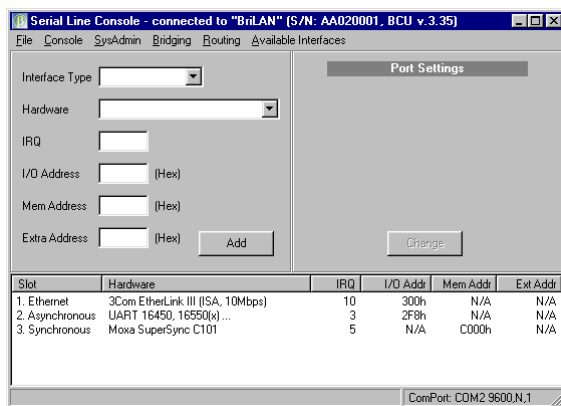
Individual data series belonging to physical ports on the interfaces are color-coded. You may remove any data series listed in the data series popup menu.

## SERIAL LINE CONSOLE WINDOW

 This chapter provides information on the Serial Line Console window of BriLAN NMS.

The **Serial Line Console** is used for setting up initial operating parameters of the **BriLAN NOS** software.

Set up of **BriLAN NOS** requires a temporary serial cable connection between the **BriLAN NMS** and the **Device**. COM1 port on the Device with 0x3F8 I/O address and IRQ=4 is dedicated for BriLAN NOS! You should use this port of the Device during the serial cable connection. Because the COM1 port is usually connected to a mouse pointing device on your BriLAN Management Station, we suggest using another available serial port. If the port is busy with other than your Device you may obtain the message: “Can't open port COMx!” If your Device is unreachable through the network then the direct serial cable connection is the **ONLY WAY** to modify its operating parameters!



All interface card specific settings of the **BriLAN NOS** software should be matched with Interface card settings provided by Manufacturer's Interface Setup Utility programs. Other relevant **BriLAN NOS** operating data is also added here. When you are working with the **Serial Line Console**, the BriLAN NMS communicates with the **BriLAN Configuration Utility (BCU)** program located on your Device.

The basic set up of **BriLAN NOS** requires a temporary serial cable connection between **BriLAN Management Station** and the **Device**.

Interface specific settings of the **BriLAN NOS** software should be matched with Interface settings provided by Manufacturer's Interface Setup Utility programs.

The screenshot shows a configuration window with the following fields:

- Interface Type: [Dropdown menu]
- Hardware: [Dropdown menu]
- IRQ: [Text input]
- I/O Address: [Text input] (Hex)
- Mem Address: [Text input] (Hex)
- Extra Address: [Text input] (Hex)
- Add: [Button]

**Interface Type****Hardware****IRQ****I/O Address****Mem Address****Extra Address**

The **main** menu of the BriLAN Configuration Utility program window contains commands for completely configuring your Device by connected to BriLAN NMS via serial line.

**File** **Console** **SysAdmin** **Bridging** **Routing** **Available Interfaces**

**File** The **File** command of the BriLAN Configuration Utility program window opens a submenu commands for saving, and resetting the changes performed in the **Serial Line Console** and resetting your Device.

**Console** Use the Console command of the BriLAN Configuration Utility program window to change the operating parameters of the serial port connection.

**SysAdmin** Use the SysAdmin command of the BriLAN Configuration Utility program window to change password of the system administrator and IP networking properties of your Device.

**Bridging** Use the Bridging command of the BriLAN Configuration Utility program window to configure bridging service on your Device.

**Routing** Use the Routing command of the BriLAN Configuration Utility program window to configure routing service on your Device.

**Available Interfaces** Use the Available Interfaces command of the BriLAN Configuration Utility program window to automatically find the configuration of all installed interfaces on your Device.

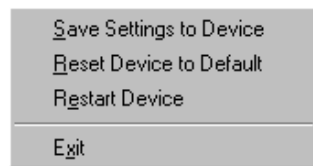
The **details pane** of the Serial Console Window contains detailed information about the installed interfaces in your Device.

Slot	Hardware	IRQ	I/O Addr	Mem Addr	Ext Addr
1. Ethernet	3Com EtherLink III (ISA, 10Mbps)	10	300h	N/A	N/A
2. Asynchronous	UART 16450, 16550(x) ...	3	2F8h	N/A	N/A
3. Synchronous	Moxa SuperSync C101	5	N/A	C000h	N/A

<b>Slot</b>	The Slot column contains information about the type of a particular Interface.
<b>Hardware</b>	The Hardware column contains information on the brand of a particular Interface.
<b>IRQ</b>	The IRQ column contains information about the unique interrupt request number using your Device when accesses a particular Interface.
<b>MemAddr.</b>	The MemAddr. column (applicable to Synchronous and Asynchronous Interface types) contains information about a block of physical memory address resources for a particular Interface.
<b>Ext.Addr.</b>	The Ext.Addr. column defines the extra address resources for a particular Interface.

## File menu of the BCU window

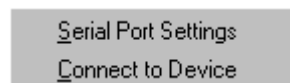
The **File** menu of the **BriLAN Configuration Utility** program window contains commands for saving, and resetting the changes performed in the **Serial Line Console** and resetting your Device.



- ❖ **Save Settings to Device** – Use the Save Settings to Device command to save new configuration to your Device.
- ❖ **Reset Device to Default** – Use the Reset Device to Default command recall the “factory” settings of your Device.
- ❖ **Restart Device** – Use the Restart Device command to remotely restart your Device.
- ❖ **Exit** – The Exit command quits execution of the BriLAN Configuration Utility program.

## Console menu of the BCU window

Use the **SysAdmin** menu of the **BriLAN Configuration Utility** program window to change password of the system administrator and IP networking properties of your Device.



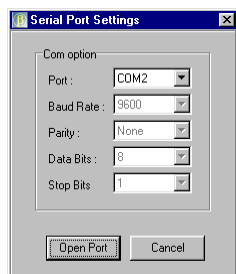
**Serial Port Settings** – Use the Serial Port Settings command to set communication parameters of the serial port where your Device is connected.

**Connect to Device** – Click the Connect to Device command to establish a new serial line connection to your Device. Reboot your Device immediately after the

“waiting” dialog appears.

## *Serial Port Settings*

Use the Serial Port Settings window to set communication parameters of the serial port where your Device is connected.



- ❖ **Port** – Use the Port box of the Serial Port Settings window to set the requested serial port, where your Device is connected.
- ❖ **Baud Rate** – Use the Bits per second box of the Serial Port Settings window to set the requested connection speed for your Device in bauds per seconds.
- ❖ **Parity** – Use the Parity box of the Serial Port Settings window to set the parity information to none.
- ❖ **Data bits** – Use the Data Bits box of the Serial Port Settings window to set the number of data bits to 8.
- ❖ **Stop bits** – Use the Stop Bits box of the Serial Port Settings window to set the number of stop bits to 1.

## SysAdmin menu of the BCU window

Use the **SysAdmin** menu of the BriLAN Configuration Utility program window to change password of the system administrator and IP networking properties of your Device.

The remote management of your *Device*, controlled by **BriLAN NMS**, is available in normal operation mode via standard network connectivity. Without specifying the password of the *Device*, the traffic and status data are available, but all management functions are disabled. Setting up parameters via serial cable does not require authorization using SysAdmin Password.

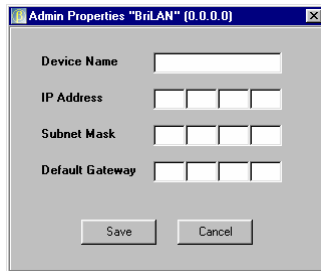
Change SysAdmin Password  
SysAdmin Device Properties

- ❖ **Change SysAdmin Password** – The Change SysAdmin Password command of the **SysAdmin Level** popup menu changes the SysAdmin Level password. To improve management security, you can change the default password “*SysAdmin*”.
- ❖ **SysAdmin Device Properties** – The **Device Admin Properties** command of the Device menu enables use of the management features of your Device.

## *Device Admin Properties window*

Use the **Device Admin Properties** window to set the name of your Device and its basic IP networking properties.

Your **Device** communicates in normal operating mode with the **BriLAN NMS** via standard IP protocol. To make your **Device** accessible in your network set particular IP networking properties. Because the management uses a routable protocol you can manage your Devices, operating in your LAN connected to the Internet, from any PC with Internet connectivity.



- ❖ **Device Name** – The Device Name box should contain a unique text identifier for your Device.
- ❖ **IP Address** – The IP Address box should contain a unique **IP Address** reserved for your Device.
- ❖ **Subnet Mask** – The Subnet Mask box should contain a network masquerading variable (e.g. 255.255.255.0 for C-class networks). If your network is not interconnected with other ones, you can leave this box empty.
- ❖ **Default Gateway** – The **Default Gateway** box should contain a IP address of the gateway.

## Bridging menu of the BCU window

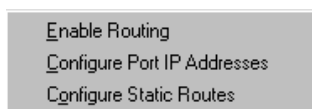
Click the **Enable Bridging** command, to change the status of bridging service.



- ❖ **Enable Bridging** –The checkmark on the left side to the Enable Bridging command indicates that the bridging service was started. Please note that the bridging service on a Device is started by default.

## Routing menu of the BCU window

Click the **Routing** command of the main menu of the Serial Console Window to configure the routing service of your Device.

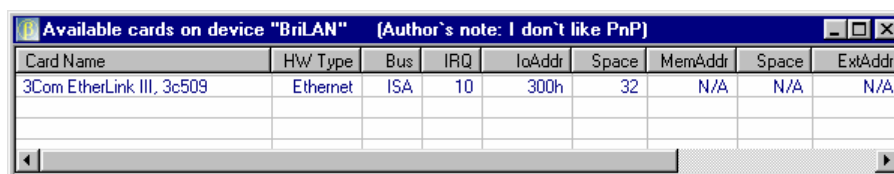


- ❖ **Enable Routing** – The checkmark on the left side to the Enable Routing command indicates that the bridging service was started. Please note that the port IP address and at least one static route should be configured before enabling the routing service.
- ❖ **Configure Port Ip Address** – Click the Configure Port IP Addresses command to associate a router port with an IP address.
- ❖ **Configure Static Routes**– Click the Configure Static Routes command, to create valid static IP routes for your BriLAN router.



## Available Interfaces menu of the BCU window

Use the Available Interfaces submenu of the BriLAN Configuration Utility program window to automatically find the configuration all installed interfaces on your Device. You can find here general information about installed interface cards (brand name, type, bus type), IRQ and addressing accessibility.



Card Name	HW Type	Bus	IRQ	IoAddr	Space	MemAddr	Space	ExtAddr
3Com EtherLink III, 3c509	Ethernet	ISA	10	300h	32	N/A	N/A	N/A

**Card Name** The Card Name column provides information about the brand name of a particular Interface.

**HW Type** The HW Type column provides information about the type of a particular Interface.

**Bus** The Bus column provides information about the bus type (ISA/PCI) of a particular Interface.

**IRQ** The IRQ column provides information about the unique interrupt request number using your Device when accesses a particular Interface.

**IoAddr** The IOAddr column provides information about the physical I/O address resources set for a particular Interface.

**Space** The Space column provides information about the I/O address resources reserved space for a particular Interface in bytes. Within this space no overlaps are permitted between the installed interfaces.

**MemAddr** The MemAddr. column provides information about the Memory Address resources set for a particular Interface.

**Space** The Space column provides information about the Memory Address reserved space for a particular Interface in bytes. Within this space no overlaps are permitted between the installed interfaces.

**ExtAddr** The Ext.Addr. column provides information about the extra address resources set for a particular Interface.

**Space** The Space column provides information about the Extra Address reserved space for a particular Interface in bytes. Within this space no overlaps are permitted between the installed interfaces.

The **ComPort** information box informs you permanently about the serial line operation parameters.

ComPort: COM2 9600,N,1

**ComPort** ComPort information box contains 4 groups of serial line specific information: Port, Baud Rate, Parity and Stop Bits data. To find out more about this topic see the Serial Port Settings dialog.

## REFERENCE SCENARIOS – BRILAN ADVANTAGES

Motto:

**Your networks were never as Accessible, Powerful, and Secure.**

**Network administration was never so Easy, Transparent, and Integrated.**

**BriLAN = Networks build on the stable pillars of Connectivity, Performance and Security.**

Connectivity	1.	The simplest BriLAN bridge
	2.	BriLAN bridge with different media and link speed
	3.	Improving wireless accessibility with BriLAN bridge
	4.	The simplest BriLAN router
	5.	Voice over data networks (analog phone through IP tunnels)
	6.	Integration of Data and Voice with BriLAN (PBX+Data transfer)
Performance	7.	QoS management with BriLAN
	8.	Traffic Shaping with BriLAN
	9.	Lowering network load with BriLAN Broadcast Storm Protection
	10.	Complex network setup and BriLAN Bandwidth Management
	11.	Remote management, understanding BriLAN Network Events
Security	12.	Securing networks with port grouping on BriLAN bridge
	13.	Securing networks with MAC address filtering on BriLAN bridge
	14.	Managing Network Nodes with Default Port Accessibility.
	15.	Securing networks with IP address filtering on BriLAN router
	16.	Using BriLAN firewall for advanced security of your networks

For more information on listed reference scenarios please refer to **BriLAN Training Kit**.

## APPENDIX A – PRODUCT FEATURES



This Appendix provides basic technical data on BriLAN NOS.

The fully graphical network management 32-bit Windows software, **BriLAN NMS**, is capable of managing your **BriLAN Network Devices** from any networked PC over the Internet.

### Bridging method

- OSI Level 2 (Data Link) store and forward
- up to 8 logical groups per port (VLAN)
- packet filtering on MAC address level

### Routing method

- OSI Level 3 Network; static routing tables
- up to 64 routing records per Device (128 optional)
- packet filtering on IP address level

### Voice features

- Voice Activity Detection (VAD)
- Comfort Noise Generation (CNG)
- Acoustic Echo Cancellation (AEC)
- True Speech G723.1 at 6.3, 5.3, 4.8 or 4.1 Kbps at 8 KHz sampling rate
- Pass-through 8/16-bit linear modes at 8 KHz sampling rate

### Maximum forwarding rate

- up to maximum Ethernet/FastEthernet speed (depending on the used hardware)
- up to 22 Mbps radio
- 64 independent traffic shaping queues per port
- speed limit in range from 32 Kbps to 2048 Kbps

### Packet buffer

- 3x512 Kbyte shared software data buffer

### Available Interfaces and Ports

Any combination of:

- Ethernet Interfaces (Single or Multiport)
- Fast Ethernet Interfaces (Single or Multiport)
- Wireless Interfaces
- Synchronous Interfaces (Single or Multiport)
- Voice Interfaces (Analog phone line)

### Standard compliance

- IEEE 802.3 Ethernet
- IEEE 802.3u FastEthernet
- IEEE 802.1d Transparent learning bridge
- IEEE 802.11(b) WLAN - Wireless network
- ITU standards for Voice (Codecs G.729a and G.711)
- H.323/H.324 industry standard Voice

### Routed protocols

- TCP/IP
- Frame Relay
- PPP

### Wireless features

- point-to-point and point-to-multipoint
- 2.4 and 5.8 GHz ISM band
- speed up to 22 Mbps
- distance up to 15 miles (22 kilometers)

### Port statistics

- complete port traffic statistics
- collection polling rate: 10 seconds

### Address table features

- 2048 learned nodes per BriLAN Network Device
- 10 min flushing time

### Compatibility list of supported Interfaces

- **Ethernet interfaces**
  - 3Com EtherLink III (3C509) 10Mbps, ISA adapter

- SMC Ultra and EtherEZ, ISA adapter
- NE2000 compatibles 10Mbps, ISA adapter
- NE2000 compatibles 10/100Mbps, PCI adapter (with RTL8139 ethernet controller)
  
- **Wireless interfaces**
  - Aironet PC4500/PC4800 11Mbps, ISA/PCI adapter
  - Cisco/Aironet 340 Series 11Mbps, PCI adapter
  - Samsung WSL-2000P 11Mbps, PCI adapter
  - WaveLan Orinoco 11Mbps, ISA adapter
  
- **Asynchronous interfaces**
  - UART 16450/16550 series
  
- **Synchronous interfaces**
  - Moxa SuperSync C101, X.21/V.35 serial synchronous ISA adapter (up to 5Mbps)
  
- **Voice interfaces**
  - QuickNet Internet LineJACK, analog phone line ISA adapter

### Security features

- Password protected management
- 64 bit software encryption
- Encrypted proprietary management protocol
- 64-bits BlowFish encrypted traffic
- Additional hardware based encryption is available

## APPENDIX B – TERMINOLOGY

 This Appendix provides an explanation of terminology used in this Guide.

- ✓ **BriLAN NOS** – BriLAN Network Operating System is software which turns a common PC into a manageable network device with combined functionality: Bridge, Multiplexor, Router, Hub, Switch, Active Repeater, Access Point and Voice Gateway. This software, named **BNOS**, is installed on your BriLAN Network Device.
- ✓ **BriLAN NMS** – BriLAN Network Management System is the software used for remote management of BriLAN Network Devices. This software, named **BNMS.EXE**, should be installed on a PC with any 32-bit Windows operating system.
- ✓ **BriLAN Network Device** – (the Device) a complete network device powered by BriLAN NOS including all hardware and software components.
- ✓ **BriLAN Management Station** – a PC running Windows operating system with the BriLAN NMS software installed.
- ✓ **BriLAN Distribution Disk** – a disk containing all BriLAN system files in shipping version. The BriLAN NOS X.Y.ZZ directory contains files necessary for

generating the BriLAN NOS on the BriLAN Bootable Medium, while the BriLAN NMS X.Y.ZZ directory includes installation files for the BriLAN NMS software. X.Y.ZZ denotes the current version of the shipped software.

- ✓ **BriLAN Bootable Medium** – contains the BriLAN NOS in executable version.
- ✓ **Compatibility List** – contains the list of all BriLAN supported hardware components.
- ✓ **Interface** – means any applicable hardware extension interface card listed in the Compatibility List.
- ✓ **Interface Manufacturer** – for more information on the Interface manufacturer see the Compatibility list
- ✓ **Manufacturer's Interface Configuration Utility** – software provided by the Interface manufacturer necessary to configure the Interface operation parameters within the hardware setup.
- ✓ **Manufacturer's Interface Test Utility** – software provided by the Interface manufacturer to test basic functionality of the particular setup.



# INDEX

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