

BriLAN

Network Management System

User Guide

**Designing and managing networks
using BriLAN NMS software**

Ver. 4

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1. I NTRODUCTI ON



This User Guide provides information about common network management tasks available on your BriLAN Network Device..

Dear customer, thank you for purchasing our BriLAN Network Device. **BriLAN** is the most effective last-mile revolutionary One-Box solution in the entire fixed wireless broadband industry. BriLAN is a software based, multifunctional network device designed for wired or wireless transmission of data and analog, as well as digital voice. It includes features such as Router, Bridge, Hub, Switch, Multiplexer, Voice Gateway, and Access Point which work on Ix86 compatible computers.

To successfully install the **BriLAN Network Device** (the **Device**), follow the steps included in the Task List chapter. To find more about operating the **Device**, refer also to **BriLAN User's Guide (this is the User Guide, do you mean Installation guide?)** and **BriLAN Reference Guide**.

To learn more about networking using the **Device**, please visit our web site: www.softhill.com or www.briLAN.com.

2. OVERVIEW



This overview lists common network management tasks available to you by using your BriLAN Network Device.

Tasks
I. Start with remote management. Change administrator password, upgrade BriLAN Network Operating System (NOS) files, restart your Device, open expanded views.
II. Tune port parameters. Fine tune port operation parameters remotely.
III. Set network bridging. Enable or disable bridging on your Device or Port level.
IV. Create port groups. Group your Interface ports to create traffic-filters.
V. Set network routing. Configure route IP address, static routes and enable or disable your subnets.
VI. Configure traffic shaping. Regulate network traffic between your bridging ports or routed subnets.
VII. Configure virtual channels. Tunnel (?) your packets (data or voice) between distant networks.
VIII. Monitor network status. Find the network load statistics in various time scales and manipulate with traffic data diagrams.



IMPORTANT NOTE: For more technical information on your Device, also refer to the BriLAN Reference Guide, or visit our web-site www.briLAN.com.



3. TERMINOLOGY



The following provides an explanation of the basic 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, Active Repeater, Access Point and Voice Gateway. This software, named **BNOS**, should be installed on your BriLAN Network Device.
-  **BriLAN NMS** – BriLAN network management system, the software used for remote management of your 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 BriLAN NMS software installed.

- ✎ **BriLAN Distribution Disk** – a disk containing all BriLAN system files. 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 software.
- ✎ **BriLAN Bootable Medium** – contains the BriLAN NOS in executable version.
- ✎ **BriLAN Policy** – defined by applied forwarding, filtering, and monitoring rules on selected **BriLAN Network Services**
- ✎ **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.

3. UNDERSTANDING BRI LAN NETWORK DEVICES



This chapter provides an overview of how BriLAN Network Device work.

BriLAN Network Devices are powered by the well-known **BriLAN system**. **BriLAN** is a PC based, unique global solution, solving one of today's critical network bottlenecks "last-mile broadband access", as well as enabling the extension of the reach of digital and analog phone lines to hard to reach places. It is the best way to create your last-mile connectivity, supporting transmission of data and both analog and digital voice communication.

3. 1 I NTRODUCTI ON

BriLAN powered devices offer an alternative to expensive leased lines, or fiber networks, providing high-performance and cost effective **LAN-to-LAN**, **LAN-to-WAN** and **PBX-to-PBX** or **Phone-to-Phone** connectivity.

The BriLAN package for PCs, designed for Ethernet, FastEthernet and Wireless Ethernet networks (using unlicensed 2.4 GHz ISM and 5.8 GHz ISM bands), contains two main software components: the network operation system (**BriLAN NOS**) and the management unit (**BriLAN NMS**).

BriLAN NOS comes in two versions:

- ✍ **BriLAN PRO** – software for handling different types of network data, combining multiple functions: Bridge, Multiplexor, Router, Hub, Switch, Active Repeater, Access Point.
- ✍ **BriLAN VOX** – software that interconnects the world of telecommunications with the world of information technologies, offering all the functionality of BriLAN PRO plus Voice features.

BriLAN NMS – sophisticated management system for managing BriLAN powered devices. Combines a complete set of network performance, planning and analysis tools into a single program running under Windows 95/98/NT/2000 OS.

The capacity of the MAC address table handled by **BriLAN NOS** is a maximum 2048 learned network nodes. Packets are forwarded by method "store and forward" with 2 x 512 Kb internal buffers, which allows full Ethernet speed on each segment.

Standard transparent bridging can be modified on a wide scale: packets can be filtered (dropped) by MAC and IP address, specified by bridge groups and traffic queues or they can have fully disabled forwarding over the chosen queue, port or entire bridge.

Static IP-routing is available with user defined routing tables on the individual Interface ports along with proprietary IP tunneling.

Using **BriLAN NOS** you can run the following services (or any appropriate combination of them) on your **BriLAN Network Device**:

- ✍ **Bridge**
- ✍ **Router**
- ✍ **Traffic Shaper**
- ✍ **Virtual Channels**

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. **BriLAN NMS** performs all remote control functions for management, forwarding, filtering, and monitoring of listed network services, 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**.

4. 2 PRODUCT FEATURE

Bridging method

- ? level 2, store and forward
- ? up to 8 logical groups per port (VLAN)
- ? packet filtering on MAC address level

Routing method

- ? level 3, 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 and 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

- ? 2x512 Kb 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

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



4. CONFIGURING BRI LAN NOS



The chapter describes steps for providing basic setup of BriLAN NOS software, including configuration of interface parameters, assigning IP networking parameters, defining device name and changing the administration password.

Using the **BriLAN Configuration Utility** of **BriLAN NMS** software, you can set basic operating parameters of **BriLAN NOS**. This includes tuning software configuration with parameters set in the step of Interface setup using Manufacturer's Interface Setup Utility programs. During the basic set up of **BriLAN NOS**, which is controlled by **BriLAN NMS** program, all communication between the **BriLAN Management Station** and **BriLAN Network Device** (the Device) is realized through a crossover serial cable connection. To perform basic setup, follow instructions given in this chapter.

4.1 CHECKLIST OF REQUESTED ITEMS NECESSARY FOR CONFIGURATION OF BRI LAN NOS

Before you start with basic configuration of your **Device**, please prepare the following items:

1. **BriLAN Distribution Disk** containing all installation files.
2. A PC or notebook equipped with functional COM port and 32-bit Windows operating system used as the **BriLAN Management Station**.



IMPORTANT NOTE: Functional network interface card installed on this PC is not necessary in this installation step.

3. A PC configured as your **Device**, meeting at least the minimum hardware requirements, and equipped as it previously described.

4. The **BriLAN Bootable Medium** prepared as instructed in the appropriate chapter.
5. A standard crossed (null-modem) serial cable.

4. 2 BASIC CONFIGURATION OF BRI LAN NOS SOFTWARE

Because **BriLAN NOS** is not designed to process commands through standard keyboard or mouse input, you should set up its initial configuration using another PC, by completing the following steps:

- ✍ Install BriLAN NMS software on a PC with Win95/98/NT operating system.
- ✍ Connect BriLAN Management Station to the Device.
- ✍ Set up Interface parameters and other operating conditions within the BriLAN NOS software.
- ✍ Disconnect BriLAN Management Station from the Device.

After finishing this procedure, your new **BriLAN Network Device** is ready to connect to the network.

4. 1. 1 Installing BriLAN NMS software

Install **BriLAN NMS** as your configuration utility:

1. Insert **BriLAN Distribution Disk** into the drive (floppy or CD-ROM drive).
2. Click the **Start** button on the Windows Taskbar, click **Run** and then continue with clicking the **Browse** button.
3. In the **Browse** window select the drive containing **BriLAN Distribution Disk**. Browse to **Disk 1**, select the file SETUP.EXE and close the dialog using the **Open** button.
4. In **Run** window click the **OK** button to start the selected **SETUP** program.
5. Follow the instructions displayed in the **Setup** window clicking the **Next** button.

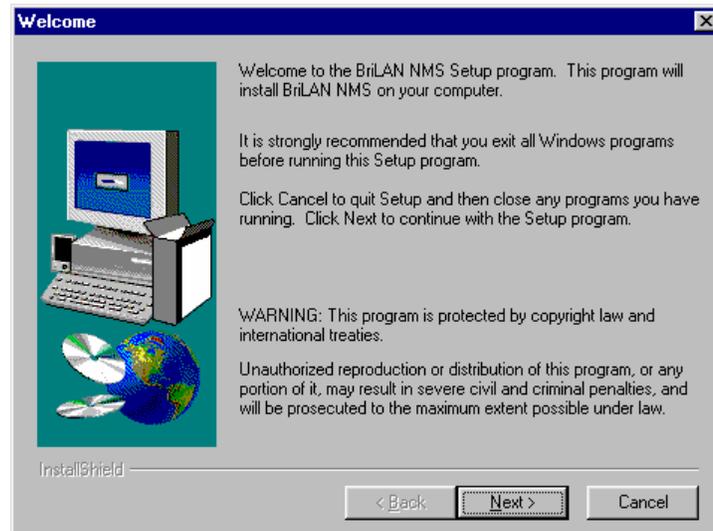


Fig. 4-1 Welcome to the BriLAN NMS Setup

6. To create the directory in **C:\Program Files** for your **BriLAN NMS**, accept the default settings by clicking the **Next** button in the **Choose destination location** window, or click **Browse** button to enter a new location.



Fig. 4-2 Choosing default destination location

7. To create a new directory or to change the default location select drive in the **Drives** box, type the new directory name in **Path** box of the **Choose Directory** window.
8. To create a new program group for your **BriLAN NMS**, accept the default settings in **Select Program Folder** window or type a new name in the **Program Folders** box.

9. In the next window check your setup and clicking the **Next** button to start copying the files.



Fig. 4-3 Selecting custom installation path

10. After completing the installation steps restart the computer. Your **BriLAN NMS** software should now be installed. Create a **BriLAN NMS** shortcut to your Windows Desktop if necessary.

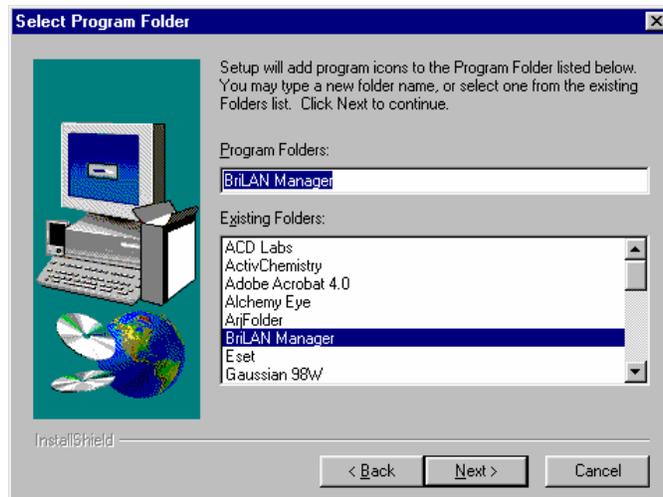


Fig. 4-4 Defining new Program Folder

4. 1. 2 *Establishing serial cable connection between BriLAN Management Station and the Device*

The basic set up of **BriLAN NOS** requires a temporary serial cable connection between **BriLAN Management Station** and the **Device**. Provide this task after the **BriLAN NMS** software is installed on your **BriLAN Management Station**, connecting a standard crossed serial cable to the appropriate ports on the **BriLAN Management Station** and the **Device** as it is given here:

1. Shut down and power OFF both computers.
2. Connect the serial ports of your **BriLAN Management Station** and your **Device** via crossover serial cable with sufficient 9 or 25 pin connectors.

IMPORTANT NOTES:



✍ **COM1 port on the Device with 0x3F8 I/O address and IRQ = 4 is dedicated to BriLAN NOS! You must use this port of the Device for serial cable connection.**

✍ **Because the COM1 port is usually connected to the mouse pointing device on your BriLAN Management Station, we suggest using another available serial port. If the port is busy with anything other than your Device you will get the message: “Can't open port COMx! “**

3. Power up the **BriLAN Management Station** and start the **BriLAN NMS** software.
4. Select **Console** in the main menu and click **Serial Port Settings** command.
5. Specify port parameters in **Serial Port Settings** window. Select the appropriate serial port of your **BriLAN Management Station** in **Port** drop-down box. This port should be configured as follows:

✍ Bits per second:	9600
✍ Data bits:	8
✍ Parity:	None
✍ Stop bits:	1

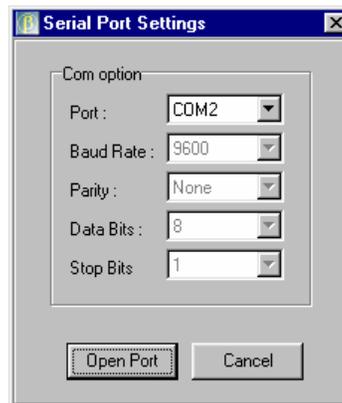


Fig. 4-5 Configuring serial port

6. To use the set parameters, click **Open port** button of the **Serial Port Setting** window. The **Not connected** status message will be displayed next to the title in **Serial line console** window.

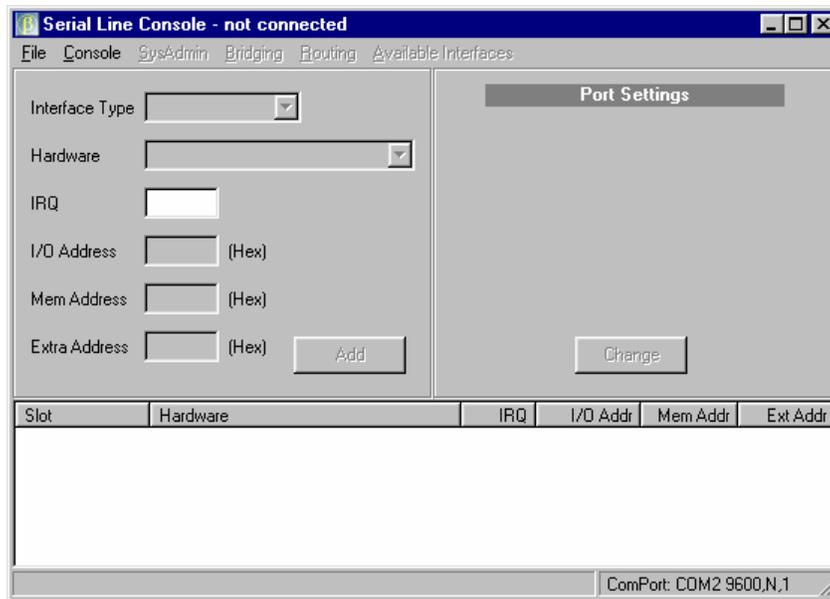


Fig. 4-6 Serial line console is not connected

7. Select **Connect** on the Main Menu of **Serial Line Console** window, and click **Connect to device** command.
8. The **Device Connecting** dialog box is displayed after clicking **Connect** button in **Device connecting** dialog box.



Fig. 4-7 The Device connecting dialog

9. Insert the **BriLAN Bootable Medium** to your **Device**, power it ON and wait for establishing connection.



Fig. 4-8 Waiting for device response

10. After successful boot-up of your **Device**, the **BriLAN Configuration Utility** window is displayed. The **BriLAN Configuration Utility** program is now ready to accept your configuration commands via the serial link.

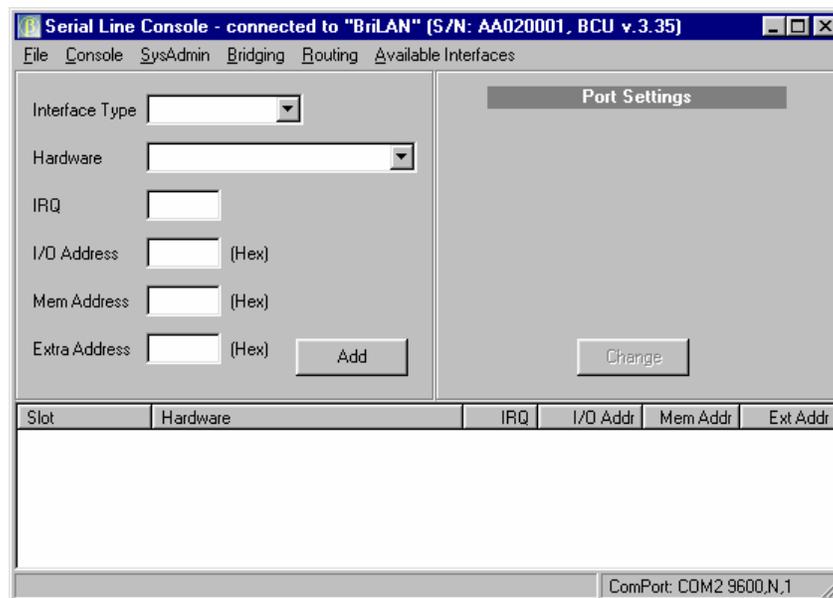


Fig. 4-9 The serial line console connection is established.

You can continue at this moment with setting up initial configuration of operating parameters of the **BriLAN NOS** software.



IMPORTANT NOTE: If your Device is unreachable through the network, than the direct serial cable connection is the ONLY WAY to modify its operating parameters!

4.1.3 Setting up initial operating parameters of the BriLAN NOS software

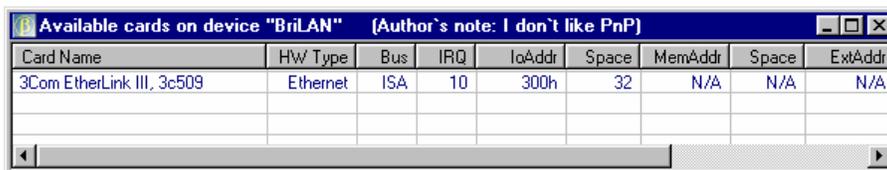
All interface card specific settings of the **BriLAN NOS** software should be matched with Interface card settings provided by Manufacturer's Interface Setup Utility programs in this installation step. Other relevant **BriLAN NOS** operating data is also added during this step. Completion of these tasks requires:

- ✍ Setting Interface configuration parameters.
- ✍ Ordering Interfaces in the slots.
- ✍ Assigning IP networking parameters.
- ✍ Assigning Device name.
- ✍ Changing default Administration password.
- ✍ Writing all settings to the permanent memory.
- ✍ Disconnecting the serial cable.

4.1.3.1 Searching for available interfaces

If you prefer automatic detection of installed interfaces and settings, carry out the following steps:

1. From the **Serial Line Console (BriLAN Configuration Utility)** window click on **Available Interfaces**.
2. Move and resize the Available Cards window if necessary.
3. Record **Card Name**, **HW Type**, **IRQ**, **IOAddr** and other necessary parameters.



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

Fig. 4-10 Searching for installed interfaces

4.1.3.2 Setting of the Ethernet Interface configuration parameters

Set Ethernet Interface card parameters as follows:

1. From the **Serial Line Console (BriLAN Configuration Utility)** window select **Ethernet** in **Interface Type** drop-down box.

2. In **Hardware** drop-down box select the requested adapter type.
3. Type a unique Interrupt request number in **IRQ** edit box.

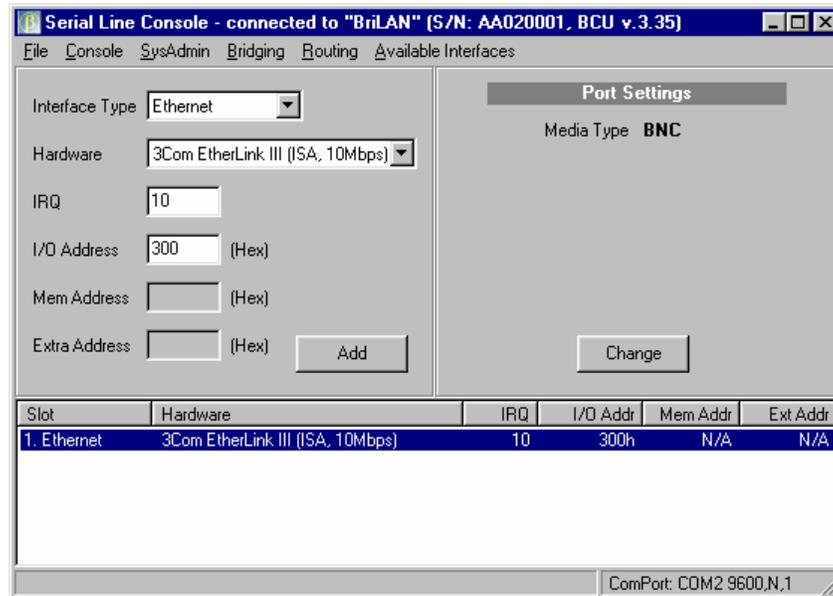


Fig. 4–11 Setting up of Ethernet Interface parameters

4. Type an unique I/O Address resource in **I/O Address** edit box.
5. Type memory address and/or extra address parameters if applicable to the **Mem.Address** and/or **Extra Address** edit boxes.
6. Click **Add** button.



IMPORTANT NOTE: For more information on Interface settings, please refer to Compatibility list of supported Interfaces in THIS Guide, or refer to BriLAN Reference Guide.

7. To change the media type, select the particular Interface in the bottom part of the **BriLAN Configuration Utility** window and click the **Change** button.
8. In the **New Value** box of the **Port settings** window, select the **Media Type** meeting your hardware. Click the **Save** button to accept the changes.



IMPORTANT NOTE: Available items in the Port settings window may vary depending on specific hardware.

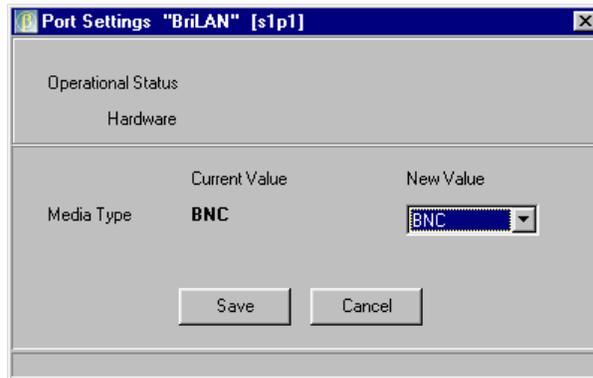


Fig. 4-12 Port settings dialog for Ethernet Interfaces

- Repeat the above steps unless all Ethernet Interfaces are configured.



IMPORTANT NOTE: After completing the settings of selected parameters, write them to the permanent memory of your Device!

4.1.3.3 Setting of Wireless Interface configuration parameters

Set your Wireless Interface card operating parameters as follows:

- From the **Serial Line Console (BriLAN Configuration Utility)** window select **Wireless** in **Interface Type** drop-down box.

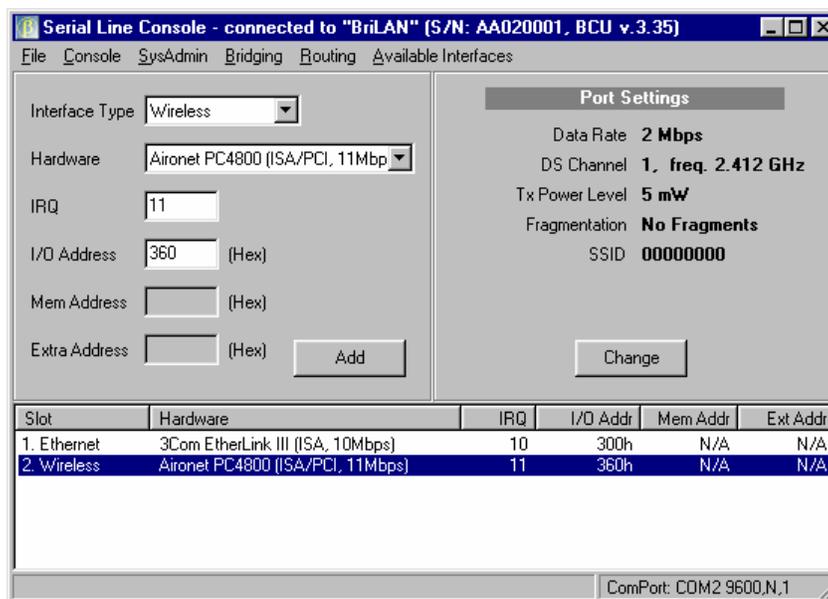


Fig. 4-13 Setting up of Wireless Interface



2. In **Hardware** drop-down box select the requested wireless adapter type.
3. Type a unique interrupt-request-number in the **IRQ** box.
4. Type an unique I/O Address resource in **I/O Address** box.
5. Type memory address and/or extra address parameters if applicable to the **Mem.Address** and/or **Extra Address** edit boxes.
6. Click **Add** button.
7. To set other Interface specific parameters like **Data Rate**, **DS Channel**, **TX Power Level**, **Fragment Threshold** and **SSID**, to meet your hardware configuration, select the particular Interface in the bottom part of the **BriLAN Configuration Utility** window and click **Change** button. To accept the changes click the **Save** button in the **Port settings** window.

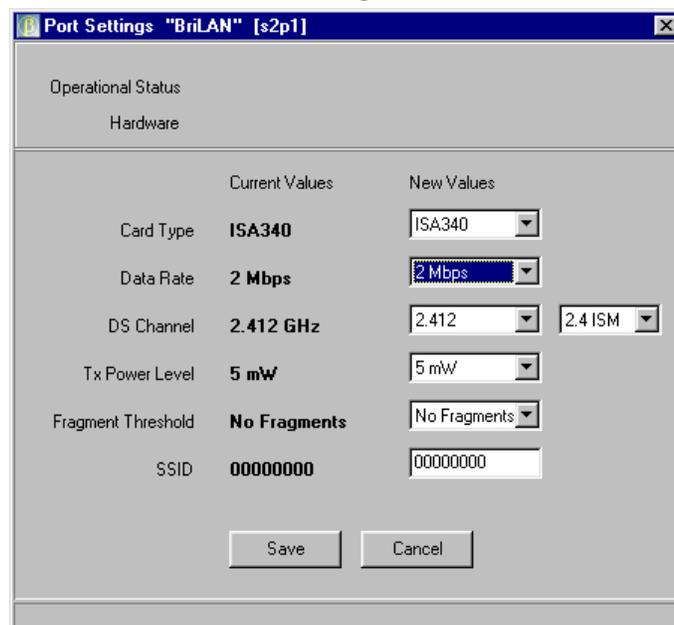


Fig. 4-14 Port settings dialog for Wireless Interfaces

8. Repeat the above steps until all Wireless Interfaces are configured.



IMPORTANT NOTE: After completing the settings of selected parameters, write them to the permanent memory of your Device!

4.1.3.4 Setting of Asynchronous (UART) Interface configuration parameters

1. From the **Serial Line Console (BriLAN Configuration Utility)** window select **Asynchronous** in **Interface Type** drop-down box.

2. In the **Hardware** drop-down box select the **UART** type.
3. Type a unique-interrupt-request number in **IRQ** box.
4. Type an unique I/O Address resource in **I/O Address** box.
5. Click the **Add** button.
6. To set other Interface specific parameters like **Baud Rate, Parity, Data Bits, Stop Bits** and **Flow Control** options meeting your hardware configuration, select the particular Interface in the bottom part of the **BriLAN Configuration Utility** window and click **Change** button. To accept the changes click the **Save** button in the **Port settings** window.
7. Repeat the above steps unless all Asynchronous Interfaces are configured.



IMPORTANT NOTE: After completing the settings of selected parameters, write them to the permanent memory of your Device!

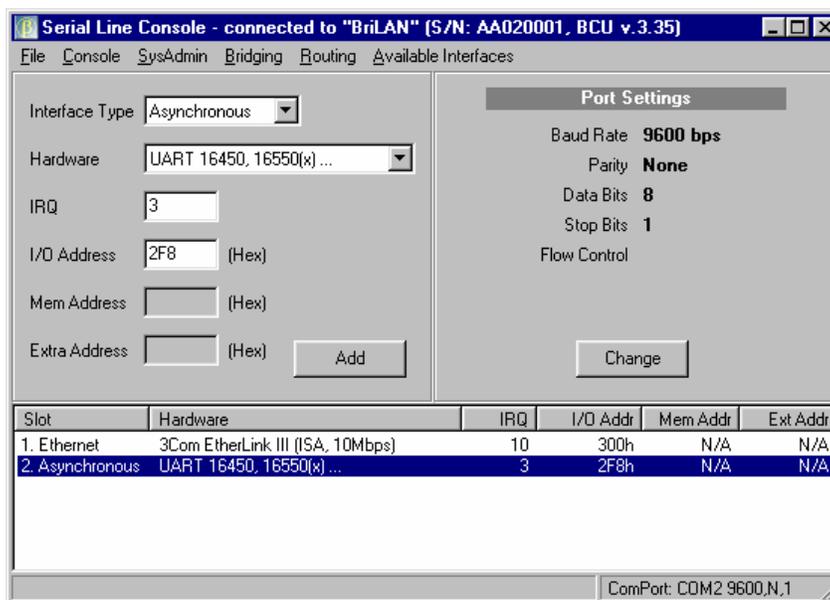


Fig. 4-15 Setting up of Asynchronous Interface parameters

4.1.3.5 Setting of Synchronous Interface configuration parameters

1. From the **Serial Line Console (BriLAN Configuration Utility)** window select **Synchronous** in **Interface Type** drop-down box.
2. In the **Hardware** drop-down box select the requested adapter type.
3. Type a unique-interrupt-request number in **IRQ** box.
4. Type memory address parameter to the **Mem.Address** edit box.



5. Click the **Add** button.
6. To set other Interface specific parameters like **Data Rate, Encapsulation, Interface Type, LMI Type** options meeting your hardware configuration, select the particular Interface in the bottom part of the **BriLAN Configuration Utility** window and click **Change** button. To accept the changes click **Save** button in the **Port settings** window.
7. Repeat the above steps until all **Synchronous** Interfaces are configured.

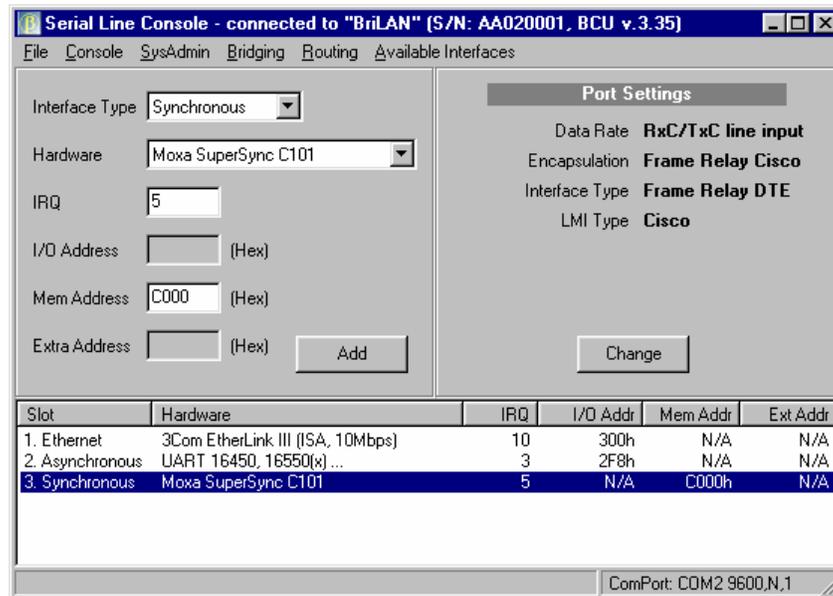


Fig.4-16 Setting up of Synchronous Interface



IMPORTANT NOTE: After completing the settings of selected parameters, write them to the permanent memory of your Device!

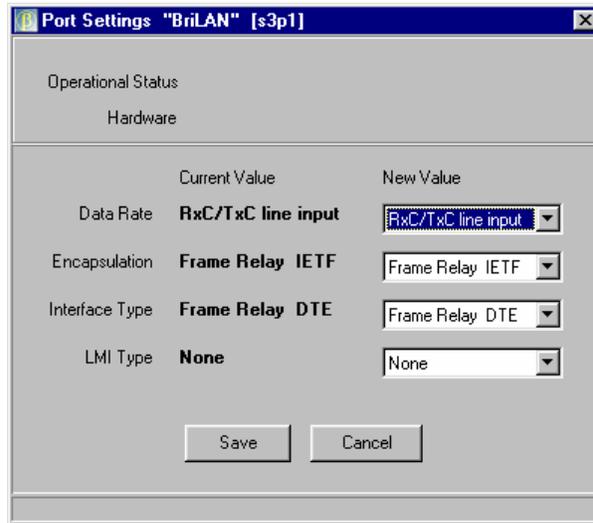


Fig. 4-17 Port settings dialog for Synchronous Interfaces

4.1.3.6 Voice Interface configuration parameters

1. From the **Serial Line Console (BriLAN Configuration Utility)** window select **Voice** in the **Interface Type** drop-down box.
2. In the **Hardware** drop-down box select the requested adapter type.
3. Type unique I/O Address resource in **I/O Address** box.
4. Click the **Add** button.

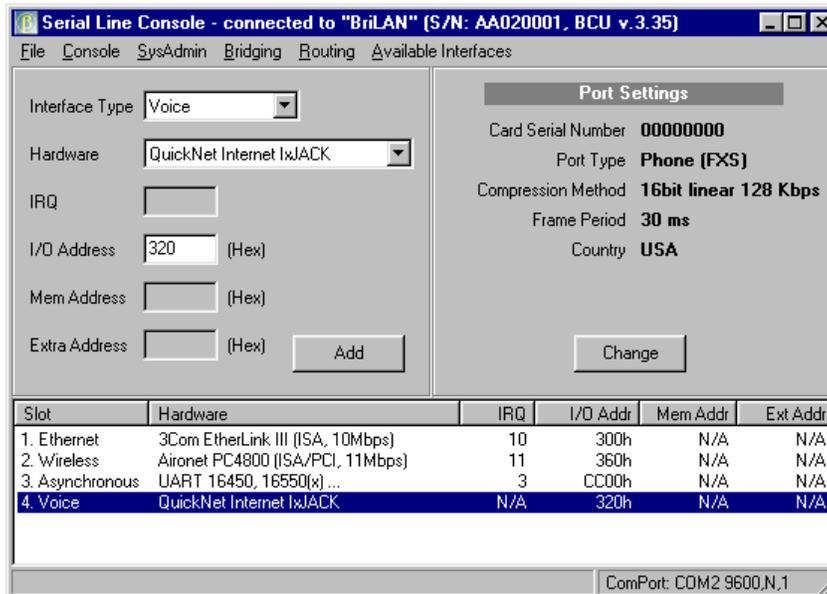


Fig. 4-18 Setting up of Voice Interface



5. To set other Voice Interface specific parameters select the particular Voice Interface, in the bottom part of the **BriLAN Configuration Utility** window and click the **Change** button. You should set up **Card Serial Number** (must be UNIQUE within the Device), **Port Type** (phone or PBX), **Compression Method, Frame Period** and **Country** (if not listed please consult with your local telecom provider) parameter.
6. To accept the changes click the **Save** button in the **Port settings** window.
7. Repeat the above steps until all **Voice** Interfaces are configured.

	Current Values	NewValues
Card Serial Number	00000000	00000000
Port Type	Phone (FXS)	Phone (FXS)
Compression Method	G.723.1 6.3 Kbps	G.723.1 6.3 Kbps
Frame Period	30 ms	30 ms
Country	USA	USA

Buttons: Save, Cancel, Advanced

Fig. 4–19 Port parameters setup for Voice Interface

IMPORTANT NOTES:



Please remember that fax (modem) data should be transferred over the Voice Interface with NO compression method (16bit linear 128kbps mode).

After completing the settings of selected parameters write them to the permanent memory of your Device!

4.1.3.7 Reordering/Removing interfaces in the Slot list

1. To change the availability of the particular Interface within the **Slot** column, select the Interface in the bottom part of the **Serial Line Console (BriLAN Configuration Utility)** window.
2. To move the record up by one position in the **Slot** list, click **Move record up** in the pop-up menu after right-clicking the Interface.
3. To move the record down by one position in the **Slot** list, click **Move record down** in the pop-up menu after right-clicking the Interface.
4. To remove an unnecessary Interface from **Slot** list, click **Delete record** in the pop-up menu after right-clicking the Interface. To confirm removing the Interface, click the **Yes** button.

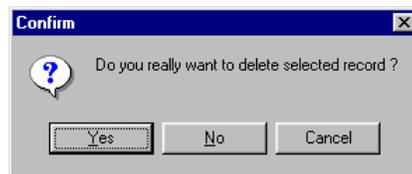


Fig. 4–20 Confirmation dialog



IMPORTANT NOTE: After completing the settings of selected parameters, write them to the permanent memory of your Device!

4.1.3.8 Changing IP networking properties

Your **Device** communicates in normal operating mode with the **BriLAN Management Station** via standard IP protocol. To make your **Device** accessible in your network, set particular IP networking properties.

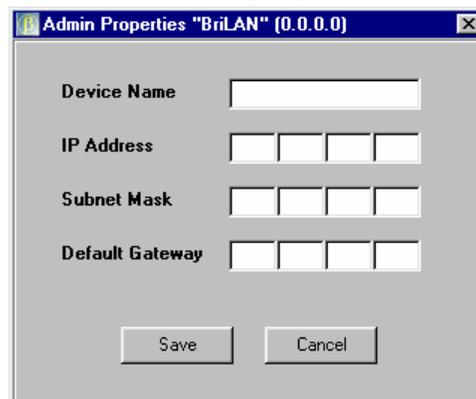


Fig. 4–21 Empty Admin properties window





IMPORTANT NOTE: *You can manage your Devices, operating in your LAN connected to the Internet, from any PC with Internet connectivity.*

1. Click the **SysAdmin** command in the **BriLAN Configuration Utility** window.
2. Click Admin properties item in **SysAdmin** menu.
3. Type the device name, used to identify your Device, in **Device Name** box.

Fig. 4–22 Admin properties before saving

4. Type IP Address in **IP Address** box according to the **Setup Worksheet**.
5. Set subnet masking in the **Subnet Mask** box.
6. Finally set the default gateway in the **Default Gateway** box. If your network is not interconnected with other ones, you can leave this box free.
7. To save the current settings click the **Save** button.

Fig. 4–23 Admin properties confirmation dialog



IMPORTANT NOTE: *After completing the settings of selected parameters, write them to the permanent memory of your Device!*



Fig. 4–24 New settings was accepted

4.1.3.9 Changing administration password

The remote management of your **Device**, controlled by **BriLAN Management Station**, 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.



IMPORTANT NOTE: *Setting up parameters via serial cable does not require authorization using SysAdmin Password.*

To improve management security, you can change the default password “*SysAdmin*” by following these steps:

1. To set the administration password click **SysAdmin** in the Menu Bar of the **Serial Line Console (BriLAN Configuration Utility)** window.
2. Click the **SysAdmin Password** item in **SysAdmin** menu.
3. Type the new password in **SysAdmin Password** dialog box, and then click the **OK** button.



IMPORTANT NOTE: *Upper and lower case letters of the SysAdmin password are distinguished.*

4. Confirm the password, retyping it in the **SysAdmin Password Confirmation** dialog box, and finally click **OK** button.



Fig. 4–25 Password changing dialog





IMPORTANT NOTE: After completing the settings of selected parameters, write them to the permanent memory of your Device!



Fig. 4-26 Password accepted message

4.1.3.10 Writing operation parameters to permanent memory

When providing the initial configuration of your **Device**, all changes of configuration parameters are sent via serial cable to the **Device**, where they are stored in RAM memory. To make these changes permanent, when rebooting the **Device**, it is necessary to write them to the permanent memory of your **Device**:

1. Click **File** command in the Menu Bar of the **Serial Line Console (BrILAN Configuration Utility)** window.
2. To write operation parameters to the permanent memory of your **Device**, click **Save settings to Device** in the **File** menu.
3. Click **Yes** button in **Confirm** dialog box.

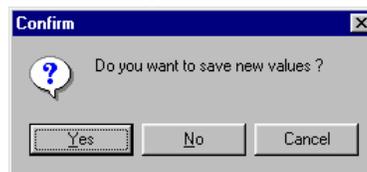


Fig. 4-27 Confirmation dialog

4. To close the **Information** box, click the **OK** button.



Fig. 4-28 Information message



IMPORTANT NOTE: When you to return to the default parameters, use the **Reset Device to Defaults** command.

4.1.3.11 *Finishing basic setup*

Writing all operation parameters to permanent memory of the **Device** fixes all changes provided during the initial setup. Finish the initial setup by completing the following tasks.

1. Close the **Serial Line Console (BriLAN Configuration Utility)** window by clicking **Exit** in the **File** menu.
2. Switch OFF the power on your **Device**.
3. Disconnect the serial cable from the COMM ports of your **Device** and the **BriLAN Management Station**.
4. Your initial setup of **BriLAN Network Device** is now completed.

Now you can connect your new **Device** to the network. After finishing the initial setup you can continue with fine-tuning its other operating parameters. To read more about the tuning procedure, continue with the next chapter.



5. REMOTE ADMINISTRATION



This section provides information about performing basic (or routine?) administration tasks through the network using BriLAN Network Operating System.

Using **BriLAN NMS** all the management tasks of your **BriLAN Network Device** (the Device) equipped with **BriLAN NOS** can be performed remotely from the **BriLAN Management Station**.

This include the following tasks:

- ✍ Running BriLAN NMS.
- ✍ Adding Device(s) to the BriLAN Network.
- ✍ Changing administration rights.
- ✍ Upgrading BriLAN NOS –(optional).
- ✍ Configuring BriLAN Network Services.
- ✍ Applying BriLAN Policies –(optional).

5. 1 RUNNING BRI LAN NMS

You can manage your **Device** from any networked PC having connectivity to the Device.

Requirements:

- ✍ Windows operating system with configured TCP/IP networking.
- ✍ Installed BriLAN NMS software.
- ✍ Running at least one Device.

✍ Connectivity to your Device(s).

Install **BriLAN NMS** as described in the ***BriLAN Installation Guide***. Ensure that your Windows TCP/IP settings work correctly on the **BriLAN Management Station** and have good network connectivity.

To run **BriLAN NMS**, follow these steps:

1. On the Windows task bar, click the **Start** button and point to **Programs** group.
2. Point to **BriLAN NMS** group and click the **BriLAN NMS** command.
3. Continue under **BriLAN NMS** program window.



HINT: To test the quality of your connectivity use the PING command from your operation system (click Start, then click Run and enter PING -t AAA.BBB.CCC.DDD in the box, where AAA.BBB.CCC.DDD is the Device's IP address from the Worksheet).

5. 2 ADDING A DEVICE TO THE BRI LAN NETWORK

Your **BriLAN Network** contains the **Devices** you may access. These Devices are available in **Device List** and **Network Map**. **Network Map** is allocated on the **Network Map** tab in the right portion of your **BriLAN NMS** window. **Device List** is allocated on the **Device List** tab in the right portion of your **BriLAN NMS** window. The left portion of your **BriLAN NMS** window brings to you basic information about operation status of your Devices in graphical form. Operation status of particular Device given by color-coded LEDs:

- ✍ Green – Clear OK
- ✍ Yellow – Critical Warning
- ✍ Red – Critical Error
- ✍ Gray – Unreachable

To add a new device to **Network Map**, follow these steps:

1. Click **Device** in the **BriLAN NMS** window menu.
2. In the **Device** menu point to **Add Device to Map** command.
3. In the **Add Device** dialog enter a valid IP address, assigned to your **Device**.



IMPORTANT NOTE: Enter a valid IP address for your Device, contained in the Setup Worksheet.



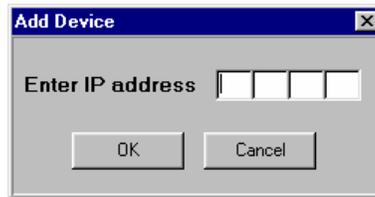


Fig. 5.1 You can select the Device to Add to your Network Map by entering IP Address of your Device in the Add Device dialog

5.3 EXPANDING VIEW OF A DEVICE

Each Device, listed on your **BriLAN Network**, can be simultaneously displayed in details in its own **Expanded View** window. 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.

5.4 SWITCHING TO SYSADMN LEVEL

The proprietary network management protocol used by the Device is secured with authorization and encrypting. When the remote management console communicates with your Device, it checks the password of the System Administrator. When your access is unauthorized or you enter an invalid password, you will not be able to modify any parameter of the Device. Authorized users work in so called **SysAdmin Level** mode.



IMPORTANT NOTE: After completing installation a new **BriLAN Network Device** is the default password set to “**SysAdmin**”.

To switch to **SysAdmin Level** mode, follow these steps:

1. Open **Expanded View** of the Device, if necessary.
2. Click **Device** on the **Expanded View** window menu bar.

3. Point to **SysAdmin Level** command and click **Open SysAdmin Level**.
4. Enter your valid password in the resulting **SysAdmin Password** dialog.



Fig. 5. 2 You can enter your SysAdmin Password in SysAdmin Password window



IMPORTANT NOTE: Upper and lower case letters of the SysAdmin password are distinguished. Valid password must have a length between 6 and 20 characters.

5. To finish the task, click **OK** button in **Information** dialog.

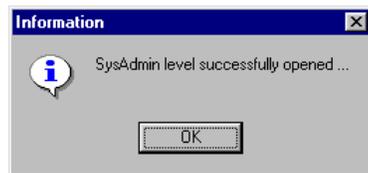


Fig. 5. 3 The message box after your Device accepted the new settings



IMPORTANT NOTE: The yellow colored key on the left side to the SysAdmin Level command indicates that SysAdmin commands were enabled.

5. 5 CHANGING SYSADMIN PASSWORD

You can change your current password in **SysAdmin Level** mode.



IMPORTANT NOTE: After completing installation of a new Device the default password set to "SysAdmin".

To set the administration password, continue with the following steps:



1. Open **Expanded View** of the Device and switch to **SysAdmin Level** mode, if necessary.
2. Click **Device** on the **Expanded View** window menu bar.
3. Point to **SysAdmin Level** and click **Change SysAdmin Password**.
4. In the resulting **SysAdmin Password** dialog enter your new password.
5. Confirm the password, retyping it in the **SysAdmin Password Confirmation** dialog box, and finally click **OK** button.



IMPORTANT NOTE: *Upper and lower case letters of the SysAdmin password are distinguished. Valid password must have length between 6 and 20 characters.*



Fig. 5.4 You can enter your new SysAdmin Password in SysAdmin Password window



Fig. 5.5 You should retype your new SysAdmin Password in SysAdmin Password window

For security reason you can disable SysAdmin commands by closing your **SysAdmin Level** session. To close your **SysAdmin Level** session perform the following steps:

1. To close **SysAdmin Level**, open **Expanded View** of the **Device**, if necessary.
2. Click **Device** on the **Expanded View** window menu bar.
3. Point to **SysAdmin Level** and click **Close SysAdmin Level** command.
4. Click **Yes** button in **Confirm** dialog box.

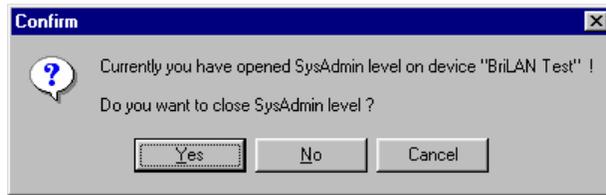


Fig. 5.6 Your confirmation is requested to save the settings

5. To finish the task, click **OK** button in **Information** message box.



Fig. 5.7 The message box after your Device accepted the new settings



HINT: If you forget your SysAdmin password, establish a direct cable connection and enter a NEW password. To get more information about this topic, refer to the Reference Guide.

5. 6 UPGRADING BRI LAN NOS

Typical installation of BriLAN NOS may include a number of **Devices**, which can be deployed in a wide physical area. To make easier prospective upgrades of BriLAN NOS, you can use a utility included in **BriLAN NMS**. This utility helps you to provide this task remotely from the **BriLAN Management Station**.

5. 6. 1 Replacing Bri LAN Image File remotely

The **BriLAN Image File** is contained on the BriLAN loadable medium. This is the executable version of your BriLAN NOS. To remotely upgrade a previous version of BriLAN Image File, transfer the new file from BriLAN NMS to the Device through the network in the following way:

1. Open **Expanded View** of the Device and switch to **SysAdmin Level** mode, if necessary.
2. Click **Device** on the **Expanded View** menu bar.
3. In the **Device** menu point to **System Upgrade**.
4. In **System Upgrade** menu click **BriLAN Image File**.



5. In the **BriLAN System Upgrade** window enter the full path and file name of the BriLAN Image file you want use or click **Browse** button to select it. After clicking the **Browse** button select or browse the new system image file (with the BIF suffix) in the **Open** dialog, and click **Open** button to confirm your selection.

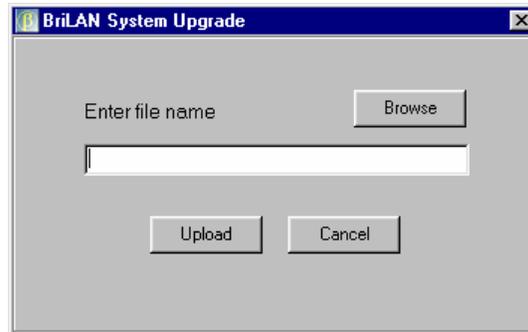


Fig. 5.8 You can specify the system upgrade file in the BriLAN System Upgrade window

6. In **BriLAN System Upgrade** window click the **Upload** button.
7. In **Confirm** dialog box click **Yes** button to save the currently uploaded file to the Device.

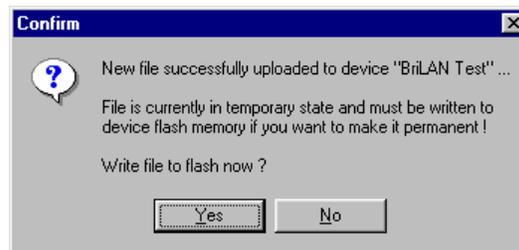


Fig. 5.9 Your confirmation is requested to save the settings

8. To restart the Device immediately, click the **Yes** button in **Confirm** dialog.

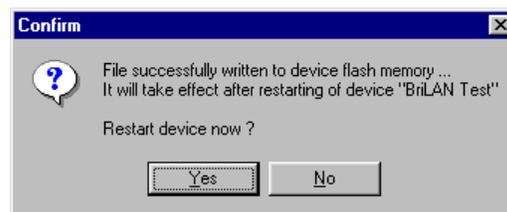


Fig. 5.10 Your confirmation is requested to restart the Device immediately



IMPORTANT NOTE: After successful upload of BriLAN Image File, it is stored in the RAM memory of the Device. To make changes permanent, save them to the storage medium of

the Device.

5. 6. 2 Replacing BriLAN Configuration Utility remotely

The **BriLAN Configuration Utility** is contained on the BriLAN loadable medium. This file is used when changing Interface options using direct cable connection. To remotely upgrade a previous version of BriLAN Configuration Utility, transfer the new file from BriLAN NMS to the Device through the network as follows:

1. Open **Expanded View** of the Device and switch to **SysAdmin Level** mode, if necessary.
2. Click **Device** on the **Expanded View** menu bar.
3. In the **Device** menu point to **System Upgrade**.
4. In **System Upgrade** popup menu click **BriLAN Configuration Utility**.
5. In **BriLAN System Upgrade** window enter the full path and file name of the BriLAN Image file you want use or click **Browse** button to select it. After clicking **Browse** button, select or browse the new configuration utility file (with the BCU suffix) in the **Open** dialog and click **Open** button to confirm your selection.

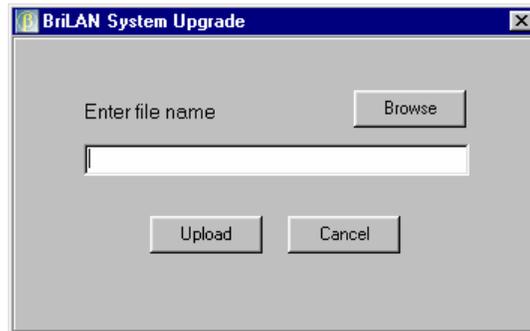


Fig. 5.11 You can specify the system upgrade file in the BriLAN System Upgrade window

6. In **BriLAN System Upgrade** window click **Upload** button.
7. In **Confirm** dialog box click **Yes** button to save the current uploaded file to the Device.



Fig. 5.12 Your confirmation is requested to save the settings

8. To restart the Device immediately, click the **Yes** button in the **Confirm** dialog box.

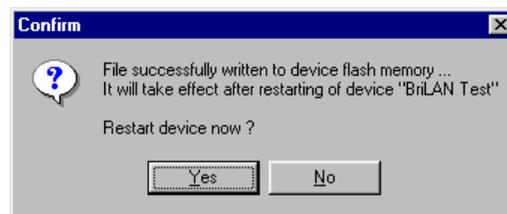


Fig. 5.13 Your confirmation is requested to restart the Device immediately



IMPORTANT NOTE: After successful upload of the BriLAN Configuration Utility, it is stored in the RAM memory of the Device. To make changes permanent, save them to the storage medium of the Device.

5.7 RESTARTING THE DEVICE REMOTELY

Occasionally you may want to restart the Device (e.g. after upgrading system files or upgrading configuration utility). You do this task remotely as follows:

1. Open the **Expanded View** of the Device and switch to **SysAdmin Level**, if necessary.
2. Click **Device** in the **Expanded View** main menu.
3. In the resulting **Device** menu click **Device Restart**.
4. To restart the **Device** immediately, click **Yes** button in the **Warning** dialog box.



Fig. 5.14 Your confirmation is requested to save the settings

- To finish the task click **OK** button in the **Information** message box.



Fig. 5.15 The message box after your Device has accepted the new settings

5. 8 GETTING INFORMATION ABOUT THE SYSTEM MAINBOARD

Sometimes you may need hardware-specific information about the system mainboard or about the utilization of the system CPU. This information can give you a picture of the current system load and also the need for prospective upgrades. Using **BriLAN NMS** you can also complete these tasks remotely.

5. 8. 1 Viewing CPU and RAM information

To view information about the hardware of your system mainboard, follow these steps:

- Open the **Expanded View** window of the selected Device, if necessary.
- Right-click the CPU-slot in the left pane of the Expanded View window.
- Point to and click **System Information** in the resulting pop-up menu.
- To close **System Information** window, click the **Close** icon.



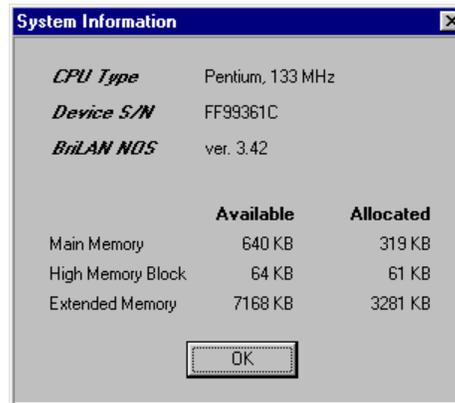


Fig. 5.16 System Information message box gives you an overall picture of installed mainboard

5.8.2 Viewing CPU utilization

To view information about the load on your system mainboard, follow these steps:

1. Open **Expanded View** window of the selected Device, if necessary.
2. Right-click the CPU-slot in the left pane of the Expanded View window.
3. Point to and click **CPU utilization in graph** in the resulting popup menu.
4. To change the time scaling of your diagram, click **Graph** in the menu bar, then point to **Collection period** and select the requested time interval.
5. To close **System Information** window, click **File** in the menu bar and click **Exit** or click the **Close** icon.

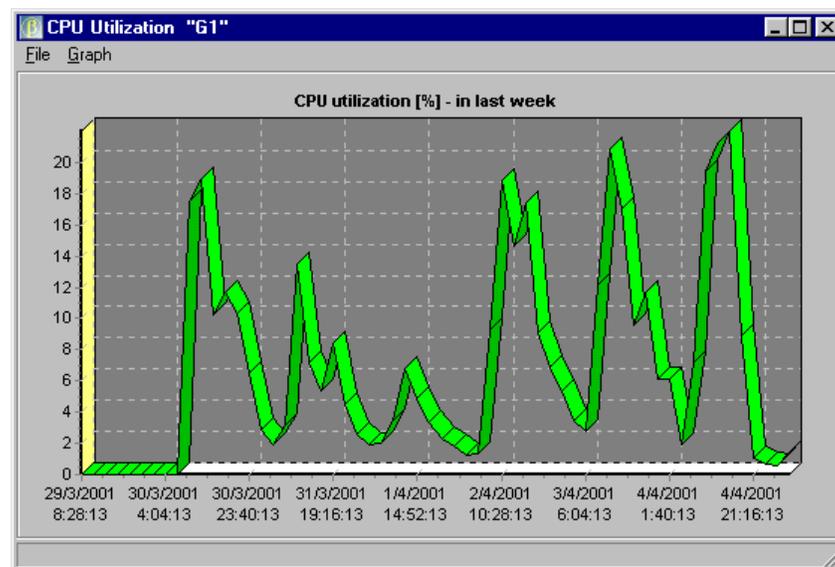


Fig. 5.17 The CPU utilization diagram allows you to see the CPU loading on your Device

5. 9 MANAGING BRI LAN NETWORK SERVICES

Using **BriLAN NOS** you can run the following services (or any appropriate combination of them) on your Device:

-  **Bridge**
-  **Router**
-  **Traffic Shaper**
-  **Virtual Channels**

BriLAN NMS contains all tools for remote configuration of listed services, with filtering, monitoring and traffic analysis, billing and event logging.



IMPORTANT NOTE: For more detailed description about configuring network services on your Device, refer to appropriate sections in this Guide.

To manage available BriLAN Network Services, complete the following tasks:

-  Configure requested BriLAN Service.
-  If necessary apply your custom BriLAN Policies*
-  Start your new BriLAN Service.

*Applied forwarding, filtering, and monitoring rules on selected **BriLAN Network Services** define your custom **BriLAN Policies**.



IMPORTANT NOTE: For more detailed description about applicable BriLAN Policies on your Device, refer to appropriate sections in this Guide.



6. TUNING INTERFACE PARAMETERS



This section provides information on modifying operating parameters of the Interface Ports on your Devices.

Sometimes you may need to check or change operating parameters of the Interface(s) installed in your **BriLAN Network Device** (the Device). You can also carry out this task remotely.

To manipulate Port operating parameters, complete the following tasks:

-  Switch to SysAdmin Level.
-  Read Port configuration- (optional).
-  Change Port configuration- (optional).
-  Tune wireless link quality- (optional).

6. 1 CHECKING PORT SETTINGS

To check Interface Port settings remotely, carry out the following steps:

1. Open **Expanded View** window for the **Device**, if necessary.
2. Right-click the **Port record** in details pane of the **Expanded View** window, or right-click the **Port** in the **Slot Panel** window. To open the **Slot Panel** window, click **Slot Panel** command in the View menu of **Expanded View** window or press CTRL+S.

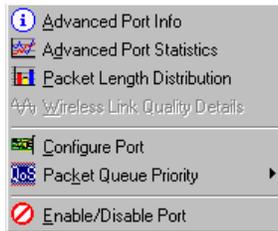


Fig. 6.1 The Port popup menu

3. In the popup menu, click **Advanced Port Info** item, and continue in **Advanced Port Info** window.

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

Fig. 6.2 Information about port setting

4. To close **Advanced Port Info**, click the **Close** icon of the **Advanced Port Info** window.

6.2 CHANGING PORT SETTINGS

You can set or alter some operating parameters like **Media Type**, **Data Rate**, **DS Channel**, **TX Power Level**, **Fragment Threshold** and **SSID** of any selected Port on your Device.



IMPORTANT NOTE: You can't remotely change the **IRQ** and the **Memory Address** settings of your Interface.



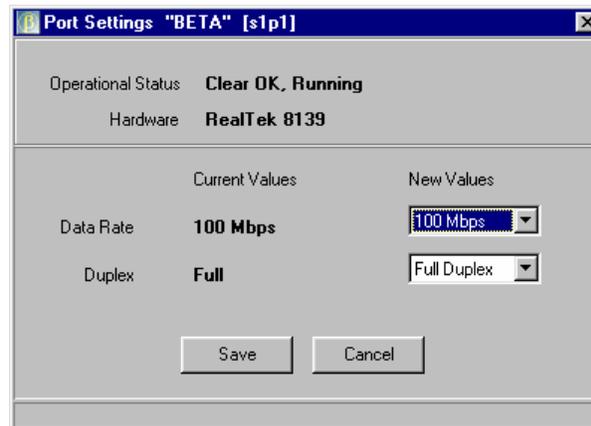


Fig. 6.3 The port settings dialog

To change Port-operating parameters remotely, provide the following steps:

1. Open the **Expanded View** window for the Device, if necessary.
2. Right-click the **Port record** in details pane of the **Expanded View** window, or right-click the **Port** in the **Slot Panel** window. To open the **Slot Panel** window, click **Slot Panel** command in the View menu of **Expanded View** window or press CTRL+S.
3. In the popup menu, click **Configure Port** item.
4. Set appropriate operation parameters in **Port Settings** window.
5. To save your new settings click **Save** button in **Port Settings** window.
6. To confirm the settings, click **Yes** button in **Confirm** dialog box.

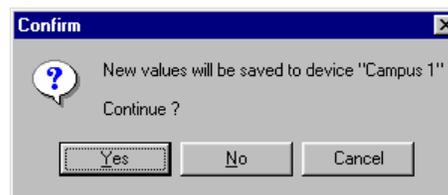


Fig. 6.4 Your confirmation is requested to save the settings

7. To finish the task, click **OK** button in **Information** message box.



Fig. 6.5 The message box after your Device accepted the new settings

6. 3 TUNING VOICE INTERFACES

Using BriLAN NMS you can tune all aspects of your voice interface card installed in the Device, such as **Volume**, **Sensitivity**, and **Attenuation** settings. For more information on this topic, see the previous section (**Changing Port Settings**).

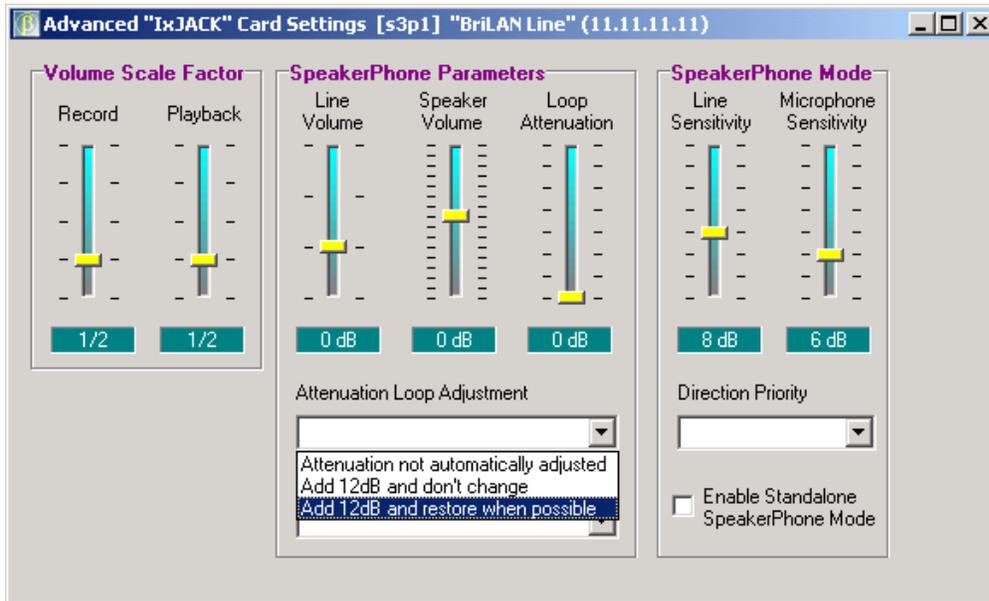


Fig. 6.6 Parameter tuning of your Voice interface card

6. 4 CHECKING PACKET LENGTH DISTRIBUTION

Knowing the current packet distribution by size can give a useful picture of the traffic on your network segments. You can check the distribution diagram of the current packet traffic in 6 predefined characteristic packet size intervals given in bytes.

To see the **Packet Length Distribution** diagram, follow the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. Right-click the **Port record** in details pane of **Expanded View** window, or right-click the **Port** in the **Slot Panel** window. To open the **Slot Panel** window, click **Slot Panel** command in the View menu of **Expanded View** window or press CTRL+S.
3. In the popup menu, click **Packet Length Distribution** item, and continue in **Packet Length Distribution** window.
4. Right-click the diagram, if you want to change diagram scaling between **Own Maximal Values**, **Common Maximal Values** and **Percentage View**, and click the requested scaling in the resulting popup menu.



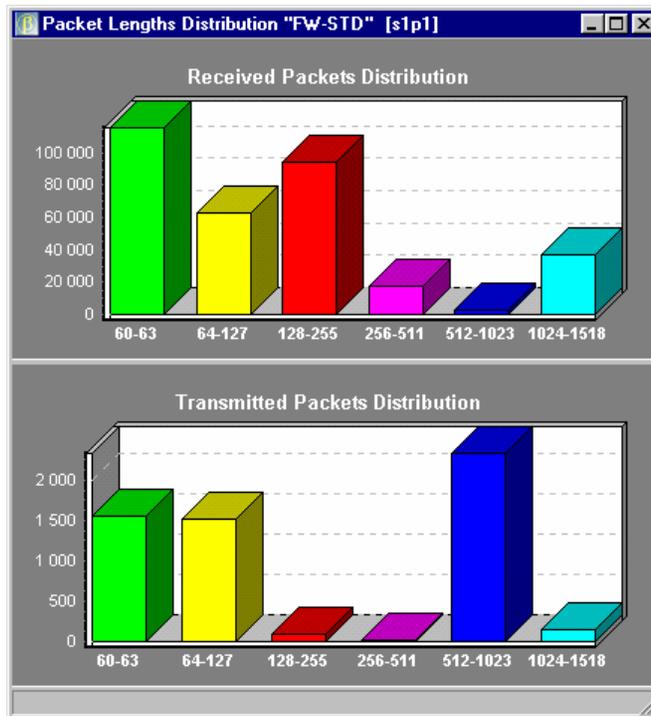


Fig. 6.7 Size distribution of received and transmitted packets

6. 5 TUNING WIRELESS LINKQUALITY

Using interface parameter options you can tune the quality of your wireless links in real-time directly from the management station. This helps you to find the best position and direction of your antenna mountings.

To see the quality of the selected wireless link, continue with the following steps:

1. Open the **Expanded View** window for the Device, if necessary.
2. Right-click your Wireless Port record in details pane of **Expanded View** window.
3. Click **Wireless Port Quality Details** and continue in **Wireless Link Quality Statistics** window.

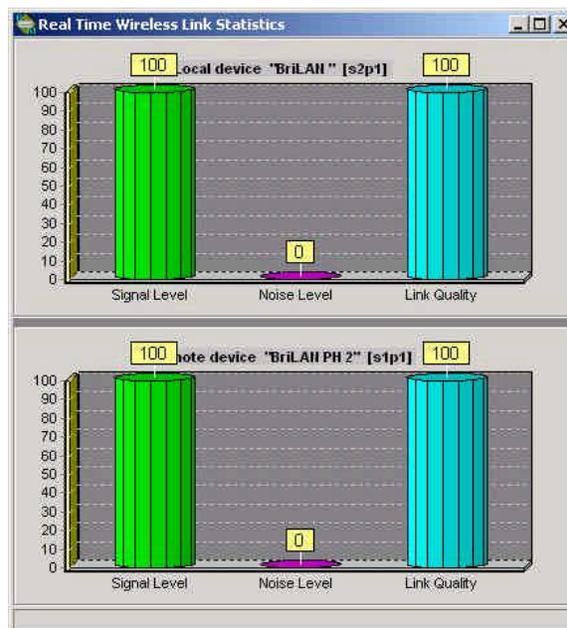


Fig. 6.8 The wireless link quality window gives you real-time link quality information

6. 6 CHANGING PORT OPERATIONSTATUS

By default all configured Ports are enabled, however you can enable or disable the selected Port at any time. If the Port is disabled, ALL network traffic is completely stopped over this Port.

1. Open **Expanded View** window for the Device, if necessary.

2. Right-click the Port record in Port column under details pane of **Expanded View** window, and then click **Enable/Disable Port**.

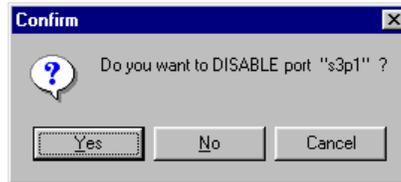


Fig. 6.9 Your confirmation is requested to change operation status

3. To change the port operation status, click the **Yes** button in the **Confirm** window.
4. To complete the task, click the **OK** button in the **Information** message box.



Fig. 6.10 The message box after your Device accepted the new settings

7. CONFIGURING BRI LAN BRIDGE SERVICE



This section describes bridging configuration options available on your BriLAN Network Devices.

Your **BriLAN Network Device** (Device) may operate as a MAC-layer multiport learning bridge. When bridging is enabled, the Device works transparently to higher level protocols and defines the boundary of the collision domain.

To use your Device in Bridging mode, complete the following tasks:

-  Switch to SysAdmin Level.
-  Enable bridging on the Device.
-  Disable bridging on some Ports -(optional).
-  Configure BriLAN Bridging Policies -(optional).

7. 1 CHANGING BRIDGING STATUS ON YOUR DEVICE

By default the bridging feature of your **Device** is enabled, however you can enable or disable Bridging on the selected Device at any time. To change the bridging status of the Device, provide the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. Click **Configure** on the **Expanded View** menu bar.



IMPORTANT NOTE: *When the bridging feature of your Device is disabled, the checkmark is hidden to the left on the Bridging command. Conversely, the checkmark appearing to the left on the Bridging command indicates that the bridging*



feature of your Device is enabled.

3. In the **Configure** menu, point to **Bridging**, and click **Enable Bridging**.



IMPORTANT NOTE: *Don't disable bridging on the Device when you are configuring it.*

4. To enable or disable bridging, click **Yes** button in **Warning** dialog box.



IMPORTANT NOTE: *If you want disable/enable bridging over the selected Port change the **SELECTED** Port bridging status only by putting it to a disabled bridge group.*

7. 2 CHANGING BRIDGING STATUS ON PORT LEVEL

By default the bridging feature on Port level is enabled, however you can disable or enable bridging on the selected Port any time.



IMPORTANT NOTE: *Changing the bridging status of the Port affects only the bridging, and it does not change the routing activity of the Port. To completely disable/enable the Port operation status use **Disable/Enable Port** command.*

To change the bridging status on the Port level (enable or disable bridging), perform the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. Click **Configure** on the **Expanded View** menu bar.
3. In the **Configure** menu, point to **Bridging** and click on **Bridge Group Manager**.
4. Click on appropriate Port in details pane in the **Bridge Groups Manager** window.
5. Select or remove selection of **Enable Bridging** checkbox in the **Bridge Groups Manager** window.

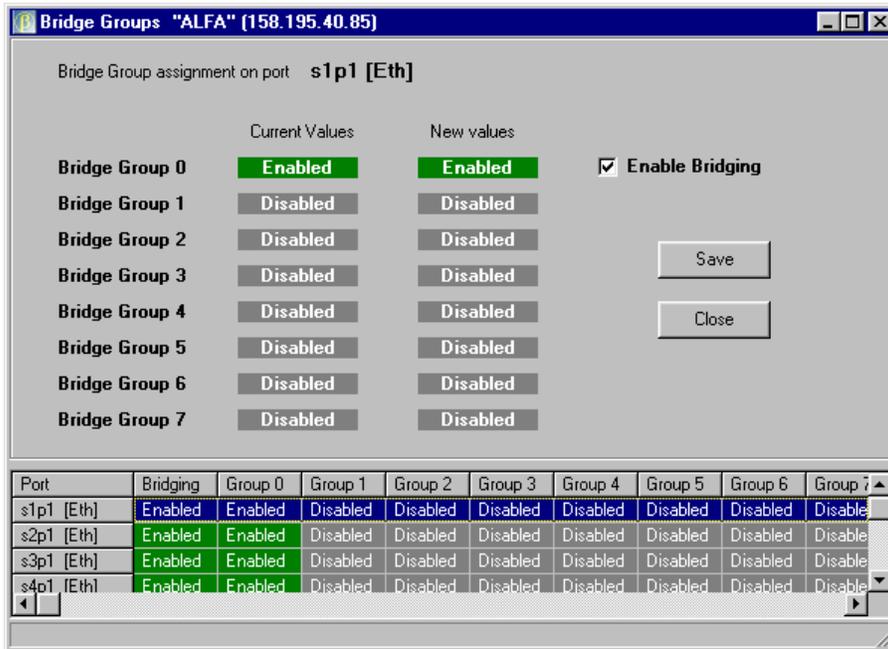


Fig. 7.1 You can change bridging status of individual ports in Bridge Group Manager

- Click **Save** button in the **Bridge Groups Manager** window and click the **Yes** button in Confirm dialog box.

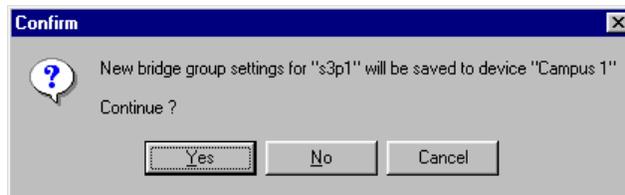


Fig. 7.2 Your confirmation is requested to change the membership in Bridging Group

- To finish the task, click **Yes** button in **Information** message box.



Fig. 7.3 The message box after your Device accepted the new settings

7.3 APPLYING BRIDGING POLICIES

After the BriLAN Bridge Service has started, you can apply several rules on packet forwarding and filtering. The following rules define your custom BriLAN Bridging Policy:

-  Port grouping for custom packet forwarding.
-  Port assignment to priority queues for QoS.
-  Network Node assignment with Permitted and Denied Ports for custom filtering.
-  Port or Network Node assignment with Traffic Shaping Queues for custom filtering.



IMPORTANT NOTE For more information about applying individual bridging rules, please refer to appropriate sections in this Guide.

8. GROUPING THE PORTS



This chapter contains information about creating virtual networking groups by introducing filtering rules on the Interface Ports.

Using **BriLAN Network Device** (Device) you can group Interface ports to create your virtual network groups. When bridging is enabled for the Device, you can create up to eight separate Bridge Groups, aggregating individual Interface ports on the Device.

This feature enables use of the Device as a “port-selective” packet filter, which controls the packet traffic between particular network segments. This means that ports belonging to a selected Bridge Group are treated with a common Forwarding Policy. Packets are forwarded between the Interface Ports, which belong the same Bridge Group, so end-nodes belonging to different Bridge Groups can't access each-other. Packets directed between different Bridging Groups (coming from/to Ports in different Bridging Groups) are stopped on the Device.

To create your virtual networking groups, complete the following tasks:

-  Switch to SysAdmin Level.
-  Enable bridging on the Device.
-  Assign Ports to the required Bridging Groups.
-  Disable bridging on appropriate Ports.-(optional)

8.1 CONFIGURING BRIDGE GROUPS

You can set up to eight Bridge Groups, containing at least two specific Interface Ports. You can assign each Interface Port to one or more Bridge Group.





IMPORTANT NOTE: To create and operate Bridge groups, your Device should have Bridging enabled.

To configure your Bridge Groups::

1. Open **Expanded View** window for the Device, if necessary.
2. Click **Configure** command on the **Expanded View** window menu bar and point to **Bridging**.
3. In the **Configure** menu click **Configure Bridge Groups** command.
4. Click **Interface Port** to assign the selected port to a Bridge Group and on the Bridge Group assignment pane click **Disabled** status-indicator under **New values**.
5. To make changes permanent, click the **Save** button.

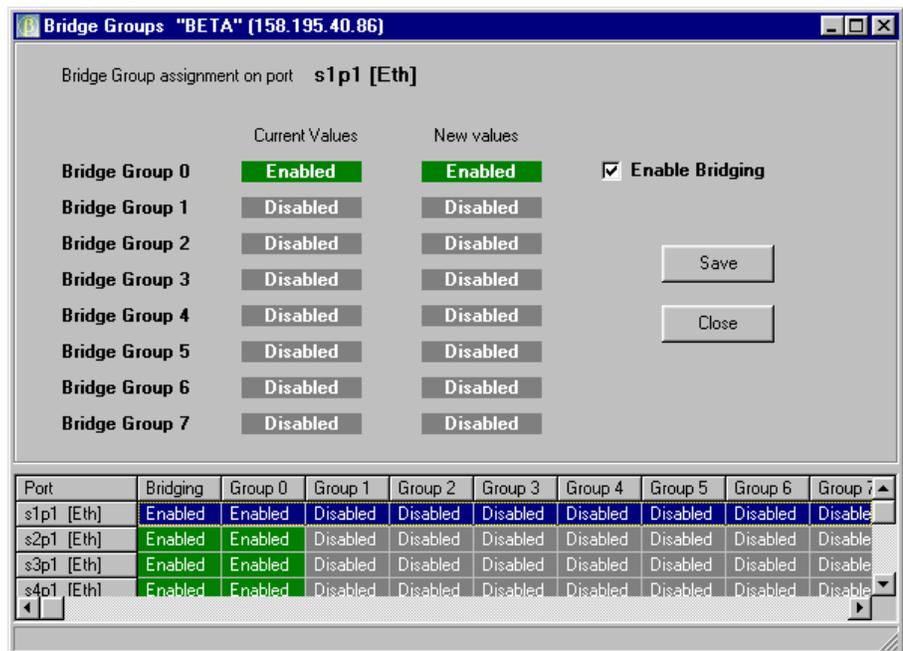


Fig. 8.1 The Bridge Groups window

This window contains all Interface Ports 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 under Current Values. When the Interface Port is not available in the Bridge Group you will find the Disabled status-indicator under Current Values.

8. 2 CHANGING THE INTERFACE PORT MEMBERSHIP IN A BRIDGE GROUP

To change the Interface Port membership in a Bridge Group, continue as follows:

1. Open **Expanded View** window for the Device, if necessary.
2. Click **Configure** command on the **Expanded View** window menu bar and point to **Bridging**.
3. In the **Configure** menu click **Configure Bridge Groups** command.
4. To change the membership of the Port, click the Port record in details pane in Port column of the **Bridge Groups** window.
5. Click the button under **New values** in the row with the requested Bridge Group.
6. To make the changes permanent, click the **Save** button.
7. To accept the settings, click the **Yes** button in **Confirm** message box.

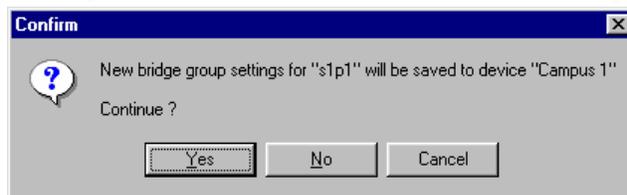


Fig. 8.2 The confirmation dialog before saving the settings

8. To finish the task, click the **OK** button in the **Information** message box.

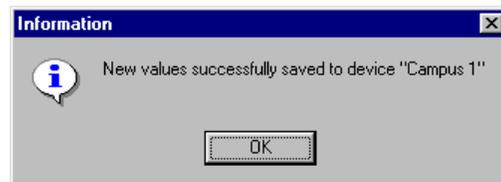


Fig. 8.3 The message box after your Device accepted the new settings



IMPORTANT NOTE: *By default all Interface Ports are enabled and assigned to the 0 Bridge Group.*



9. CONFIGURING BRI LAN ROUTER



This section describes available routing configuration options on your BriLAN Network Devices.

You can set up your **BriLAN Network Device** (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.



IMPORTANT NOTE: *The table of applicable static routes should be configured BEFORE routing is enabled. Please note that routing has a higher priority in the Device than bridging.*

To use **Routing** on your Device, complete the following tasks:

-  Switch to SysAdmin Level.
-  Assign appropriate IP addresses to the router's ports.
-  Create static IP routes to your subnets.
-  Enable routing on your Device.
-  Configure BriLAN Routing Policies – (optional).

9. 1 ASSIGNING A PORT IP ADDRESS

All Ports on your Device can be associated with a unique IP address. Provide this task BEFORE you create your IP routes. To assign an IP address to the Port, perform the following steps:

1. Open the **Expanded View** window for the Device, if necessary.
2. Right-click the Port record in Port column under details pane of **Expanded View** window, and then click **Configure Port IP Address**.
3. Using the **Select Port** drop-down list click the Port in the **Port IP Address** window.



IMPORTANT NOTE: Please note that for the abbreviated port specification the "sXpXqX" nomenclature is used. For more details refer to the *BriLAN Reference Guide*.

4. In the **Port IP Addresses** window enter a valid IP address in **Port IP Address** box and Net Mask settings in **Subnet Mask** box.

Port	IP Address	Subnet Mask	Broadcast	Encapsulation
s1p1 [Eth]	158.195.40.201	255.255.255.0	158.195.40.255	Ethernet

Fig. 9.1 You can assign IP addresses to the Ports in the Port IP Address window

5. Click the **Add** button in **Port IP Address** window.
6. To add the port IP address click the **Yes** button in the **Confirm** dialog box.

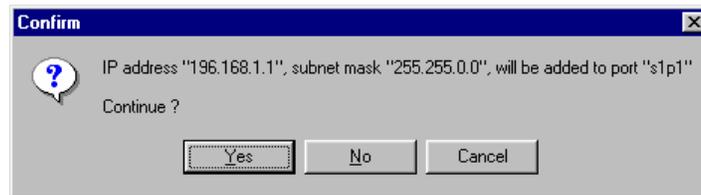


Fig. 9.2 The confirmation dialog before saving the settings

7. To complete the task, click the **OK** button in the **Information** message box.



Fig. 9.3 The message box after your Device accepted the new settings



IMPORTANT NOTE: *You can't add the same IP address more than once within a Device.*

9.2 CHANGING A PORT IP SETTINGS

Sometimes you may need to change IP networking information associated with the port like **Associated interface**, **Port Address**, **Subnet Mask** settings. You may also need to remove the IP address from the Port. To change or delete a Port IP address setting, perform the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. Right-click the Port record in Port column under details pane of the **Expanded View** window, and then click **Configure Port IP Address**.
3. Click on the Port IP address record in the **Port IP Addresses** window under the details pane.
4. To change Associated interface, Port Address or Subnet Mask settings first remove the Port IP address record and then add a new entry. To remove the selected **Port IP Address** record, click the **Delete** button.

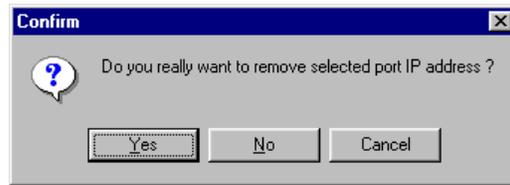


Fig. 9.4 Your confirmation is requested before the Device accepts the settings

- To finish the task, click **OK** button in **Information** message box.



Fig. 9.5 The message box after your Device accepted the new settings

9.3 ADDING IP ROUTES

Valid IP routes, associated with specific Port are stored in a static routing table of the Device. To configure IP routes for the Device, perform the following steps:

- Open **Expanded View** window for the Device, if necessary.
- Click **Configure** on the **Expanded View** menu bar.
- In the **Configure menu**, point to **Routing**, and click **Configure IP Routes**.

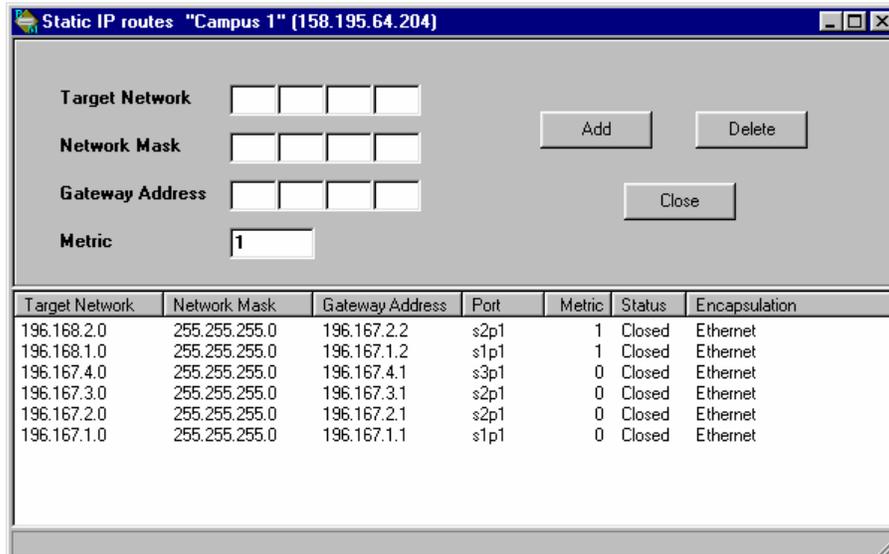


Fig. 9.6 You can create your static IP routes in Static IP Routes window



4. In the **Static IP Routes** window enter a valid **Target Network**, **Network Mask** and **Gateway** for in the appropriate text boxes. (If applicable, enter valid **Metric** and **DLCI** settings).
5. To add your setting to the routing table, click **Add** button.
6. To confirm a new IP route, click **Yes** button in **Confirm** dialog box.

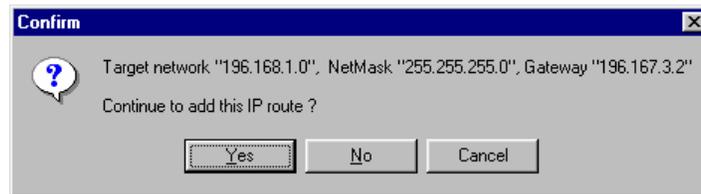


Fig. 9.7 Your confirmation is requested before the Device accepts the settings

7. To finish the task, click **OK** button in **Information** message box.



Fig. 9.8 The message box after your Device accepted the new settings

9.4 REMOVING AN IP ROUTE

To track changes in your network configuration, you may need to remove an expired IP route from your Device. You can remove an IP route record by in the following way:

1. Open **Expanded View** window for the Device, if necessary.
2. Click **Configure** on the **Expanded View** menu bar.
3. Point to **Routing** in the **Configure menu**, and click **Configure IP Routes**.
4. In the details pane of **Static IP Routes** window click the IP route record.
5. With the selected **IP Route** click the **Delete** button or right-click the record and than click **Delete Entry**.
6. In **Confirm** dialog box click the **Yes** button.

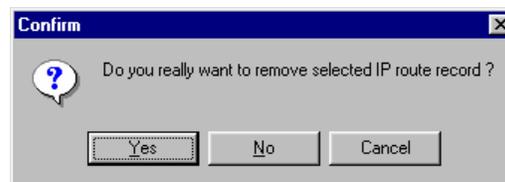


Fig. 9.9 Your confirmation is requested before the Device accepts the settings

- To finish the task click the **OK** button in **Information** dialog.



Fig. 9.10 The message box after your Device accepted the new settings

9.5 CHANGING ROUTING STATUS

By default the routing feature of your **Device** is disabled, however you can enable or disable routing on your Device.



IMPORTANT NOTE: *Your port IP addresses and static IP routes should be configured **BEFORE** routing is enabled.*

To change the routing status of the Device (enable or disable Routing), perform the following steps:

- Open **Expanded View** window for the Device, if necessary.
- Click **Configure** on the **Expanded View** menu bar.
- In the **Configure menu**, point to **Routing**, and click **Enable Routing**.
- To change the routing status on the Device, click the **Yes** button in the **Confirm** dialog box.

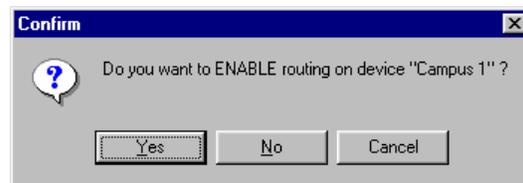


Fig. 9.11 Your confirmation is requested before the Device accepts the settings

- To finish the task click, **OK** button in **Information** message box.



Fig. 9.12 The message box after your Device accepted the new settings





IMPORTANT NOTE: When the routing feature of your Device is disabled, the checkmark is hidden to the left on the Routing command. On the other hand, the checkmark displayed to the left on the Routing command indicates that the routing feature of your Device is enabled.

9. 6 APPLYING ROUTING POLICIES

After the BriLAN Router Service is started, you can apply several rules on packet forwarding and filtering. The following rules define your custom BriLAN Routing Policy:

-  Port assignment to priority queues for QoS.
-  Network Node assignment with Permitted and Denied Ports for custom filtering.
-  Port or Network Node assignment with Traffic Shaping Queues for custom filtering.



IMPORTANT NOTE: For more information about applying individual routing rules, please refer to appropriate sections in this Guide.

10. SHAPING THE TRAFFIC



This section describes configuration of Traffic Shaping Service available on your BriLAN Network Devices.

You can set up your **BriLAN Network Device** (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.

You can include your bridging or routing Ports or your Network Nodes defined by MAC or IP addresses in 64 independent Traffic Shaping Queues. Speed limit and queue membership are customizable rules, available in **Traffic Shaping Manager**.



IMPORTANT NOTE: To apply BriLAN Traffic Shaping Policy you should Enable Traffic Shaping service on the Device.

To use Traffic Shaping on your Device, complete the following tasks:

-  Switch to SysAdmin Level.
-  Enable traffic shaping queue on the Port.
-  Set Queue assignment -(optional).
-  Set speed limits for the Queue(s) -(optional).
-  Start traffic shaping queue on the Port.
-  Enable traffic shaping queue on the Device.



10. 1 SETTING TRAFFIC SHAPING LIMITS

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:



10. 2 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.

The screenshot shows the Traffic Shaping Manager interface for a device named 'B2-3' (158.195.40.84). The interface includes several control panels and a data table.

Queue 1 Configuration:

- Enable:** A green button with a green light, indicating the queue is enabled.
- Start:** A green button with a green light, indicating the queue is started.
- Assignment:** Set to 'Port Level' with a green light and 's1p1' selected.
- Queue Speed Limit:** IN: 4096 Kbps, OUT: 64 Kbps. A 'Set' button is present.
- Duplex:** A green button with a green light.

Channel IN Statistics:

- Packets: 29 522 556
- Bytes: 12 265 802 245
- Discards: 323 181
- Data rate: 186 Kbps
- Utilization: 5% (indicated by a green bar)
- Buffer Usage: 0% (indicated by a green bar)

Channel OUT Statistics:

- Packets: 0
- Bytes: 0
- Discards: 0
- Data rate: 0 Kbps
- Utilization: 0%
- Buffer Usage: 0%

TS Queue	Status	Assignment	Utilization %	Pkts Sent	Bytes Sent	Pkts Discard
Queue 1	Enabled	s1p1	5	29 522 556	12 265 802 245	323 181
Queue 2	Disabled					
Queue 3	Disabled					
Queue 4	Disabled					
Queue 5	Disabled					
Queue 6	Disabled					

✎ **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.

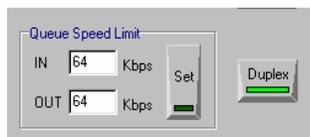
Use the **Queue Assignment** pane to set the type of queue membership. Traffic Shaping Queues may contain Ports or Network Nodes. The appropriate Network Node assignment may be controlled in the **Users** menu of the Traffic Shaping main menu at MAC or IP addresses mode.





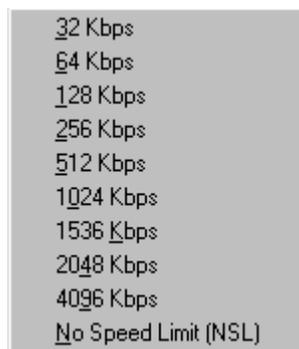
- ✎ **Users Level** – Use the Users Level option to define the queue membership per network node level (by MAC or IP addresses)
- ✎ **Port Level**– Use the Port Level option to define the queue membership per physical port level.
- ✎ **Discard** – Use the Discard button to completely delete packets in 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 as well as user definable speed limits.



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

10.2.1.1 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.

You can configure up to 128 traffic queues for limiting data speed for your Device: Queues, with defined data speed limit within speed range 32-4096 Kbps, can be independently started or stopped.

10. 3 ASSI GNI NG PORTS OR ADDRESSES

Traffic Shaping Queues may contain Ports or Network Nodes, defined by MAC or IP addresses. To create a Traffic Shaping Policy, you should first set the Network Node or Address mode.

10. 3. 1 Setting Network Node Level Queue

Choose this mode, to define queue membership on network node level.

To set queue membership on network node level, follow these steps:

1. Open **Expanded View** window for the Device, if necessary.
2. Click **BW Management** command in menu bar of the **Expanded View** window.
3. Point to **Traffic Shaping** and click **Traffic Shaping**.
4. Choose the assignment of the queue from Assignment drop-down menu.

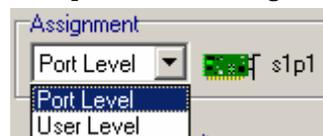


Fig. 10.1 Selecting queue type



- Right-click user icons in **Assignment** column and point to requested user definition (**MAC / IP Address Level**).

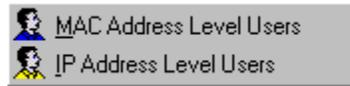


Fig. 10.2 Selecting queue type

- In the resulting **MAC/IP address Level Users** window select **MAC/IP Address** in **User Name** column, and click **Queue number** under **TSQ**.
- Click the **Save** button in the **MAC/IP address Level Users** window.

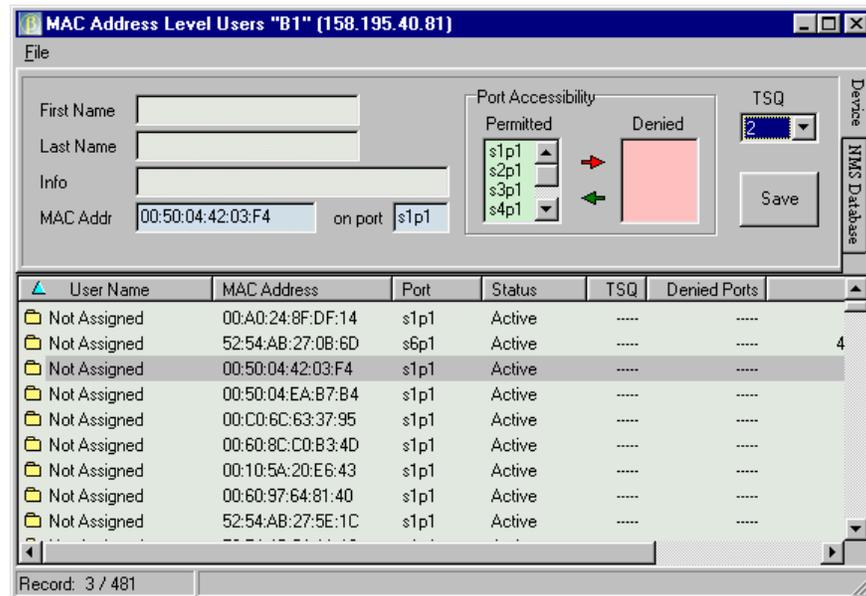


Fig. 10.3 Setting queue number

- Click **Close** icon in the **Traffic Shaping Manager** window.

11. CREATING VIRTUAL CHANNELS



This section describes virtual channel configuration options available on your BriLAN Network Devices.

Virtual channels work as IP tunnels between two **BriLAN Network Devices** and enable you to connect your phones or PBX-s over data networks (proprietary VoIP), allowing you to transmit computer terminal data or integrate your distant subnets over the Internet. Data directed to your virtual channel on the selected **BriLAN Network Device** are encapsulated to IP packets and forwarded to the next **BriLAN Network Device**.



IMPORTANT NOTE: Virtual channels work only with properly configured IP networking. For more details see chapter Configuring BriLAN Router.

To create your virtual channels, complete the following tasks:

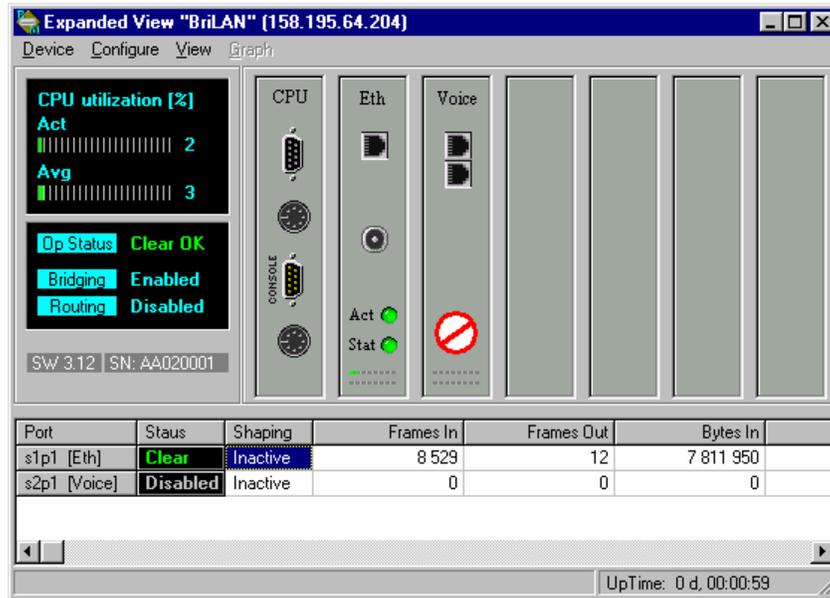
-  Switch to SysAdmin Level.
-  Add at least two Devices to you Network Map.
-  Assign appropriate IP addresses to the ports of your BriLAN routers.
-  Enable routing on your Devices.
-  Create and activate your Virtual Channel.



11. 1 CREATING VIRTUAL CHANNELS

By default, no Virtual Channel is available on your Device. To create a new Virtual Channel on a selected Device, perform the following steps:

1. Open the **Expanded View** window for the Device, if necessary.
2. Enable routing for at least the Devices intended to be used for Virtual Channeling.
3. Click **Configure** on the **Expanded View** menu bar.



11. 1 Expanded View window before creating Virtual channel for Voice Interface

4. In the **Configure** menu click **Virtual Channels**.
5. Set routing parameters for your **Local** Device selecting Port in **Local Port** drop down menu of the **Virtual Channel Manager** window.

IMPORTANT NOTE: Because you can create a Virtual Channel only if the second Device is accessible Your Device Map should contain at least two Devices.



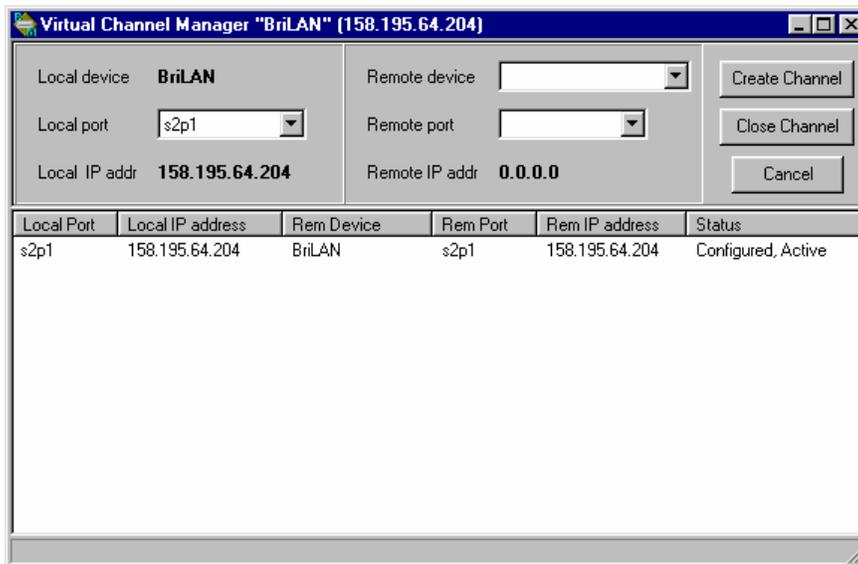
IMPORTANT NOTE: There is no need to change configuration on the second Device, because the parameters of your new Virtual Channel are set up automatically on it.

6. Set routing parameters for **Remote** Device selecting in **Remote Device** and **Remote Port** drop down menus of the **Virtual Channel Manager** window.
7. Create your new Virtual Channel by clicking on the **Create Channel** button in the **Virtual Channel Manager** window.

11. 2 REMOVING VIRTUAL CHANNELS

To remove a Virtual Channel on a selected Device, perform the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. Click **Configure** on the **Expanded View** menu bar.
3. In the **Configure** menu click **Virtual Channels**.
4. Select the Virtual Channel to remove in the detail pane of the **Virtual Channel Manager** window.
5. Click the **Close Channel** button with the selected Virtual Channel.



11. 2 Virtual Channel Manager window with configured Virtual Channel.

12. QUALITY OF SERVICES



This section describes Quality of Services features available on your BriLAN Network Devices.

Your network setup may contain requirements on guaranteed network throughput (e.g. voice/video streams), which is achievable using packet priority rules. **BriLAN Network Device** (the Device) has implemented 3 different level of packet priority queues.

To use the QoS feature on your Device, complete the following tasks:

-  Switch to SysAdmin Level.
-  Configure the selected Port for bridging or routing.
-  Assign Port(s) to the appropriate queue.

12. 1 ASSIGNING A PORT TO QOS

To set an appropriate Quality of Services priority Queue to the selected Port, provide the following steps:

1. Open **Expanded View** window for the **Device**, if necessary.
2. Right-click the **Port record** in details pane of **Expanded View** window, or right-click the **Slot Panel** window. To open the **Slot Panel** window, click **Slot Panel** command in the View menu of **Expanded View** window or press CTRL+S. You can click the **QoS** command in the **Expanded View** menu.
3. In the resulting popup menu point to Packet Queue Priority and then, click the appropriate Packet Priority Queue (**Low, Medium, and High**).

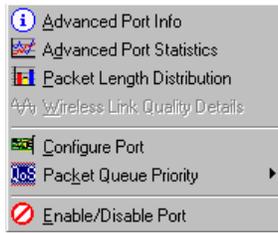


Fig. 12.1 The Port popup menu

12.2 VIEWING QoS QUEUES

To view available Quality of Services priority Queues and the Port assignment, carry out the following steps:

1. Open **Expanded View** window for the **Device**, if necessary.
2. Click the **QoS** command in the **Expanded View** menu.

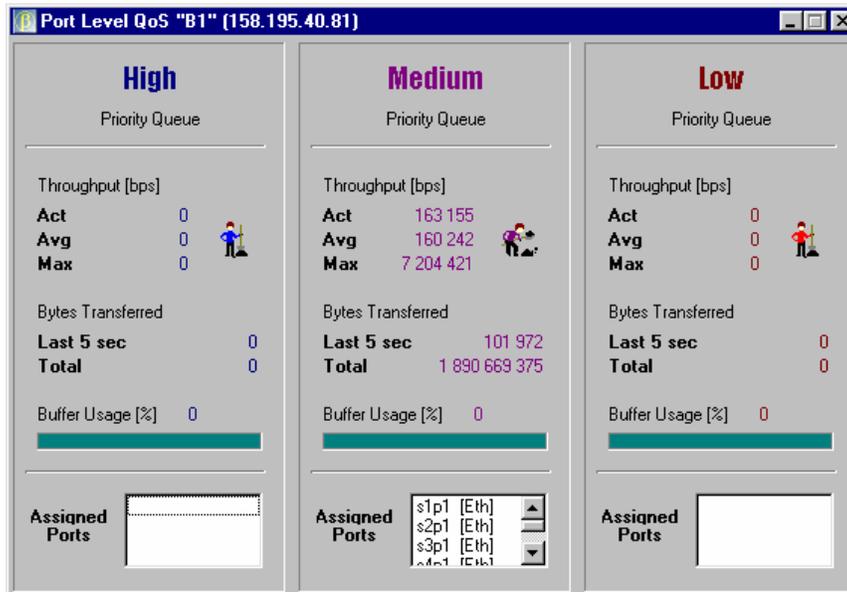


Fig. 12.2 Port level QoS window with assigned physical Ports



13. MANAGEMENT ON NETWORK NODE LEVEL



This section describes the use of the network node management feature available in your BriLAN Network Devices.

Using **BriLAN Network Device** (the Device) you can implement customized **Connectivity Policy** on individual Network Nodes, defined by MAC or IP addresses. This feature is available with built-in MAC and IP address database, which helps you to keep on track your basic **Network Node Identifiers** regarding all network nodes, like **Fist Name, Last Name, Custom Info, Port Assignment, Accessibility Rules on Ports, and Traffic Shaping Queue Assignment**.

To use customized Connectivity Policy on individual Network Nodes, complete the following tasks:

-  Switch to SysAdmin Level.
-  Fill in necessary Network Node Identifiers. — Optional.
-  Configure Port for bridging or routing.
-  Set Port accessibility rules on the Network Node.
-  Configure and enable Traffic Shaping on the Device.
-  Assign the Network Node to an appropriate Traffic Shaping Queue.
-  Save the created Policy.

The Connectivity Policy of a particular network node, includes it's accessibility rules on selected ports and it's assignment to an appropriate Traffic Shaping Queue (TSQ).

13. 1 ENTERING NETWORK NODE IDENTIFIERS

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 identify your network nodes by First and Last Name (usually of characteristic user) and with additional information (usually address, room or phone number, e-mail of users). 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**). Because the network node database is stored on each individual Device, you can use both the Device (local) and NMS Database (Distributed).

13. 1. 1 Working with network nodes on MAC Address Level

To edit Network Node Identifiers, carry out the following steps:

1. Open the **Expanded View** window for the **Device**, if necessary.
2. Click the **Users** command in the **Expanded View** menu.
3. In the **Users** menu click **MAC Address Level Users**.
4. Modify the content of **First Name, Last Name** or **Info** text boxes, if necessary.
5. To permanently write the changes to the Device, click the **Save** button.
6. To close the **MAC Address Level Users** window, click the **Close** icon.

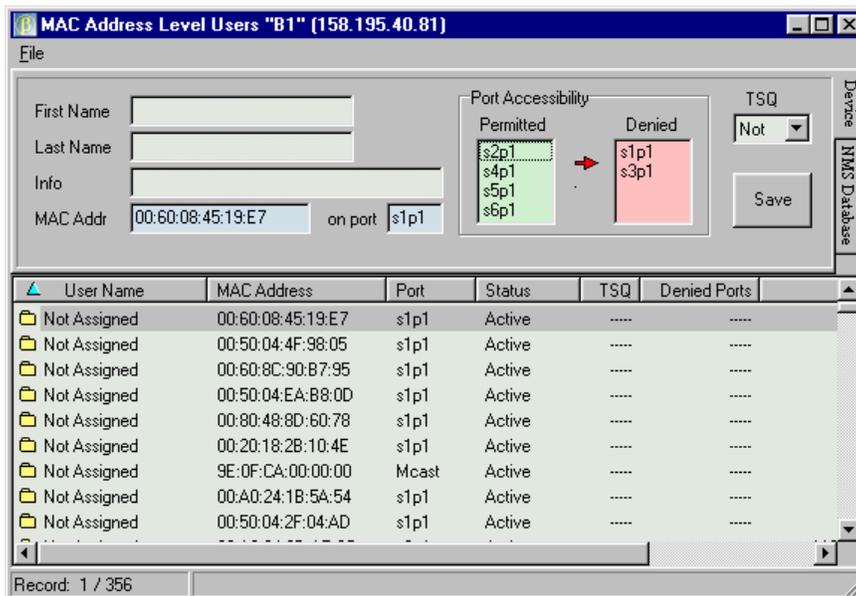


Fig. 13.1 Network Node management on MAC address level

13. 1. 2 Working with network nodes on IP Address Level

To edit Network Node Identifiers, carry out the following steps:

1. Open the **Expanded View** window for the **Device**, if necessary.
2. Click the **Users** command in the **Expanded View** menu.
3. In the **Users** menu click **IP Address Level Users**.
4. Modify the content of **First Name**, **Last Name** or **Info** text boxes, if necessary.
5. To permanently write the changes to the Device, click the **Save** button.
6. To close the **IP Address Level Users** window, click the **Close** icon.

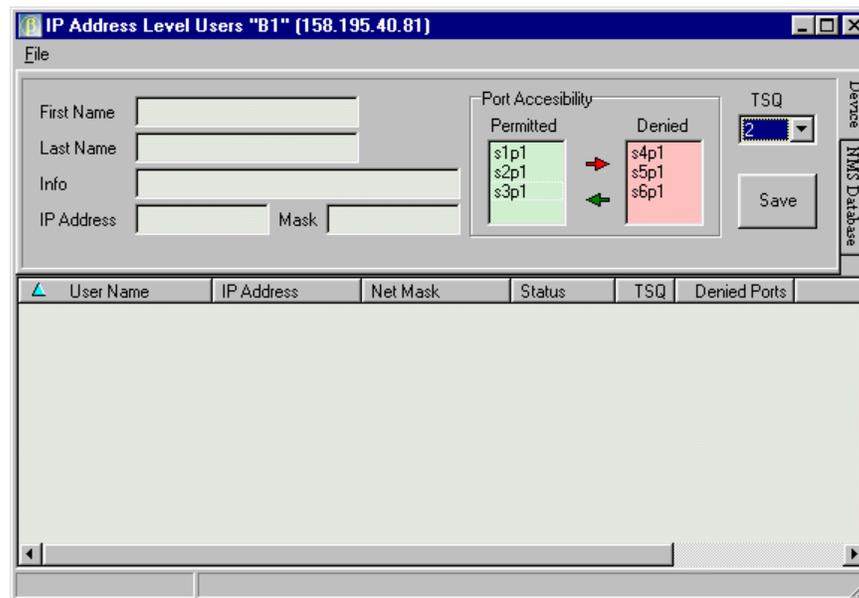


Fig. 13.2 Network Node management on IP address level

13. 2 CHANGING PORT ACCESSIBILITY

If a particular network node is **Denied** on a selected Port, all network traffic is disabled over this Port, both coming from/to this address.

To change accessibility of a particular Port for the selected network node, carry out the following steps:

1. Open the **Expanded View** window for the **Device**, if necessary.
2. Click the **Users** command in the **Expanded View** menu.
3. In the **Users** menu click **MAC** or **IP Address Level Users**.

4. Under **User Name** column of details pane of **MAC** or **IP Address Level Users** window, select network node, and under **Port Accessibility** select the **Port**, which accessibility you want to change.
5. Using the red or green arrows, move the Port to **Denied** or **Permitted** ports for that network node.
6. To permanently write the changes to the Device, click the **Save** button.
7. To close the **IP Address Level Users** window, click the **Close** icon.



IMPORTANT NOTE: *By default all Network Nodes all Permitted an all Ports. If you need stop all traffic for all Network Nodes, use the Disable Port command instead of moving all Network Nodes to Denied Port.*

13.3 CHANGING TRAFFIC SHAPING QUEUE ASSIGNMENT

To change Traffic Shaping Queue (TSQ) assignment for a particular network node, carry out the following steps:

1. Open the **Expanded View** window for the **Device**, if necessary.
2. Click the **Users** command in the **Expanded View** menu.
3. In the **Users** menu click **MAC** or **IP Address Level Users**.
4. Under **User Name** column of details pane of **MAC** or **IP Address Level Users** window, select network node, and under **TSQ** assign an appropriate **Queue number** (from 1-64).
5. To write permanently the changes to the Device, click the **Save** button.
6. To close the **IP Address Level Users** window, click the **Close** icon.



IMPORTANT NOTE: *Please remember that an assigned Traffic Shaping Queue must be correctly configured and also must be started when Traffic Shaping services run on your Device. To learn more about Traffic Shaping, refer to appropriate sections in this Guide.*



14. MONITORING THE NETWORK



This section describes network-monitoring options available on your BriLAN Network Devices.

Knowing the exact status of your network may help to better understand current network requirements of your users, and also can assist in planning the future development in your network infrastructure. **BriLAN Network Device** (Device) works as a continuous network traffic monitor. You can easily find all network load statistics over various time scales, locate your top-talker network nodes and error generating sources.



IMPORTANT NOTE: Network monitoring tools are available without using SysAdmin mode.

To monitor your network traffic, complete the following tasks:

-  Expand the View of a selected Device.
-  Select information to display.
-  Configure graph scaling - (optional).
-  Zoom in/out of a particular graph area - (optional).
-  Select normal or logarithmic scaling - (optional).
-  Add more data series - (optional).



IMPORTANT NOTE: To quickly switch Expanded View of a selected device to Graph Tab, press CTRL+G.

14. 1 SELECTI NG DATA

By default traffic data on your Device are available on Port level, which are displayed in spreadsheet format, in Cells of the details pane. To display selected type of traffic data, use the drag and drop method as follows:

1. In the details pane of the current window click the cell containing the information to display in graphical form.
2. While holding down the right mouse button, drag the cell and drop it into the graph area.

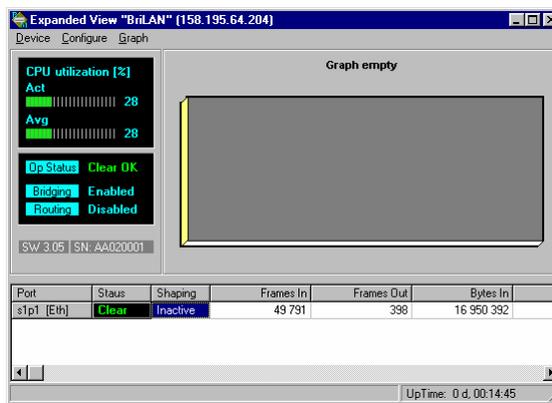


Fig. 14.1 The Expanded View window with empty Graph area

14. 2 CONF I GURI NG TI MESCALE

You can choose from several types of display of data collection periods, ranging from a very short time (5 minutes) up to last week. By default the last 5 minutes period is selected. To change data collection period, carry out the following steps:

1. Select and display information in graphical form, if necessary.
2. Click **Graph** menu on the menu bar of the current window.
3. In the **Graph** menu, point to **Collection period** and select required time-scale.

14. 3 CHANGI NG NORMAL OR LOGARITHMIC SCALI NG

You may have traffic data with various amplitudes, from very small values up to very high ones. In such cases it is useful to display your graphs in logarithmic scaling. To change data display mode, carry out the following steps:

1. Select and display information in graphical form, if necessary.
2. Click **Graph** menu on the menu bar of the current window.
3. In the **Graph** menu, click on the **Logarithmic View**.
4. When the Logarithmic View is activated a checkmark appears to the left of the **Logarithmic View** menu item.

14. 4 WORKING WITH MULTIPLE DATA SERIES

Sometimes you may need to compare data series measured on different Ports. To combine them in one diagram data series, carry out the following steps:

1. Select and display information in graphical form, if necessary.
2. While holding down the right mouse button, drag the cell and drop it into the graph area.



IMPORTANT NOTE: *You can combine ONLY the same type of data series coming from different Ports.*

14. 5 ZOOMING A SPECIFIC GRAPH AREA

To display a particular area of your graph you may need to use the zoom feature. You can zoom in or zoom out the selected graph area.

To change zoom properties, provide the following steps:

1. Select and display information in graphical form, if necessary.
2. Click in the specific graph the area you want to zoom-in or zoom-out.
3. While holding down the right-mouse button drag the selection area to the left (zooming in) or to the right.

14. 6 CREATING BASIC PORT STATISTICS GRAPHS

Your Device comes with built in traffic counters, which permanently monitor all basic network activities. The following traffic counters are available on Port level:

- ✍ Frames in/out
- ✍ Bytes in/out
- ✍ Errors in/out

- ✍ Dropped in/out
- ✍ ActUtil in/out
- ✍ ActBitRate in/out



IMPORTANT NOTE: To learn more about this topic, refer also to the *BriLAN Reference Guide*.

You can see the current values of the selected counters or you can display them as time dependent function values. To display an evolution of specified information, provide the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. In the details pane of the **Expanded View** window click the cell containing the information to display in graphical form.
3. While holding down the right mouse button, drag the cell and drop it into the graph area.
4. Add more traffic data series and select appropriate data collection period, if necessary.
5. To display details of your graph change to logarithmic or normal view and zoom-in or zoom-out the specific graph area.

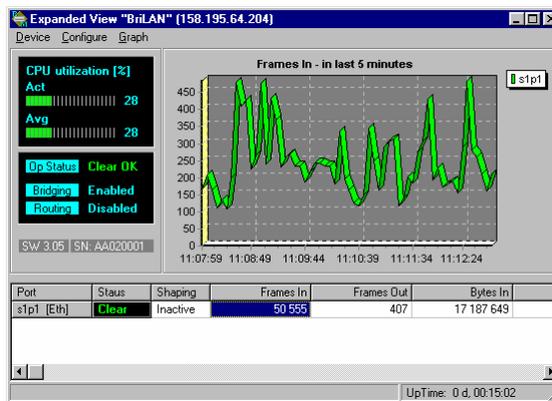


Fig. 14.2 The Expanded View window with Frames In traffic data in last 5 minutes

14.7 CREATING ADVANCED PORT STATISTICS GRAPHS

Your Device contains advanced traffic counters, which constantly monitor specific network activities. The following advanced traffic counters are available at Port level:

Frames in

- ✍ 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.



IMPORTANT NOTE: To learn more about this topic also refer to the *BriLAN Reference Guide*.

Such traffic measures can be particularly useful when troubleshooting your network. You can see the current values of the mentioned counters or you can display them as time dependent function values. To display an evolution of specified information, carry out the following steps:

1. Open **Expanded View** window for the Device, if necessary.
2. In the details pane of the **Expanded View** window right-click the Port record and in the resulting popup menu click on **Advanced Port Statistics**.
3. In the details pane of the **Advanced Port Statistics** window click the cell in **Counters** column containing the information to display in graphical form.
4. While holding down the right mouse button, drag the cell and drop it into the graph area.
5. Add more traffic data series and select the appropriate data collection period, if necessary.
6. To display details of your graph change to logarithmic or normal view and zoom in or zoom out the specific graph area.

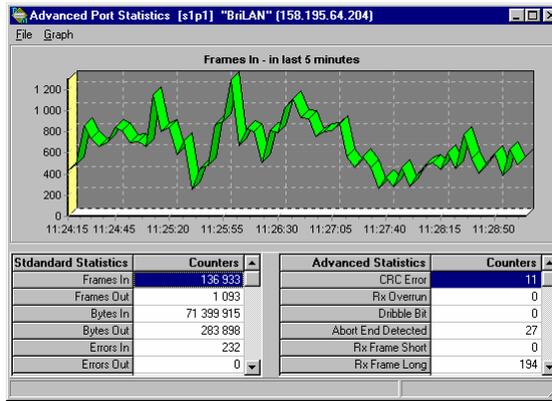


Fig. 14.3 The Advanced Port Statistics window with Frames In traffic data in last 5 minutes

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