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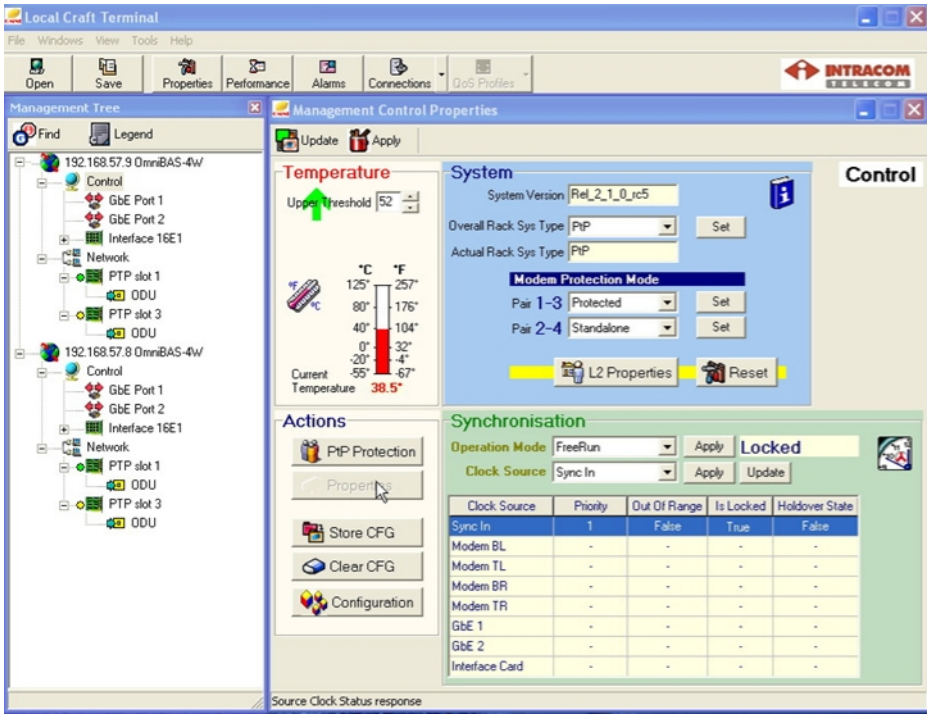
omniBAS

Local Craft Terminal Application



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User Manual

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Table of Contents

1 Introduction

About this Document

Scope of document

This document provides detailed instructions on the management of OmniBAS systems, through the OmniLCT application, Release 1.1.3.

The management capabilities of the OmniBAS LCT (OmniLCT) application include the configuration, monitoring and testing of any OmniBAS node that consists of an OmniBAS-4W subrack and the corresponding ODUs.

Target Audience

This document is intended for the operators that are responsible for commissioning OmniBAS systems, locally or remotely. The operators commissioning an OmniBAS system should have experience in the operation of radio telecommunication systems.

Document Conventions

This document applies the following conventions:

- **Bold** fonts are used for:
  - Buttons
  - Menus and Submenus
  - Options
  - Tabs
  - Text boxes, check boxes and drop-down lists
- *Italic* fonts are used for:
  - Window names
  - Tabbed sheet names
  - Values of an attribute

NOTE A note calls your attention to important supplementary information.

This symbol means **CAUTION**. The purpose of this symbol is to prevent you from performing an action that might result in damage of the equipment or loss of data.

About OmniLCT Application

The OmniLCT application is a robust SNMP based application designed to locally manage the OmniBAS system by providing a user friendly GUI.

The following main functions are provided through OmniLCT application for the management of an OmniBAS system:

- Configuration Management:
  - Monitoring and configuration of the elements of an OmniBAS Node (processor module, E1 tributary module, power and fan modules, modems and corresponding ODUs, GbE ports and E1 TDM lines)
  - Configuration and monitoring of Ethernet and PWE3 TDM traffic
  - Monitoring and configuration of PtP link
  - Monitoring and configuration of protections (modems protection – ring protection) concerning an OmniBAS Node.
  - Monitoring and configuration of Remote OmniBAS Nodes
  - Checking system release, modems and ODUs versions
  - System re-configuration in case of interruptions
  - Backup and restore of system configuration
- Fault Management:
  - Displaying the active alarms and events of the system
  - Saving the active alarms and events in log files
- Performance Management:
  - Displaying GbE ports statistic counters
  - Displaying Ethernet traffic statistic counters
  - Displaying PWE3 TDM traffic statistic counters

Hardware & Software Requirements

Recommended H/W

PC or Laptop with the following features:

- Intel 2.6 GHz/ 2 MB L2 cache processor
- 512 MB RAM
- 80 GB hard disk
- Monitor with 1280 x 800 pixels resolution
- Display adapter 256 MB VRAM
- CD/ DVD Rom drive
- Ethernet network card (10/ 100BaseT or 100/ 1000BaseT)
- Serial (DB9) and parallel (Centronics) ports
- Mouse or pointing device

Also, an Ethernet cable is required for connecting the PC/ Laptop with the OmniBAS-4W subrack.

Required S/W

- Microsoft® Windows XP (SP2) / 2000
- OmniLCT application, Release 1.1.3

2 Getting Started

This chapter provides all necessary information before starting the configuration of the OmniBAS nodes. The chapter includes the following topics:

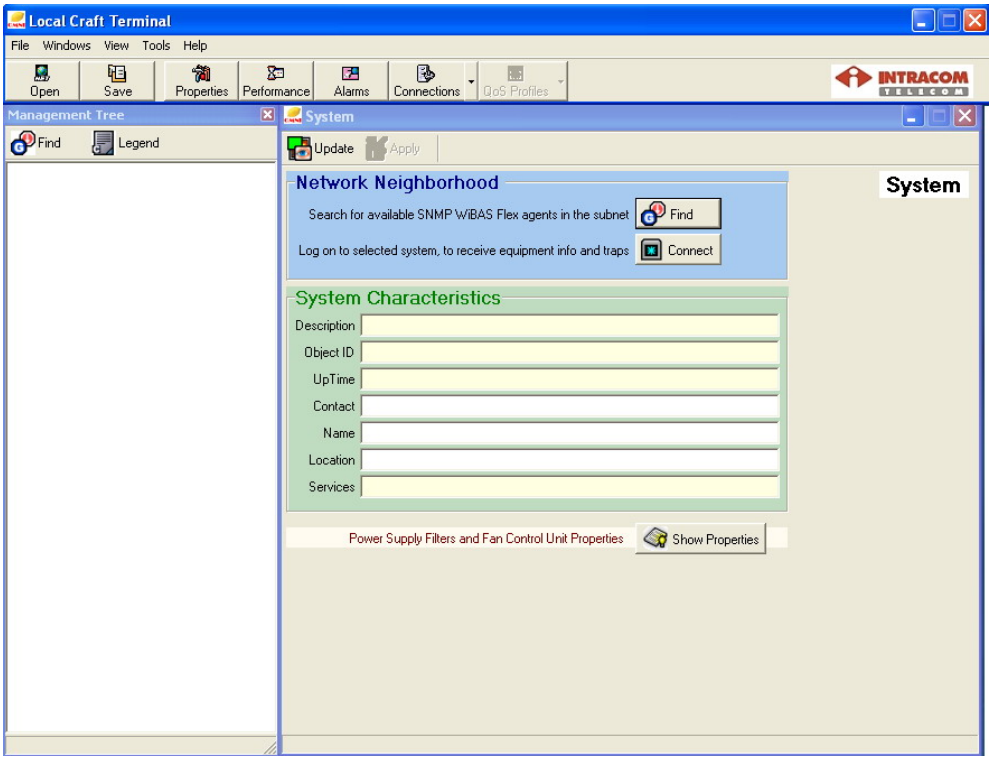
2.1 Installing & Launching the OmniLCT Application

Installing the OmniLCT application

Use the CD provided by INTRACOM TELECOM to copy the *OmniLCT.exe* ( ) file to your PC/ Laptop.

Launching the OmniLCT application

To launch the OmniLCT application, in your PC/ Laptop, double-click the *OmniLCT.exe* ( ) file. The main environment of the OmniLCT application appears:



2.2 Cabling Instructions for Connecting LCT to OmniBAS-4W

Introduction

This paragraph provides the following topics for connecting an OmniBAS system to the OmniLCT application using either an inband or outband connection:

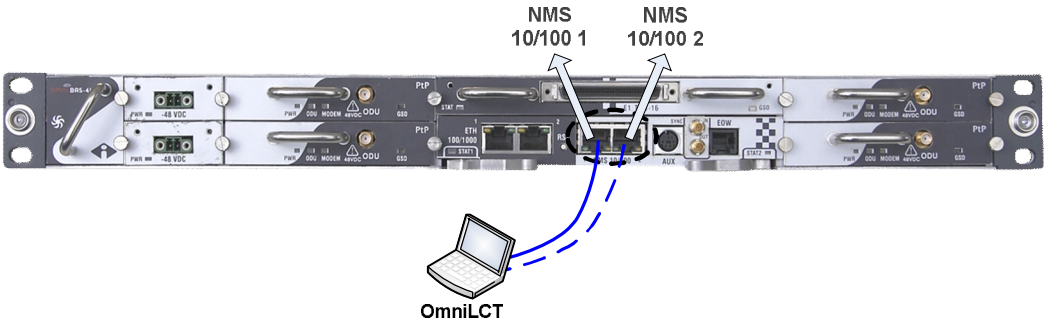
- Cabling connection for outband management (directly on OmniLCT)
- Cabling connection for outband management (through a DCN)
- Cabling connection for inband management

NOTE In case you want to monitor not only the local OmniBAS node but also the associated remote nodes, you must establish an inband connection.

Cabling connection for outband management (directly on OmniLCT)

To carry out an outband connection of the OmniBAS-4W equipment directly on your PC/ Laptop:

- Use an Ethernet CAT5 cable (8 wires-24 AWG)
- Connect the one end of the cable to a Fast Ethernet port (**NMS 10/100 1** or **NMS 10/100 2**) of the OmniBAS-4W subrack and the other end to the Ethernet port of your PC/ Laptop.



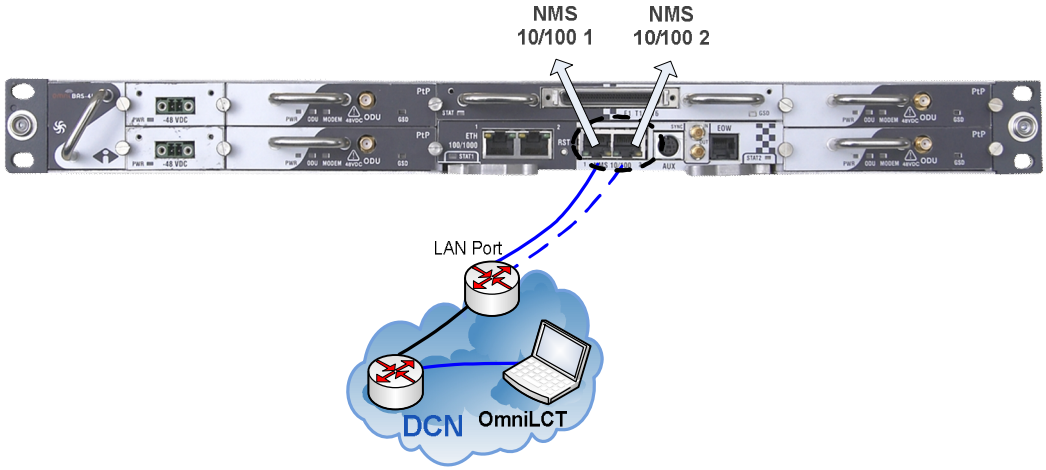
Continued on next page

Cabling Instructions for Connecting LCT to OmniBAS-4W,
Continued

Cabling connection for outband management (through a DCN)

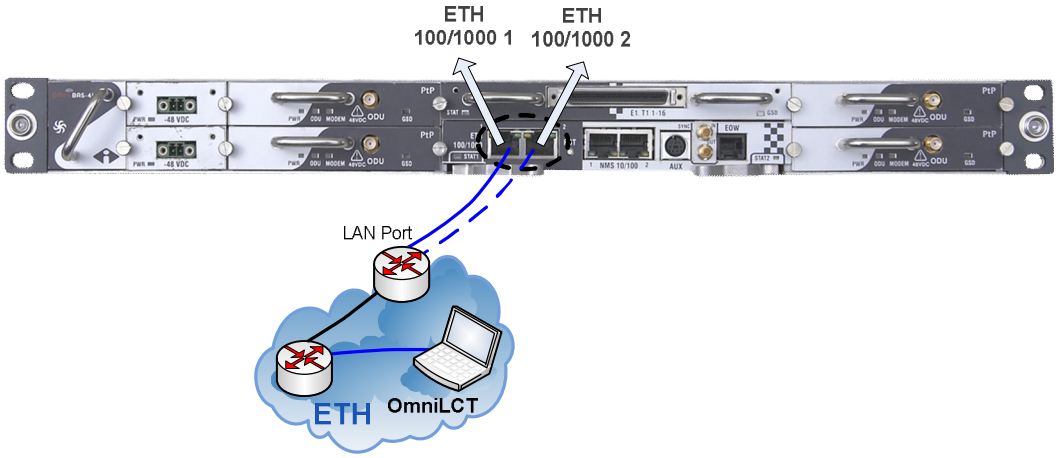
To carry out an outband connection of the OmniBAS-4W equipment through an existing LAN:

- Use an Ethernet CAT5 cable (8 wires-24 AWG)
- Connect the one end of the cable to a Fast Ethernet port (**NMS 10/100 1** or **NMS 10/100 2**) of the OmniBAS-4W subrack and the other end to an available LAN port.



Cabling connection for inband management

The inband management of an OmniBAS system is carried out through the GbE port (**ETH 100/1000 1** or **ETH 100/1000 2**) of the OmniBAS-4W subrack. For the GbE connection, an Ethernet CAT6 cable (8 wires-24 AWG) is used.



NOTE Using inband management, you can monitor not only the local OmniBAS node but also the associated remote nodes.

2.3 Establishing Connection with an OmniBAS Node

Introduction

This paragraph provides the following two procedures for connecting the OmniLCT application with an OmniBAS node (locally or remotely):

- Establishing local or remote connection by entering the IP address of the OmniBAS node
- Establishing local or remote connection by using the FIND button

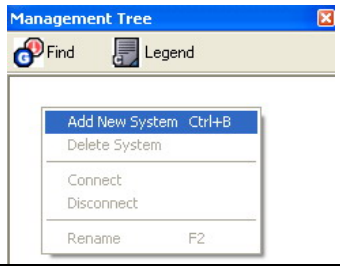
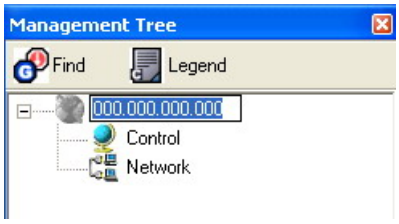
NOTE When both, OmniLCT application and OmniBAS node are in the same subnet, you can use any of the two procedures. But, when OmniLCT application and OmniBAS node are in different subnets you can use only the first procedure.

NOTE The default IP address of the outband management interface is 192.168.1.100.

Establishing local or remote connection by entering the IP address of the OmniBAS node

To establish a local or remote connection with an OmniBAS node, proceed as follows:

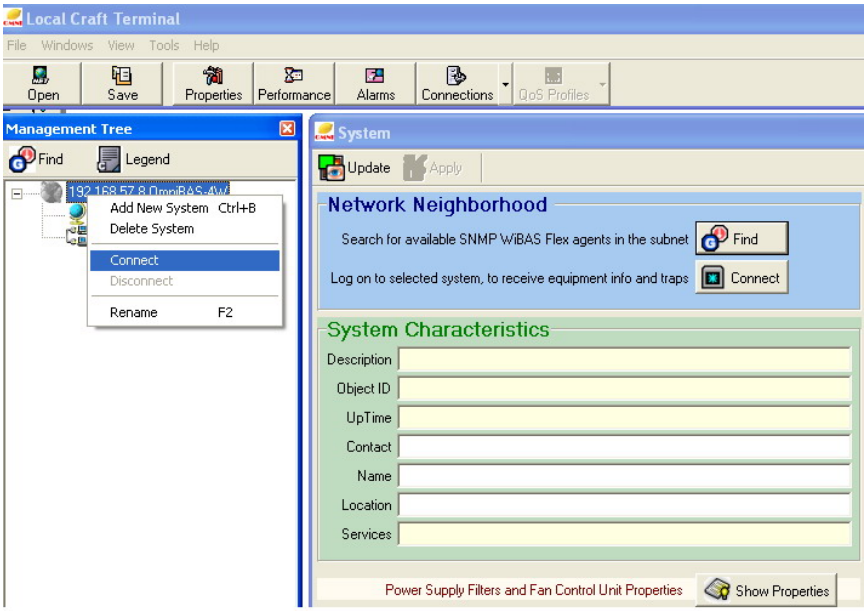
NOTE Alternatively, when both, OmniLCT application and OmniBAS node are in the same subnet, you can establish local or remote connection with an OmniBAS node by following the procedure provided in par. Establishing local or remote connection by using the FIND button, on page 13.

Step	Action
1	Double-click the *OmniLCT.exe* () file to launch the OmniLCT application.
2	 After launching the application, right click in the blank area of the *Management Tree*, and from the drop-down menu, select the **Add New System** option.
3	 In the top element that appears (displaying 000.000.000.000), type the IP address of the OmniBAS node (e.g. 192.168.57.8), to which the OmniLCT is to be connected. Press **Enter** to set.

Continued on next page

Establishing Connection with an OmniBAS Node, Continued

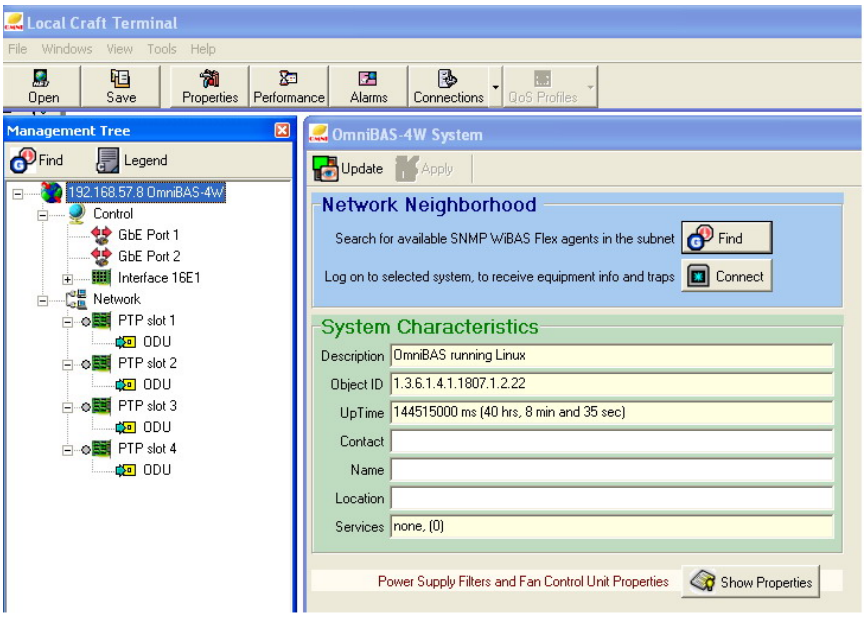
Establishing local or remote connection by entering the IP address of the OmniBAS node (continued)

Step	Action
4	In the *Management Tree*, right click the OmniBAS IP address, and from the drop-down menu, select the **Connect** option to automatically build-up the OmniBAS *Management Tree*.  Alternatively, you can click the Connect button in the **Network Neighborhood** group box of the *System* window.

Continued on next page

Establishing Connection with an OmniBAS Node, Continued

Establishing local or remote connection by entering the IP address of the OmniBAS node (continued)

Step	Action
5	When the connection with the OmniBAS node has been established successfully, the connected node is displayed in the *Management Tree* and its characteristics appear in the **System Characteristics** group box of the *OmniBAS System* properties window: 

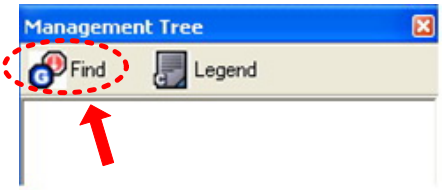
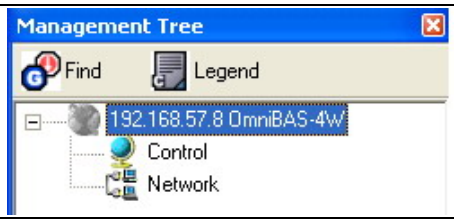
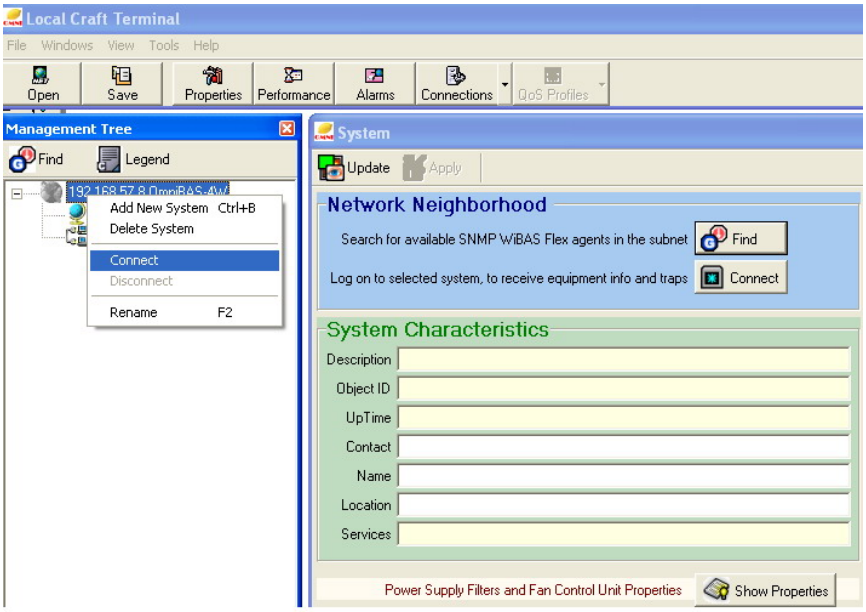
End of procedure.

Continued on next page

Establishing Connection with an OmniBAS Node, Continued

Establishing local or remote connection by using the FIND button

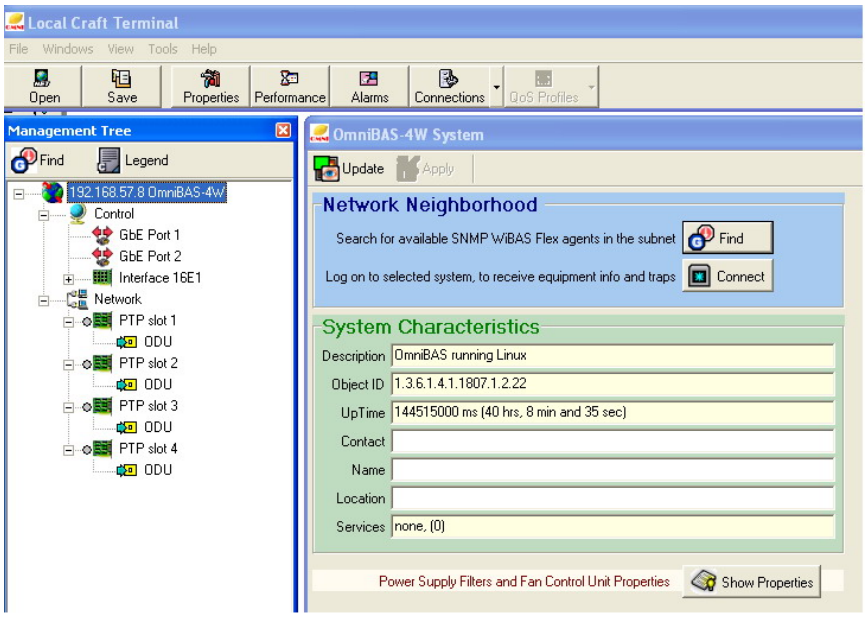
To establish a local or remote connection with an OmniBAS node, when both OmniLCT application and OmniBAS-4W are in the **same subnet**, proceed as follows:

Step	Action
1	Double-click the *OmniLCT.exe* ( ) file to launch the OmniLCT application.
2	 In the *Management Tree* click the Find button to ping the network for active OmniBAS agents.
3	 When an OmniBAS node is found, the *Management Tree* displays the IP address of the node (e.g. 192.168.57.8).
4	In the *Management Tree*, right click the OmniBAS IP address, and from the drop-down menu, select the **Connect** option to automatically build-up the OmniBAS *Management Tree*.  Alternatively, you can click the Connect button in the **Network Neighborhood** group box of the *System* window.

Continued on next page

Establishing Connection with an OmniBAS Node, Continued

Establishing local or remote connection by using the FIND button (continued)

Step	Action
5	When the connection with the OmniBAS node has been established successfully, the connected node is displayed in the *Management Tree* and its characteristics appear in the **System Characteristics** group box of the *OmniBAS System* properties window: 

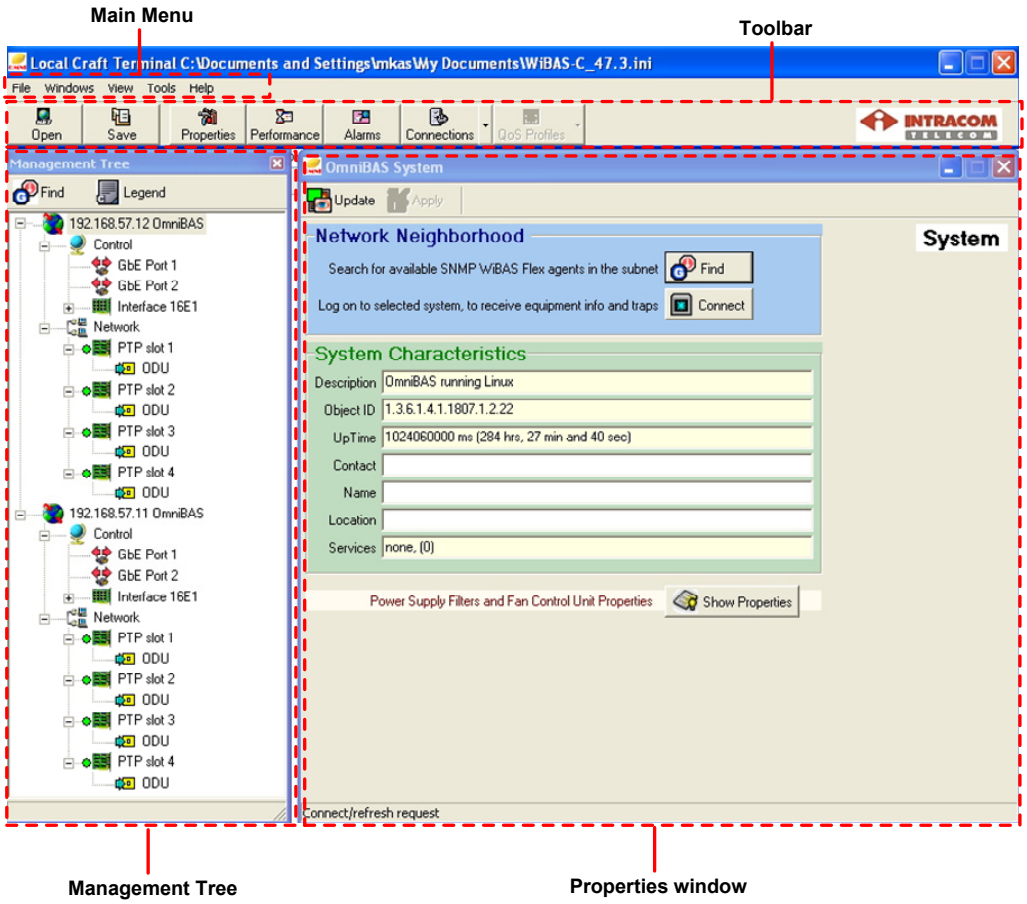
End of procedure.

2.4 GUI Overview

Introduction

The scope of this section is to get you familiar with the Graphical User Interface (GUI) of the OmniLCT application.

The OmniLCT GUI consists of the following parts:



GUI Parts	Reference
Main Menu	par. Main Menu & Toolbar (page 16)
Toolbar	
Management Tree	• par. Elements Representation in Management Tree (page 17) • par. Drop-Down Menu & Toolbar of Management Tree (page 18)
Properties window	par. Properties Window (page 19)

Main Menu & Toolbar

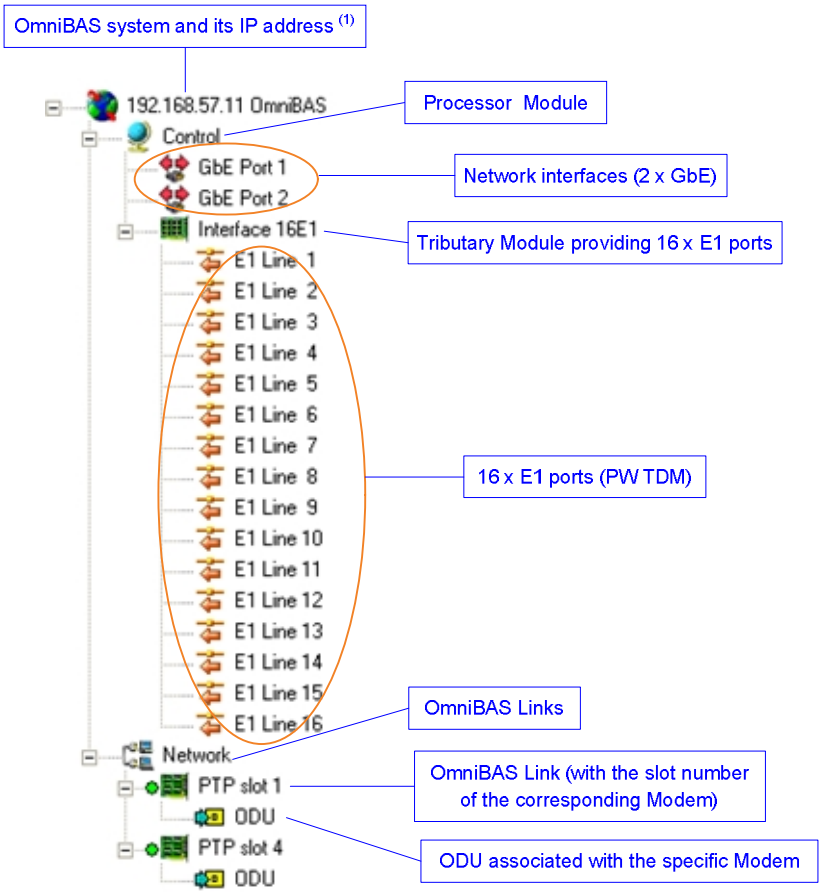
The following table provides a short description of the *Main Menu* and the *Toolbar* of the OmniLCT application:

Menu	Sub-Menu	Toolbar button	Description	Reference
File	Open Region		To load a group (region) of OmniBAS nodes.	See par. Creating/ Loading a Group of OmniBAS Nodes (Region) (page 24)
	Save Region		To create/ save a group (region) of OmniBAS nodes.	
	Cancel	–	To cancel an action that is running.	–
	Exit	–	To terminate the OmniLCT application.	–
	Shut Down Now	–	To shut down the OmniLCT application. **Use the shut down option only if the system does not respond**.	–
Windows	Properties		To display the *OmniBAS System* properties window.	–
	Performance Monitor		To display the *Performance Monitor* window.	See Ch. 6. Monitoring the Performance of an OmniBAS Node
	Management Tree	–	To appear/ disappear the *Management Tree*.	–
View	Message Trace	–	To display the *Message Trace* window.	See par. Message Traces (page 133)
Tools	Connection List		To display the *Connections List* window.	See par. Creating PWE3 TDM Connections(page 74)
	Connection Wizard		To open the *Connection Setup Wizard*.	
	Environment Options	–	To display the *Environment Options* window.	See par. Configuring the Application's Environment (page 21)
	Alarm & Event List		To display the *Alarms & Events Report* window.	See par. Alarms & Events Report (page 131)
Help	About	–	To check the release of the OmniLCT application.	–

Elements Representation in Management Tree

Management Tree – Elements Representation

The elements that constitute a connected OmniBAS node are displayed in the *Management Tree*. A short description of the OmniBAS Management Tree is shown in the following schematic:



(1) Through this element, you can also monitor the power and fan modules of the OmniBAS-4W subrack.

Modems slot numbering

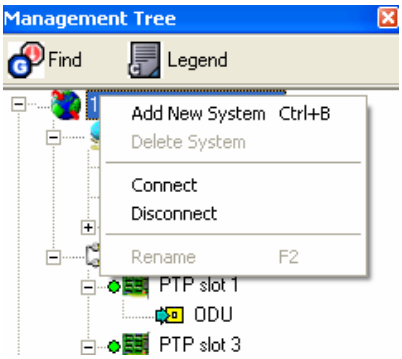
An OmniBAS-4W subrack can be equipped with up to four modems. The following figure shows the slot numbering of the OmniBAS-4W modems.

An OmniBAS modem is depicted in the *Management Tree* as **PtP slot x**, where **x** = 1, 2, 3, 4 (e.g. PTP slot 1).

Drop-Down Menu & Toolbar of Management Tree

Management Tree – drop down menu

When you right click on an OmniBAS node (or on the blank area) of the *Management Tree* window, a drop-down menu appears.

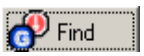
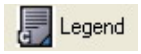
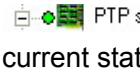


The drop-down menu of the *Management Tree* window provides the following options:

Option	Description
Add New System	To add a new OmniBAS node in the *Management Tree* (1).
Delete System	To delete an OmniBAS node from the *Management Tree*. An OmniBAS node can be deleted from the *Management Tree* only when it is disconnected (2).
Connect	To establish a connection with an OmniBAS node (1).
Disconnect	To disconnect an OmniBAS node (2).
Rename	To rename an OmniBAS node (1).

Management Tree – Toolbar

The toolbar of the *Management Tree* includes the following buttons:

Button	Description
	Click this button to ping the network for active OmniBAS agents (1).
	When clicking this button the following *Legend* box appears.  The *Legend* box provides the explanation of the icons existing at the left side of some elements (e.g. ) for indicating their current status.

(1) As described in par. Establishing Connection with an OmniBAS Node, on page 10.

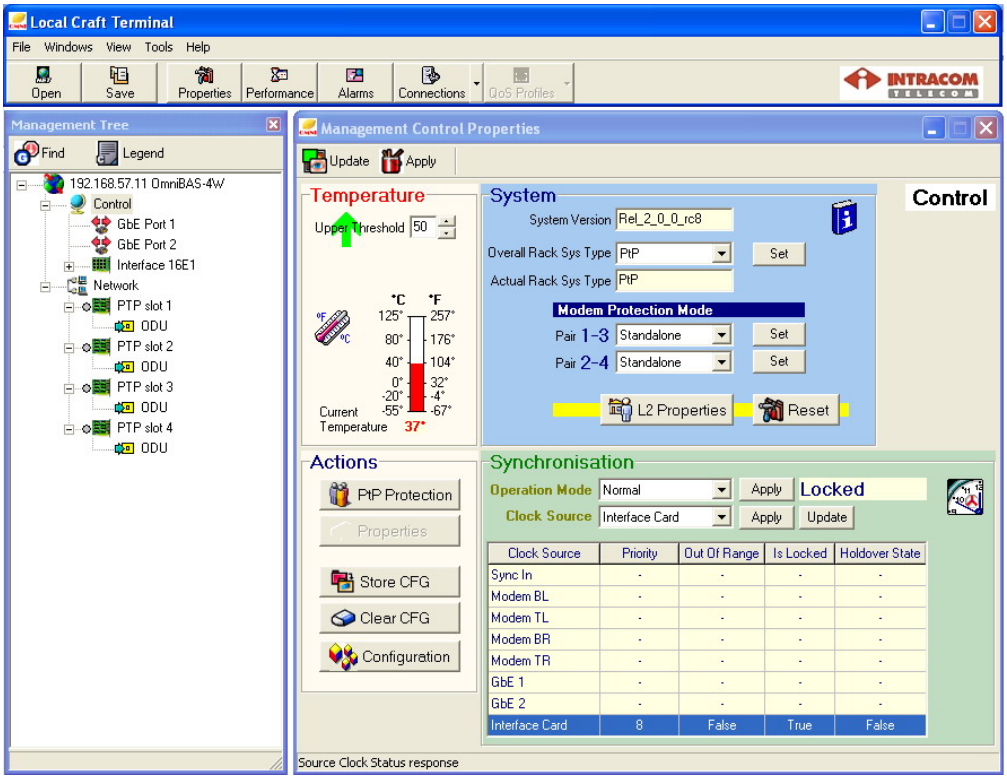
(2) As described in par. Disconnecting/ Deleting an OmniBAS Node, on page 20.

Properties Window

Properties window

When you select an OmniBAS element in the *Management Tree*, the corresponding *Properties* window appears.

For example, the following screenshot shows the *Properties* window (naming *Management Control Properties*) that appears when you select the *Control* element:



The *Properties* window contains the toolbar, the messages area at the bottom of the window (that displays the most current SNMP message (trace)) and the properties and settings related to the selected element.

Through a *Properties* window, you can:

- Configure the selected element
- Monitor the status of the selected element

Properties window toolbar - Most common buttons

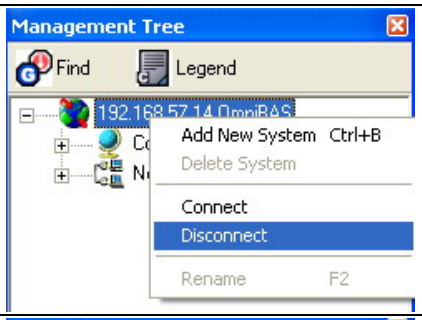
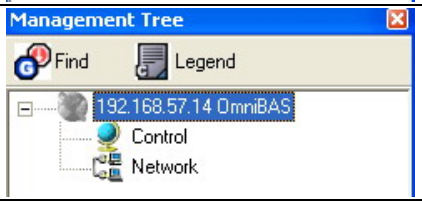
Depending on the selected element, the buttons of the toolbar can vary. The most common buttons of a *Properties* window toolbar are described in the following table:

Button	Description
	To retrieve the current information regarding the selected element.
	When you change a configuration setting of the selected element, then, click this button to apply the new value.

2.5 Disconnecting/ Deleting an OmniBAS Node

Disconnecting an OmniBAS node

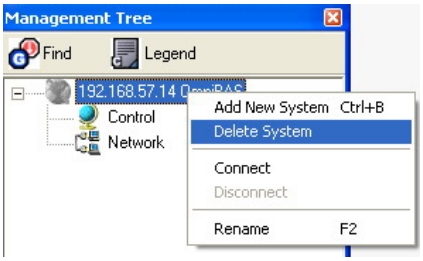
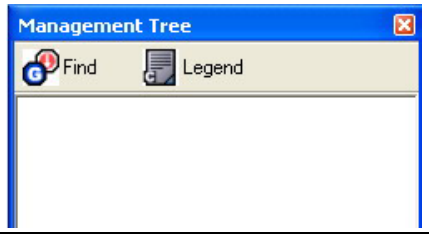
To disconnect an OmniBAS node from the OmniLCT application, proceed as follows:

Step	Action	
1		In the *Management Tree*, select the top element (e.g. 192.168.57.14) corresponding to the OmniBAS node you want to disconnect, right click and from the drop-down menu select the **Disconnect** option.
2		The OmniBAS node is disconnected from the OmniLCT application.

End of procedure.

Deleting an OmniBAS node

To remove an OmniBAS node from the *Management Tree*, proceed as follows:

Step	Action	
1	Disconnect the OmniBAS node as described in previous par. Disconnecting an OmniBAS node.	
2		Select the top element (e.g. 192.168.57.14) corresponding to the OmniBAS node you want to remove, right click and from the drop-down menu select the **Delete System** option.
3		The selected OmniBAS node is removed from the *Management Tree*.

End of procedure.

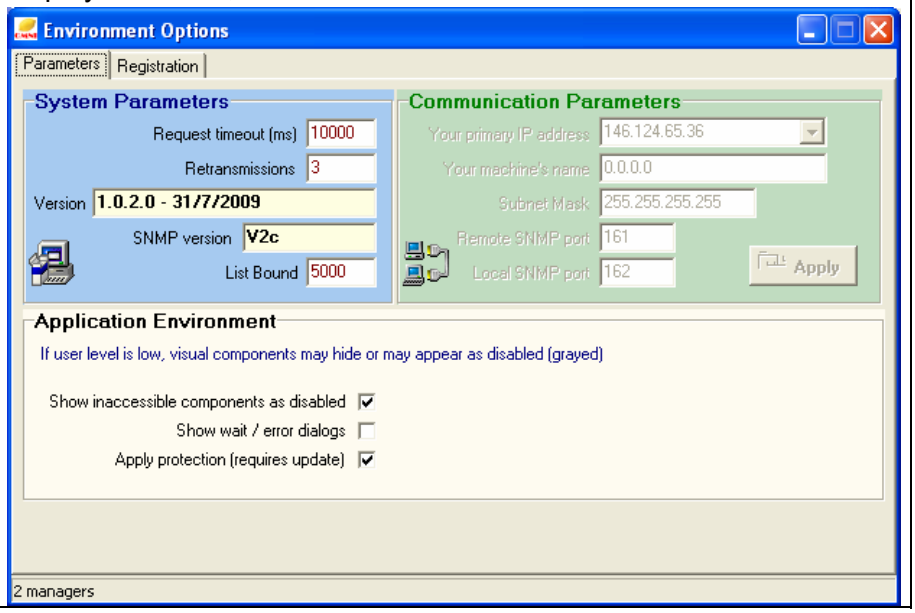
2.6 Configuring the Application's Environment

This section provides the following procedures to configure the application's environment:

- Configuring the Environment Parameters (system responses, requests timeout, etc.)
- Viewing the Registered IP Addresses
  Use this procedure to view all registered IP addresses and/ or to register the IP address of your PC/ Laptop.

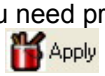
Configuring the Environment Parameters

To configure the application's operating environment, proceed as follows:

Step	Action
1	On the *Toolbar*, click **Tools** > **Environment Options**.
2	In the window that appears, ensure that the **Parameters** tab is displayed – if not, select it: 

Continued on next page

Configuring the Environment Parameters, Continued

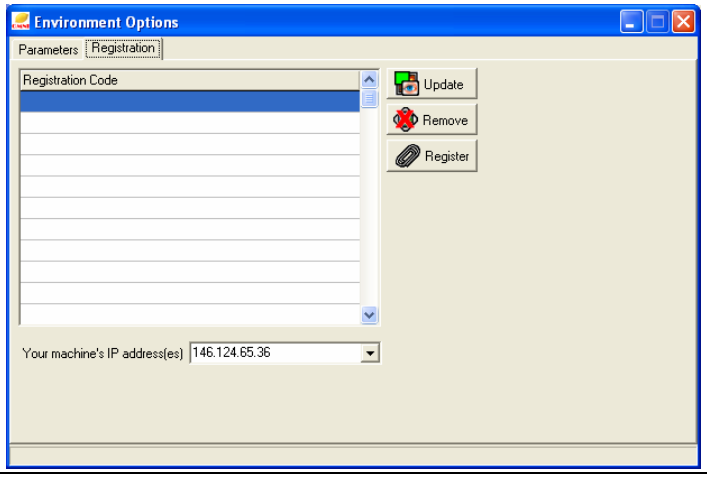
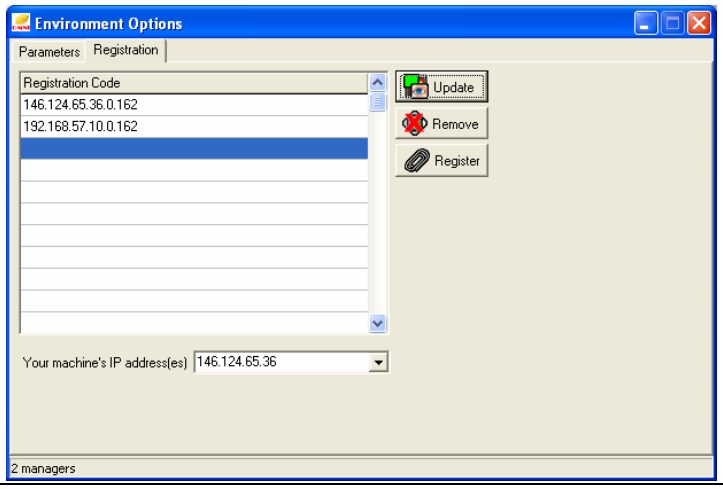
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>In the System Parameters group box, define the following parameters:
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Request timeout (ms)</td><td>The time (in ms) the application will wait for an answer from the supervised system, since the instance of a request. The default value is 10000.</td></tr>
<tr><td>Retransmissions</td><td>The maximum number of retries before the request is considered as unanswered. The default value is 3.</td></tr>
<tr><td>List Bound</td><td>The maximum number of logged alarms/ messages to display in the relevant report. When this number is reached, the report is cleared and new alarms/ messages can be logged. The default value is 5000.</td></tr>
</table></td></tr>
<tr><td>4</td><td>In the Application Environment group box, select the appropriate check boxes:
<table>
<tr><th>Check Box</th><th>Select if</th></tr>
<tr><td>Show inaccessible components as disabled</td><td>You want the application to display the inaccessible components as disabled (default setting = selected).</td></tr>
<tr><td>Show wait / error dialogs</td><td>You want the application to display dialogs relevant to progress or errors regarding the various executable tasks (default setting = clear).</td></tr>
<tr><td>Apply protection (requires update)</td><td>You need protection against accidental misuse of the 

button (default setting = selected).</td></tr>
</table></td></tr>
</table>

End of procedure.

Viewing the Registered IP Addresses

To view all registered IP addresses and/ or register the IP address of your PC / Laptop, proceed as follows:

Step	Action
1	On the *Toolbar*, click **Tools** > **Environment Options**.
2	In the window that appears, click the **Registration** tab. 
3	Click Update to display all the registered IP addresses. 
4	If you want to register the IP address of your PC / Laptop (if not yet listed), click Register and then click Update.
5	If you want to remove an IP address from the list, first select the IP address, click Remove and then click Update. The selected IP address is now removed from the list.

End of procedure.

2.7 Creating/ Loading a Group of OmniBAS Nodes (Region)

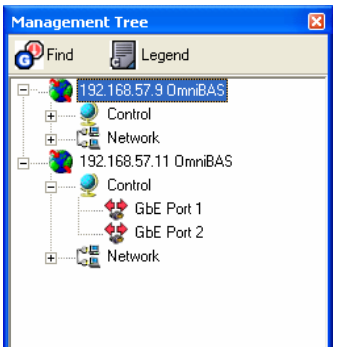
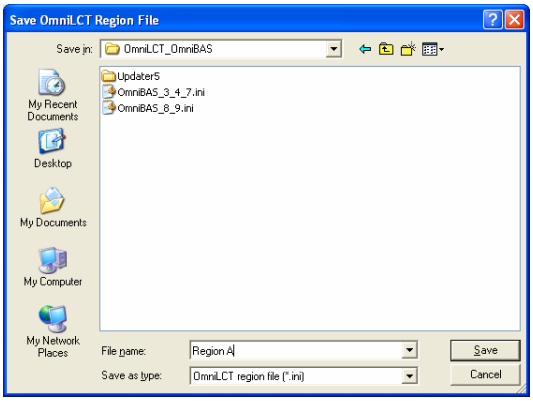
Introduction

This paragraph describes how to create, save and load a group (region) of OmniBAS nodes featuring common geographical, conceptual, etc. characteristics.

NOTE When you log in to the OmniLCT application, the region file recently used is automatically loaded in the *Management Tree*.

Creating/ saving a region

To create/ save a group (region) of OmniBAS nodes, proceed as follows:

Step	Action
1	 Load the OmniBAS nodes you want to group (e.g.*192.168.57.9 OmniBAS* and *192.168.57.11 OmniBAS*).
2	On the *Main Menu*, select **File** > **Save Region** (or click  , on the *Toolbar*).
3	 In the *Save OmniLCT Region File* window that appears, save the region in .ini format (e.g. *Region A.ini*) and click **Save**. The region is created/ saved (e.g. *Region A* including the *192.168.57.9 OmniBAS* and *192.168.57.11 OmniBAS* nodes).

End of procedure.

Loading a region

To load a group (region) of OmniBAS nodes, select **File** > **Open Region** on the *Main Menu* (or click  , on the *Toolbar)*. The selected group (region) of the OmniBAS nodes appears in the *Management Tree*.

3 Configuring OmniBAS System

This chapter includes the following topics through which all necessary procedures to configure an OmniBAS system are provided:

- Configuring a Radio Link
- Configuring Ethernet Traffic
- Configuring PWE3 TDM Connections
- Setting Static MAC Addresses
- Setting/ Monitoring System Synchronization

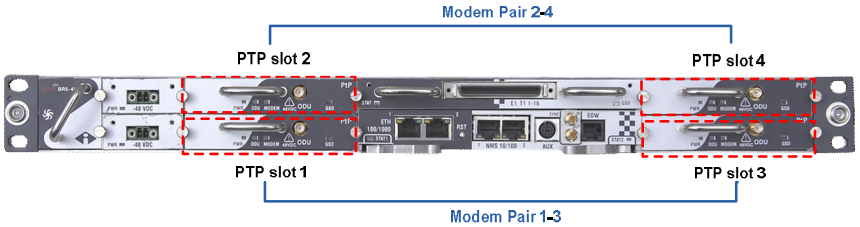
3.1 Configuring a Radio Link

This section provides the following step-by-step procedures to configure an OmniBAS radio link.

Configuring the Protection of an OmniBAS Node

Introduction

An OmniBAS-4W can be equipped with up to four modems. The modems located at slots 1 and 3 constitute a protection pair (Pair 1-3). Also, the modems located at slots 2 and 4 constitute the second protection pair (Pair 2-4) of the subrack.



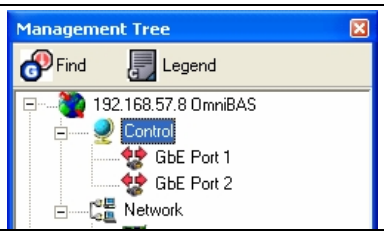
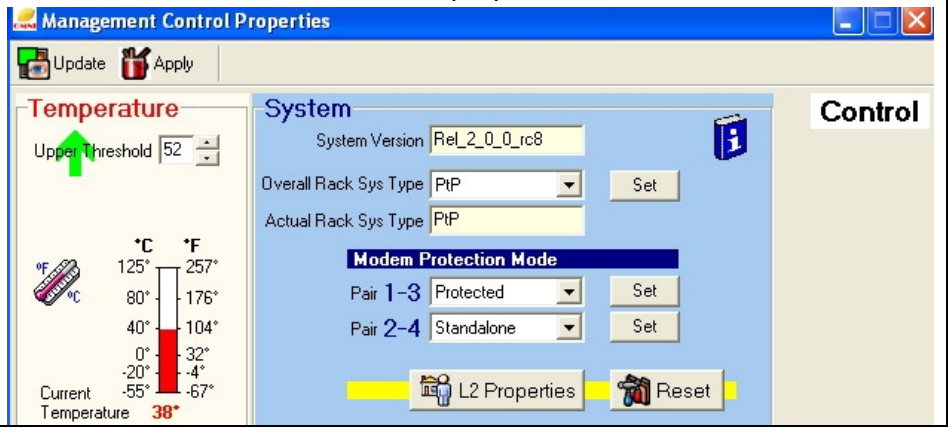
A protection pair is defined as *Standalone* (when both modems work in standalone mode) or *Protected* (when the one modem is in working mode and the other in standby).

This paragraph provides step-by step procedures for configuring the protection of an OmniBAS node (i.e. for setting a modems pair to work in standalone or protection mode).

Setting a standalone pair

To set the modems pair 1-3 in standalone mode, proceed as follows:

NOTE The following procedure describes how to set the modems Pair 1-3 in standalone mode. Follow a same procedure for the Pair 2-4.

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to view the current properties of the *Control* element. 

Continued on next page

Configuring the Protection of an OmniBAS Node, Continued

Setting a standalone pair (continued)

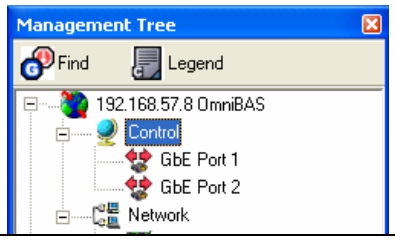
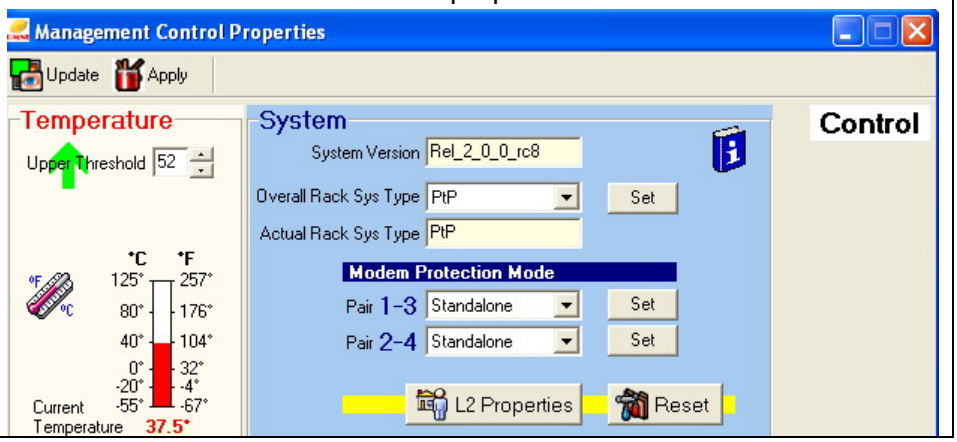
Step	Action
3	In the **System** group box, click the **Pair 1-3** drop-down list and select *Standalone*. 
4	Click the corresponding Set button to apply the setting.

End of procedure.

Setting a protected pair

To set the modems pair 1-3 in protected mode, proceed as follows:

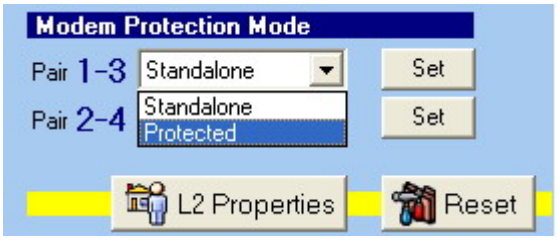
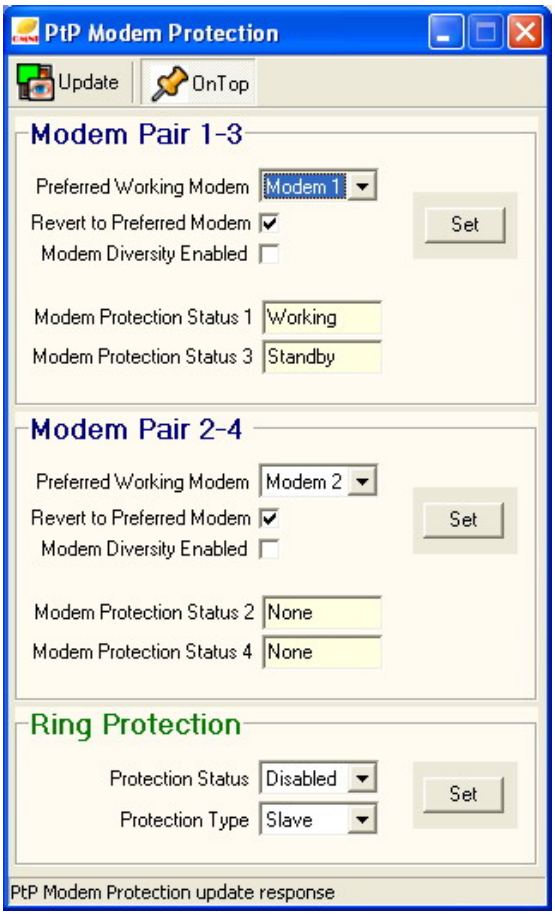
NOTE The following procedure describes how to set the modems Pair 1-3 in protected mode. Follow a same procedure for the Pair 2-4.

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to view the current properties of the *Control* element. 

Continued on next page

Configuring the Protection of an OmniBAS Node, Continued

Setting a protected pair (continued)

Step	Action
3	In the **System** group box, click the **Pair 1-3** drop-down list and select *Protected*. Click the corresponding Set button to apply the setting. 
4	In the **Actions** group box, click the PtP Protection button. The *PtP Modem Protection* window that appears, click the Update button to view the current protection settings of the selected OmniBAS node.  In the **Modem Pair 1-3** group box: • The **Modem Protection Status 1** field shows the current protection status (e.g. *Working*) of the modem located at slot 1 (PTP slot 1). • The **Modem Protection Status 3** field shows the current protection status (e.g. *Standby*) of the modem located at slot 3 (PTP slot 3).

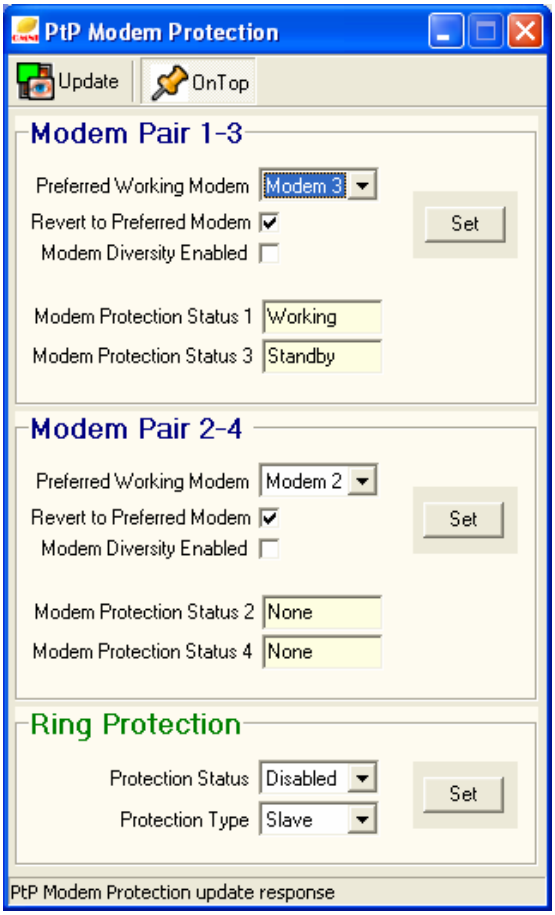
Continued on next page

Configuring the Protection of an OmniBAS Node, Continued

Setting a protected pair (continued)

Step	Action
5	• Select the **Revert To Preferred Modem** check box, in case you want, the protection mechanism to revert to the preferred working modem in case it recovers from a failure. By default, this check box is selected. • Click the Set button to apply the setting.

6	• For setting:
	  ◦ 1+1 FD (Frequency Diversity) protection, select the **Diversity Enabled** check box.
	  ◦ 1+1 HSB (Hot Stand-By) protection, leave the **Diversity Enabled** check box, unselected.
	• Click the Set button to apply the setting.

7	 • If you want to switch the modems (i.e. the working modem to enter standby mode and vice-versa), select the modem you want to enter working mode (e.g. select Modem 3) from the **Preferred Working Modem** drop-down list. • Click the Set button to apply the modems switching.

End of procedure.

Configuring an ODU

Introduction

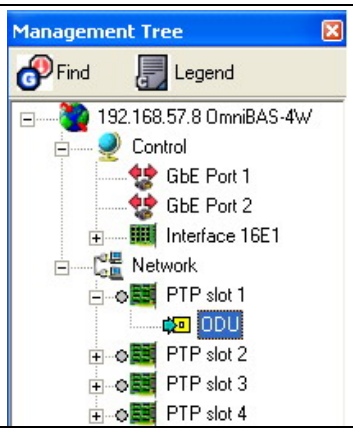
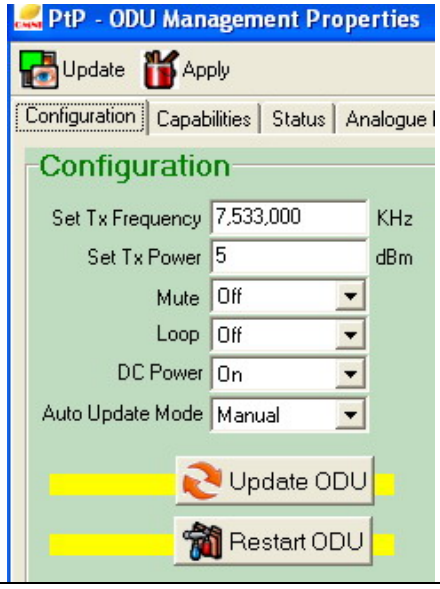
This paragraph describes how to:

- Configure an ODU (Tx frequency, Tx power, etc.)
- Set the alarm thresholds (RSSI and temperature upper threshold) of an ODU
- Upgrade the firmware of an ODU

To configure an OmniBAS radio link, perform the procedures provided in this paragraph to both ODUs (local and remote) of the link.

Configuring an ODU

To configure an ODU of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element and click the ODU you want.
2	In the *PtP -ODU Management Properties* window, ensure that the **Configuration** tab is displayed – if not, select it. In the *Configuration* tabbed sheet, click the Update button to view the current properties of the ODU. 

Continued on next page

Configuring an ODU, Continued

Configuring an ODU (continued)

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>Consult the following table to define the parameters of the ODU:
<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td>Set Tx Frequency</td><td>In the Set Tx Frequency text box enter the Tx frequency value (in kHz) (1).</td></tr>
<tr><td>Set Tx Power</td><td>In the Set Tx Power text box enter the Tx power value (in dBm) (1).</td></tr>
<tr><td>Mute</td><td>From the Mute drop-down list select mute:
• ON, to mute the ODU. Muting an ODU results in transmission interruption of the ODU.
• OFF, to unmute the ODU.</td></tr>
<tr><td>Loop</td><td>From the Loop drop-down list select:
• ON, to enable ODU loopback.
• OFF, to disable ODU loopback.</td></tr>
<tr><td>DC Power</td><td>From the DC Power drop-down list select:
• ON, to enable the selected ODU’s power up.
• OFF, to enable the ODU’s power down.</td></tr>
<tr><td>Auto Update Mode</td><td>From the Auto Update Mode drop-down list select:
• Auto, to enable the automatic upgrading of the ODU. The upgrading of the ODU starts automatically, when OmniLCT application detects that a new firmware should be installed.
• Manual, to enable the manual upgrading of the ODU(2).

NOTE The Update Status of the ODU (Updated, Needs Update or Updated Now) is displayed in the Status tabbed sheet (see par. Monitoring ODU current status, page 123).

Be careful with the upgrading of an ODU, since when an ODU upgrading process is completed, the ODU reboots; this reboot process will cause link downtime.</td></tr>
</table></td></tr>
</table>

Continued on next page

(1) You can see the upper and lower thresholds of the Tx Frequency and Tx Power in the corresponding fields of the *Capabilities* tabbed sheet.

(2) To upgrade the firmware of an ODU manually, see par. Manual Upgrading of ODU firmware, on page 34.

Configuring an ODU, Continued

Configuring an ODU (continued)

Step	Action
4	When you finish, click the  button to apply the new settings to the selected ODU.

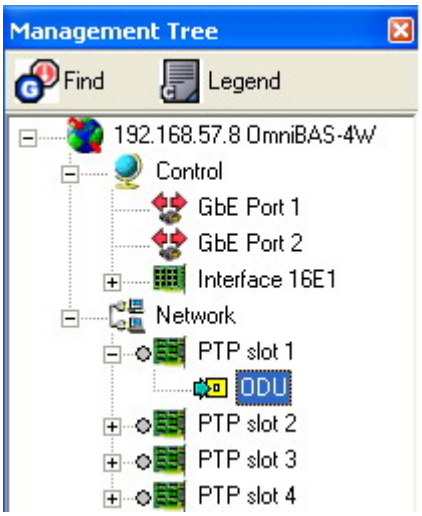
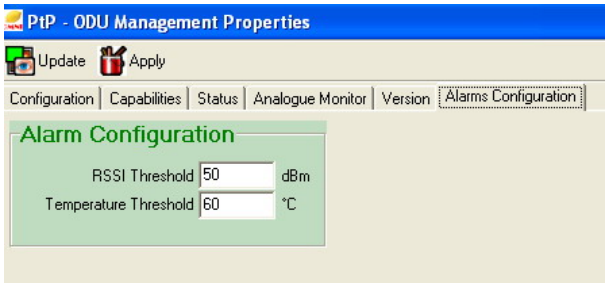
End of procedure.

Continued on next page

Configuring an ODU, Continued

Setting RSSI & Temperature alarm thresholds

To set the RSSI and Temperature alarm thresholds of an ODU, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element and click the ODU you want.
2	In the *PtP -ODU Management Properties* window, click the **Alarms Configuration** tab. In the *Alarms Configuration* tabbed sheet that appears, click the Update button to retrieve the current alarm thresholds of the ODU. 
3	To set a new RSSI threshold, type the new one in the **RSSI Threshold** text box. RSSI threshold should range between 30 dBm and 85 dBm. Click the Apply button to apply the new setting.
4	To set a new Temperature threshold, type the new one in the **Temperature Threshold** text box. Temperature threshold should range between 60 ºC and 80 ºC. Click the Apply button to apply the new setting.

End of procedure.

Continued on next page

Configuring an ODU, Continued

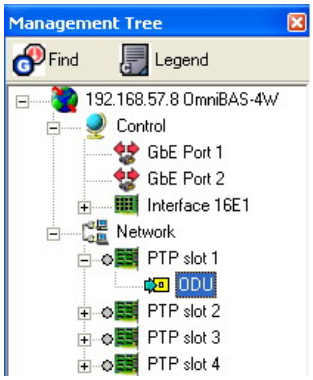
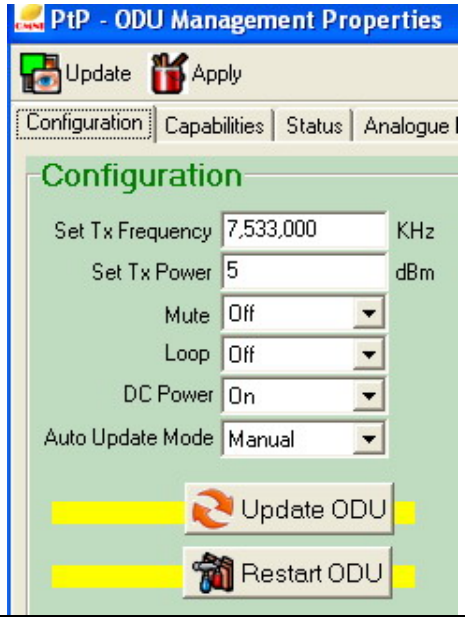
Manual Upgrading of ODU firmware

To upgrade the firmware of an ODU (manually), proceed as follows:

Be careful with the upgrading of an ODU, since when an ODU upgrading process is completed, the ODU reboots; this reboot process will cause link downtime.

NOTE An ODU should be upgraded when the *Needs Updated* message is displayed in the **Update Status** field of the ODU's *Status* tabbed sheet. (See par. Monitoring ODU current status, on page 123).

NOTE Nothing is happen when you try to update an already updated ODU (i.e. the *Updated* message is displayed in the **Update Status** field of the ODU's *Status* tabbed sheet.

Step	Action
1	 In the *Management Tree*, expand the *Network* element and click the ODU you want.
2	 In the *PtP -ODU Management Properties* window, click the **Configuration** tab. In the *Configuration* tabbed sheet, click the Update button to view the current properties of the ODU.

Continued on next page

Configuring an ODU, Continued

Manual Upgrading of ODU firmware (continued)

Step	Action
3	Verify that the *Manual* option appears in the **Auto Update Mode** drop-down list. To change the **Auto Update Mode** attribute of the ODU, see par. Configuring an ODU, on page 30.
4	Click the  button to start the upgrading process.
5	In the following confirmation message that appears, click **Yes** to continue: 
6	Wait for the ODU upgrading process to complete. When the ODU upgrade is complete, a trap is sent in the *Alarms & Events Report* window and the *Updated* message is displayed in the **Update Status** field of the ODU's *Status* tabbed sheet[1].

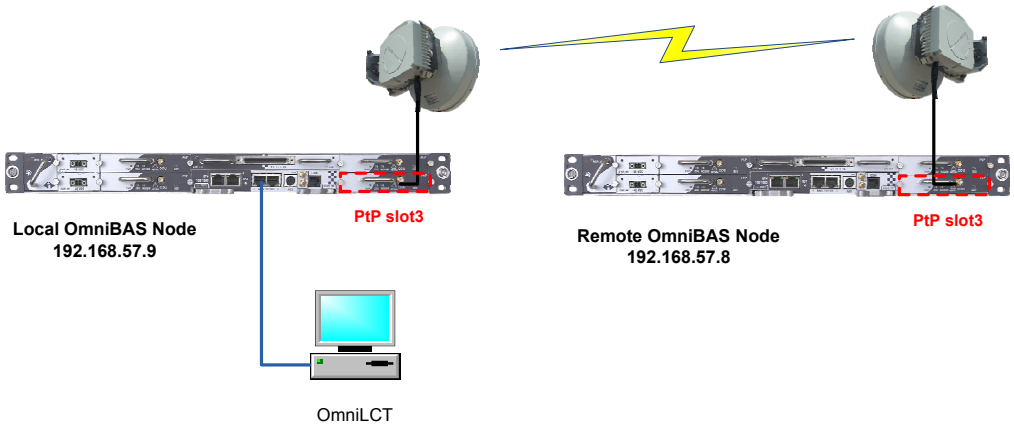
End of procedure.

[1] See par. Monitoring ODU current status, on page 123.

Setting the Channel Bandwidth of a Link

Introduction

To set the channel bandwidth of an OmniBAS link, you should assign the same channel bandwidth settings to both OmniBAS nodes (local and remote) of the link.



The procedure provided below, describes how to set the channel bandwidth of the one edge of the OmniBAS link (e.g. to PtP Slot 3 of the Remote OmniBAS Node). Repeat the procedure, for the other edge of the link (e.g. to PtP Slot 3 of the Local OmniBAS Node).

The channel bandwidth setting must be carried out only by qualified personnel.

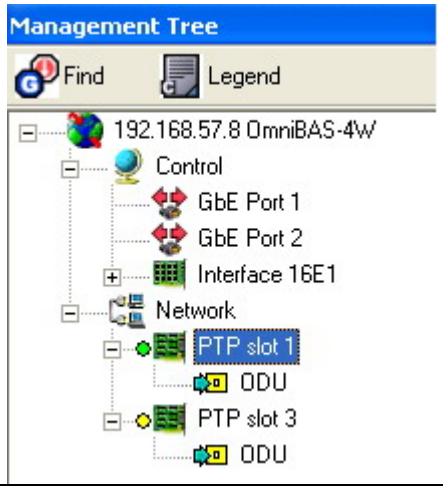
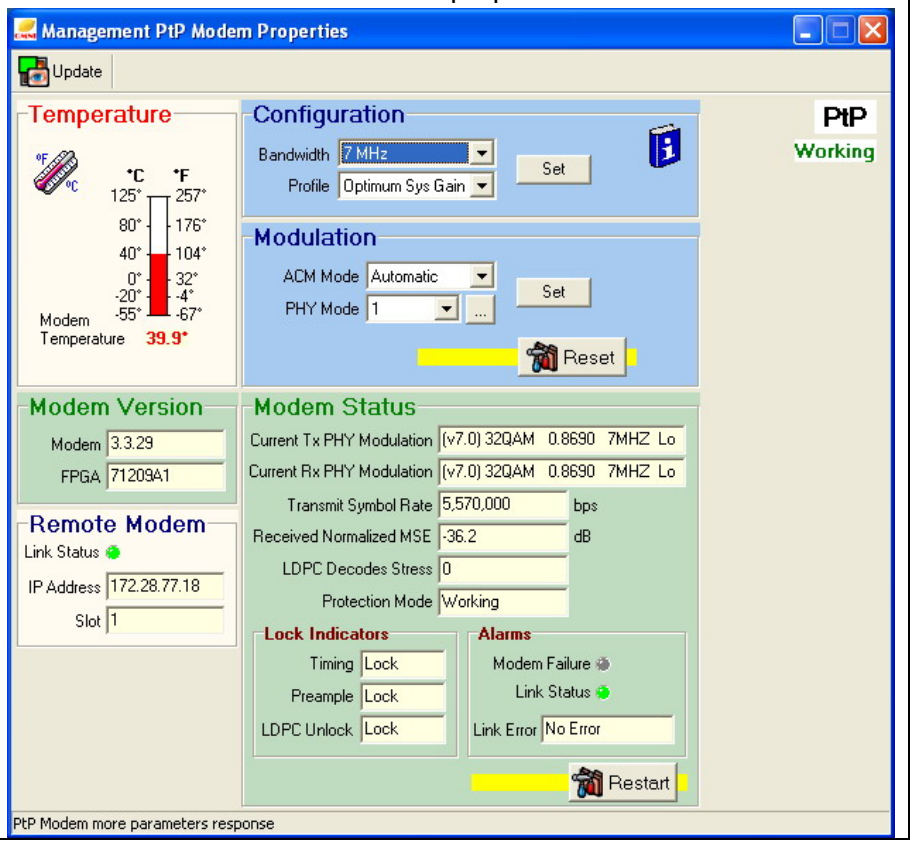
During the channel bandwidth configuration, link downtime is caused. For this reason, it is recommended to start with the channel bandwidth configuration of the most remote node to reduce the total link downtime.

Continued on next page

Setting the Channel Bandwidth of a Link, Continued

Setting channel BW

To set the channel bandwidth of the one edge of an OmniBAS link, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element of the local or remote OmniBAS node (e.g. 183.168.57.8) and click the modem corresponding to the link you want (e.g. PTP slot 1).
2	In the *Management PtP Modem Properties* window, click the Update button to view the current properties of the modem. 

Continued on next page

Setting the Channel Bandwidth of a Link, Continued

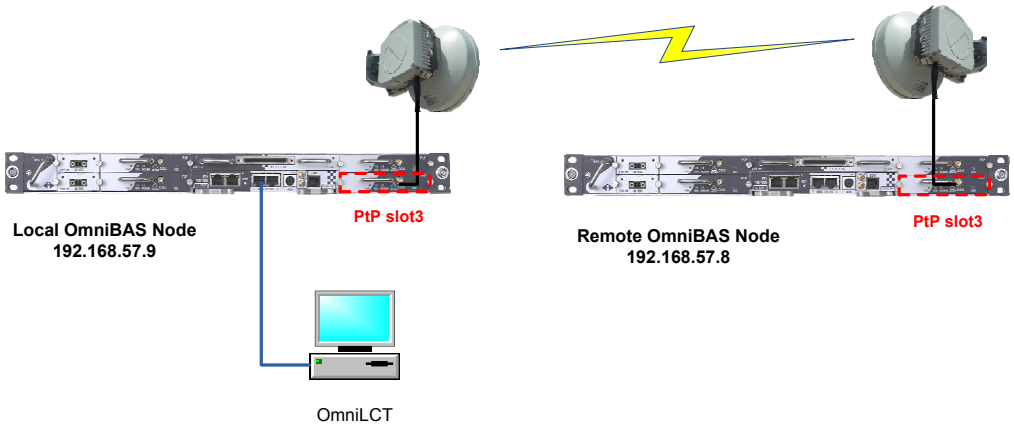
Step	Action
3	In the **Configuration** group box, click the **Bandwidth** drop-down list and select the channel bandwidth to be associated with the selected modem: *7 MHz*, *14 MHz*, *28 MHz* or *56 MHz*. 
4	From the **Profile** drop-down list select one of the following profiles to be associated with the link: • *Optimum Sys Gain,* to enable higher gain performance (and hence, lower capacity) for the link • *Optimum Capacity,* to enable higher capacity performance (and hence, lower gain) for the link • *Normal,* to enable normal gain and capacity performance for the link
5	In the **Configuration** group box, click the Set button to apply the channel bandwidth settings to the selected modem of the OmniBAS link.

End of procedure.

Enabling Adaptive Coding & Modulation (ACM)

Introduction

To enable the Adaptive Coding & Modulation (ACM) of an OmniBAS link, you should enable the ACM to both OmniBAS nodes (local and remote) of the link.



The procedure provided below, describes how to enable the ACM to the one edge of the OmniBAS link (e.g. to PtP Slot 3 of the Remote OmniBAS Node). Repeat the procedure, for the other edge of the link (e.g. to PtP Slot 3 of the Local OmniBAS Node).

About ACM

When the Adaptive Coding & Modulation (ACM) is enabled, the modem automatically adjusts modulation (from 256QAM to QPSK and vice versa). Enabling ACM, the modem operates in the highest possible modulation, according to link quality metrics. This way, the critical, real-time applications run unaffected, independently of the weather conditions

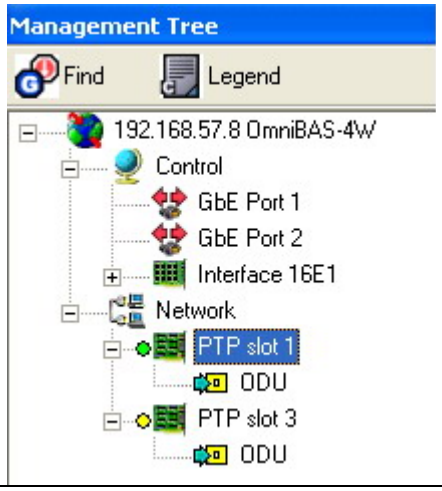
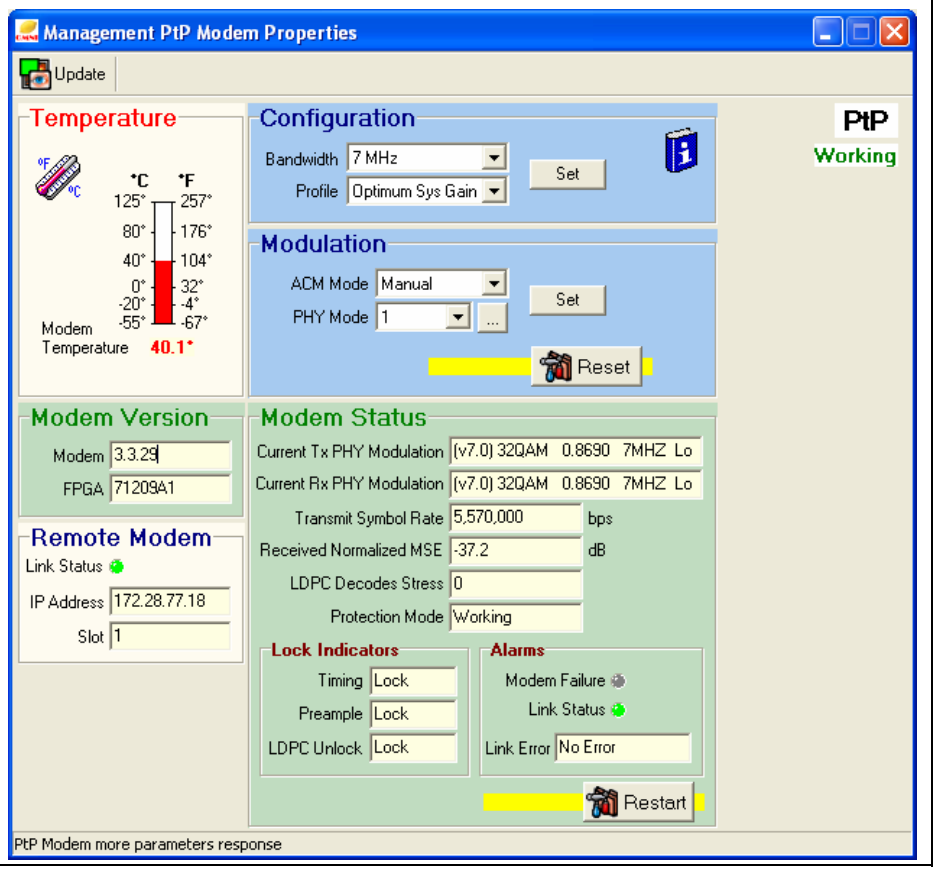
During stormy weather, for instance, the modem automatically reduces the modulation so that non real-time, data-based applications may be affected by throughput degradation, but real-time, high-revenue applications (such as real-time video and voice) will continue to run uninterrupted.

Continued on next page

Enabling Adaptive Coding & Modulation (ACM), Continued

Enabling ACM

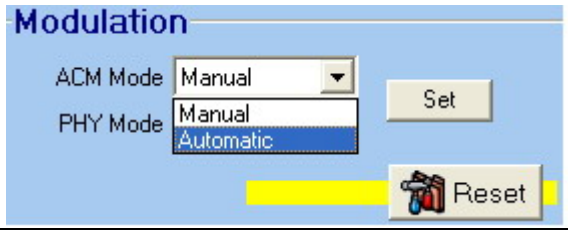
To enable the ACM feature of a modem, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element of the OmniBAS node (e.g. 183.168.57.8) and click the modem you want (e.g. PTP slot 1).
2	In the *Management PtP Modem Properties* window, click the  button to view the current properties of the modem. 

Continued on next page

Enabling Adaptive Coding & Modulation (ACM), Continued

Enabling ACM (continued)

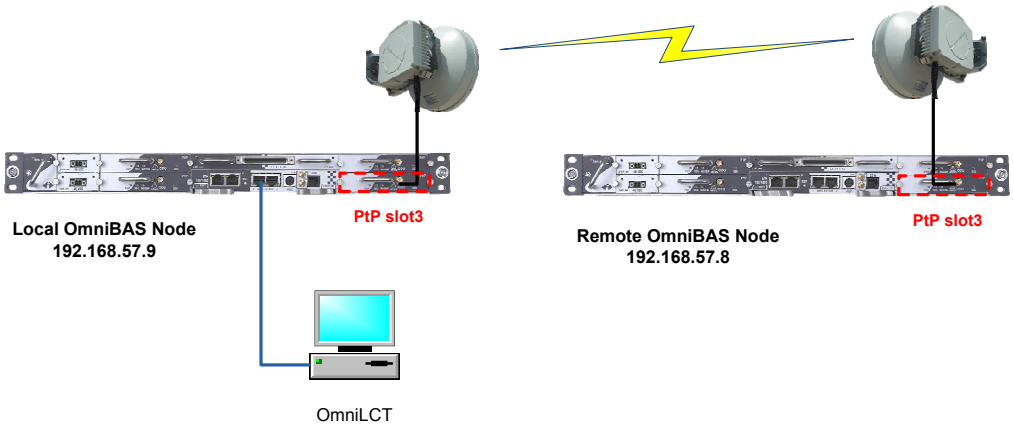
Step	Action
3	In the **Modulation** group box, click the **ACM Mode** drop-down list and select *Automatic*. 
4	In the **Modulation** group box, click the Set button to apply the new setting to the modem. **NOTE** You do not need to reset the modem for the change to apply.

End of procedure.

Setting Manual Modulation Mode

Introduction

To set the manual modulation mode of an OmniBAS link, you should assign the same modulation settings to both OmniBAS nodes (local and remote) of the link.



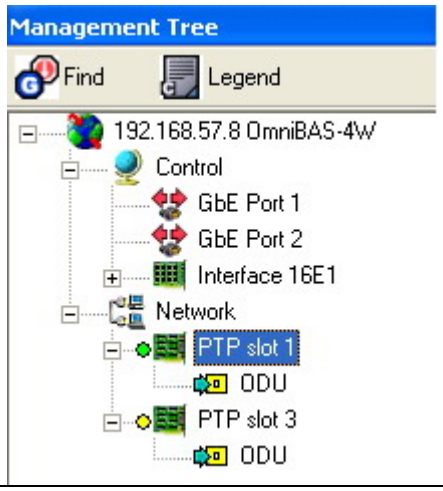
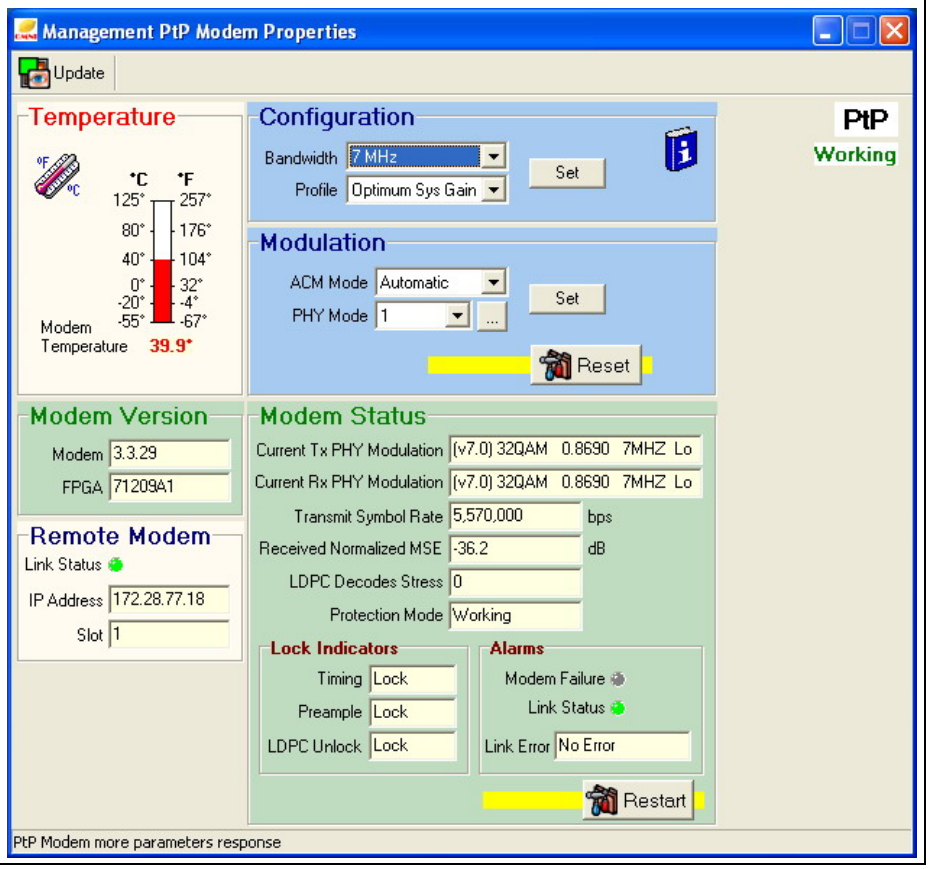
The procedure provided below, describes how to set the manual modulation mode of the one edge of the OmniBAS link (e.g. to PtP Slot 3 of the Remote OmniBAS Node). Repeat the procedure, for the other edge of the link (e.g. to PtP Slot 3 of the Local OmniBAS Node).

Continued on next page

Setting Manual Modulation Mode, Continued

Setting manual modulation mode

To set the manual modulation mode of a modem, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element of the OmniBAS node (e.g. 183.168.57.8) and click the modem you want (e.g. PTP slot 1).
2	In the *Management PtP Modem Properties* window, click the  button to view the current properties of the modem. 

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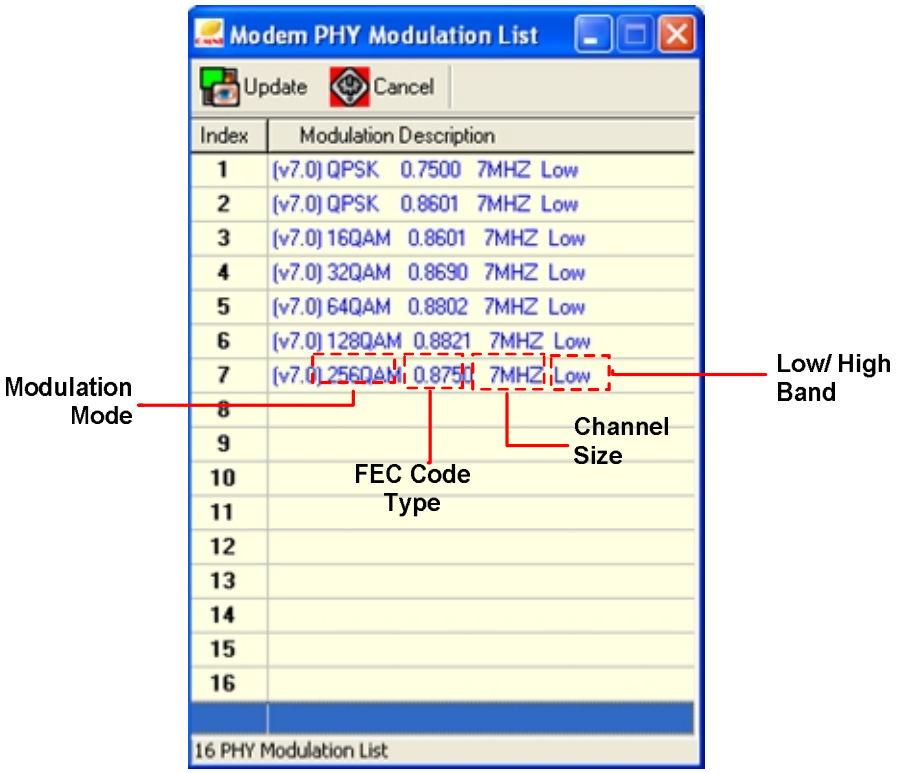
Setting Manual Modulation Mode, Continued

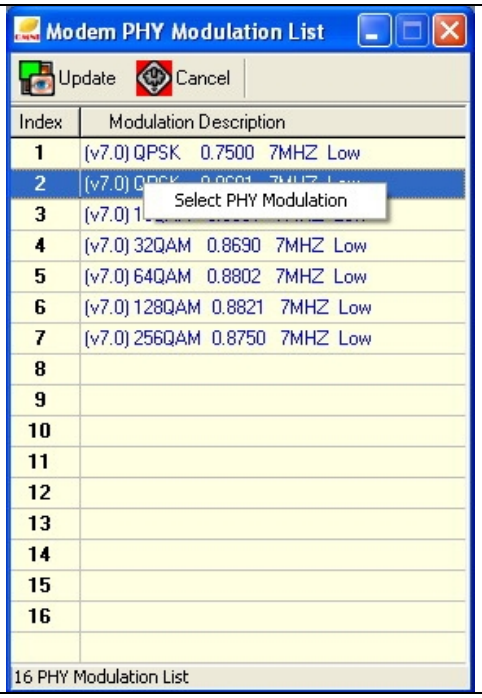
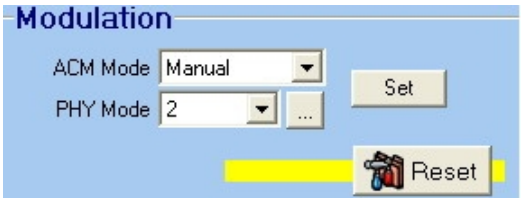
Setting manual modulation mode (continued)

Step	Action
3	In the **Modulation** group box, click the **ACM Mode** drop-down list and select *Manual*.  The modem will use the modulation mode that you will assign through the **PHY Mode** drop-down list.
4	Click the ··· button (next to the **PHY Mode** drop-down list). The **Modem PHY Modulation List** appears displaying up to 16 physical profile entries. 

Continued on next page

Setting Manual Modulation Mode, Continued

Setting manual modulation mode (continued)

Step	Action
5	 Select the physical profile entry you want, click the right mouse button and from the drop-down menu that appears, click **Select PHY Modulation**.
6	The selected physical profile entry (and specifically, its index) appears in the **PHY Mode** drop-down list. 
7	In the **Modulation** group box, click the Set button to apply the modulation settings to the modem. **NOTE** You do not need to reset the modem for the change to apply.

End of procedure.

3.2 Configuring Ethernet Traffic

This section provides the following step-by-step procedures to configure the Ethernet traffic.

Setting L2 Bridging Mode

Introduction

OmniLCT application automatically creates six L2 ports for an OmniBAS node, two corresponding to the GbE ports (Wireline L2 ports) with index 1 and 2 and four corresponding to the modems (Wireless L2 ports) with index 3, 4, 5 and 6.

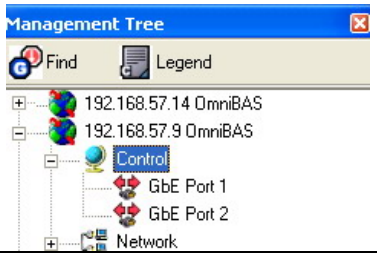
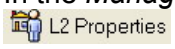
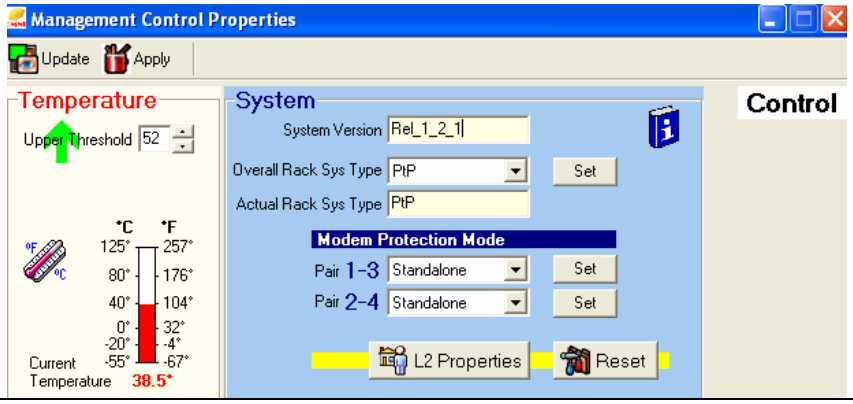
The L2 ports cannot be deleted. The default VLAN of the L2 ports is the native VLAN (VLAN with ID=1).

The L2 ports of an OmniBAS node must be configured to operate in C-VLAN mode or S-VLAN[1] mode. All L2 ports of an OmniBAS must be configured to operate only in one of the above modes (C-VLAN or S-VLAN).

This paragraph describes how to set the L2 bridging mode of an OmniBAS node.

Setting L2 bridging mode

To set the L2 bridging mode of an OmniBAS node, proceed as follows:

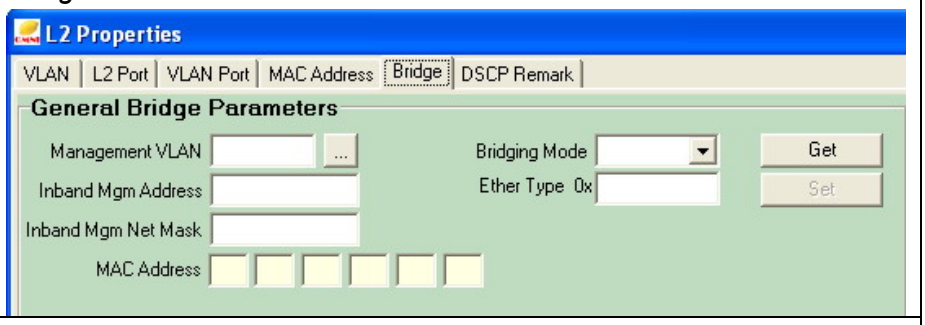
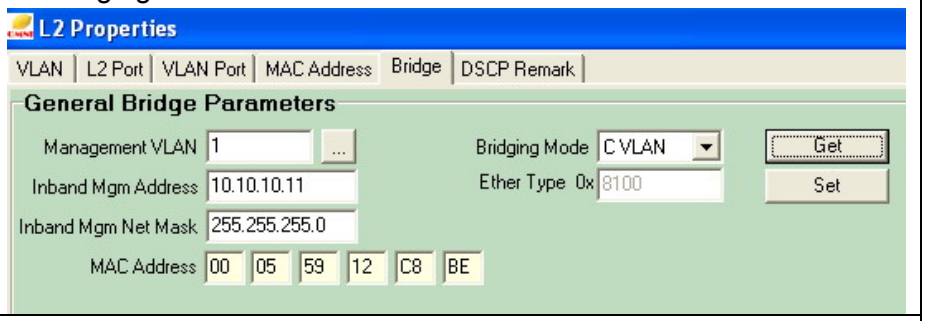
Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the  button (located in the **System** group box). 

Continued on next page

(1) Future release

Setting L2 Bridging Mode, Continued

Setting L2 bridging mode (continued)

Step	Action
3	In the *L2 Properties* window, click the **Bridge** tab to display the *Bridge* tabbed sheet. 
4	Click the Get button to retrieve the current configuration of the L2 bridging mode. 
5	If you want to change the L2 bridging mode of the OmniBAS node: • From the **Bridging Mode** drop-down list, select *C-VLAN* or *S-VLAN*. • Click the Set button to apply the selected bridging mode to all L2 ports of the OmiBAS node.

End of procedure.

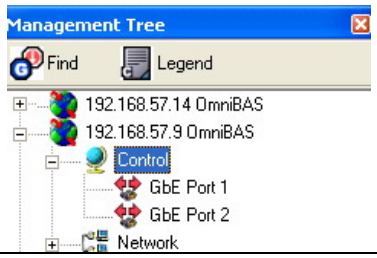
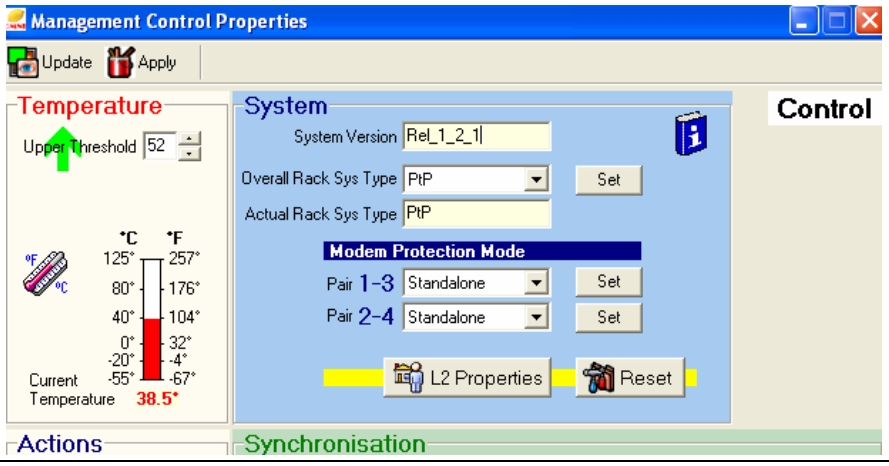
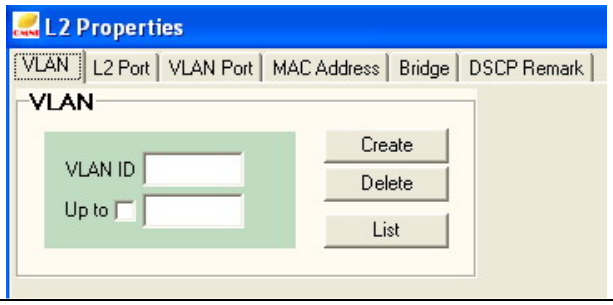
Creating VLANs

Introduction

This paragraph describes how to create VLANs in an OmniBAS node.

Creating VLANs

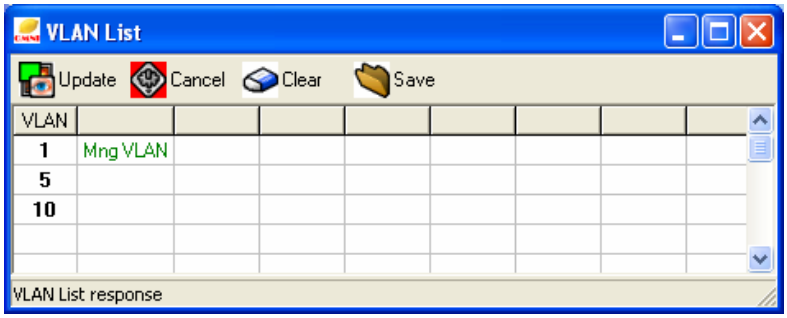
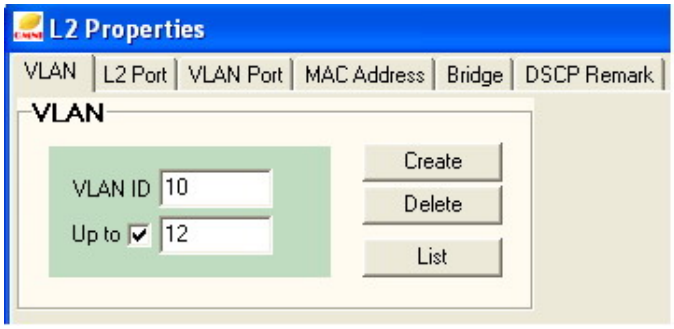
To create the VLANs of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window that appears, ensure that the **VLAN** tab is displayed – if not, select it: 

Continued on next page

Creating VLANs, Continued

Creating VLANs (continued)

Step	Action
4	To view the list regarding all created VLANs, click the List button. In the *VLAN List* window that appears, click the Update button to display the list of the created VLANs.  **NOTE** By default, the VLAN with ID =1 is used for the management VLAN.
5	In the *VLAN* tabbed sheet: • Type the ID of the VLAN you want to create (e.g. 10) in the **VLAN ID** text box. Type a value between 2 and 4094. • If you want to create more than one VLAN (with contiguous ID), select the **Up to** check box and type the ID of the last VLAN you want to create in the corresponding text box (e.g.12 – therefore, the following three VLANs are requested to be created: 10, 11 and 12). 
6	Click the Create button, to create the customer VLAN(s). If you want to verify the creation of the new VLAN(s), repeat step 4.

NOTE In case you want to delete VLANs, see par. Removing VLAN(s), on page 139.

End of procedure.

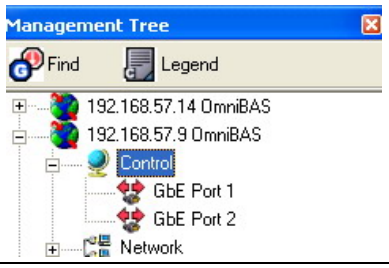
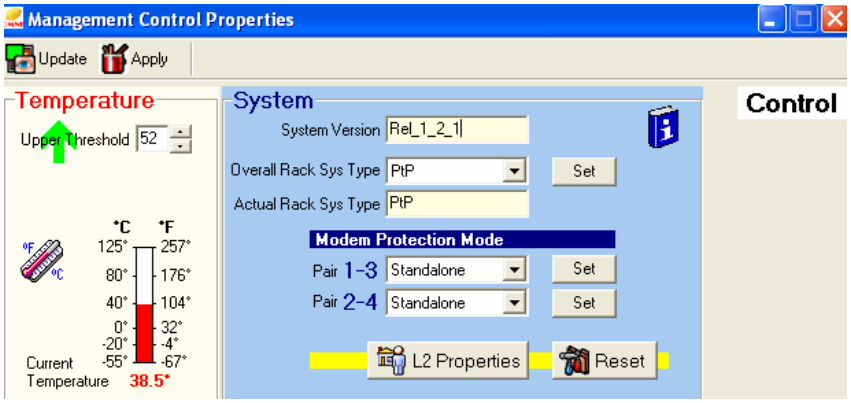
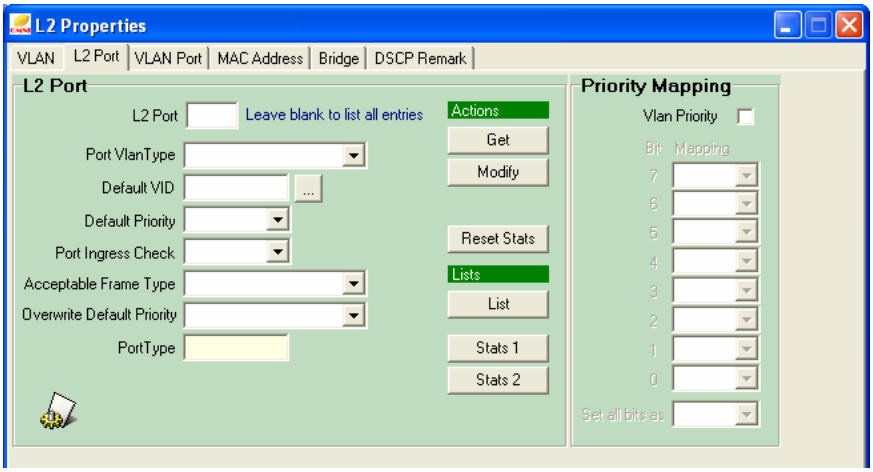
Setting L2 Ports

Introduction

This paragraph describes how to monitor the current settings of the L2 ports of an OmniBAS node and also how to change the settings of an L2 port.

Monitoring/ Modifying L2 ports

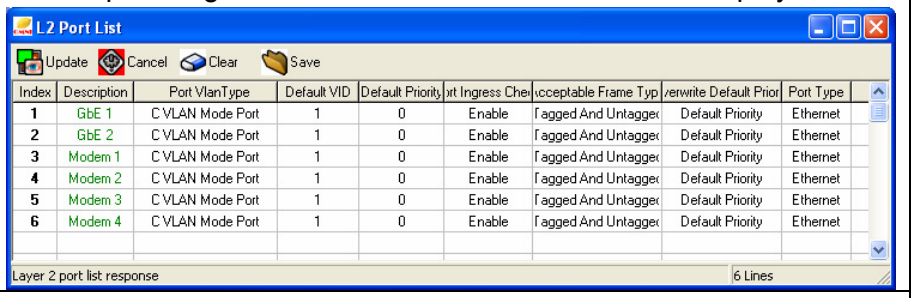
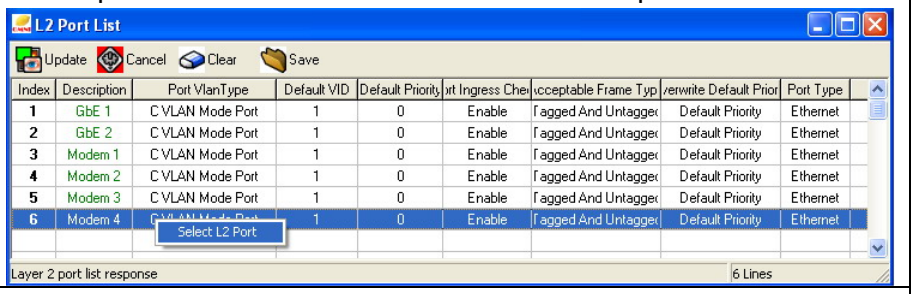
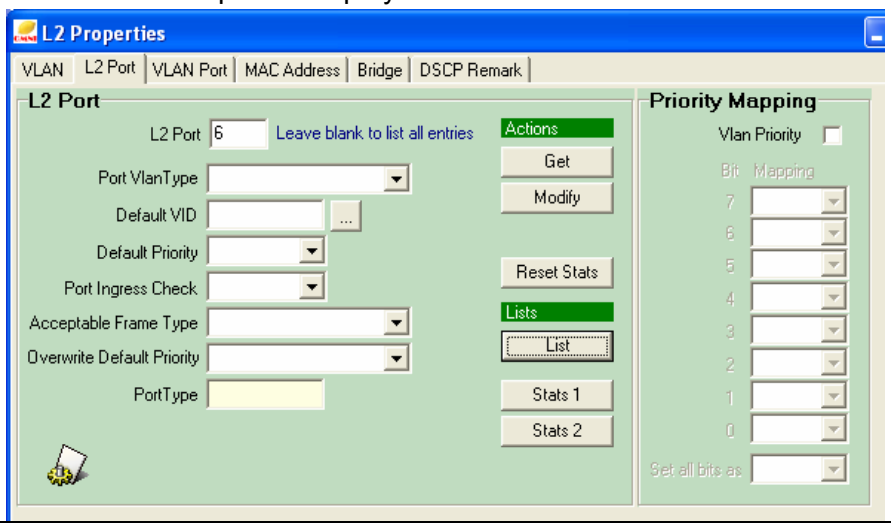
To monitor/ change the settings of an L2 port, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window, click the **L2 Port** tab.  In the *L2 Port* tabbed sheet, click the List button.

Continued on next page

Setting L2 Ports, Continued

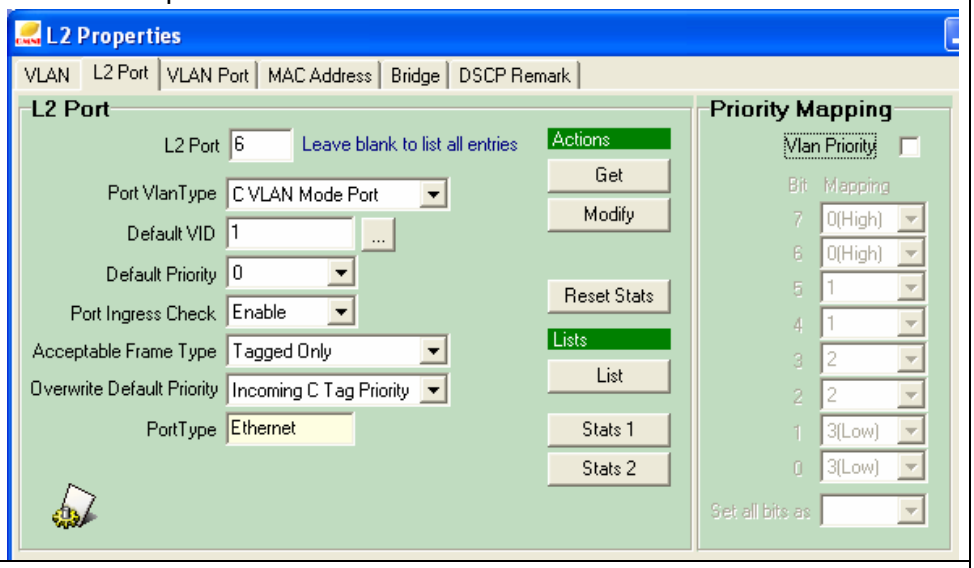
Monitoring/ Modifying L2 ports (continued)

Step	Action
4	In the *L2 Port List* window that appears, click the Update button to display the L2 ports of the OmniBAS node. The L2 ports together with their current attributes are displayed. 
5	In case you want to change the settings of an L2 port, select the L2 port you want (e.g. Modem 4), click the right mouse button and from the drop-down menu select the **Select L2 Port** option. 
6	The selected L2 port is displayed in the *L2 Port* tabbed sheet. 

Continued on next page

Setting L2 Ports, Continued

Monitoring/ Modifying L2 ports (continued)

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>7</td><td>Click the Get button to retrieve the current attributes of the selected L2 port.
 
</td></tr>
<tr><td>8</td><td>Consult the following table to modify any of the L2 port attribute:
<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td>L2 Port</td><td>Displays the selected L2 port.</td></tr>
<tr><td>Port VLAN Type</td><td>Displays the L2 bridging modes: C VLAN Port Mode or S VLAN Port Mode (1).</td></tr>
<tr><td>Default VID</td><td>Displays the default VLAN of the selected L2 port. This is the VLAN tag by which the incoming untagged frames are tagged and it is used for the cases where user traffic is untagged or priority tagged(2).
If you want to change the Default VID of the L2 port:
– Click the ... button.
– In the VLAN list window that appears, click the Update button to display all created VLANs.
– Select the VLAN you want, click the right mouse button and from the drop-down menu that appears select the Select VLAN option.
The selected VLAN ID is displayed in the Default VID field.</td></tr>
</table></td></tr>
</table>

Continued on next page

(1) Future release

(2) See Appendix B – 802.1Q Ethernet Frame for the description of the Ethernet MAC frame.

Setting L2 Ports, Continued

Monitoring/ Modifying L2 ports (continued)

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>8</td><td>
<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td>Default Priority</td><td>This is the default priority applied to the incoming untagged packets. It can be also applied to priority tagged packets when the Overwrite Default Priority attribute takes Default Priority value.
To change the default priority of the selected L2 port, select a new one (0 (lowest priority) to 7 (highest priority), with default value = 0) from the Default Priority drop-down list.</td></tr>
<tr><td>Port Ingress Check</td><td>From the Port Ingress Check drop-down list, select:
• Enable: If a packet arrives to this L2 port and its VLAN does not belong to the port tagged list (list of VLANs defined for this port), it is dropped.
• Disable: All packets arriving to this L2 port are accepted.</td></tr>
<tr><td>Acceptable Frame Type</td><td>From the Acceptable Frame Type drop-down list, select(2):
• Untagged Only: L2 port accepts only untagged frames and priority tagged frames
• Tagged Only: L2 port accepts only tagged frames
• Tagged and Untagged: L2 port accepts all frames, tagged and untagged
• Accept None: L2 port drops all frames (tagged and untagged)</td></tr>
<tr><td>Overwrite Default Priority</td><td>From the Overwrite Default Priority drop-down list, select the priority type for the selected L2 port: Default Priority or Incoming C Tag Priority.
Note that this field is applicable only when S-VLAN mode(1) is selected.</td></tr>
<tr><td>Port Type</td><td>Displays the type of the selected L2 port (Ethernet).</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>If you change the attributes of the L2 port, click the Modify button to apply the changes.</td></tr>
</table>

NOTE To enable the priority mapping feature, see par. Setting Ethernet QoS, on page 60.

NOTE Through the *L2 Port* tabbed sheet (of the *L2 Properties* window), you can select to monitor the statistics of an L2 port. For the procedure concerning the monitoring of the L2 ports statistics, see par. Monitoring the L2 Ports Performance , on page 162.

End of procedure.

Continued on next page

(1) Future release
(2) See Appendix B – 802.1Q Ethernet Frame for the description of the Ethernet MAC frame.

Setting L2 Ports, Continued

Toolbar of L2 Port List window

The toolbar of the *L2 Port List* window includes the following buttons:

Button	Description
	To retrieve the list entries.
	To cancel a request.
	To clear the list.
	To save the L2 Port list in a text file.

Also, you can press the “+”/ “-”keyboard’s keys to enlarge/ reduce the list’s font size.

Associating VLANs with L2 Ports

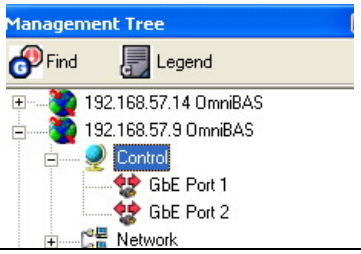
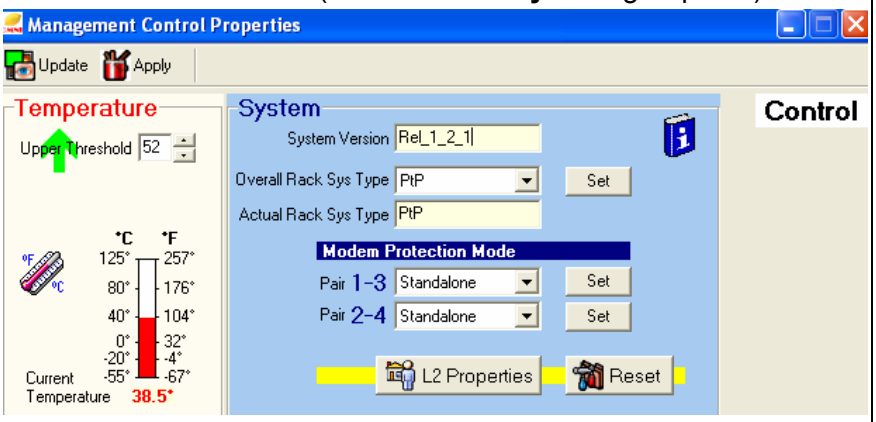
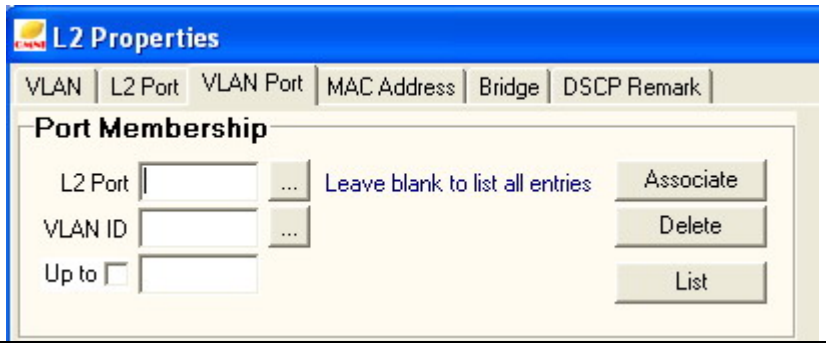
Introduction

This paragraph describes how to:

- View the list providing the current associations of the VLANs with the L2 ports
- Associate the VLANs you want to an L2 port.

Viewing the VLAN Port Membership List

To view the list providing the current associations of the VLANs with the L2 ports, proceed as follows:

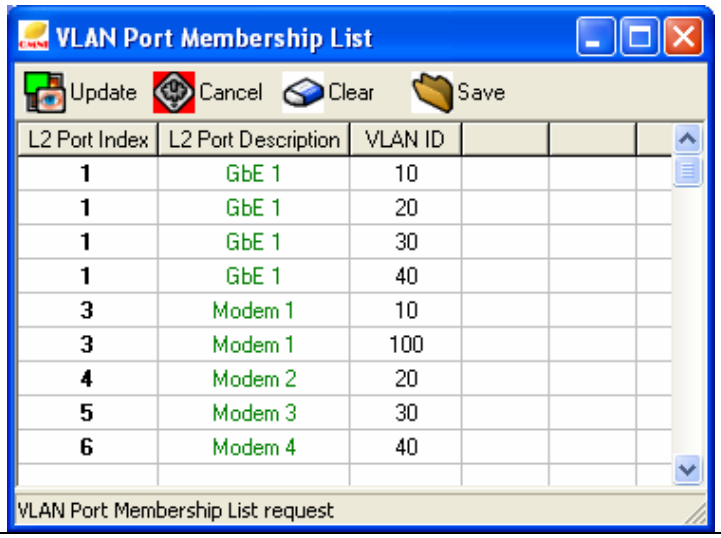
Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window that appears, click the **VLAN Port** tab. 

Continued on next page

Associating VLANs with L2 Ports, Continued

Viewing the VLAN Port Membership List (continued)

Step	Action
4	To view the list regarding all associations between VLANs and L2 ports, click the List button. In the *VLAN Port Membership List* window, click the Update button to display the list:



NOTE In case you want to delete a VLAN port, see par. Removing VLAN ports, on page 142.

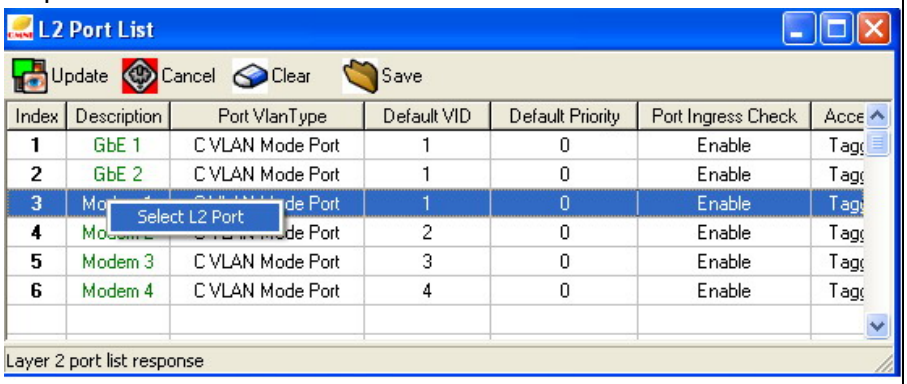
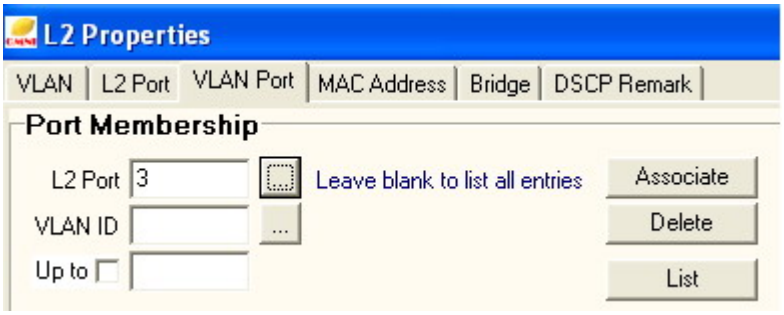
End of procedure.

Continued on next page

Associating VLANs with L2 Ports, Continued

Associating VLANs with L2 ports

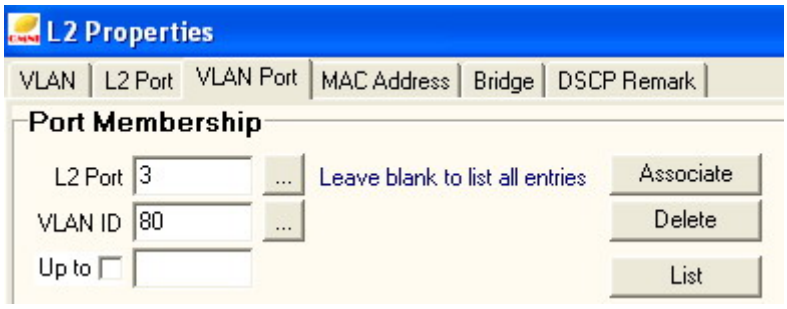
To associate VLANs with an L2 port, proceed as follows:

Step	Action
1	Repeat steps 1 to 3 of the previous par. Viewing the VLAN Port Membership List.
2	First, in the *VLAN Port* tabbed sheet, select the L2 port you want: • Click the ... button located next to **L2 Port** field. • In the *L2 Port List* window that appears, click the Update button to display the L2 ports of the OmniBAS node. • Select the L2 port you want (e.g. Modem 1), click the right mouse button and from the drop-down menu select the **Select L2 Port** option.  The selected L2 port is displayed in the *VLAN Port* tabbed sheet. 

Continued on next page

Associating VLANs with L2 Ports, Continued

Associating VLANs with L2 ports (continued)

Step	Action
3	Then, in the *VLAN Port* tabbed sheet, select the VLAN to be associated to the selected L2 port:  • Click the ... button located next to **VLAN ID** field. • In the *VLAN List* window that appears, click the Update button to display all created VLANs. • Select the VLAN you want (e.g. VLAN 80), click the right mouse button and from the drop-down menu select the **Select VLAN** option. The ID of the selected VLAN is displayed in the *VLAN Port* tabbed sheet [1]. 
4	Click the Associate button, to create the association(s). If you want to verify the creation of the new VLAN port(s), click the List button in the *VLAN Port* tabbed sheet (see par. Viewing the VLAN Port Membership List, on page 56).

End of procedure.

[1] If you want to associate more than one VLAN to the selected L2 port, select the **Up to** check box and in the corresponding text box, type the ID of the last VLAN you want to associate. For example, if you select the **Up to** check box and then type VLAN ID = 130, the following six VLANs are requested to be associated with the selected L2 port: 100, 110, 112, 114, 120 and 130 (and not the VLAN with ID = 80).

Setting Ethernet QoS

Introduction

OmniBAS system supports advanced Ethernet QoS functionality at Layer 2/ 3 of OSI model enabling the traffic prioritization and performing dynamic multicast filtering. Ethernet QoS prioritizes network traffic and manages available bandwidth so that the most important traffic (packets with higher priority) to be forwarded first when network congestion occurs.

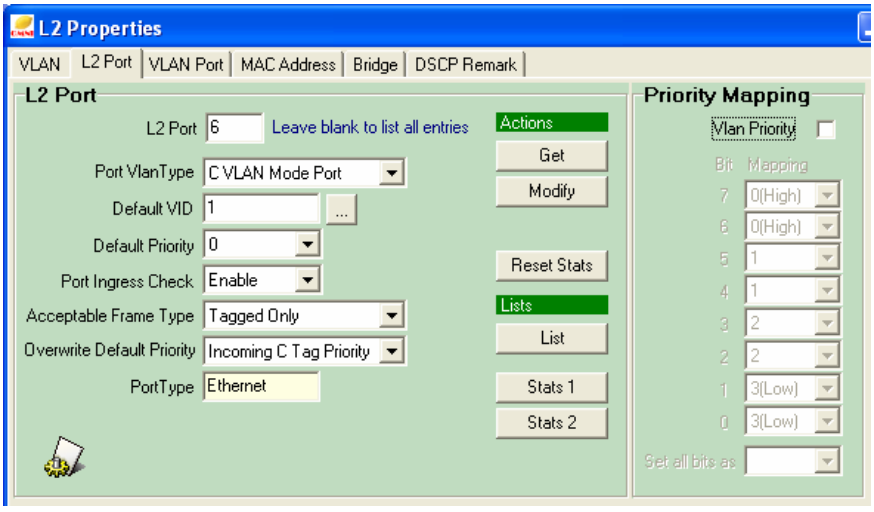
This paragraph describes how to assign:

- IEEE 802.1 P/Q priority in a VLAN packet (Layer 2).
  Note that, for the priority-to-queue mapping, OmniBAS system supports four *service classes (queues)*: 0 (highest queue priority), 1, 2 and 3 (lowest queue priority).
- DSCP (Differentiated Services Code Point) in an IP packet (Layer 3)

NOTE In the current OmniBAS release (2.0.0), the IEEE 802.1 P/Q priority feature is supported only for the wireless L2 ports. Also, the DSCP priority feature is supported only for the GbE ports.

Configuring the priority mapping of a wireless L2 port

To configure the priority mapping table of a wireless L2 port, proceed as follows:

Step	Action
1	Select the L2 port and retrieve its current attributes, by carrying out the procedure described in par. Monitoring/ Modifying L2 ports, on page 51 (steps 1 to 7).  When the priority mapping of the L2 port is not enabled (see the above screen), the packets are forwarded according their incoming VLAN priority(1) (that ranges from 0 for low priority to 7 for high priority).

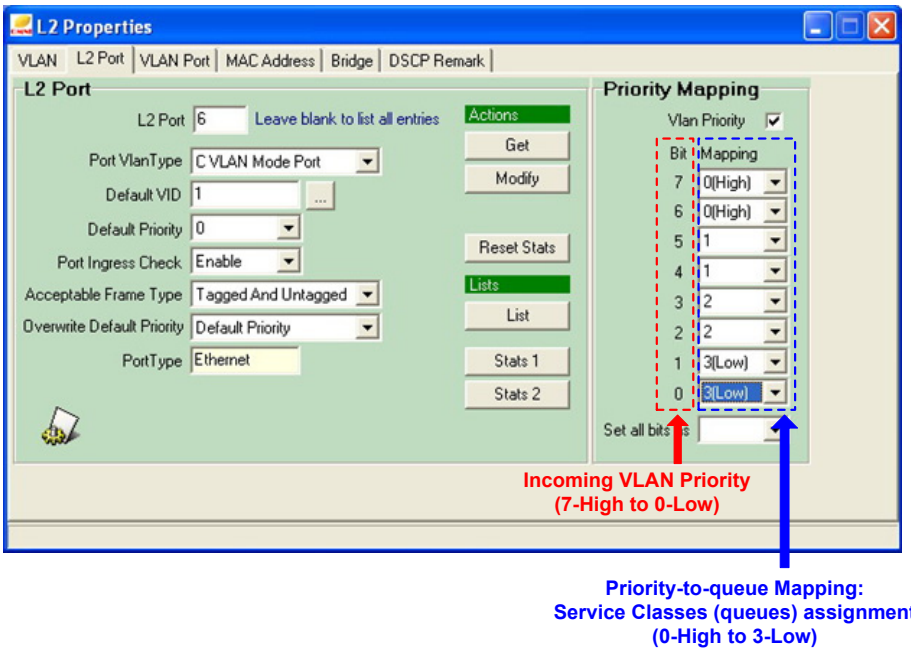
Continued on next page

(1) PCP field of the Ethernet MAC frame (see Appendix B – 802.1Q Ethernet Frame).

Setting Ethernet QoS, Continued

Configuring the priority mapping of a wireless L2 port (continued)

Step	Action
2	To enable the priority mapping of the L2 port, select the **VLAN Priority** check box in the **Priority Mapping** group box.

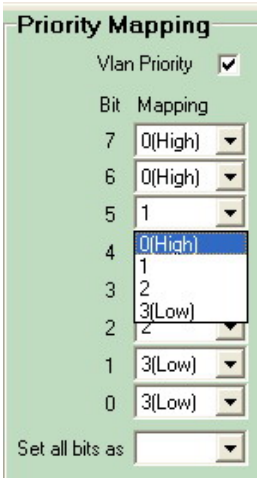


When you enable the priority mapping of the L2 port, the VLAN priority of the incoming packets can be mapped to one of the four service classes (queues) supported by the OmniBAS system. The packets with the highest priority queue are always transmitted first and packets with lowest priority queue are always transmitted last.

Continued on next page

Setting Ethernet QoS, Continued

Configuring the priority mapping of a wireless L2 port (continued)

Step	Action
3	Assign a service class (queue) (0 (High), 1, 2 or 3 (Low)) to each incoming VLAN priority (0 to 7) by using the corresponding drop down-lists. In the following example the service class 0 (High) is assigned to incoming-VLAN Priority 5:  About **Set all bits as** drop-down list You can use the **Set all bits as** drop-down list to assign the same service class (queue) to all incoming-VLAN priorities. In this way, when a service class (queue) is assigned more times than the others, you can avoid assigning the service classes (queues) one-by-one (i.e. you assign the service class (queue) you want to all incoming-VLAN priorities, and then you select the different ones, wherever needed).
4	When you complete the priority mapping assignments, click the Modify button, to apply the priority mapping settings to the selected L2 port.

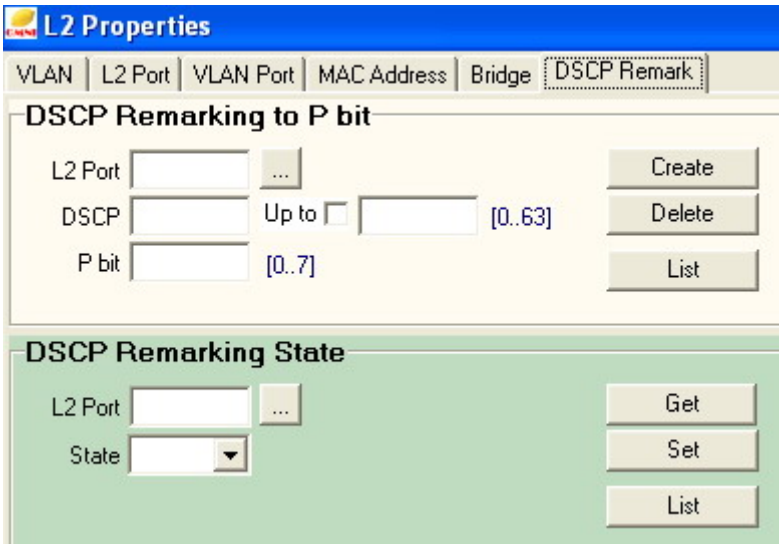
End of procedure.

Continued on next page

Setting Ethernet QoS, Continued

Configuring the DSCP priorities of a wireline (GbE) L2 port

To configure the DSCP priority mapping of a wireline (GbE) L2 port, proceed as follows:

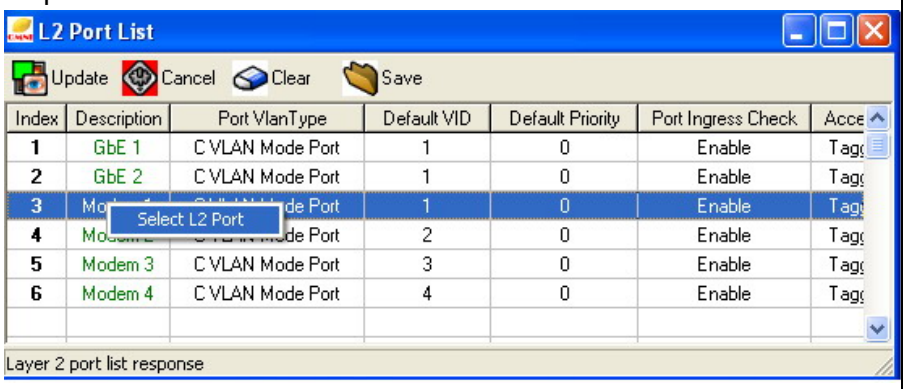
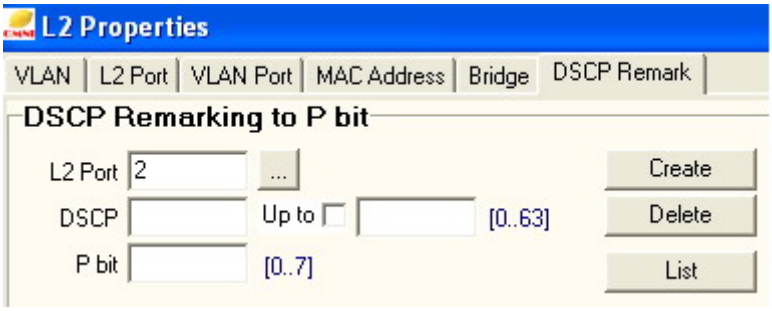
Step	Action
1	Configure the priority-to-queue mapping of the GbE port, by carrying out a same procedure as this described in the previous par. Configuring the priority mapping of a wireless L2 port. Then, carry out the following steps to assign DSCP entries(1) and associate them with the service classes you have specified.
2	In the *L2 Properties* window of the selected *Control* element, select the **DSCP Remark** tab: 

Continued on next page

(1) The DSCP entry is written to the TOS/DSCP field in the IP header of the incoming packets and takes values from 0 for low priority to 63 for high priority.

Setting Ethernet QoS, Continued

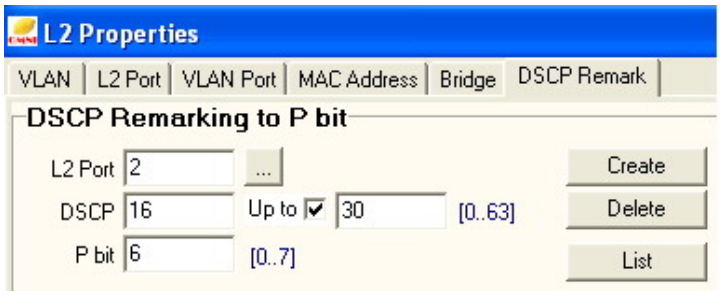
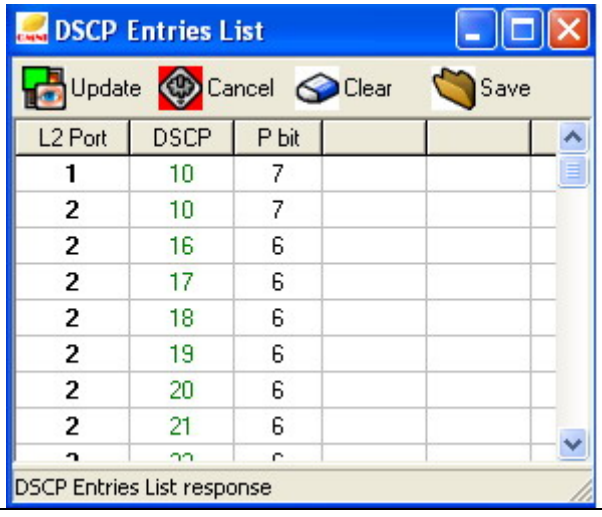
Configuring the DSCP priorities of a wireline (GbE) L2 port (continued)

Step	Action
3	To assign new DSCP entries, select the L2 port you want in the **DSCP Remarking to P bit** group box, as follows: • Click the ... button located next to **L2 Port** field. • In the *L2 Port List* window that appears, click the Update button to display the L2 ports of the OmniBAS node. • Select the L2 port you want (e.g. Modem 1), click the right mouse button and from the drop-down menu select the **Select L2 Port** option.  The selected L2 port is displayed in the *DSCP Remarking to P bit* group box. 

Continued on next page

Setting Ethernet QoS, Continued

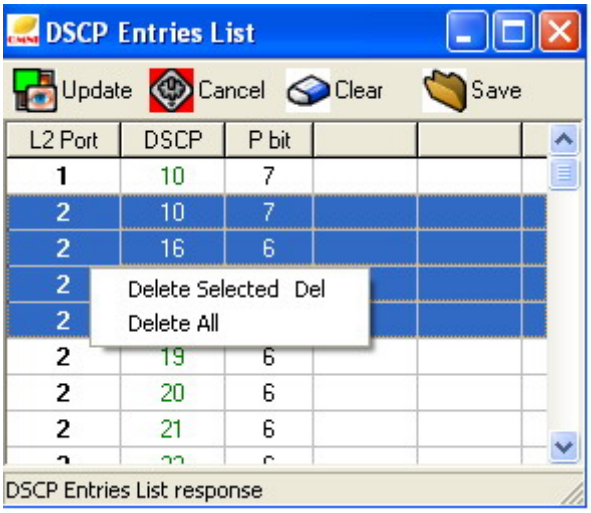
Configuring the DSCP priorities of a wireline (GbE) L2 port (continued)

Step	Action
4	Specify a DSCP entry and associate it to a P bit. Actually, the P bit corresponds to the service class that is mapped to the VLAN priority of the incoming packet. To specify a DSCP entry to a P bit, type the DSCP value (from 0 to 63) to the **DSCP** text box and the priority P bit value (from 0 to 7) to the **P bit** text box To associate more than one DSCP entries to a P bit, type the first DSCP value in the **DSCP** text box, click the **Up to** check box and type the last one in the corresponding text box. For instance, the following screen shows that the 16 to 30 DSCP values are assigned to P bit = 6.  The following table shows an example of DSCP remarking to P bit: **DSCP values**: 0, 8, 16, 24, 32, 40, 48, 56 **P bit**: 0, 1, 2, 3, 4, 5, 6, 7
5	Click the Create button, to apply the DSCP remarking to P bit.
6	If you want to verify the creation of the new DSCP entries, click the List button. In the *DSCP Entries List* window that appears, click the Update button to display the list of the created DSCP entries. 

Continued on next page

Setting Ethernet QoS, Continued

Configuring the DSCP priorities of a wireline (GbE) L2 port (continued)

Step	Action
7	In case you want to delete DSCP entries, in the *DSCP Entries List* window, click the rows corresponding to the DSCP entries you want to remove. Then, click the right mouse button and from the drop-down menu: • Select the **Delete Selected** option. The selected DSCP entries are removed. • Select the **Delete All** option to remove all DSCP entries.  Alternatively, carry out steps 1 to 5 of the above procedure and in the *DSCP Remarking to P bit* group box, click the Delete button.

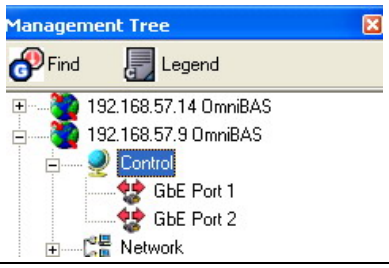
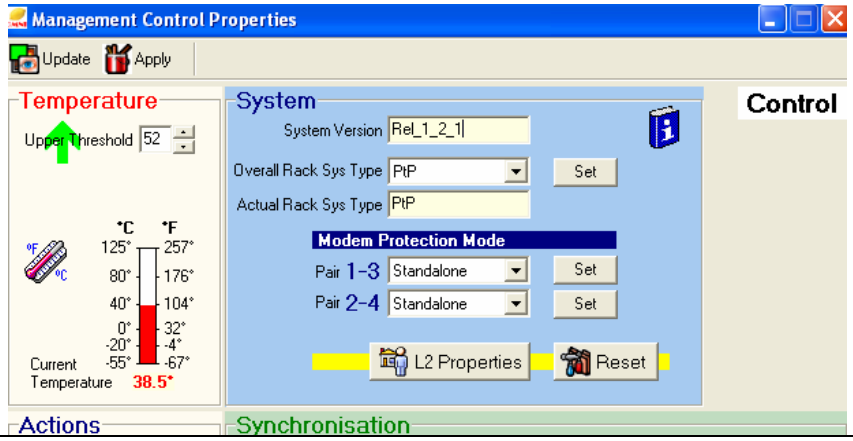
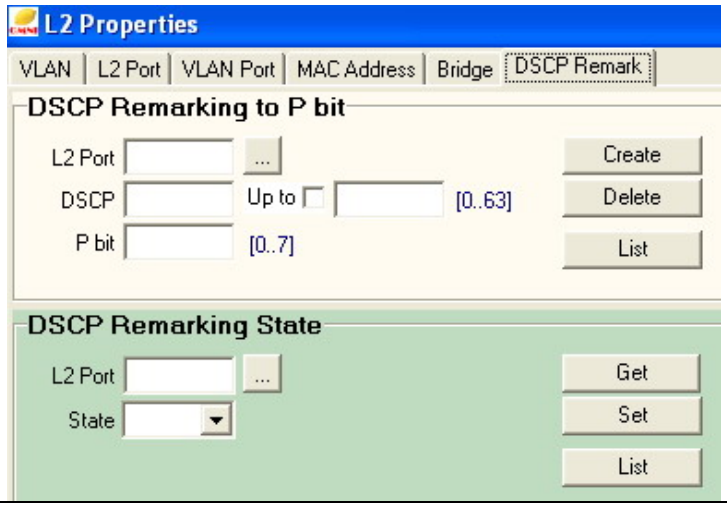
End of procedure.

Continued on next page

Setting Ethernet QoS, Continued

Enabling/ Disabling DSCP priorities

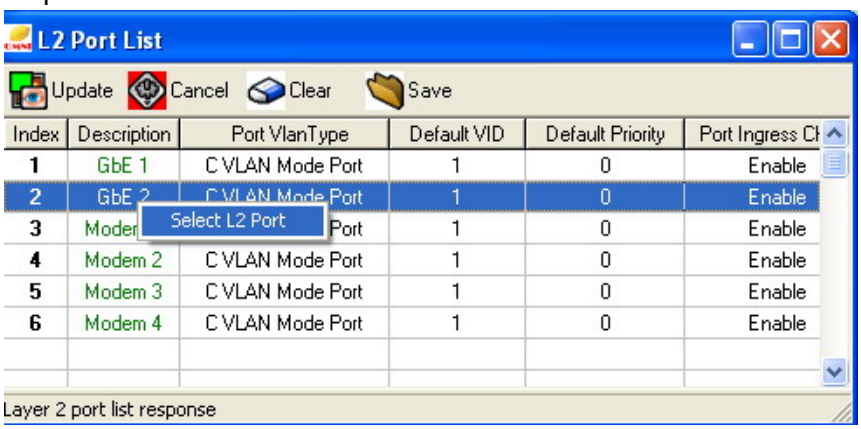
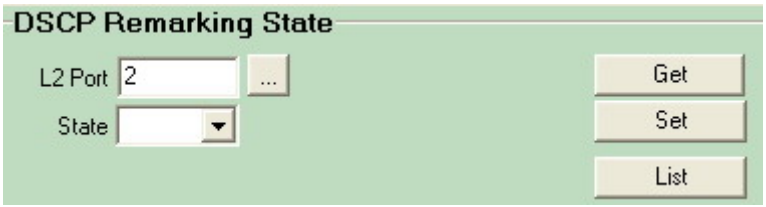
To enable or disable the DSCP priorities of a wireline (GbE) L2 port, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window that appears, select the **DSCP Remark** tab: 

Continued on next page

Setting Ethernet QoS, Continued

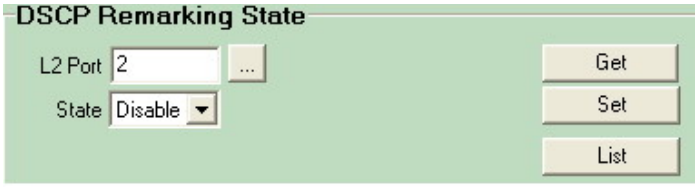
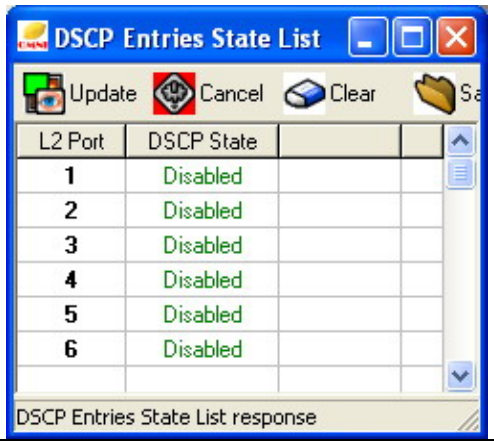
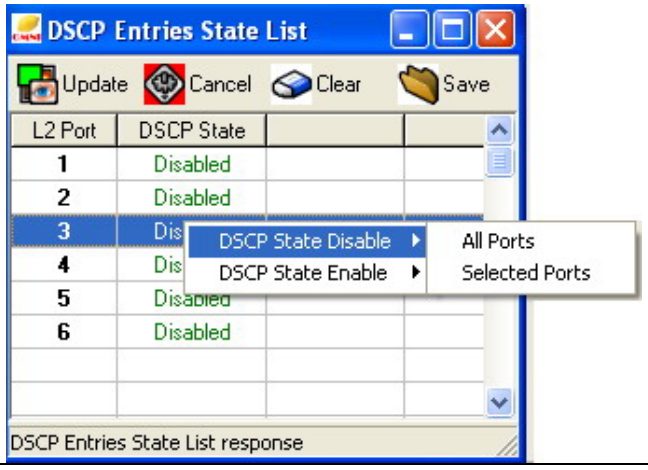
Enabling/ Disabling DSCP priorities (continued)

Step	Action
4	In the **DSCP Remarking State** group box, select the L2 port, whose DSCP priorities you want to enable or disable: • Click the ... button located next to **L2 Port** field. • In the *L2 Port List* window that appears, click the Update button to display the L2 ports of the OmniBAS node. • Select the L2 port you want (e.g. GbE 2), click the right mouse button and from the drop-down menu select the **Select L2 Port** option.  The selected L2 port is displayed in the *DSCP Remarking State* group box. 

Continued on next page

Setting Ethernet QoS, Continued

Enabling/ Disabling DSCP priorities (continued)

Step	Action
5	Click the Get button, to retrieve the current state of the selected L2 port.   In case you want to view the DSCP state of all L2 ports, click the List button and in the *DSCP Entries State List* window that appears, click the Update button.
6	To change the DSCP state of an L2 port, from the **State** drop-down list of the *DSCP Remarking State* group box, select: • *Enable*, to enable the DSCP properties of the selected L2 port. • *Disable*, to disable the DSCP properties of the selected L2 port. Alternatively, you can enable or disable the DSCP state of L2 ports, as follows: in the *DSCP Entries State List* window, select the L2 ports you want, click the right-mouse button and from the drop-down list that appears select to enable/ disable the selected ports or all ports of the list. 

End of procedure.

3.3 Configuring PWE3 TDM Connections

In an OmniBAS node, utilizing PWE3 functionality, TDM traffic is incorporated in Ethernet traffic and it is directed through a GbE interface (wireline port) or through a modem L2 port (wireless port). Therefore, a PWE3 TDM connection is established between an E1 line (provided by the Interface 16E1 module) and the one of the two GbE ports or one of the four wireless ports.

The following step-by-step procedures must be carried out for creating PWE3 TDM connections in an OmniBAS node:

#	Procedure	Page
1	Configuring an E1 Line	71
2	Creating VLANs	49
3	• Creating PWE3 TDM Connections (through GbE Ports)	74
	• Creating PWE3 TDM Connections (through Modem L2 Ports)	81

Configuring an E1 Line

Introduction

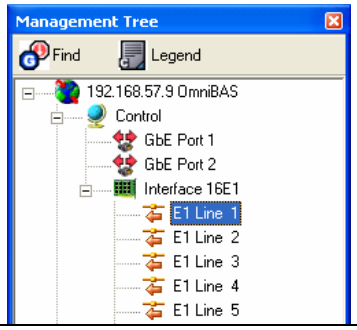
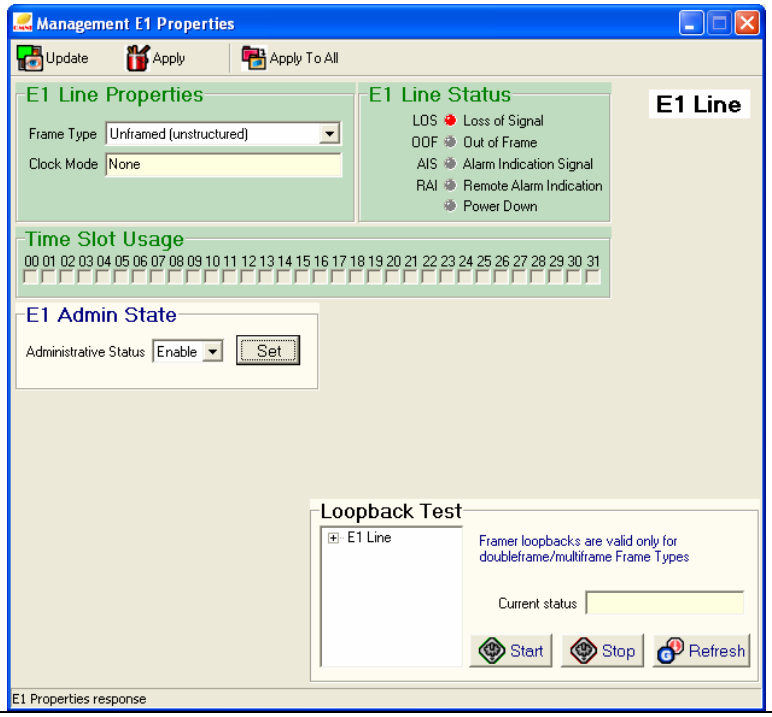
This paragraph describes how to:

- Set the frame type of an E1 line
- Enable/ Disable an E1 line

The configuration of an E1 line is performed through the corresponding *Management E1 Properties* window.

Setting the E1 frame type

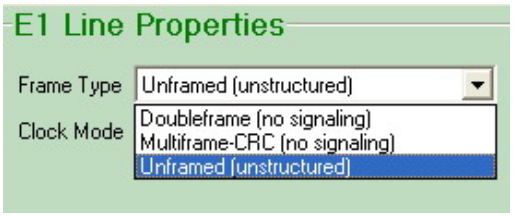
To set the frame type of an E1 line, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Interface 16E1* element and click the E1 line you want (e.g. *E1 Line 1*).
2	In the *Management E1 Properties* window, click the Update button to view the current properties of the selected line. 

Continued on next page

Configuring an E1 Line, Continued

Setting the E1 frame type (continued)

Step	Action
3	In the **E1 Line Properties** group box, click the **Frame Type** drop-down list and select the E1 frame format you want. • *Doubleframe (no signaling):* G.704 structured. Timeslots TS1 to TS31 transfer payload. Frame synchronization is carried over timeslot TS0. No payload signaling is used. • *Multiframe-CRC (no signaling):* G.704 structured. Timeslots TS1 to TS31 transfer payload. Frame synchronization is carried over timeslot TS0. The Si bits of each Frame Alignment Signal (FAS) are used to implement CRC-4 control. No payload signaling is used. • *Unframed (unstructured):* stream of bits at 2048 kbit/s; no channels are associated with any specific group of bits. 
4	In the *Management E1 Properties* window, click the Apply button to apply the new setting to the selected E1 Line. NOTE If you want to apply the new setting to all E1 Lines that are not associated with a connection, click the Apply To All button (instead of the Apply button).

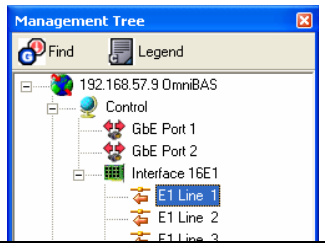
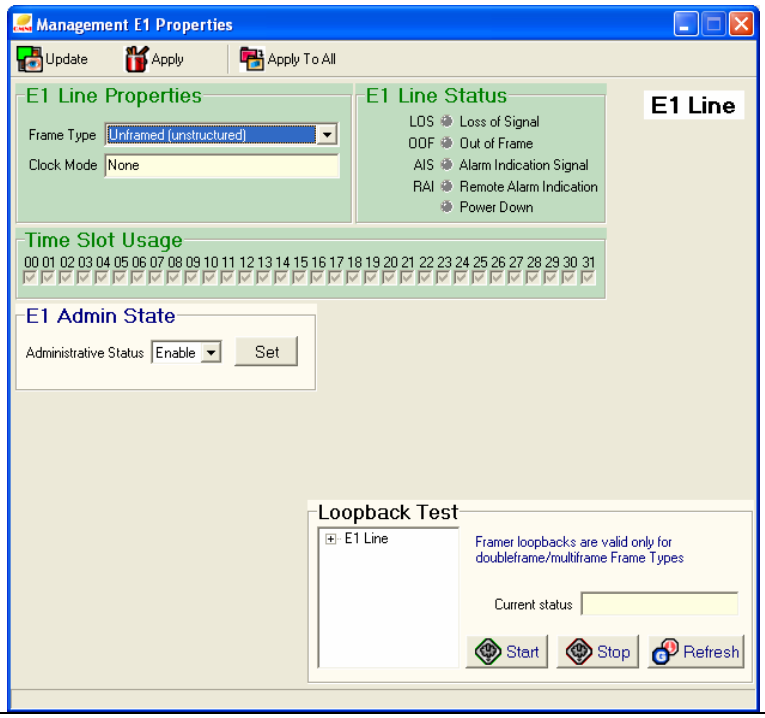
End of procedure.

Continued on next page

Configuring an E1 Line, Continued

Enabling/ disabling an E1 line

To enable/ disable an E1 line, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Interface 16E1* element and click the E1 line you want (e.g. *E1 Line 1*).
2	In the *Management E1 Properties* window, click the  button to view the current properties of the selected line. 
3	From the **Administrative Status** drop-down list of the **E1 Admin State** group box, select: • *Enable*, to enable the selected E1 line • *Disable*, to disable the selected E1 line 
4	Click the  button to apply the new setting to the selected E1 line.

End of procedure.

Creating PWE3 TDM Connections (through GbE Ports)

Introduction

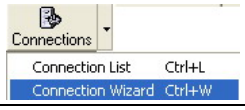
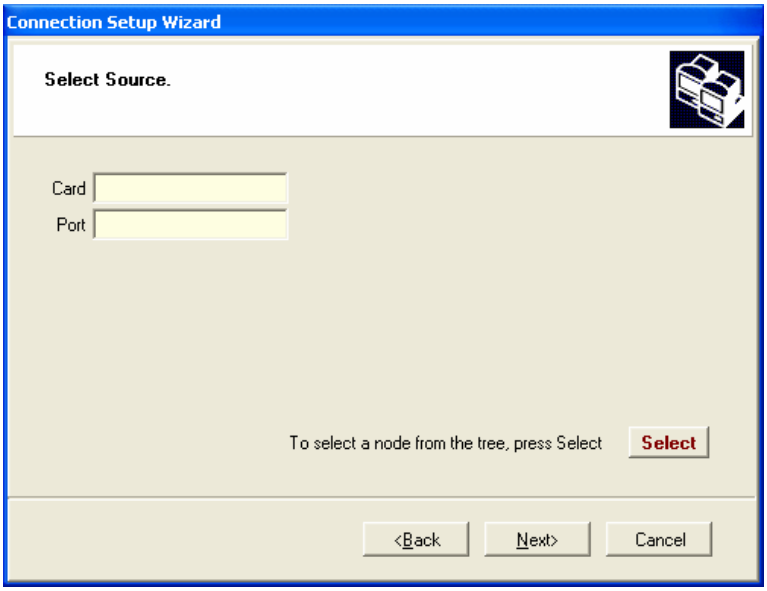
This paragraph describes how to create PWE3 TDM connections through the GbE ports in an OmniBAS node.

OmniLCT application provides a *Connection Setup Wizard* for the quick and easy creation of the OmniBAS connections.

Note that in a PWE3 TDM connection, all 32 timeslots of the selected E1 line are used.

Procedure

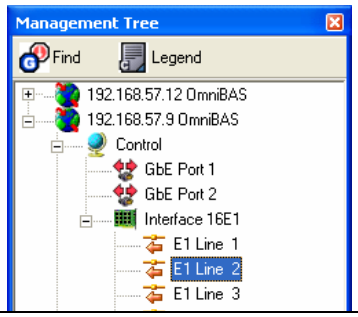
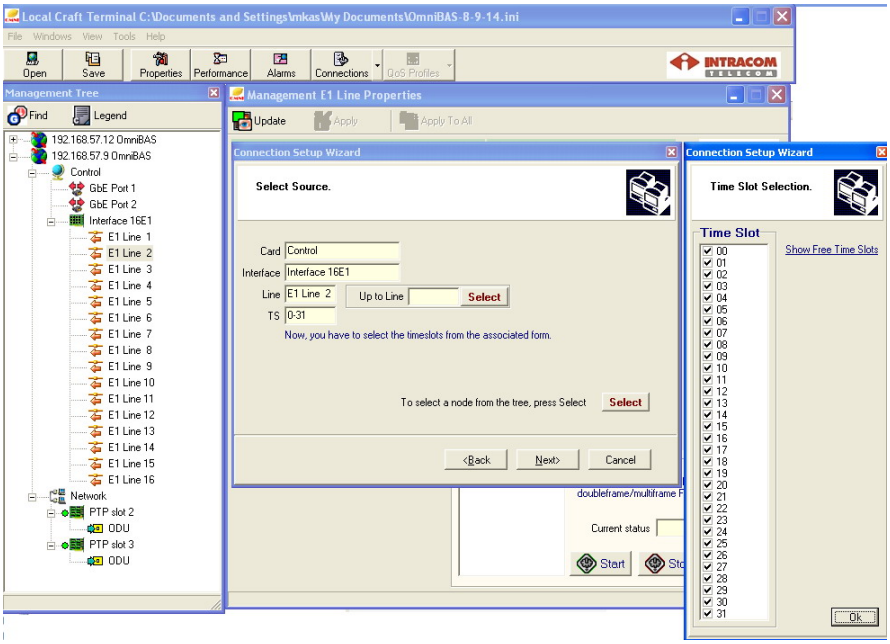
To create PWE3 TDM connections through the GbE ports, proceed as follows:

Step	Action
1	On the *Main Menu*, select **Tools** > **Connection Wizard** (or click  , on the *Toolbar*).
2	In the first Wizard screen that appears, click the **Next** button. The *Select Source* screen appears: 

Continued on next page

Creating PWE3 TDM Connections (through GbE Ports), Continued

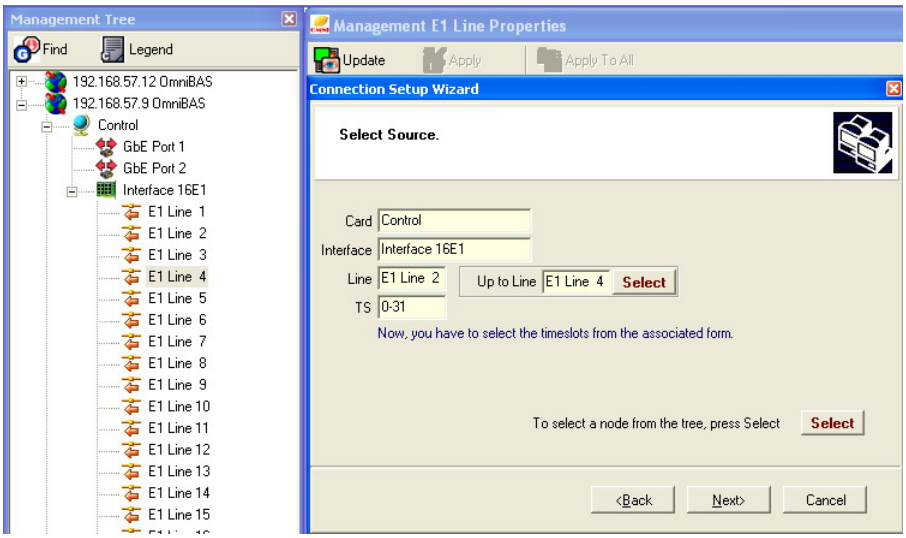
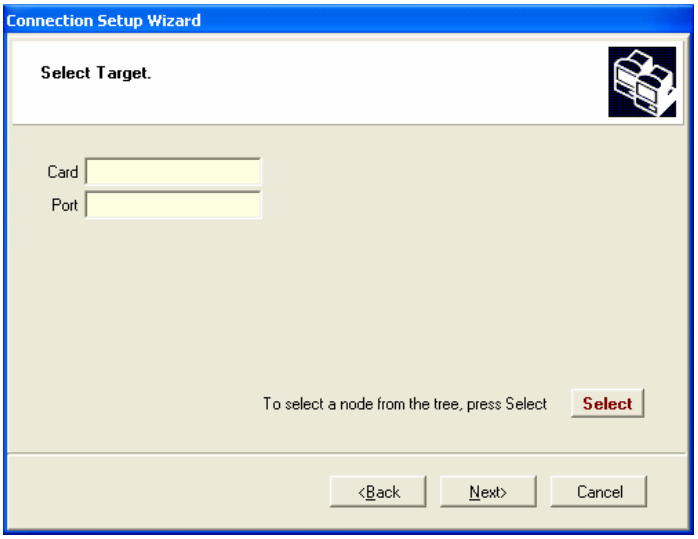
Procedure (continued)

Step	Action
3	Click the Select button. The mouse pointer will change to a hand (☝). Use this hand (☝) and select the source point of the connection to be created in the *Management Tree*.  This point is one of the available E1 lines (e.g. E1 Line 2) of the selected Interface 16E1 element.
4	When you select the source point in the *Management Tree* (e.g. E1 Line 2), the source data are automatically entered in the corresponding fields (**Card**, **Interface**, **Line** and **TS**) of the wizard and the *Time Slot Selection* window appears.  **NOTE** All 32 timeslots of the selected E1 line must be selected in a PWE3 TDM connection. As a result, when you select the source point in the *Management Tree* (e.g. E1 Line 2), the **TS** (timeslots) field automatically takes the value *0-31* and also the *Time Slot Selection* window appears with all timeslots selected.

Continued on next page

Creating PWE3 TDM Connections (through GbE Ports), Continued

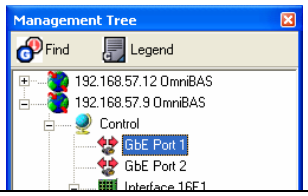
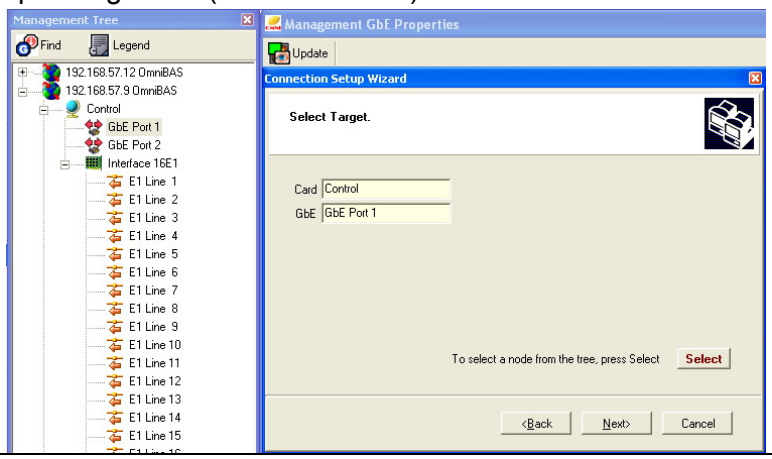
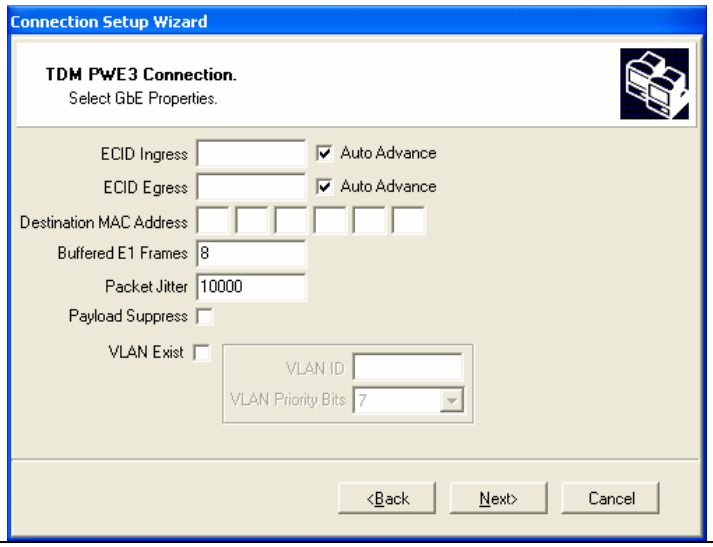
Procedure (continued)

Step	Action
5	If you want to connect more that one contiguous E1 Lines with a specific GbE port, click the **Select** button located next to **Up to Line** field. The mouse pointer will change to a hand ( ). In the *Management Tree*, use this hand ( ) to select the last E1 Line. For instance, by selecting the E1 Line 2 as the first source point and the E1 Line 4 as the last, the E1 Line 2, E1 Line 3 and E1 Line 4 are selected as source points. 
6	After completing the source data selection, click the **Next** button. The *Select Target* screen appears: 

Continued on next page

Creating PWE3 TDM Connections (through GbE Ports), Continued

Procedure (continued)

Step	Action
7	Click the Select button. The mouse pointer will change to a hand (☝). Use this hand (☝) and select the target point of the connection(s) to be created in the *Management Tree*.  This point is one of the two GbE ports (e.g. GbE Port 1).
8	When you select the target point in the *Management Tree* (e.g. GbE Port 1), the target data are automatically entered in the corresponding fields (**Card** and **GbE**) of the wizard. 
9	After completing the target data selection, click the **Next** button. The *TDM PWE3 Connection* screen appears to define the attributes of the TDM PWE3 connection(s) to be created. 

Continued on next page

Creating PWE3 TDM Connections (through GbE Ports), Continued

Procedure (continued)

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>10</td><td>Consult the following table to define the parameters of the connection(s):
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>ECID Ingress</td><td>Ingress Emulated Circuit Identifier for the GbE side of the PWE3 TDM connection. (Value range: 1 to 65535)(1)</td></tr>
<tr><td>ECID Egress</td><td>Egress Emulated Circuit Identifier for the GbE side of the PWE3 TDM connection. (Value range: 1 to 65535)(1)</td></tr>
<tr><td>Destination MAC Address</td><td>In the Destination MAC Address text box, enter the MAC address of the tributary module on which the created PWE3 TDM connection terminates.</td></tr>
<tr><td>Buffered E1 Frames</td><td>This parameter is used to calculate the PSN packet size(2). By default, the value is 8.
(Value Range: 1 to 255).</td></tr>
<tr><td>Packet Jitter</td><td>Refers to the latency of the packets. By default, the value is 10000. (Value range: 250 µsec to 30000 µsec).</td></tr>
<tr><td>Payload Suppress</td><td>Select the Payload Suppress check box to stop transmitting packets when E1 has nothing to send (all zeros).</td></tr>
<tr><td>VLAN Exist</td><td>Select the VLAN Exist check box in case you want to associate a VLAN to the GbE port.</td></tr>
<tr><td>VLAN ID</td><td>Enter the VLAN ID. (To view the VLANs list, see par. VLAN List, on page 138).</td></tr>
<tr><td>VLAN Priority Bits</td><td>From the VLAN Priority Bits drop down list, select the 802.1p priority bit. It takes values from 0 to 7
(7 is the highest priority, 0 is the lowest priority).</td></tr>
</table></td></tr>
</table>

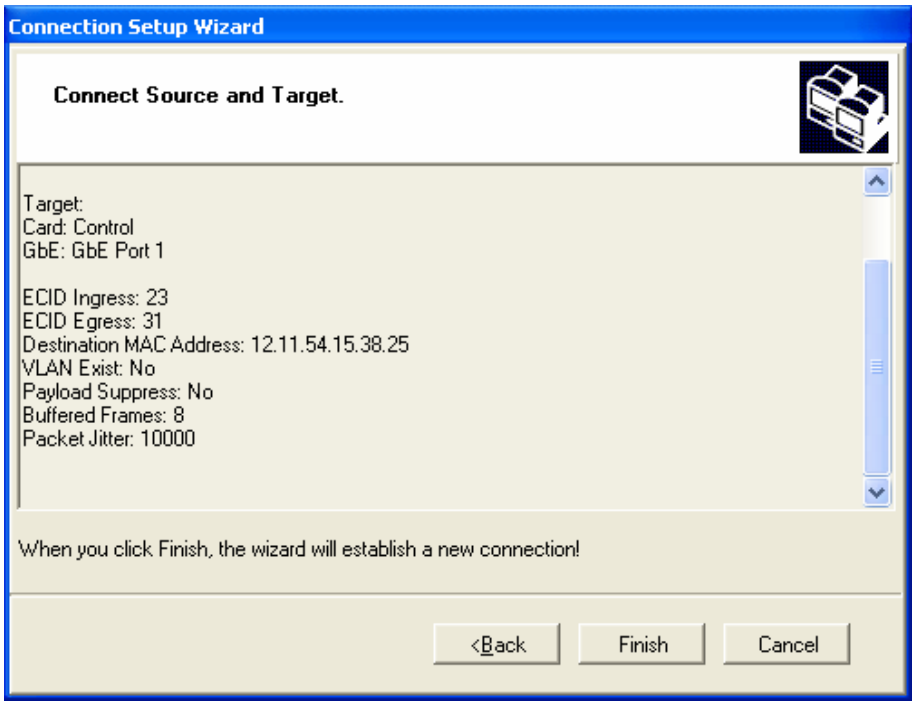
Continued on next page

(1) When you create more than one connection, select also the **Auto Advance** check box. When this check box is selected the value entered in the ECID Ingress/ Egress field is increased in steps of 1 for generating ECID Ingress/ Egress values for all connections that are going to be created.

(2) PSN: Packet Switched Network,
PSN packet size = (Buffered E1 frames) x (nSlots), where nSlots = 32 in unstructured mode.

Creating PWE3 TDM Connections (through GbE Ports), Continued

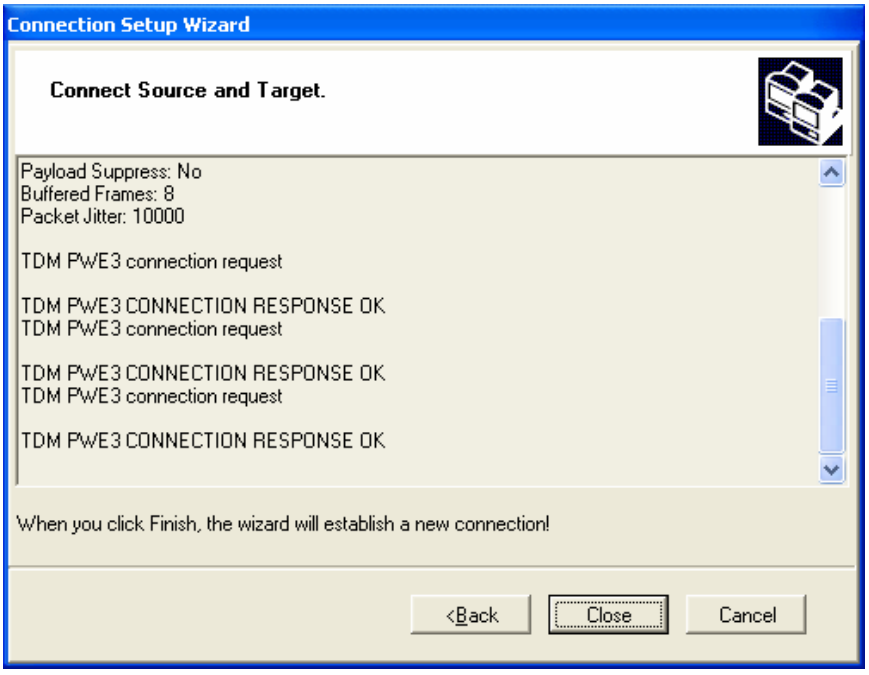
Procedure (continued)

Step	Action
11	When you complete, click the **Next** button. The *Connect Source and Target* screen appears:  Click the **Finish** button to establish the new TDM PWE3 connection(s).

Continued on next page

Creating PWE3 TDM Connections (through GbE Ports), Continued

Procedure (continued)

Step	Action
12	When the connections are established successfully, the “TDM PWE3 CONNECTION RESPONSE OK” messages appear (a message for each connection request). Click the **Close** button to close the wizard.  In case of failure, the “TDM PWE3 CONNECTION RESPONSE WITH ERROR!” message appears. Use the **Back** button to check again the connection settings and try again. **NOTE** To view the *Connections List* window that display all created connections of the OmniBAS node, see par. Connections List, on page 134.

End of procedure.

Creating PWE3 TDM Connections (through Modem L2 Ports)

Introduction

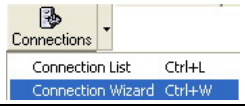
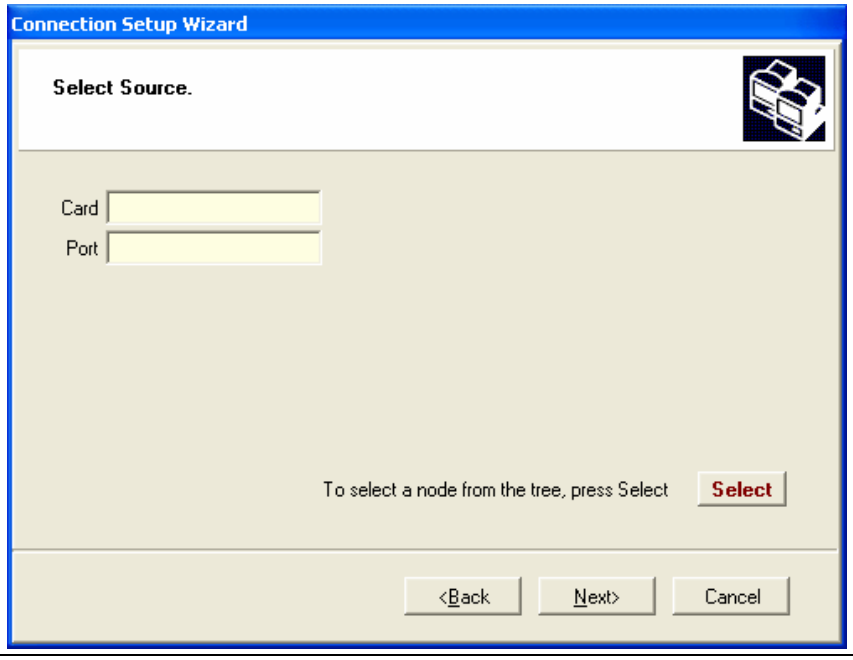
This paragraph describes how to create PWE3 TDM connections through the modem L2 (wireless) ports in an OmniBAS node.

OmniLCT application provides a *Connection Setup Wizard* for the quick and easy creation of the OmniBAS connections.

Note that in a PWE3 TDM connection, all 32 timeslots of the selected E1 line are used.

Procedure

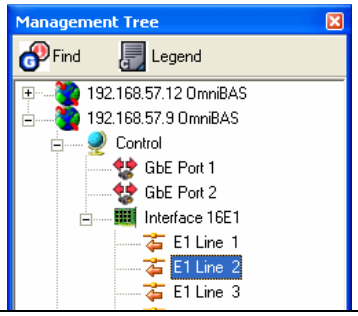
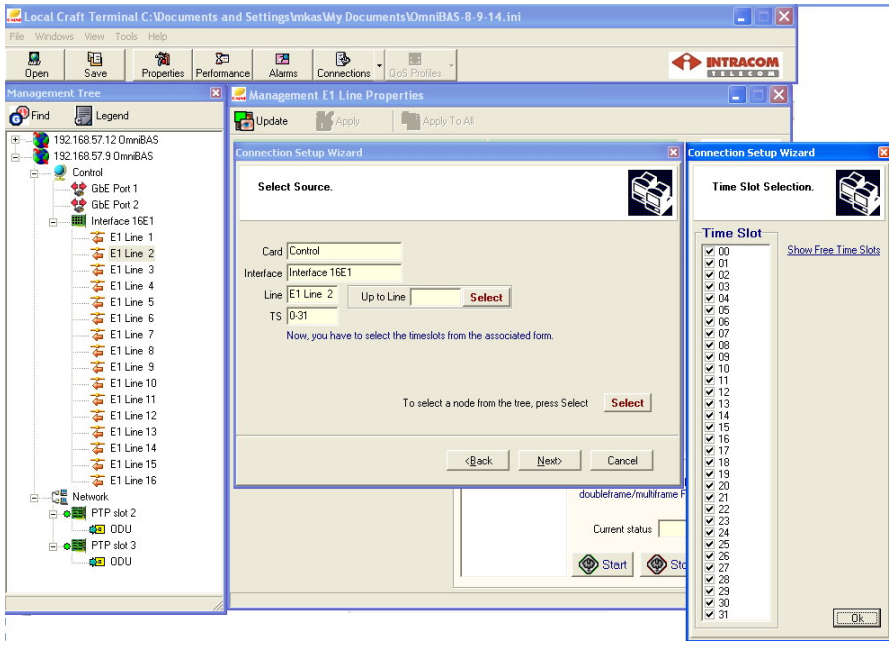
To create PWE3 TDM connections through the wireless ports, proceed as follows:

Step	Action
1	On the *Main Menu*, select **Tools** > **Connection Wizard** (or click  , on the *Toolbar*).
2	In the first Wizard screen that appears, click the **Next** button. The *Select Source* screen appears: 

Continued on next page

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

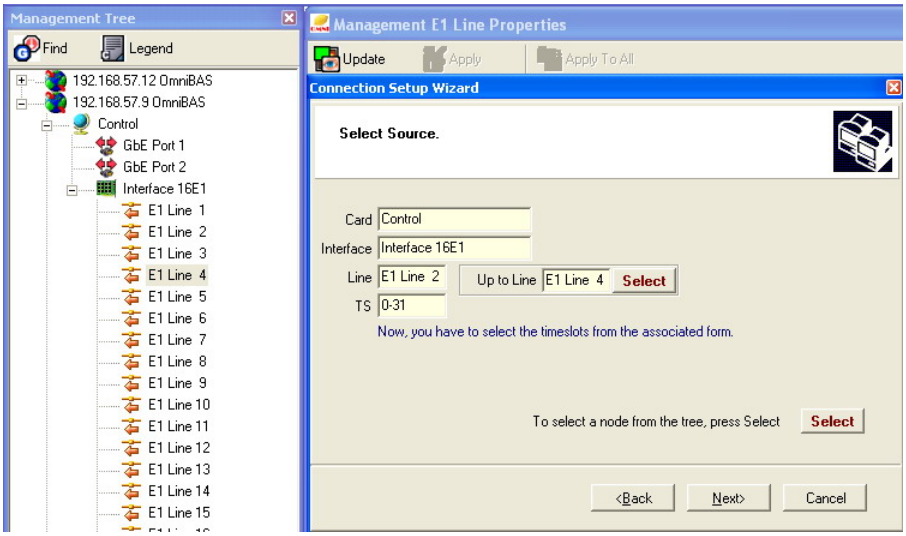
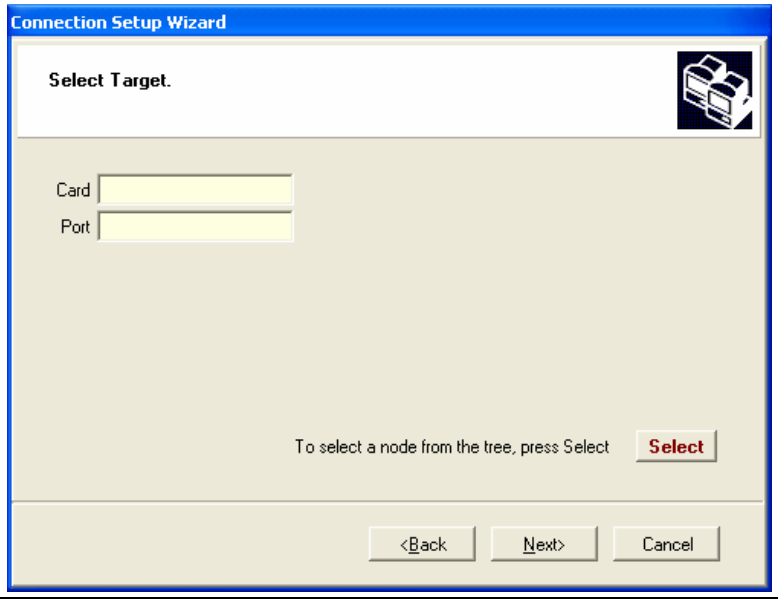
Procedure (continued)

Step	Action
3	Click the Select button. The mouse pointer will change to a hand (☝). Use this hand (☝) and select the source point of the connection to be created in the *Management Tree*.  This point is one of the available E1 lines (e.g. E1 Line 2) of the selected Interface 16E1 element.
4	When you select the source point in the *Management Tree* (e.g. E1 Line 2), the source data are automatically entered in the corresponding fields (**Card**, **Interface**, **Line** and **TS**) of the wizard and the *Time Slot Selection* window appears.  **NOTE** All 32 timeslots of the selected E1 line must be selected in a PWE3 TDM connection. As a result, when you select the source point in the *Management Tree* (e.g. E1 Line 2), the **TS** (timeslots) field automatically takes the value *0-31* and also the *Time Slot Selection* window appears with all timeslots selected.

Continued on next page

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

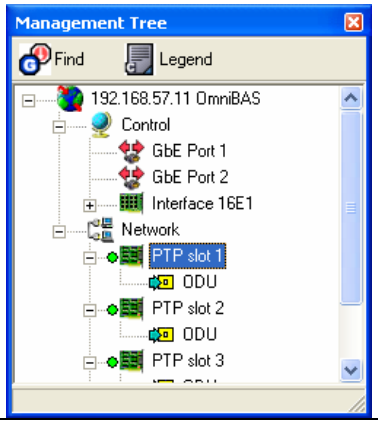
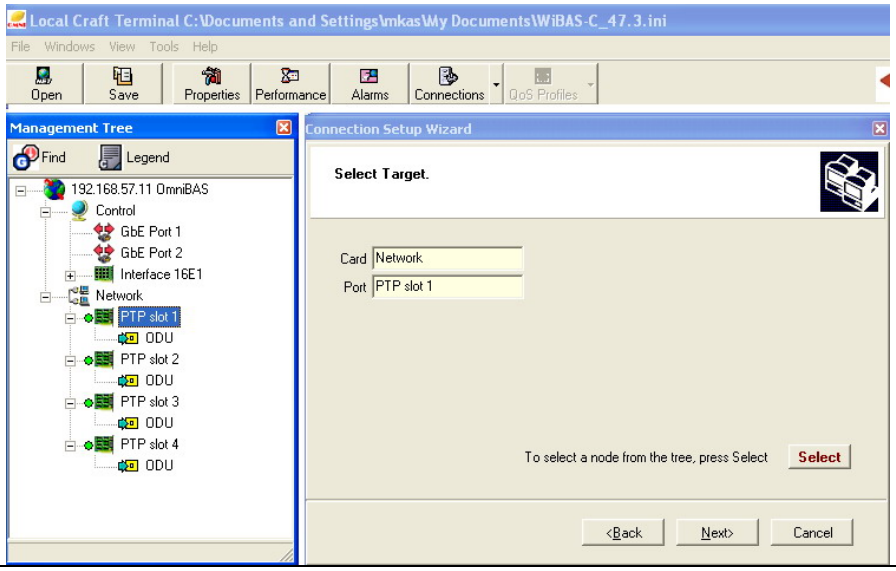
Procedure (continued)

Step	Action
5	If you want to connect more that one contiguous E1 Lines with a specific GbE port, click the **Select** button located next to **Up to Line** field. The mouse pointer will change to a hand (). In the *Management Tree*, use this hand () to select the last E1 Line. For instance, by selecting the E1 Line 2 as the first source point and the E1 Line 4 as the last, the E1 Line 2, E1 Line 3 and E1 Line 4 are selected as source points. 
6	After completing the source data selection, click the **Next** button. The *Select Target* screen appears: 

Continued on next page

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

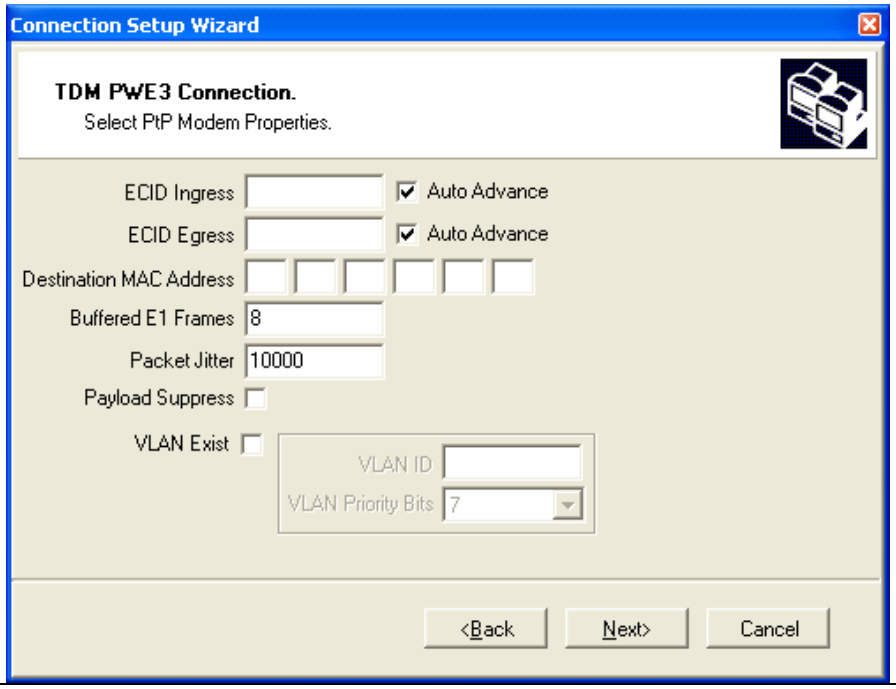
Procedure (continued)

Step	Action
7	Click the Select button. The mouse pointer will change to a hand (). Use this hand () and select the target point of the connection(s) to be created in the *Management Tree*.  This point is one of the four wireless ports (e.g. PtP slot 1 corresponding to modem located in slot 1).
8	When you select the target point in the *Management Tree* (e.g. PtP slot 1), the target data are automatically entered in the corresponding fields (**Card** and **Port**) of the wizard. 

Continued on next page

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

Procedure (continued)

Step	Action
9	After completing the target data selection, click the **Next** button. The *TDM PWE3 Connection* screen appears to define the attributes of the TDM PWE3 connection(s) to be created. 

Continued on next page

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

Procedure (continued)

Step	Action
10	Consult the following table to define the parameters of the connection(s):

Parameter	Description
ECID Ingress	Ingress Emulated Circuit Identifier for the wireless ports side of the PWE3 TDM connection. (Value range: 1 to 65535)(1)
ECID Egress	Egress Emulated Circuit Identifier for the wireless ports of the PWE3 TDM connection. (Value range: 1 to 65535)(1)
Destination MAC Address	In the **Destination MAC Address** text box, enter the MAC address of the tributary module on which the created PWE3 TDM connection terminates.
Buffered E1 Frames	This parameter is used to calculate the PSN packet size(2). By default, the value is 8. (Value Range: 1 to 255).
Packet Jitter	Refers to the latency of the packets. By default, the value is 10000. (Value range: 250 µsec to 30000 µsec).
Payload Suppress	Select the **Payload Suppress** check box to stop transmitting packets when E1 has nothing to send (all zeros).
VLAN Exist	Select the **VLAN Exist** check box in case you want to associate a VLAN to the GbE port.
VLAN ID	Enter the VLAN ID. (To view the VLANs list, see par. VLAN List, on page 138).
VLAN Priority Bits	From the **VLAN Priority Bits** drop down list, select the 802.1p priority bit. It takes values from 0 to 7 (7 is the highest priority, 0 is the lowest priority).

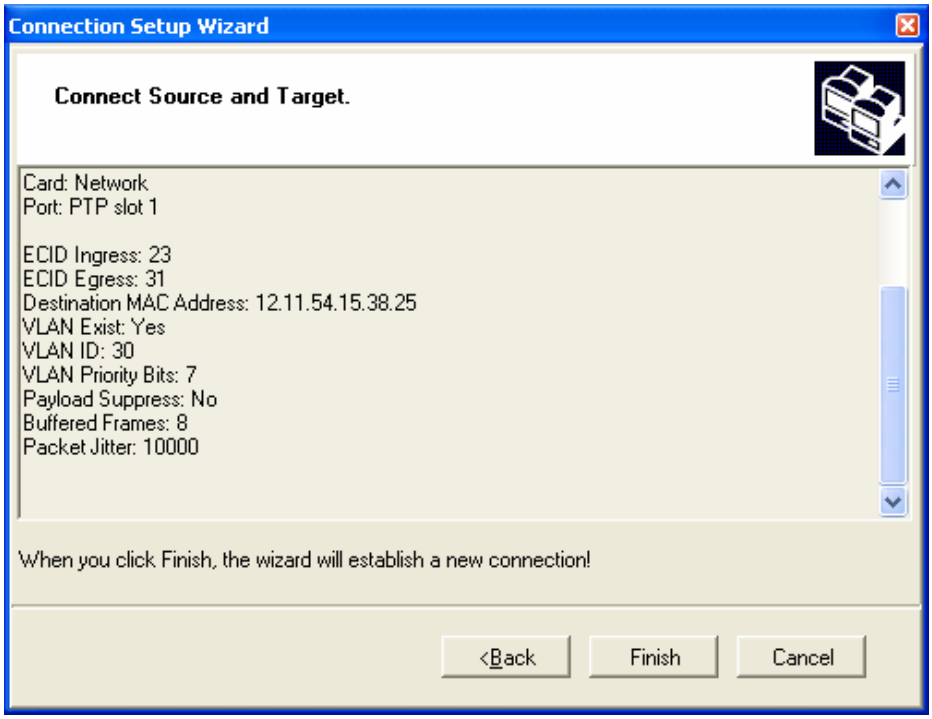
Continued on next page

(1) When you create more than one connection, select also the **Auto Advance** check box. When this check box is selected the value entered in the ECID Ingress/ Egress field is increased in steps of 1 for generating ECID Ingress/ Egress values for all connections that are going to be created.

(2) PSN packet size = (Buffered E1 frames) x (nSlots), where nSlots = 32 in unstructured mode.

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

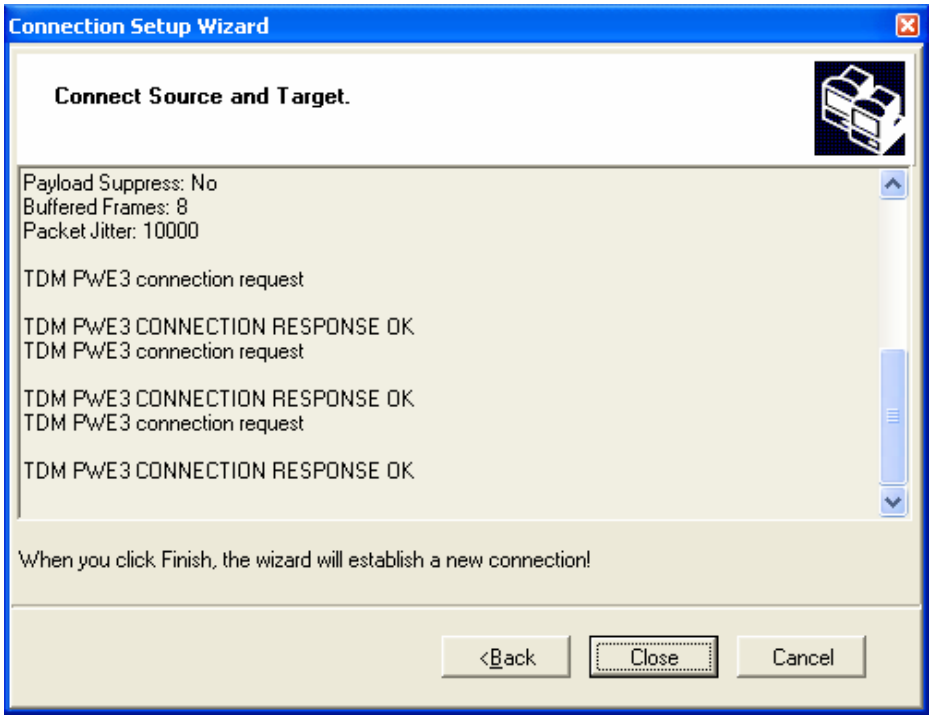
Procedure (continued)

Step	Action
11	When you complete, click the **Next** button. The *Connect Source and Target* screen appears:  Click the **Finish** button to establish the new TDM PWE3 connection(s).

Continued on next page

Creating PWE3 TDM Connections (through Modem L2 Ports), Continued

Procedure (continued)

Step	Action
12	When the connections are established successfully, the “TDM PWE3 CONNECTION RESPONSE OK” messages appear (a message for each connection request). Click the **Close** button to close the wizard.  In case of failure, the “TDM PWE3 CONNECTION RESPONSE WITH ERROR!” message appears. Use the **Back** button to check again the connection settings and try again **NOTE** To view the *Connections List* window that display all created connections of the OmniBAS node, see par. Connections List, on page 134.

End of procedure.

3.4 Setting Static MAC Addresses

Introduction

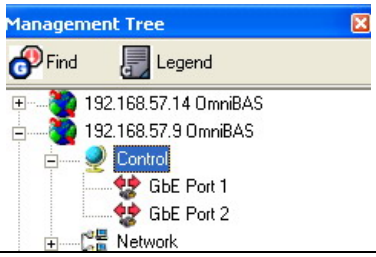
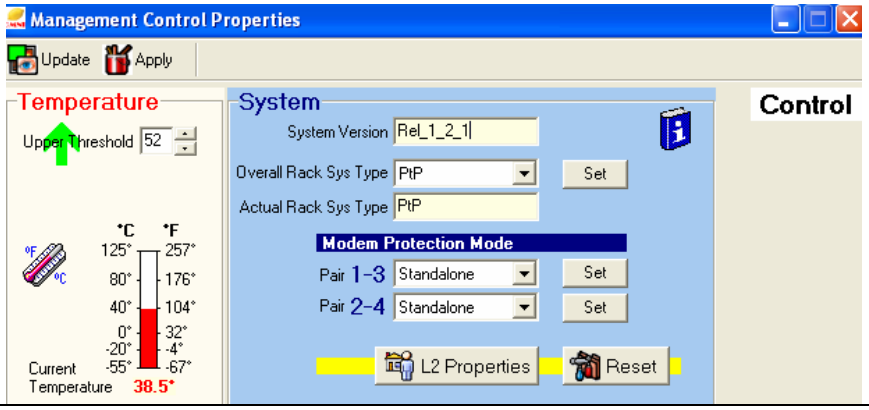
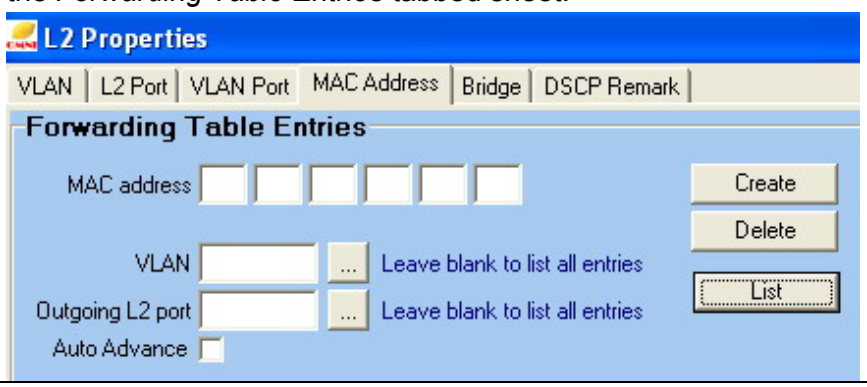
This paragraph describes how to:

- View the static MAC addresses of an OmniBAS node
- Create static MAC addresses in an OmniBAS node
- Delete static MAC addresses of an OmniBAS node

Forwarding process feature ensures that only specific MAC addresses can access an L2 port (and traffic from any other MAC addresses will be discarded).

Viewing static MAC addresses list

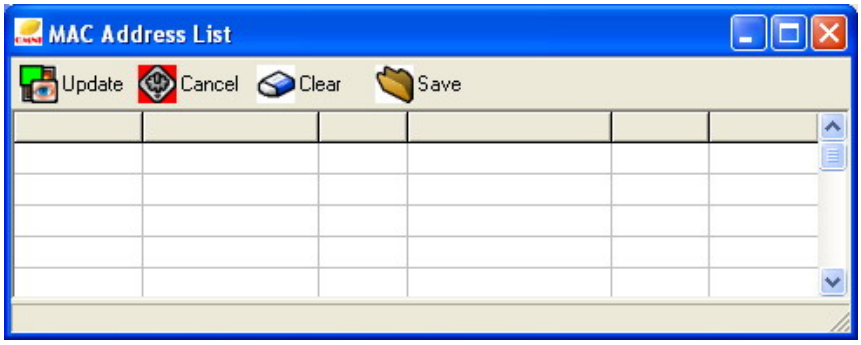
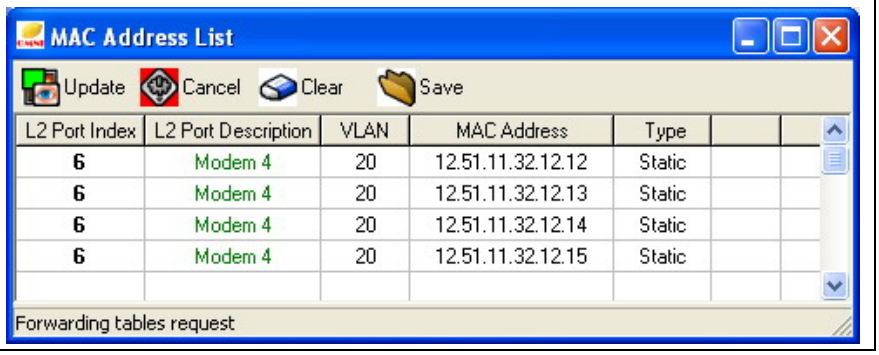
To view the static MAC address list of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window, click the **MAC Address** tab to display the *Forwarding Table Entries* tabbed sheet. 

Continued on next page

Setting Static MAC Addresses, Continued

Viewing static MAC addresses list (continued)

Step	Action
4	In the *Forwarding Table Entries* tabbed sheet, click the List button to display the *MAC Address List* window. 
5	Click the Update button to display the list of all static MAC addresses of the OmniBAS node. Each row of the list indicates the L2 port to which a received frame with specific VLAN ID and destination MAC address is forwarded. When no entries are found for a received frame, the frame is sent to all L2 ports. 

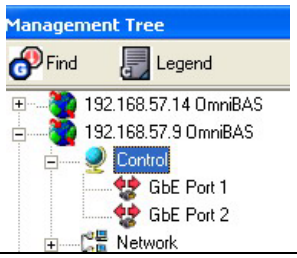
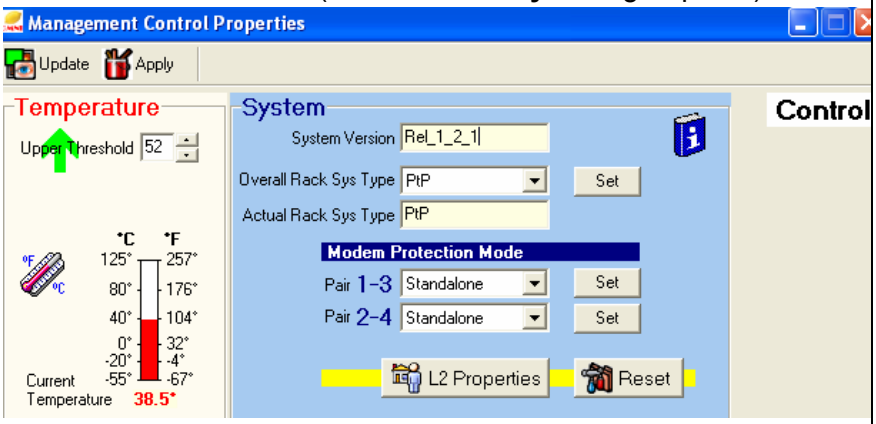
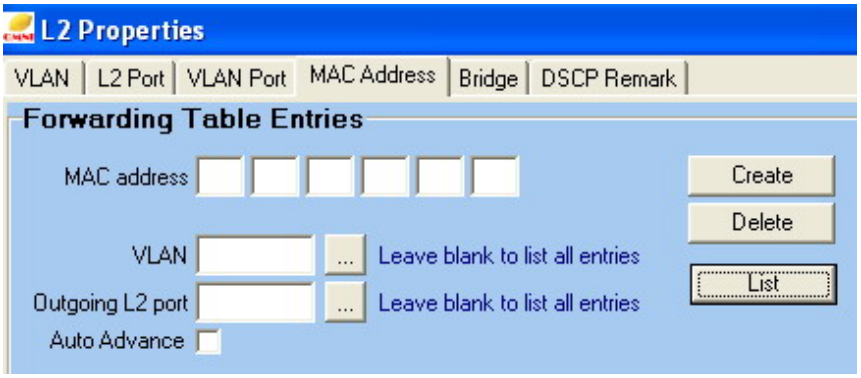
End of procedure.

Continued on next page

Setting Static MAC Addresses, Continued

Creating a static MAC address

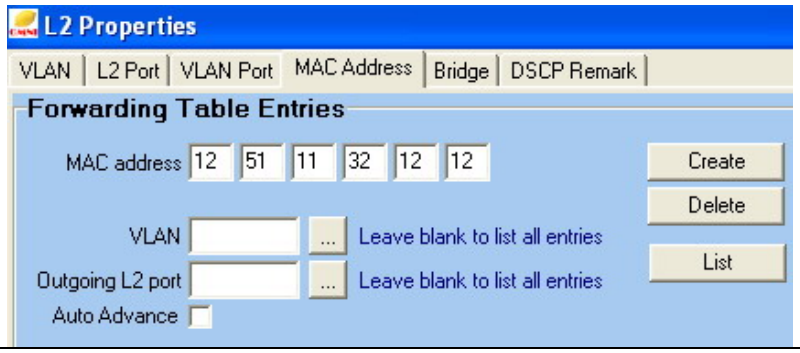
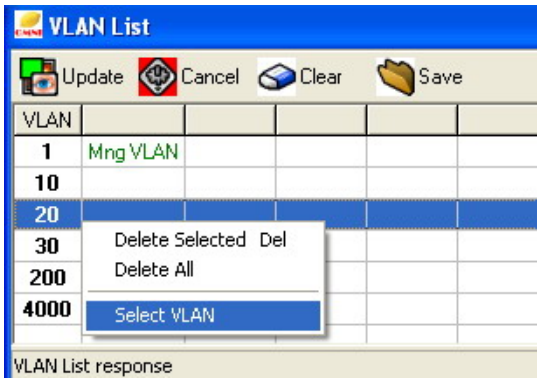
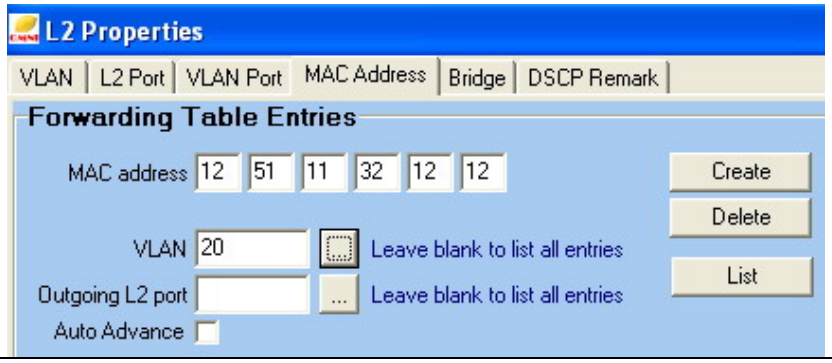
To create a static MAC address, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window, click the **MAC Address** tab to display the *Forwarding Table Entries* tabbed sheet. 

Continued on next page

Setting Static MAC Addresses, Continued

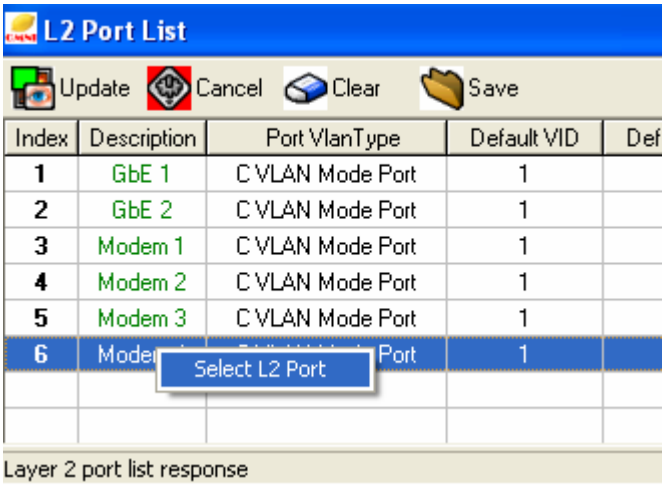
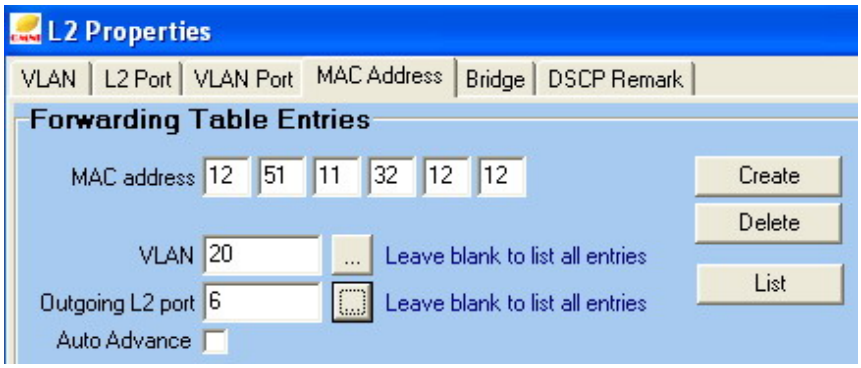
Creating a static MAC address (continued)

Step	Action
4	In the **MAC address** text box, enter the destination MAC address. 
5	Carry out the following instructions to select the VLAN you want to associate with this MAC address: • Click the ... button located next to **VLAN** field. • In the *VLAN List* window that appears, click the Update button to display all created VLANs. • Select the VLAN you want (e.g. VLAN 10), click the right mouse button and from the drop-down menu select the **Select VLAN** option.  The ID of the selected VLAN is displayed in the *Forwarding Table Entries* tabbed sheet. 

Continued on next page

Setting Static MAC Addresses, Continued

Creating a static MAC address (continued)

Step	Action
6	Select the outgoing L2 port, as follows: • Click the ... button located next to **Outgoing L2 Port** field. • In the *L2 Port List* window that appears, click the Update button to display the L2 ports of the OmniBAS node. • Select the L2 port you want (e.g. Modem 1), click the right mouse button and from the drop-down menu select the **Select L2 Port** option.  The selected L2 port is displayed in the *Forwarding Table Entries* tabbed sheet. 
7	Click the Create button, to create the static MAC address.

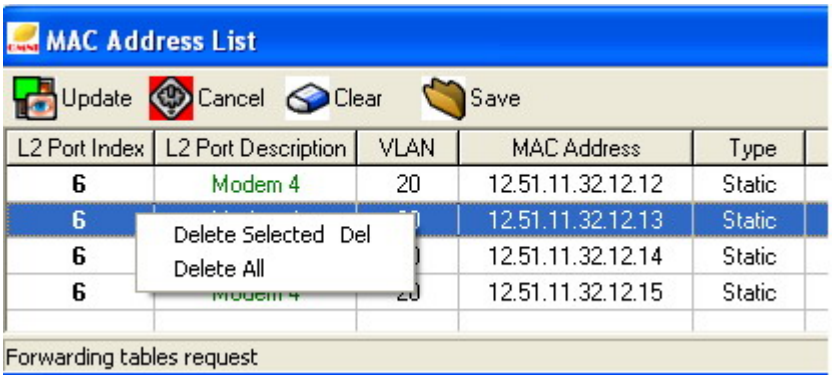
End of procedure.

Continued on next page

Setting Static MAC Addresses, Continued

Removing a static MAC address

To remove static MAC addresses from an OmniBAS node, proceed as follows:

Step	Action
1	Activate the *MAC Address List* window of the OmniBAS node, as described in the previous par. Viewing static MAC addresses list, on page 89.
2	In the *MAC Address List* window, select the static MAC address you want, click the right mouse button and from the drop-down menu that appears, select: • **Delete Selected**, to delete the selected MAC address • **Delete All**, to delete all existing MAC addresses  The selected MAC addresses are removed from the OmniBAS node.

End of procedure.

3.5 Setting/ Monitoring System Synchronization

Introduction

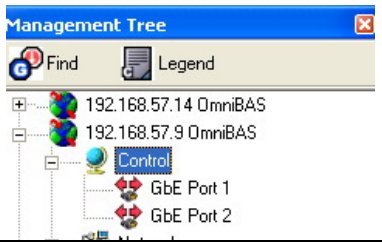
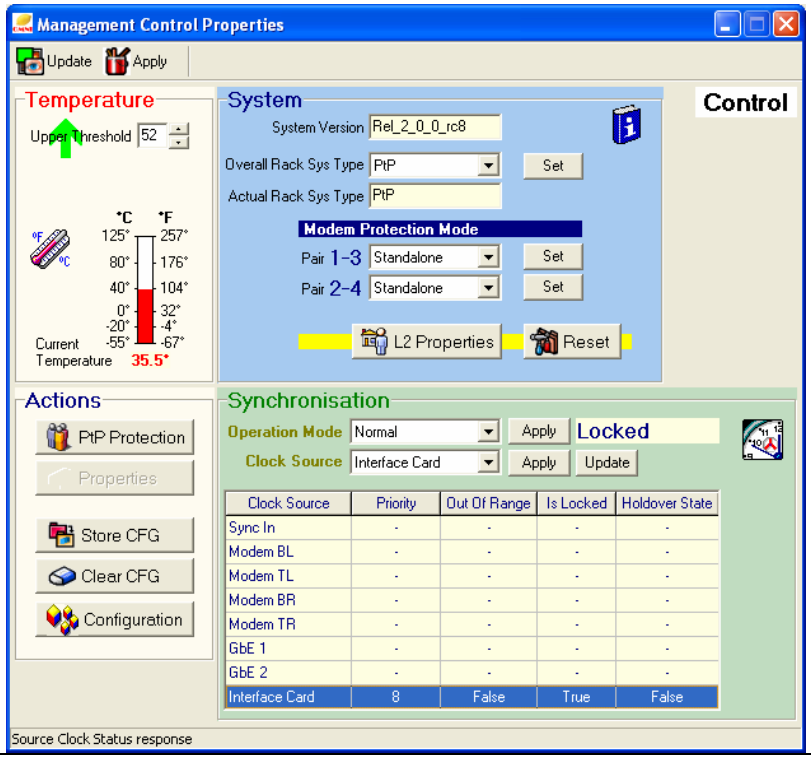
This chapter describes how to set the OmniBAS nodes synchronization providing the following procedures:

- Setting the operation mode of the synchronization (*Normal* or *FreeRun*). The synchronization of the OmniBAS system can be derived through either the local oscillator (*FreeRun* operation mode) or one of the eight available clocks (*Normal* operation mode).
- Defining the clock source (in case of *Normal* operation mode).
- Monitoring the current state of the system synchronization.

Setting the synchronization operation mode

To set the OmniBAS node synchronization, first select the synchronization operation mode (*Normal* or *FreeRun*):

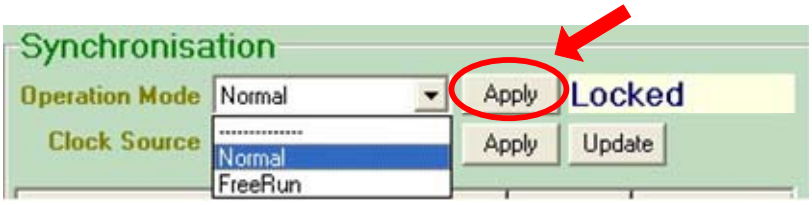
To set the operation mode of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to update the displayed data. 

Continued on next page

Setting/ Monitoring System Synchronization, Continued

Setting the synchronization operation mode (continued)

Step	Action
3	From the **Operation Mode** drop-down list of the **Synchronization** group box, select: • *FreeRun*, the system gets synchronization from the internal oscillator of the processor module. • *Normal*, the system gets clock synchronization from one of the eight available clock sources. NOTE If you select *Normal* operation mode, you must also select the clock source to be used for the synchronization of the system, as described in the following par. Defining the clock source, on page 97 
4	Click the corresponding Apply button to apply the setting. NOTE To verify that the setting is applied, click the Update button, to refresh the displayed data in the **Synchronization** group box.

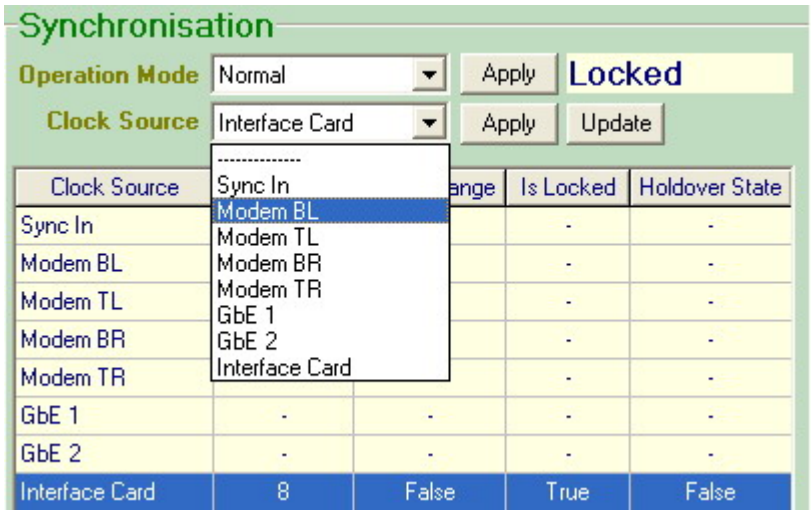
End of procedure.

Continued on next page

Setting/ Monitoring System Synchronization, Continued

Defining the clock source

To select the clock source needed for the system synchronization (in case of *Normal* operation mode) , proceed as follows:

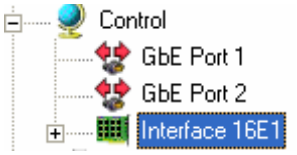
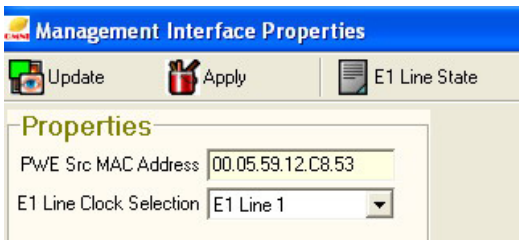
Step	Action
1	From the **Clock Source** drop-down list of the **Synchronization** group box, select the clock source to be used for the system synchronization (e.g. Modem BL).  OmniBAS system provides the following eight clock sources: **Clock Source**[1] / **Timing signal retrieved from:** Sync In — Sync IN port of the processor module Modem BL — Modem located in slot 1 Modem TL — Modem located in slot 2 Modem BR — Modem located in slot 3 Modem TR — Modem located in slot 4 GE 1 — GbE port 1 of the processor module GE 2 — GbE port 2 of the processor module Interface Card — An E1 port of the Interface E1 tributary module
2	If you select the *Interface Card* as clock source proceed to step 3. Otherwise, proceed to step 4.

Continued on next page

(1) To identify the slots position, see par. Modems slot numbering, on page 17.

Setting/ Monitoring System Synchronization, Continued

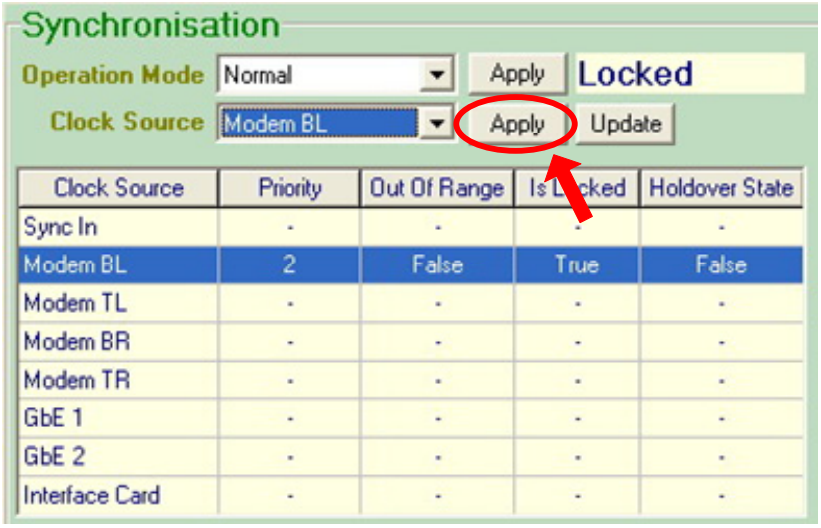
Defining the clock source (continued)

Step	Action
3	When you select the *Interface Card* as clock source, an E1 line must be selected too. To select the E1 line:  • In the *Management Tree*, click the *Interface 16E1* element.  • In the *Management Interface Properties* window that appears, click the Update button • From the **E1 Line Clock Selection** drop-down list, select the E1 Line (e.g. E1 Line 1) to be associated with the clock source. • Click the Apply button, to apply the E1 line's selection. • In the *Management Tree*, select again the *Control* element. The *Management Control Properties* window appears.

Continued on next page

Setting/ Monitoring System Synchronization, Continued

Defining the clock source (continued)

Step	Action
4	In the **Synchronization** group box, click the corresponding Apply button to apply the clock source setting.  The system succeeds to lock in the selected clock source, when *Is Locked* = *True* (i.e. the system has succeeded in finding an acceptable clock source and has locked to it)(1). **NOTE** To verify that the clock source setting is applied, click the Update button, to refresh the displayed data in the **Synchronization** group box.

End of procedure.

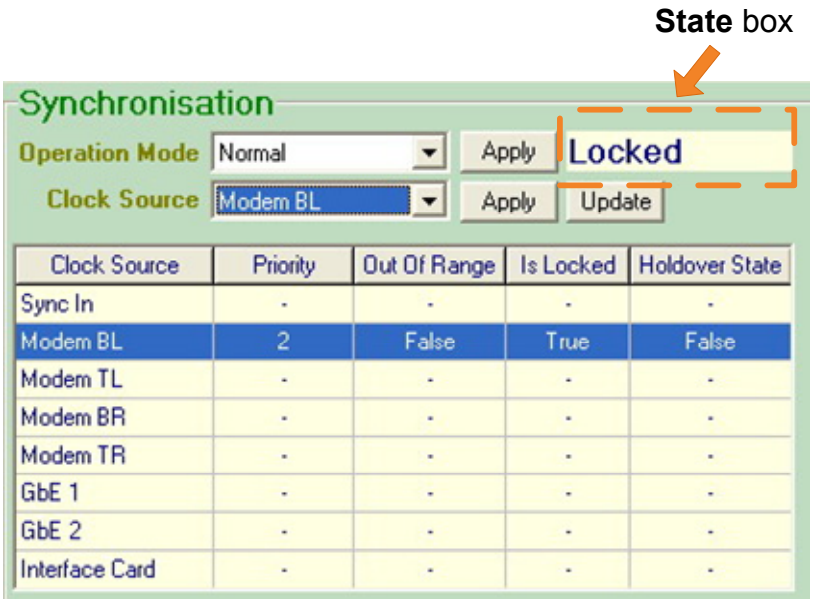
Continued on next page

(1) *Holdover State*: The system loses the clock to which it is locked and fails to find any other available clock.
Out of Range: When clock is out of its nominal frequency by more than ±12 ppm.
Note also that *Priority* is not supported in the current OmniLCT release (1.1.3).

Setting/ Monitoring System Synchronization, Continued

Monitoring the state of system synchronization

Through the *State* box, you can monitor the current status of the system synchronization.



The possible values of the synchronization state are shown in the following table:

State value	Description
Locked	Indicates that the system has succeeded in finding an acceptable clock source and has locked to it.
HoldOver	The system enters *HoldOver* mode as soon as it loses the clock to which it is locked and fails to find any other available clock. Being in *HoldOver* mode, the system tries to simulate the previous clock by making use of an internal memory.
FreeRun	The system enters *FreeRun* mode when there is no available clock source and the internal simulation memory of the system has not been filled up to allow the system work in *HoldOver* mode.

NOTE Do not confuse the “state” of the synchronization with the “operation mode”. For example, even though the *Normal* operation mode is selected, it is possible the *FreeRun* or *HoldOver* (instead of *Locked*) synchronization status to be displayed in the *State* box, due to unavailability of adequate clock sources.

4 Monitoring an OmniBAS Node

This chapter describes how to monitor an entire OmniBAS node on-line, and also how to define basic operational parameters. The monitoring of the OmniBAS node regards:

- Monitoring Fan Trays/ Power Supplies/ External Alarms
- Monitoring the Control
- Monitoring the GbE Ports
- Monitoring the Interface 16E1 Element
- Monitoring the E1 Line
- Monitoring the Modem
- Monitoring the ODU

Monitoring Fan Trays/ Power Supplies/ External Alarms

Introduction

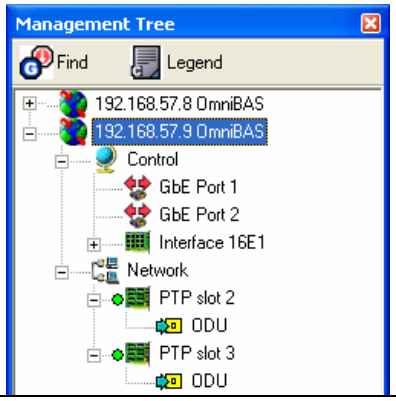
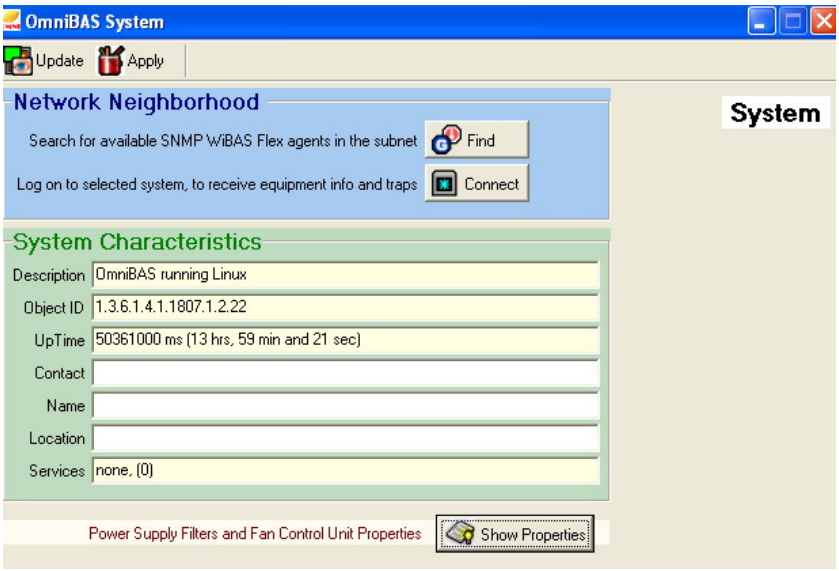
This paragraph describes how to monitor:

- The status of the power and fan modules of the OmniBAS-4W subrack
- The status of the external alarms

The monitoring of the above items is performed through the *Management Fan Tray – PSU Properties* window.

Monitoring procedure

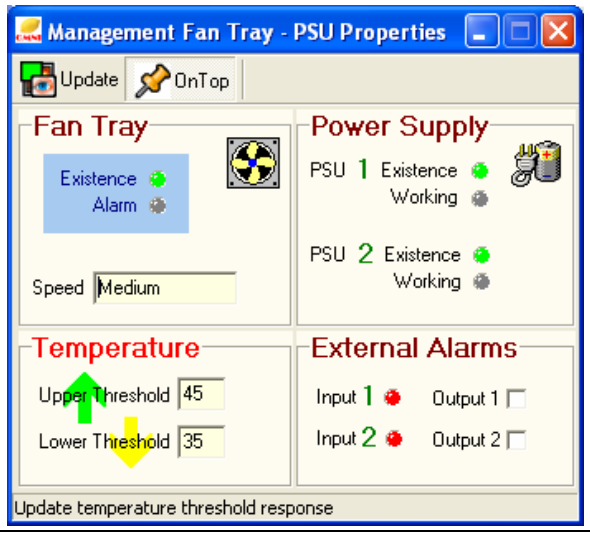
To monitor the power and fan modules and the external alarms of the OmniBAS-4W, proceed as follows:

Step	Action
1	 In the *Management Tree*, click the top element (e.g. 192.168.57.9); this element corresponds to the OmniBAS-4W subrack.
2	In the *OmniBAS System* properties window, click the  button. 

Continued on next page

Monitoring Fan Trays/ Power Supplies/ External Alarms,
Continued

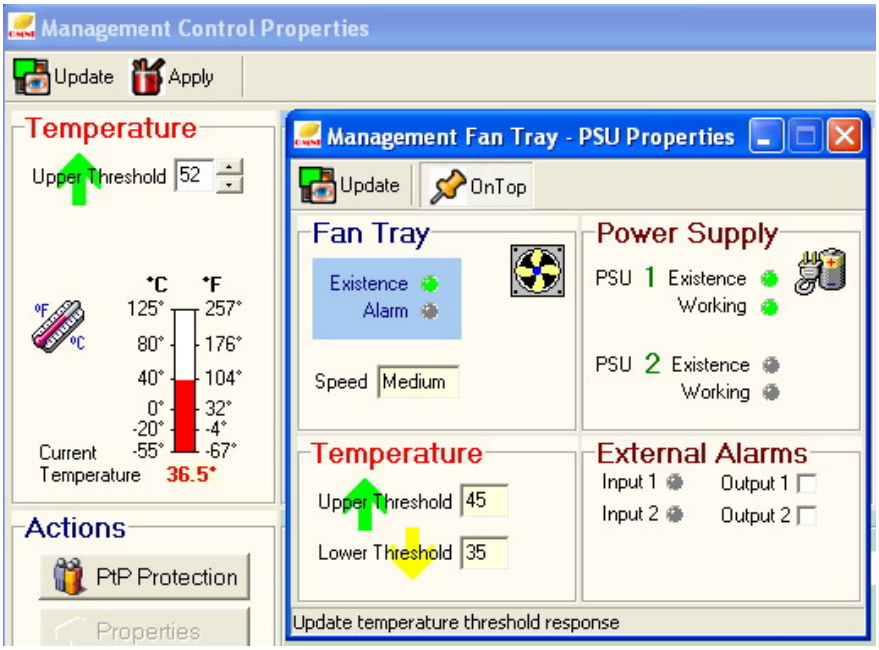
Monitoring procedure (continued)

Step	Action
3	In the *Management Fan Tray – PSU Properties* window that appears, click the Update button to update all displayed fields. 
4	The **Power Supply** group box refers to the power modules of the OmiBAS-4W subrack. The **PSU 1** corresponds to the main power module, while the **PSU 2** to the redundant one. If a power supply module fails, the other takes over all load; if both are OK, the load is shared. For each power module (Main - PSU 1 or Redundant - PSU2), you can check: • Its physical state. When the power module is in place, the corresponding **Existence** “virtual” led is green. Otherwise, it is red. • Its operational status. When the power module operates normally, the corresponding **Working** “virtual” led is green. Otherwise, it is red.
5	In the **Temperature** group box, you can view the upper and lower threshold values that factory predefined for the temperature associated with the fans speed (Low, Medium or High).

Continued on next page

Monitoring Fan Trays/ Power Supplies/ External Alarms,
Continued

Monitoring procedure (continued)

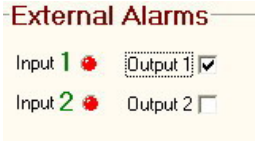
Step	Action
6	The **Fan Tray** group box refers to the fan module of the OmiBAS-4W subrack.  Through this group box, you can check: • The physical state of the fan module. When it is in place, the **Existence** “virtual” led is green. Otherwise, it is red. • The operational status of the fan module. When a problem occurs, the corresponding **Alarm** “virtual” led is red. Normally, the **Alarm** “virtual” led must be grey. • The **Speed** of the fans. The fans operate at: – *Low* speed, when the OmiBAS-4W current temperature (1) is lower than the Temperature **Lower Threshold**. – *Medium* speed, when the OmiBAS-4W current temperature (1) is between the **Lower** and **Upper Thresholds**. – *High* speed, when the OmiBAS-4W current temperature (1) exceeds the Temperature **Upper Threshold**.

Continued on next page

(1) OmiBAS-4W current temperature is displayed in the *Management Control Properties* window (see par.Monitoring the Control Element, on page 106).

Monitoring Fan Trays/ Power Supplies/ External Alarms,
Continued

Monitoring procedure (continued)

Step	Action
7	 The **External Alarms** group box refers to external devices (e.g. fan trays located in the doors of an outdoor cabinet in which the OmniBAS-4W subrack is placed). • You can check the current operating status of the external devices by checking the status of the **Input 1** and **Input 2** "virtual" leds. Normally, the leds must be grey. A red coloured (*ON*) led indicates an alarm condition. • You can activate/ deactivate an external device by selecting/ unselecting the corresponding Output check box (**Output 1**, **Output 2**).

End of procedure.

Monitoring the Control Element

Introduction

This paragraph describes:

- How to set the upper temperature threshold of the OmniBAS-4W subrack's processor module and also how to monitor the temperature inside the module.
- How to check the release of the OmniBAS system
- How to restore the default settings of the OmniBAS system

The monitoring of the *Contro*l element of an OmniBAS node is performed through the *Management Control Properties* window (that appears when you select the *Control* element in the *Management Tree*).

Regarding the *Control* element, you can also perform the actions listed in the following table. For these actions, refer to the corresponding paragraphs (shown in the **Reference** column).

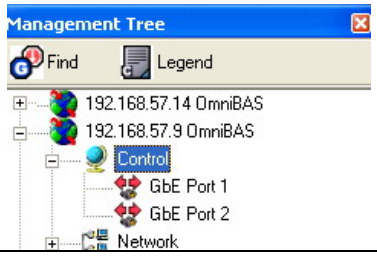
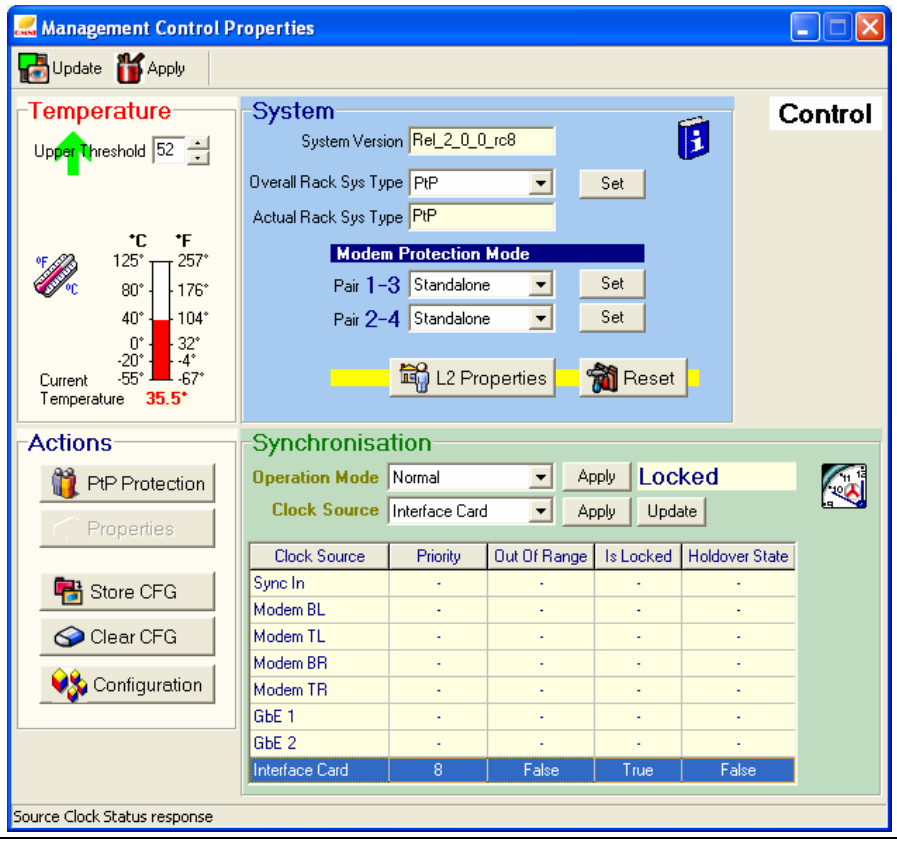
Action	Reference
Monitoring the protection status of the OmniBAS node	Par. Configuring the Protection of an OmniBAS Node (page 26)
Using **L2 Properties** button.	Par. 3.2 Configuring Ethernet Traffic (page 46)
Configuring system synchronization	Par. 3.5 Setting/ Monitoring System Synchronization (page 95)
Resetting the processor module	Par. Resetting Processor Module (page 174)
Performing a Store, Backup or Restore action.	Par. 7.1 Performing Store, Backup or Restore Action (page 164)
Performing a Clear CFG action.	Par. 7.3 Clearing OmniBAS Node Configuration (page 180)

Continued on next page

Monitoring the Control Element, Continued

Monitoring Control element

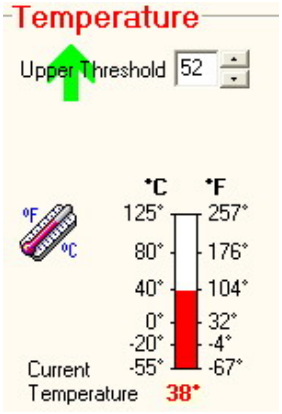
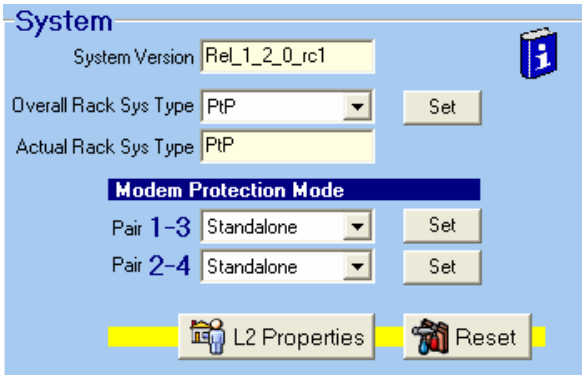
To monitor the current status of the *Control* element of an OmniBAS node, proceed a follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to update the displayed data. 

Continued on next page

Monitoring the Control Element, Continued

Monitoring Control element (continued)

Step	Action
3	In the **Temperature** group box, you can view the current temperature inside the processor module of the OmniBAS-4W subrack (e.g. 38 ºC).  Through the **Temperature** group box of the *Management Control Properties* window, you can also set the upper temperature threshold for the processor module of the OmniBAS-4W subrack. To do this, use the up/ down arrows ( ) of the **Upper Threshold** field to select the upper temperature threshold you want (it does not exceed 60 ºC). Then click the Apply button to apply the new setting.
4	In the **System Version** field of the **System** group box, you can view the current release of the OmniBAS system [1].  Besides, in the **Actual Rack Sys Type** field, the PtP (Point-to-Point) value is displayed.

End of procedure.

[1] In case you need to upgrade the firmware of the OmniBAS system, refer to the *Start Up & Commissioning Manual* of the OmniBAS system.

Monitoring the GbE Ports

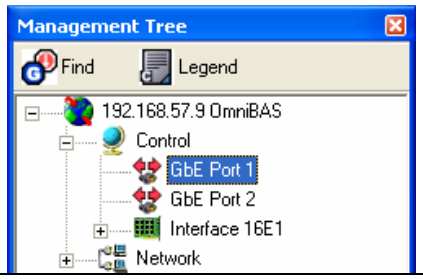
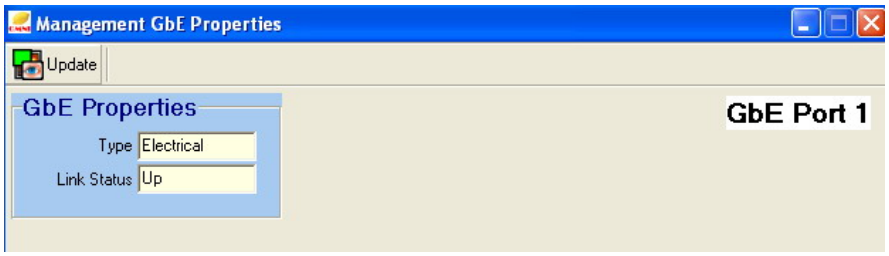
Introduction

This paragraph describes how to monitor the status of the electrical and optical GbE ports.

OmniLCT application detects the physical type of the selected GbE port (electrical or optical), displaying the corresponding *Management GbE Properties* window.

Monitoring electrical GbE port

To monitor the current status of an electrical *GbE Port*, proceed a follows:

Step	Action
1	 In the *Management Tree*, click the *GbE Port* you want to monitor its status.
2	In the *Management GbE Properties* window, click the Update button to retrieve information regarding the selected GbE port. 
3	Through the **GbE Properties** group box, you can check the current status of the selected GbE port: • **Type** – Indicates the type of the port (*Electrical*) • **Link Status** – Indicates if the link associated with this port is operating normally (*Up*) or not (Down).

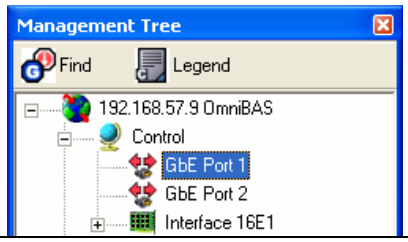
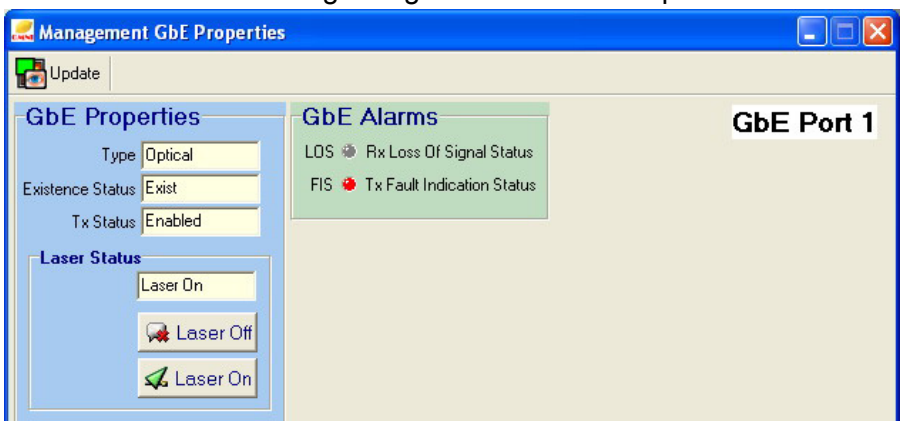
End of procedure.

Continued on next page

Monitoring the GbE Ports, Continued

Monitoring an optical GbE port

To monitor the current status of an optical *GbE Port*, proceed a follows:

Step	Action
1	 In the *Management Tree*, click the *GbE Port* you want to monitor its status.
2	In the *Management GbE Properties* window, click the Update button to retrieve information regarding the selected GbE port. 
3	Through the **GbE Properties** group box, you can check the current status of the selected GbE port: • **Type** – Indicates the type of the port (*Optical*) • **Existence Status** – Indicates the physical state of the selected GbE port. When the optical GbE port is in place, the *Exist* value appears. Otherwise, the *Not Exist* value appears. • **Tx Status** – Indicates if the link associated with this port is *Enabled* or *Disabled*.
4	Through the **Laser Status** group box, you can monitor the laser status of this optical GbE port (*Laser On* or *Laser Off*). • If you want to deactivate the GbE port, click the Laser Off button. • To activate again the GbE port, click the Laser On button.
5	Through the **GbE Alarms** group box, you can monitor the GbE alarms. Normally, the “virtual” leds of the alarms must be grey. The “virtual” led of the following alarms turns on (red) when: • **LOS** – There is no signal at the specific GbE port input • **FIS** – There is fault in the output signal of the specific GbE port

End of procedure.

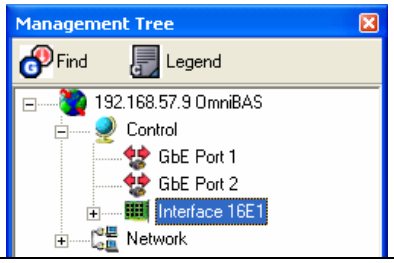
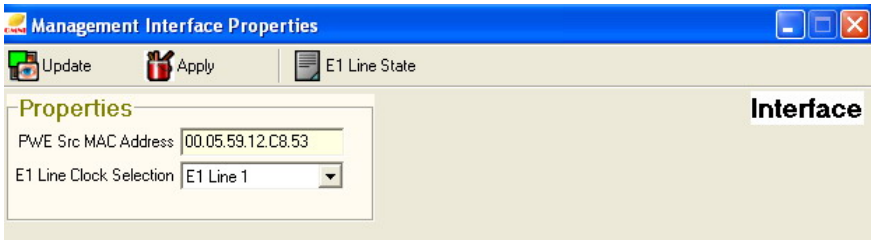
Monitoring the Interface 16E1 Element

Introduction

This paragraph describes how to monitor the status of the *Interface 16E1* element. The *Interface 16E1* element corresponds to E1 Tributary Module of the OmniBAS-4W subrack.

Monitoring Interface 16E1

To monitor the current status of the *Interface 16E1* element, proceed as follows:

Step	Action
1	 In the *Management Tree*, click the *Interface 16E1* element.
2	In the *Management Interface Properties* window, click the Update button to retrieve information regarding the selected element. 
3	In the **PWE Src MAC Address** field, you can view the MAC address of the Tributary module of the selected OmniBAS node.
4	In the **E1 Line Clock Selection** field, you can see the E1 line used as clock source for the system synchronization (when the *Interface Card* is selected as clock source). For more information, see par. Setting/ Monitoring System Synchronization, on page 95.

NOTE For the selected *Interface 16E1* element, you can also monitor the status of the associated E1 Lines, by clicking the E1 Line State button. For more information about this feature, see par. Monitoring the E1 Lines, on page 112.

End of procedure.

Monitoring the E1 Lines

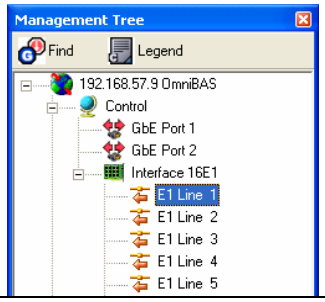
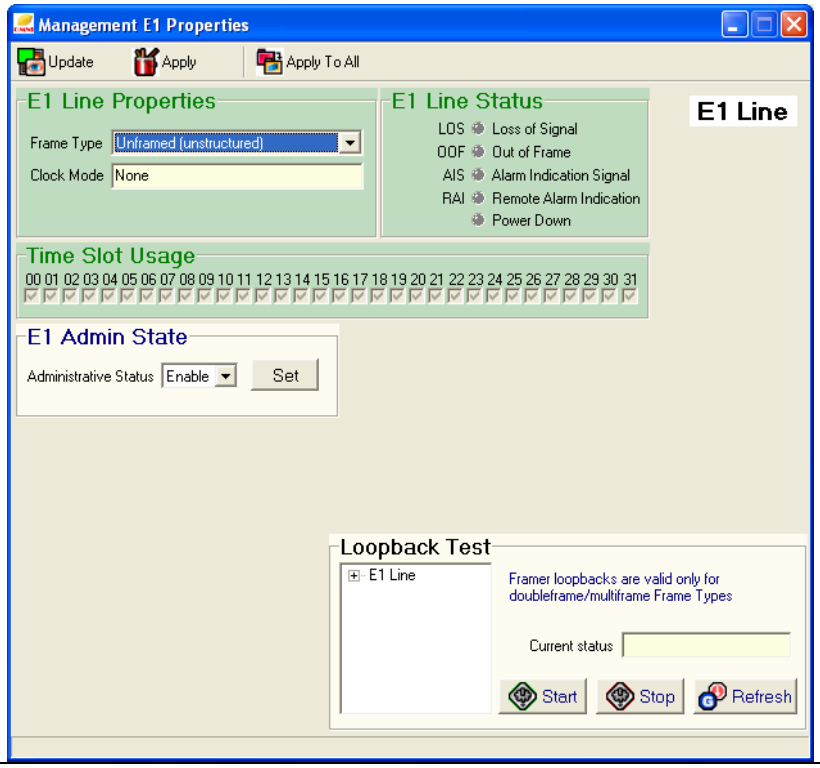
Introduction

This paragraph describes how to:

- View the attributes of an E1 line (frame type, administrative state, alarms status, TS usage)
- View a list of all E1 lines together with their attributes
- Perform loopback tests in an E1 line

Monitoring the properties of an E1 Line

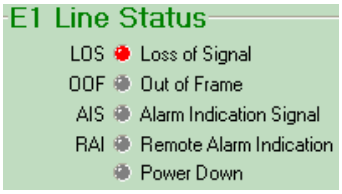
To monitor the current status of an E1 line, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Interface 16E1* element and click the E1 line you want (e.g. *E1 Line 1*).
2	In the *Management E1 Properties* window, click the Update button to view the current properties of the selected line. 

Continued on next page

Monitoring the E1 Lines, Continued

Monitoring the properties of an E1 Line (continued)

Step	Action
3	In the **Frame Type** drop-down list of the **E1 Line Properties** group box, you can see the current E1 frame format: • *Doubleframe (no signaling):* G.704 structured. Timeslots TS1 to TS31 transfer payload. Frame synchronization is carried over timeslot TS0. No payload signaling is used. • *Multiframe-CRC (no signaling):* G.704 structured. Timeslots TS1 to TS31 transfer payload. Frame synchronization is carried over timeslot TS0. The Si bits of each Frame Alignment Signal (FAS) are used to implement CRC-4 control. No payload signaling is used. • *Unframed (unstructured):* stream of bits at 2048 kbit/s; no channels are associated with any specific group of bits. 
4	In the **Clock Mode** field the *None* value is displayed (i.e. the timing of the E1 frame is retrieved from the synchronization network).
5	In the **E1 Line Status** group box, you can check if active alarms (LOS, OOF, AIS, RAI and Power Down) currently exist for the selected E1 Line.  A **red** icon, next to an alarm, denotes an active alarm of this type. Normally, all five alarm icons must be grey (denoting no alarms).
6	In the **Time Slot Usage** field, you can view the timeslots status of the selected E1 line: When all timeslots are selected (√), they are associated with a PWE3 TDM connection. Otherwise, the timeslots are displayed unselected. 

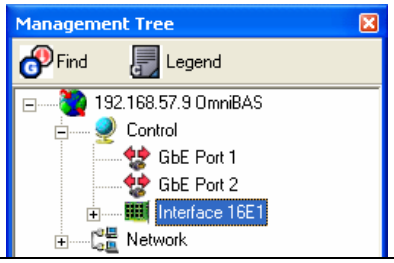
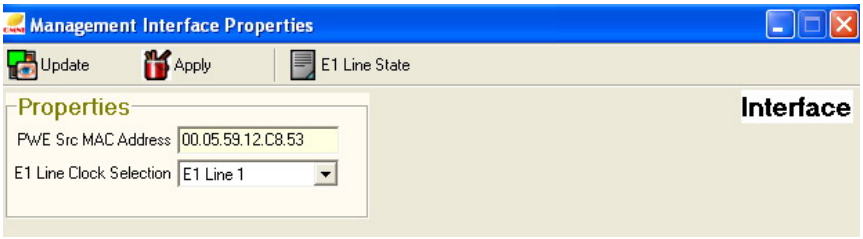
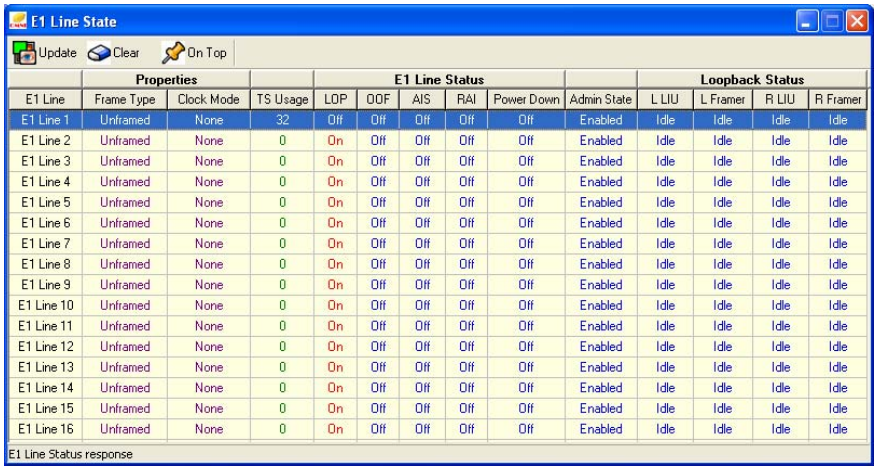
End of procedure.

Continued on next page

Monitoring the E1 Lines, Continued

Massive monitoring of E1 Lines

To monitor the E1 lines status of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, click the *Interface 16E1* element of the OmniBAS node.
2	In the *Management Interface Properties* window that appears, click the E1 Line State button. 
3	In the *E1 Line State* window that appears, click the Update button to display the current information regarding the E1 lines.  The 16 E1 lines of the selected *Interface 16E1* element are displayed together with their attributes (frame type, TS usage, alarms status, administrative state, loopback status, etc.).

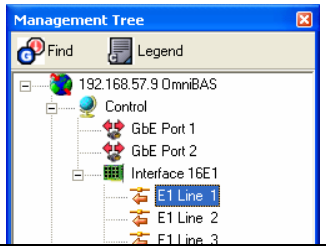
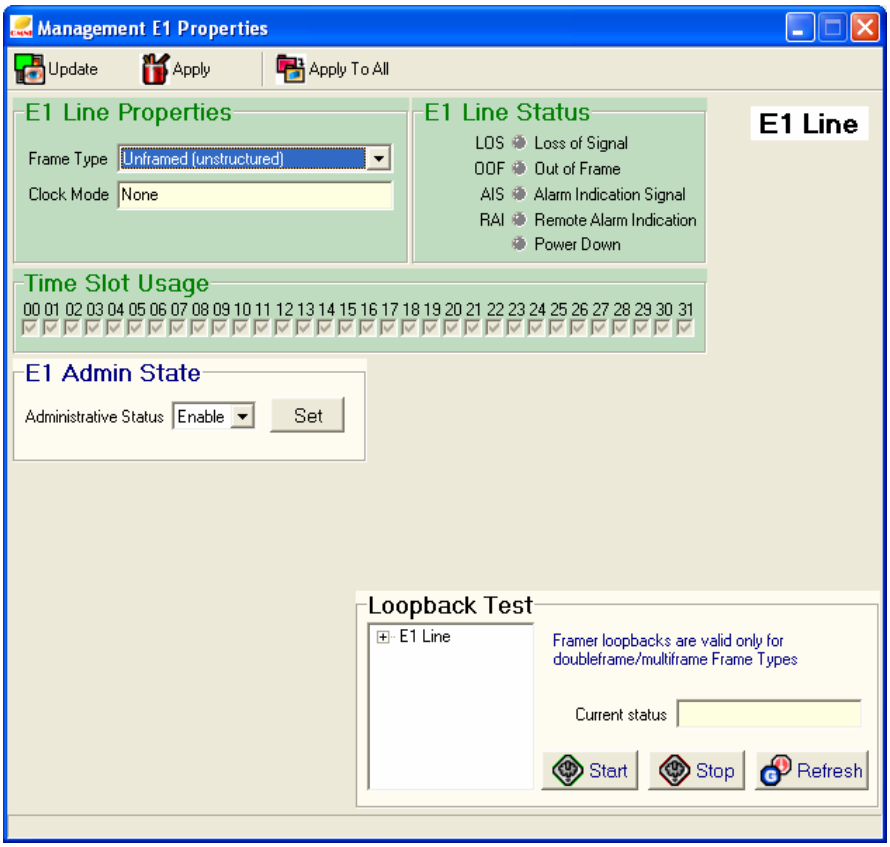
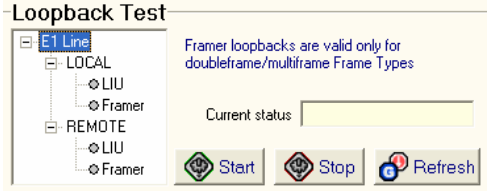
End of procedure.

Continued on next page

Monitoring the E1 Lines, Continued

Performing loopbacks in an E1 Line

To perform loopback test in case of E1 (PWE3 TDM) line fault, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Interface 16E1* element and click the E1 line you want (e.g. *E1 Line 1*).
2	In the *Management E1 Properties* window, click the Update button to view the current properties of the selected line. 
3	 In the **Loopback Test** group box, expand **E1 Line**.

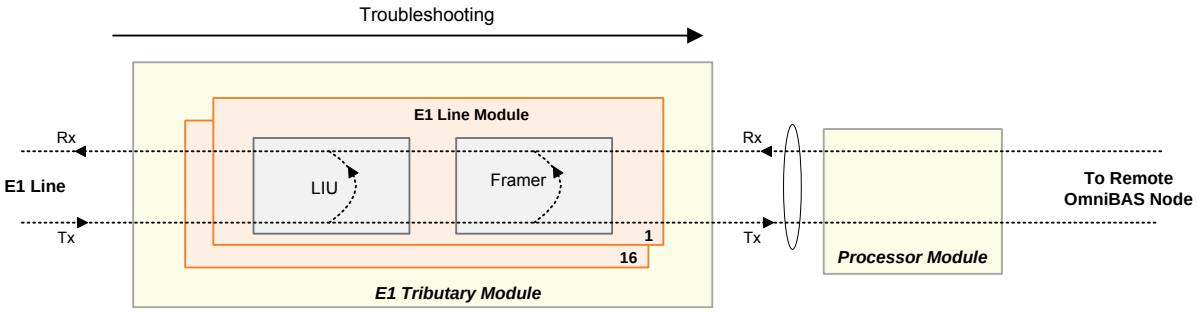
Continued on next page

Monitoring the E1 Lines, Continued

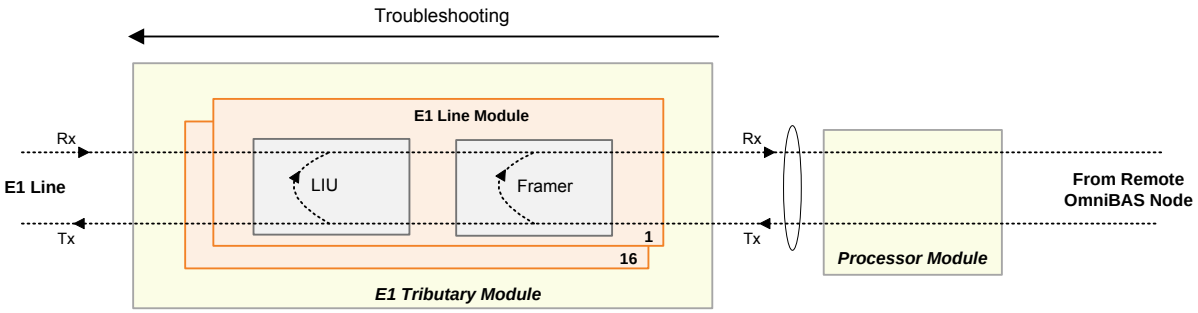
Performing loopbacks in an E1 Line (continued)

Step	Action
4	Expand either **LOCAL** or **REMOTE** and then click the loopback you want to perform, *LIU* or *Framer*. See schematic below showing the different loopback tests that can be set in case of E1 (PWE3 TDM) line fault. NOTE Framer loopback cannot be set for unframed (unstructured) PWE3 TDM services.
5	Click the Start button to set the loopback.
6	To see the current status of the loopback (*Running*, *Idle*), click the Refresh button. The current status of the loopback is displayed in the **Current status** field.
7	When you want to terminate the loopback, click the Stop button.

Local Framer / LIU Loopbacks



Remote Framer / LIU Loopbacks



End of procedure.

Monitoring the Modems

Introduction

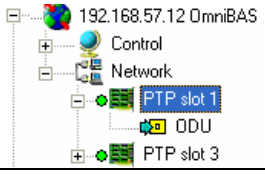
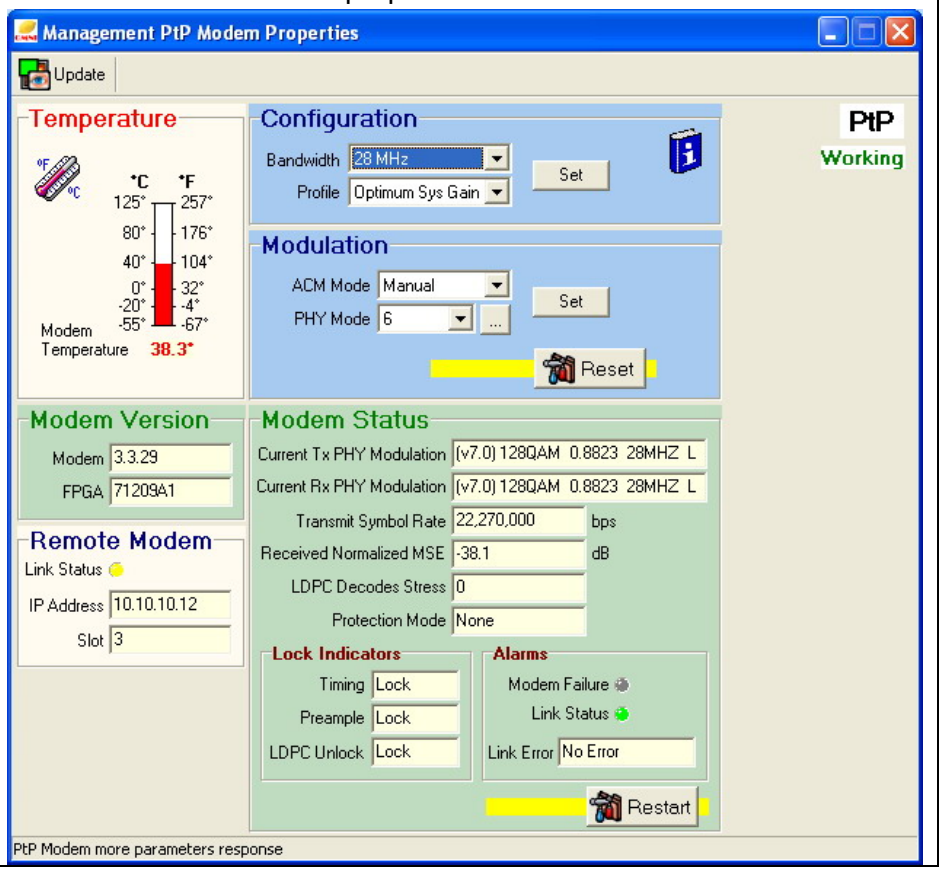
This paragraph describes how to:

- Monitor whether a modem is in standalone or protection mode
- Monitor the current temperature inside a modem
- Monitor the current status of a modem (modulation, lock indicators, alarms, etc.)
- Identify the corresponding remote modem and also monitor the link status

The monitoring of the above items is performed through the *Management PtP Modem Properties* window.

Monitoring modem status

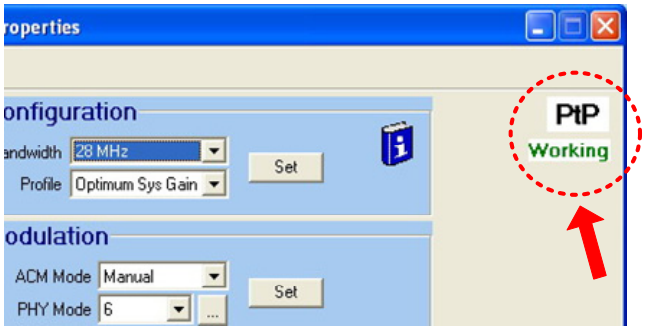
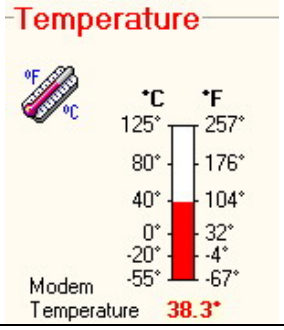
To monitor the current status of a modem, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element and click the modem you want (e.g. PTP slot 1).
2	In the *Management PtP Modem Properties* window, click the Update button to view the current properties of the modem. 

Continued on next page

Monitoring the Modems, Continued

Monitoring modem status (continued)

Step	Action
3	At the upper-right part of the window, check if the modem is in standalone (*None*) or protection mode (*Working* or *Protected*). 
4	 In the **Temperature** group box, you can view the current temperature inside the modem (e.g. 38.3 ºC).
5	In the **Modem Version** group box, you can see information about the version of the modem.
6	In the **Configuration** group box, you can view the current channel bandwidth and profile of the modem. To modify the channel bandwidth, see par. Setting the Channel Bandwidth of a Link, on page 36.
7	In the **Modulation** group box, you can view the modulation status of the modem. To modify the modulation status of the modem, see par. Enabling Adaptive Coding & Modulation (ACM), on page 39 and par. Setting Manual Modulation Mode, on page 42.
8	In the **Modem Status** group box, you can see information about the current status of the modem (modulation, protection mode, etc.), and you can monitor the status of the displayed lock indicators and alarms as well. Further to this paragraph, the information concerning the **Modem Status** group box is described in detail.
9	In case you want to reset or restart the selected modem, see par. Resetting/ Restarting a Modem, on page 176.

End of procedure.

Continued on next page

Monitoring the Modems, Continued

Modem status properties

The following tables describes the properties displayed in the **Modem Status** group box of the *Management PtP Modem Properties* window:

Property	Description
Current Tx/ RX PHY Modulation	Displays the current Tx/ Rx physical modulation mode and the channel bandwidth of the OmniBAS node.
Transmit Symbol Rate	Displays the transmit symbol rate for the incoming flow in bps.
Received Normalized MSE	Displays the received normalized MSE (Mean Square Error) in dB.
LDPC Decodes Stress	Displays the Low-Density Parity Check code (LDPC) encoding.
Protection Mode	Displays the protection status of the selected modem taking one of the following values: • *None* – The selected modem works in standalone mode (i.e. it is not protected by a redundant one). • *Working* –The selected modem works in protection mode and it is in working mode (i.e. it is protected by redundant one). • *Protect* – The selected modem works in protection mode and it is in standby mode.

Modem status-Lock Indicators

The following table describes the lock indicators displayed in the *Management PtP Modem Properties* window:

Lock Indicator	Description
Timing	Indicates if the selected modem is locked or unlocked in the symbol timing of the received signal.
Preamble	Indicates if the selected modem has detected (*Lock*) or not (*Unlock*) the required distribution of preamble patterns in the received signal.
LDPC Unlock	Indicates if the LDPC decoder of the selected modem is locked or unlocked.

Continued on next page

Monitoring the Modems, Continued

Modem status-Alarms

The following table describes the alarms displayed in the *Management PtP Modem Properties* window:

Alarm	Description
Modem Failure	Through this alarm, you can check the modem connection status. When the corresponding “virtual” led is: • *Red* (ON) – There is no link communication with corresponding remote modem • *Grey* (OFF) – Link communication with corresponding remote modem is Ok
Link Status	Through this alarm, you can check the Rx link status. When the corresponding “virtual” led is: • *Green* – Rx link communication with the corresponding remote modem is Ok (Rx link is locked and it is Ok). • *Yellow* – Rx link is not locked yet • *Red* – Modem failure
Link Error	Through this field, you can view the type of the link error. Otherwise, it takes the *No Error* value. The possible link errors are the following: • *Failed at AGC* • *Failed at Timing* • *Failed at Freq Sweep* • *MSE Error* • *Bit Error* • *Service Error* • *Failed at BLIND* • *Failed on Timeout* • *Stopped* • *Fatal Error*

End of procedure.

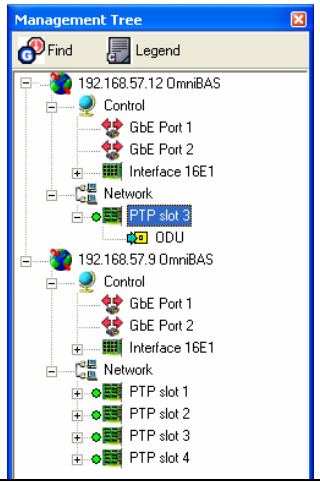
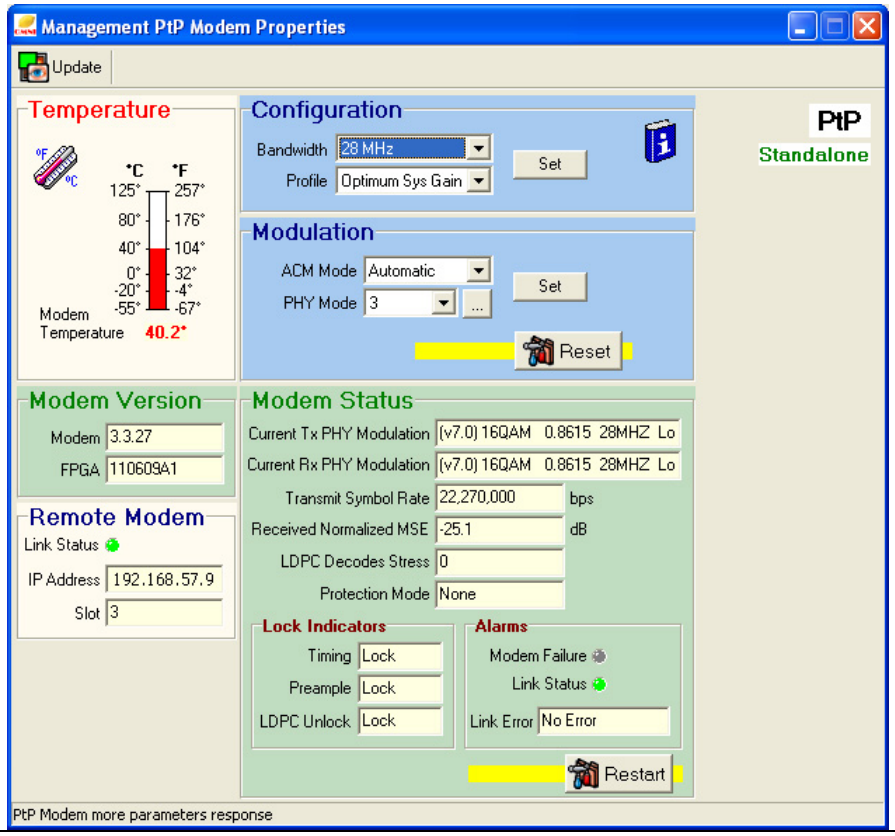
Continued on next page

Monitoring the Modems, Continued

Identifying the remote modem

When monitoring the status of a modem, you can also identify the corresponding modem of the remote station and the status of this link as well.

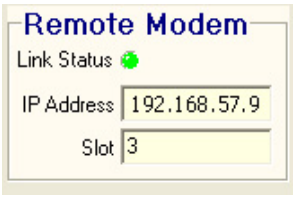
To identify the remote modem related to a selected-local modem, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element and click the modem of the local station you want (e.g. PTP slot 3 of 192.168.57.12 OmniBAS).
2	In the *Management PtP Modem Properties* window, click the Update button to view the current properties of the selected modem. 

Continued on next page

Monitoring the Modems, Continued

Identifying the remote modem (continued)

Step	Action
3	 Through the **Remote Modem** group box, you can view: • The IP address of the corresponding remote modem and its current slot position (e.g. modem located in slot 3 of the 192.168.57.9 OmniBAS node). • The link status through the **Link Status** “virtual” led:

When the Link Status “virtual” led is:	Description
Green	Remote modem reception is Ok.
Yellow	Link communication is failed. Remote modem reception is not locked.
Grey	Link communication is failed. Remote modem status cannot be retrieved.

End of procedure.

Monitoring the ODUs

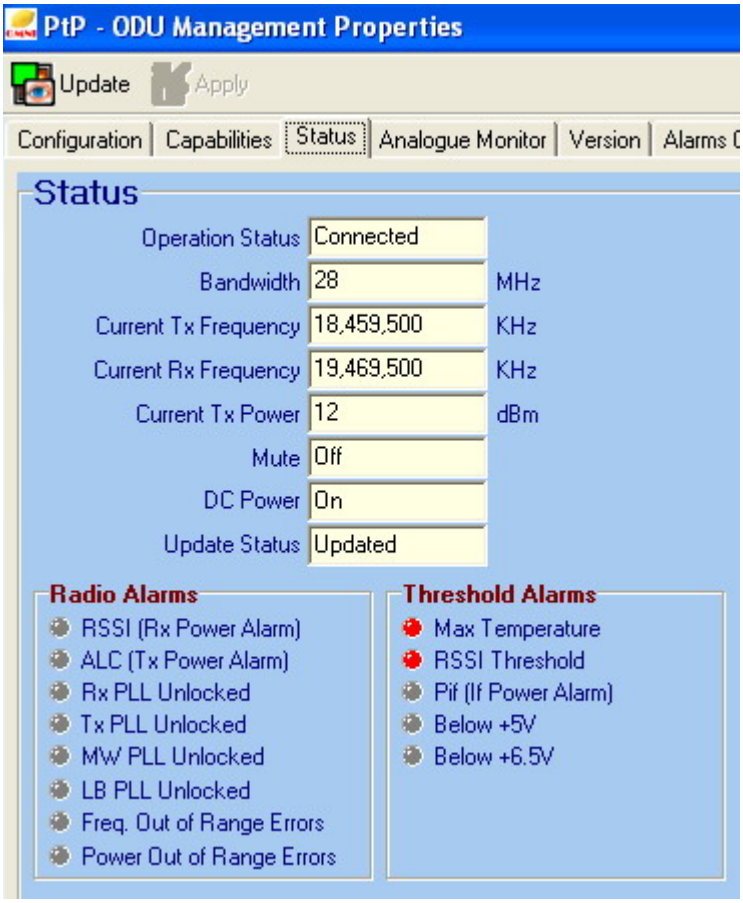
Introduction

This paragraph describes how to monitor the current status, the radio and threshold alarms, the capabilities, the measurements and the version of an ODU.

The monitoring of an ODU is performed through the *PtP ODU Management Properties* window (that appears when you select the ODU you want in the *Management Tree*).

Monitoring ODU current status

In the *PtP -ODU Management Properties* window, click the **Status** tab. In the *Status* tabbed sheet that appears, click the Update button to update the displayed data.



Attribute	Description
Operation Status	Displays the operation status of the ODU (*Connected* or *Disconnected*).
Bandwidth	Displays the current channel bandwidth (7 MHz, 13.75/ 14 MHz, 27.5/ 28 MHz or 55/ 56 MHz) of the ODU.
Current Tx Frequency	Displays the current operating Tx frequency

Continued on next page

Monitoring the ODUs, Continued

Monitoring ODU current status (continued)

Attribute	Description
Current Rx Frequency	Displays the current operating Rx frequency
Current Tx Power	Displays the current power transmitted from the ODU (in dBm)
Mute	Indicates the mute status of the ODU (mute/ *ON,* unmute/ *OFF*)
DC Power	Indicates if the DC power of the ODU is powered down (*OFF*) or not (*ON*).
Update Status	Indicates the current firmware status of the ODU. The following messages can be displayed: • *Updated* – The firmware status of the ODU is OK (the ODU is updated with the latest firmware). • *Needs Update* – The firmware of the ODU should be updated. The ODU's firmware is updated either automatically or manually(1). • *Updated Now* – The ODU's firmware upgrading process is taking place.

Continued on next page

(1) See par. Configuring an ODU, on page 30.

Monitoring the ODUs, Continued

Monitoring radio alarms

In the *PtP -ODU Management Properties* window, click the **Status** tab. In the *Status* tabbed sheet that appears, click the Update button to retrieve the current information regarding the radio alarms of the selected ODU.

The following table describes when the threshold alarms are generated. When an alarm is generated, the corresponding “virtual” led is red.

Radio Alarm	Alarm Generation
RSSI (Rx Power Alarm)	When the power from the remote radio unit (Rx power) is less than the factory pre-defined value.
ALC (Tx Power Alarm)	When the output power is 3 dB less than the desired Tx Power value (defined by the user in the *Configuration* tabbed sheet). **NOTE** In case the desired Tx Power value is greater than the current Max Tx Power(1), the ALC alarm is generated when the output power is 3 dB less than the current Max Tx Power value.
Rx PLL Unlocked	When the receiver’s PLL synthesizer is unlocked.
Tx PLL Unlocked	When the transmitter’s PLL synthesizer is unlocked.
MW PLL Unlocked	When the fractional PLL synthesizer is unlocked.
LB PLL Unlocked	When the loopback synthesizer is activated and unlocked.
Freq. out of range errors	When the frequency of the ODU transmission radio band is out of supported range or it is not an integer multiple of supported frequency step. The supported range of the ODU Tx frequency and the frequency step are shown in the *Capabilities* tabbed sheet.
Power out of range errors	The Tx power of the ODU is out of dynamically estimated supported range. The supported range of the ODU output power is shown in the *Capabilities* tabbed sheet.

Continued on next page

(1) The current Max Tx Power is displayed in the *Capabilities* tabbed sheet.

Monitoring the ODUs, Continued

Monitoring ODU threshold alarms

In the *PtP -ODU Management Properties* window, click the **Status** tab. In the *Status* tabbed sheet that appears, click the Update button to retrieve the current information regarding the threshold alarms of the selected ODU.

The following table describes when the threshold alarms are generated. When an alarm is generated, the corresponding “virtual” led is red.

Alarm	Alarm Generation
Max Temperature	When the temperature inside the ODU exceeds the threshold you have set (see par. Configuring an ODU, on page 30.).
RSSI Threshold	When Rx power (i.e. power from the remote radio unit) is less than the threshold defined by the user (see par. Configuring an ODU, on page 30.).
Pif (If Power Alarm)	When the power of the Tx IF signal falls below -26.5 dBm.
Below +5 V	When the output voltage of the ODU internal power supply unit falls below +4.85 V.
Below +6.5 V	When the output voltage of the ODU internal power supply unit falls below +6.35 V.

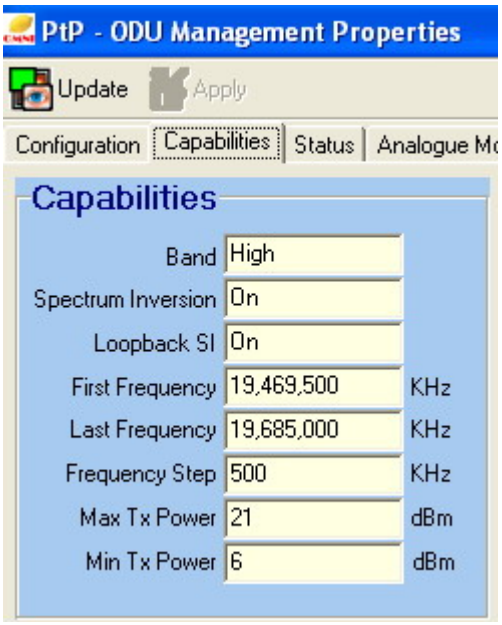
Continued on next page

Monitoring the ODUs, Continued

Monitoring ODU capabilities

In the *PtP -ODU Management Properties* window, click the **Capabilities** tab.

In the *Capabilities* tabbed sheet that appears, click the Update button to retrieve the current information regarding the capabilities of the selected ODU.



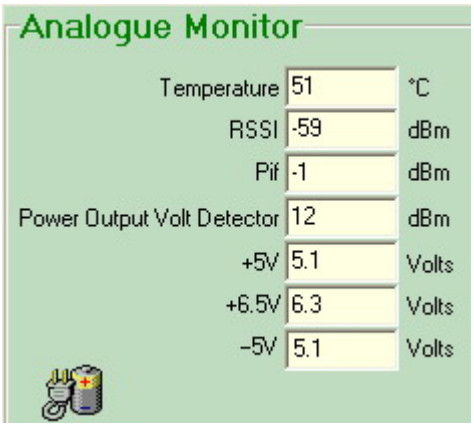
Attribute	Description
Band	Displays the transmission radio band of the ODU (*High* or *Low*).
Spectrum Inversion	Indicates if spectrum inversion is enabled (*ON*) or not (*OFF*).
Loopback SI	Indicates if the ODU loopback capability is supported (*ON*) or not (*OFF*).
First Frequency	Displays the first frequency of the ODU transmission radio band (in kHz).
Last Frequency	Displays the last frequency of the ODU transmission radio band (in kHz).
Frequency Step	Displays the frequency step used for frequency channel selection.
Max Tx Power	Displays the upper limit of the power allowed for specific modulation (in dBm).
Min Tx Power	Displays the lower limit of the power allowed (in dBm).

Continued on next page

Monitoring the ODUs, Continued

Monitoring ODU measurements

In the *PtP -ODU Management Properties* window, click the **Analogue Monitor** tab. In the *Analogue Monitor* tabbed sheet that appears, click the Update button to retrieve the current measurements regarding the selected ODU.



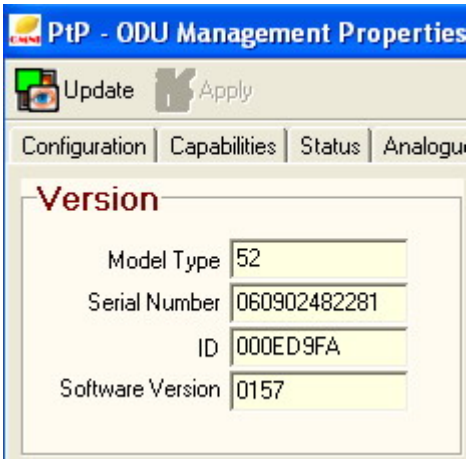
Attribute	Description
Temperature	Displays the temperature inside the ODU (in ºC).
RSSI	Displays the ODU reception level (in dBm).
Pif	Displays the power of the Tx IF signal from the indoor equipment (OmniBAS-4W subrack) (in dBm).
Power Output Volt Detector	Displays the power at the ODU output i.e. the transmission power (in dBm).
+6,5 V, +5 V, - 5 V	Displays the output voltages of the ODU's internal power supply units.

Continued on next page

Monitoring the ODUs, Continued

Monitoring ODU version

In the *PtP -ODU Management Properties* window, click the **Version** tab. In the *Version* tabbed sheet that appears, click the Update button to retrieve the current information regarding the version of the selected ODU.



Attribute	Description
Model Type	Displays the model type of the ODU.
Serial Number	Displays the S/N of the ODU.
ID	Displays the identification number of the ODU.
Software Version	Displays the firmware version of the ODU.

5 Viewing Lists

This chapter describes how to retrieve details concerning the alarms, the SNMP messages and the PWE3 TDM connections through the corresponding lists of the OmniLCT application. The chapter also provides step-by-step procedures to remove OmniBAS entities (PWE3 TDM connections, VLANs, VLAN ports).

The chapter contains the following topics:

- Alarms & Events Report
- Message Traces
- Connections List
- VLAN List
- VLAN Port Membership List

Alarms & Events Report

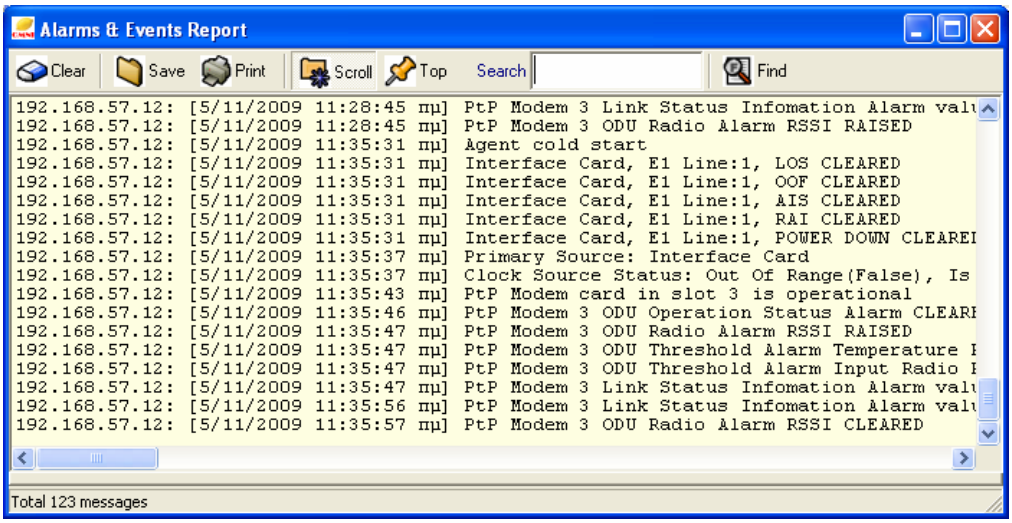
Introduction

By default, the OmniLCT application performs tracking and recording of the various alarms and events related to the connected OmniBAS nodes. This paragraph describes how to retrieve the alarms and events list of the connected OmniBAS nodes.

Alarms & Events Report window

To view the alarms and events report, select **Tools** > **Alarm & Event List** on the *Main Menu* (or click 

, on the *Toolbar*).
In the *Alarms & Events Report* window that appears, you can see details about tracked system alarms and events, together with their current status.



NOTE By default, the maximum number of the logged alarms/ events (rows) displayed in the *Alarms & Events Report* window is 5000. When this number is reached, the list is cleared and new alarms/ events can be logged. To re-define the list bound, see par. Configuring the Application's Environment (page 21).

Continued on next page

Alarms & Events Report, Continued

Toolbar of Alarms & Events Report window

The *Alarms & Events Report* window includes a toolbar through which you can perform the actions described in the following table:

Button	Description
	To clear the list.
	To save the list in a text file.
	To print the list.
	List scrolls automatically.
	List stays always on top.
	To search for specific text in the list, use the  text box. After typing the text you want, click the  button.

Also, you can press the “+”/ “-”keyboard’s keys to enlarge/ reduce the list’s font size.

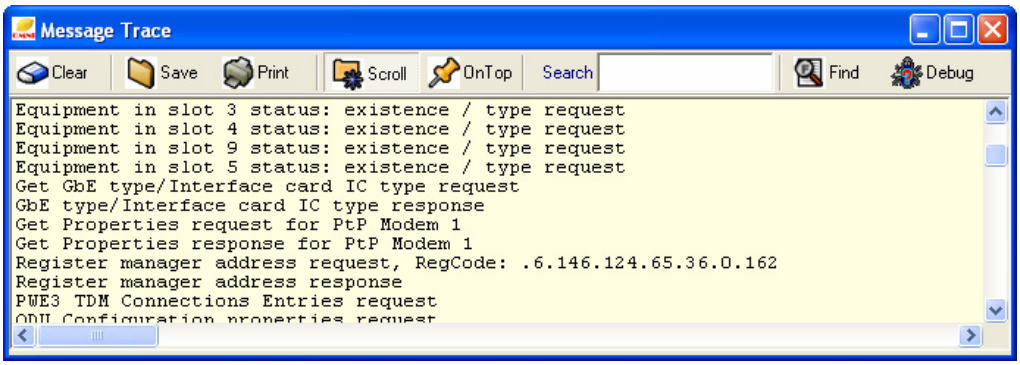
Message Traces

Introduction

By default, the OmniLCT application provides a list with the current SNMP messages and errors related to the connected OmniBAS nodes. This paragraph describes how to retrieve the messages list.

Message Traces window

To view the *Message Trace* window, select **View** > **Message Trace** on the *Main Menu*. The *Message Trace* window displays the user requests and the application responses.



NOTE By default, the maximum number of the logged messages (rows) displayed in the *Message Trace* window is 5000. When this number is reached, the list is cleared and new messages can be logged. To re-define the list bound, see par. see par. Configuring the Application's Environment (page 21).

Toolbar of Message Traces window

The *Message Trace* window includes a toolbar through which you can perform the actions described in the following table:

Button	Description
Clear	To clear the list.
Save	To save the list in a text file.
Print	To print the list.
Scroll	List scrolls automatically.
OnTop	List stays always on top.
Find	To search for specific text in the list, use the Search text box. After typing the text you want, click the Find button.
Debug	To view details concerning the packets exchanged between the OmniLCT and the SNMP agent.

Also, you can press the "+"/ "-"keyboard's keys to enlarge/ reduce the list's font size.

Connections List

Introduction

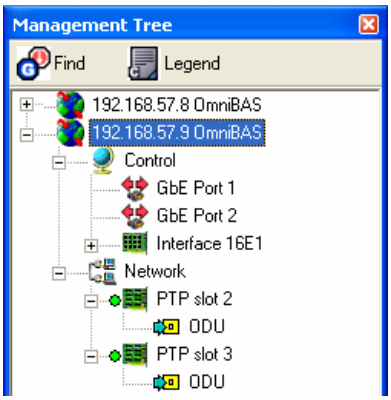
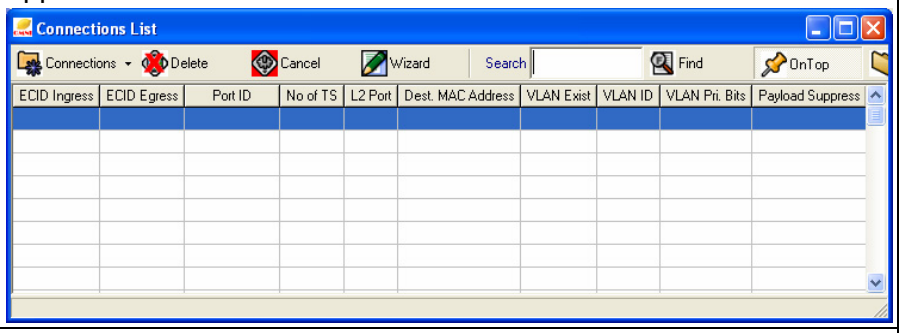
This paragraph describes the *Connections List* window, through which you can view the PWE3 TDM connections of the OmniBAS node together with their attributes. Also, this paragraph describes how to:

- Activate the *Connections List* window.
- Remove PWE3 TDM connections from the OmniBAS node

NOTE Through the *Connections List* window, you can also monitor the performance of the PWE3 TDM connections, as described in par. Monitoring the Performance of a PWE3 TDM Connection, on page 158.

Activating Connections List

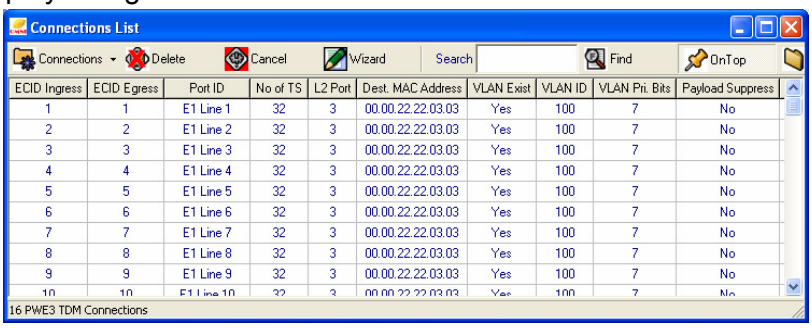
To activate the *Connections List* window of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, click on the OmniBAS node you want.
2	On the *Main Menu*, select **Tools** > **Connection List** (or click  on the *Toolbar*).
3	The *Connections List* window of the selected OmniBAS node appears: 
4	On the toolbar of the *Connections List* window, expand the  button and click **PWE3 TDM**.

Continued on next page

Connections List, Continued

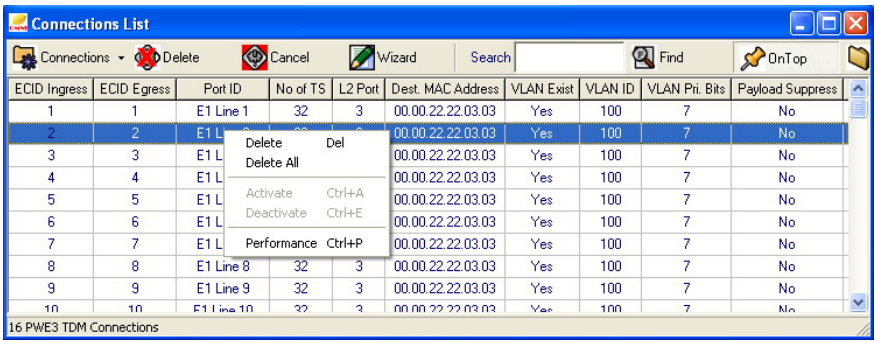
Activating Connections List (continued)

Step	Action
5	The created PWE3 TDM connections of the OmniBAS node are displayed together with their attributes.  Further to this paragraph, the attributes description of the PWE3 TDM connections, as well as, the Toolbar description of the *Connections List* window, is provided.

End of procedure.

Removing connections

To remove connections from an OmniBAS node, proceed as follows:

Step	Action
1	Activate the *Connections List* window of the OmniBAS node, as described in the previous par. Activating Connections List.
2	In the *Connections List* window select the connection you want, click the right mouse button and from the drop-down menu that appears, select: • **Delete**, to delete the selected connection • **Delete All**, to delete all created connections  The selected PWE3 connection(s) are removed from the OmniBAS node.

End of procedure.

Continued on next page

Connections List, Continued

Attributes description

The following table describes the attributes of the PWE3 connections displayed in the *Connections List* window:

Attribute	Description
ECID Ingress	Ingress Emulated Circuit Identifier for the L2 port side of the PWE3 TDM connection. (Value range: 1 to 65535)
ECID Egress	Egress Emulated Circuit Identifier for the L2 port side of the PWE3 TDM connection. (Value range: 1 to 65535)
Port ID	Indicates the E1 line associated with the PWE3 TDM connection.
No of TS	Indicates the number of timeslots associated with the PWE3 connection. This number is equal to 32, as all timeslots of the E1 line are used for the creation of the PWE3 TDM connection.
L2 Port	Indicates the L2 port associated with the PWE3 TDM connection. The L2 ports with index 1 and 2 correspond to GbE Port 1 and GbE Port 2, respectively. The L2 ports with index 3 to 6 correspond to the modems L2 ports, as follows: – L2 port with index 3 corresponds to modem-PTP slot 1 – L2 port with index 4 corresponds to modem-PTP slot 2 – L2 port with index 5 corresponds to modem-PTP slot 3 – L2 port with index 6 corresponds to modem-PTP slot 4
Dest. MAC Address	MAC address of the tributary module on which the created PWE3 TDM connection terminates.
VLAN Exist	Indicates if the L2 port is associated (*Yes*) or not (*No*) with a VLAN.
VLAN ID	Indicates the VLAN ID (if a VLAN is associated with the L2 port).
VLAN Pri. Bits	Indicates the VLAN Priority Bits (802.1p priority bit) and takes values from 0 to 7 (7 is the highest priority, 0 is the lowest priority).
Payload Suppress	When taking value: • *Yes*: No packets are transmitted when the source E1 has nothing to send (all zeros). • *No*: All packets are thransmitted
Buf E1 Frames	Indicates the number of Buffered E1 Frames. This attribute is used for the calculation of the PSN packet size(1). By default, the value is 8. (Value Range: 1 to 255).
Packet Jitter	Refers to the latency of the packets. By default, the value is 10000. (Value range: 250 µsec to 30000 µsec).
Oper Status	Indicates the operational status of the connection and takes only the *Enabled* value.

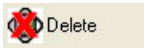
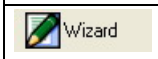
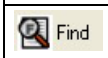
Continued on next page

(1) PSN packet size = (Buffered E1 frames) x (nSlots), where nSlots = 32 in unstructured mode.

Connections List, Continued

Toolbar

The *Connections List* window includes a toolbar through which you can perform the actions described in the following table:

Button	Description
	To retrieve the list of the created PWE3 TDM connections.
	To delete the selected connection(s).
	To cancel a request.
	To open the Connection Setup Wizard. (See also par. 3.3 Configuring PWE3 TDM Connections, on page 70).
	To search for specific text in the list, use the  text box. After typing the text you want, click the  button.
	Connections list stays always on top.
	To save the connections list in a text file.

VLAN List

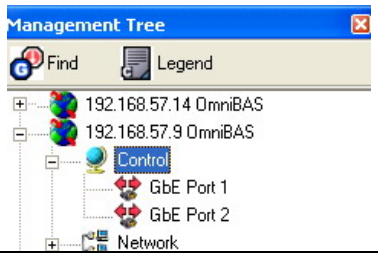
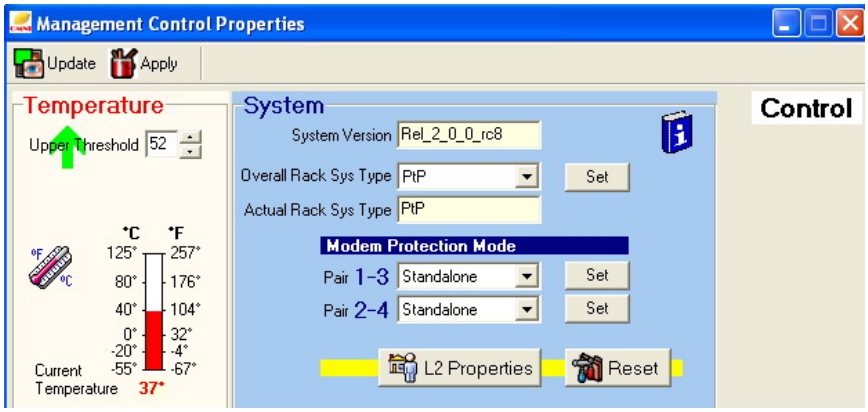
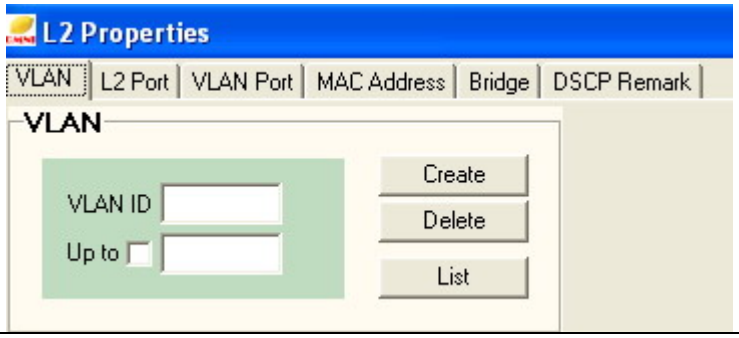
Introduction

This paragraph describes the *VLAN List* window, through which you can:

- View the created VLANs of an OmniBAS node
- Delete a VLAN (or all VLANs)
- Select a VLAN

Viewing VLAN List

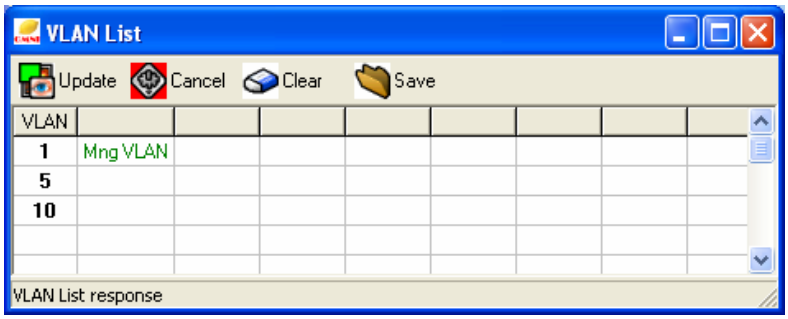
To view the *VLAN List* window, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *VLAN* tabbed sheet of the *L2 Properties* window that appears, click the List button. 

Continued on next page

VLAN List, Continued

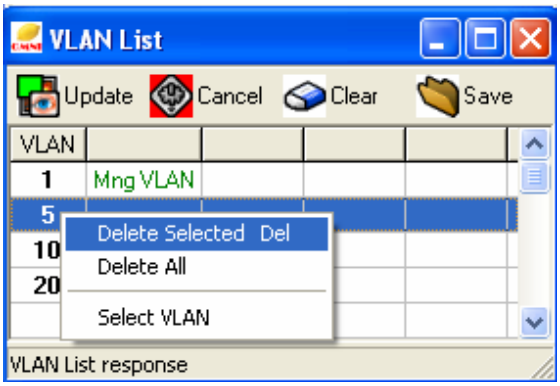
Viewing VLAN List (continued)

Step	Action
4	The *VLAN List* window appears. Click the Update button to display the list of the created VLANs.  The VLAN column displays the ID of all created VLANs. Also, you can identify the management VLAN (*Mng VLAN* – VLAN with ID=1 is used by default as the management VLAN).

End of procedure.

Removing VLAN(s)

To remove a VLAN, proceed as follows:

Step	Action
1	Activate the *VLAN List* window of the OmniBAS node, as described in the previous par. Viewing VLAN List. **NOTE** Prior to removing a VLAN, ensure that no L2 port is already associated with this specific VLAN.
2	In the *VLAN List* window select the VLAN you want, click the right mouse button and from the drop-down menu that appears, select:  • **Delete Selected**, to delete the selected VLAN • **Delete All**, to delete all created VLANs The selected VLAN(s) are removed from the OmniBAS node.

End of procedure.

Continued on next page

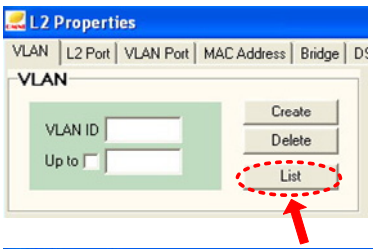
VLAN List, Continued

Selecting a VLAN

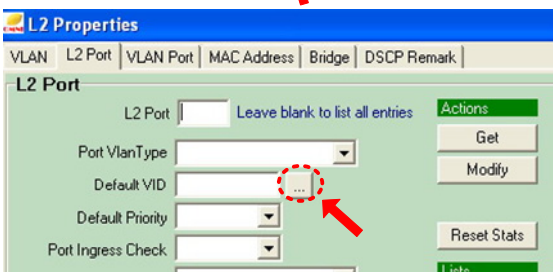
The procedure provided below, describes how to select a VLAN from the *VLAN List* window.

The selection of a VLAN could be needed, when:

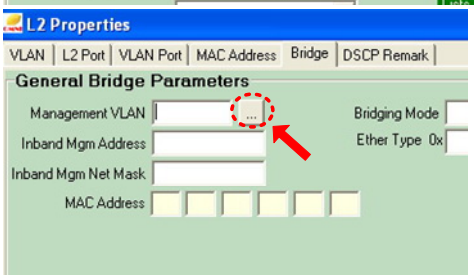
- Creating VLANs



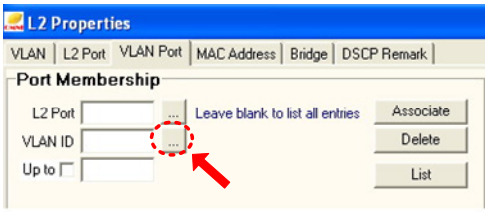
- Setting L2 Ports



- Setting L2 Bridging Mode



- Associating VLANs with L2 Ports

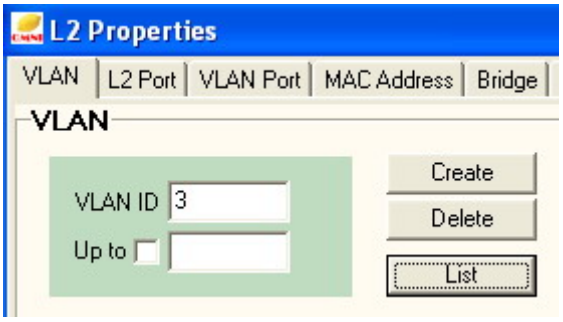


Continued on next page

VLAN List, Continued

Selecting a VLAN (continued)

To select a VLAN, proceed as follows:

Step	Action
1	Activate the *VLAN List* window (through the corresponding buttons (List or ···) shown in the above screens).
2	In the *VLAN List* window, select the VLAN you want (e.g. VLAN ID=3), click the right mouse button and from the drop-down menu that appears, select the **Select VLAN** option. 
3	 The selected VLAN is displayed in the corresponding window (e.g. in the *VLAN* tabbed sheet).

End of procedure.

Toolbar

The *VLAN List* window includes a toolbar through which you can perform the actions described in the following table:

Button	Description
Update	To retrieve the list of the created VLANs.
Cancel	To cancel a request.
Clear	To clear the VLAN list.
Save	To save the VLAN list in a text file.

VLAN Port Membership List

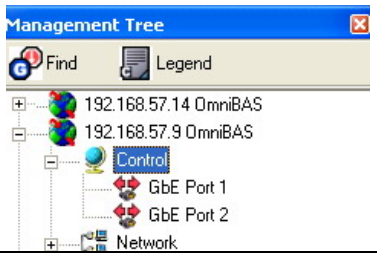
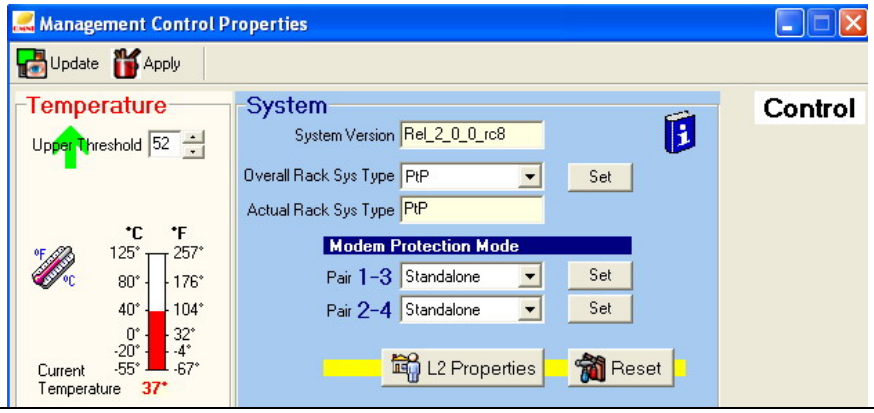
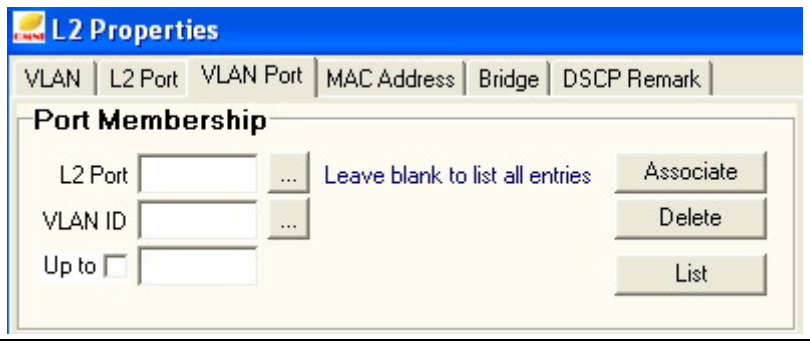
Introduction

This paragraph describes how to remove VLAN ports. A VLAN port is defined as the association between an L2 port and the corresponding VLAN.

NOTE To view the list providing the current associations of the VLANs with the L2 ports, see par. Viewing the VLAN Port Membership List, on page 56).

Removing VLAN ports

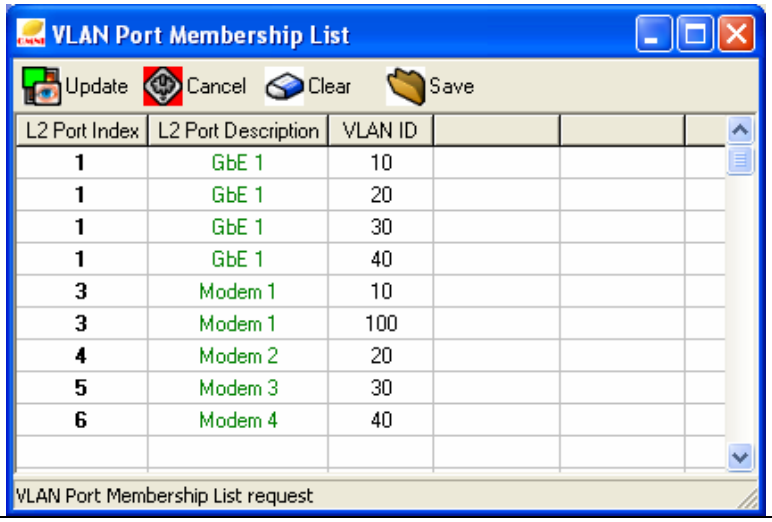
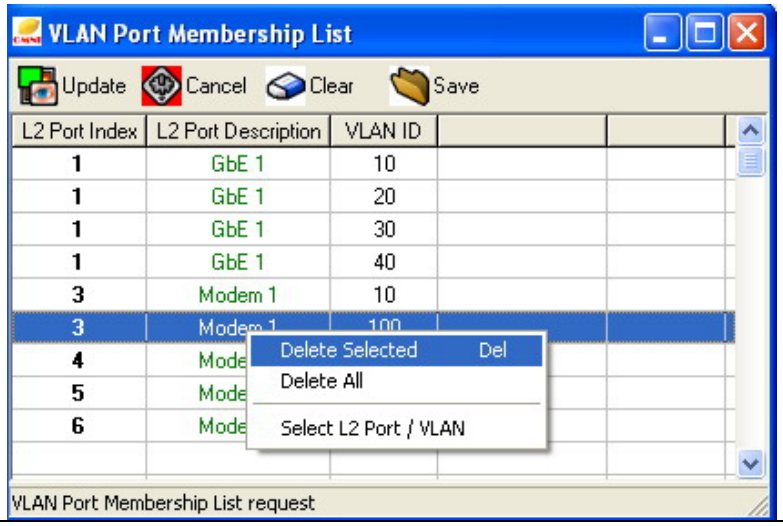
To remove VLAN port(s), proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *VLAN Port* tabbed sheet of the *L2 Properties* window that appears, click the List button. 

Continued on next page

VLAN Port Membership List, Continued

Removing VLAN ports (continued)

Step	Action
4	In the *VLAN Port Membership List* window, click the Update button to display the list of all associations between L2 ports and VLANs. 
5	In the *VLAN Port Membership List* window, click the row corresponding to the association you want to remove (e.g. GbE1 Port with VLAN ID = 30). 
6	Click the right mouse button and from the drop-down menu: • Select the **Delete Selected** option. The selected association (e.g. Modem 1 Port with VLAN ID = 100) is removed. • Select the **Delete All** option to remove all VLAN ports.

End of procedure.

6 Monitoring the Performance of an OmniBAS Node

This chapter describes how to monitor the performance of an OmniBAS node. The chapter includes the following topics:

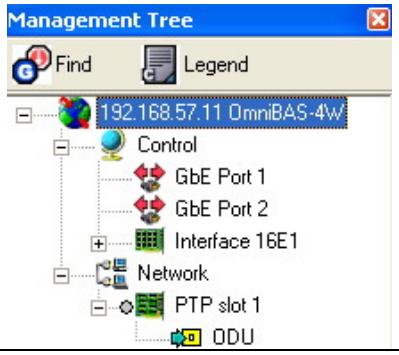
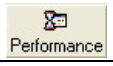
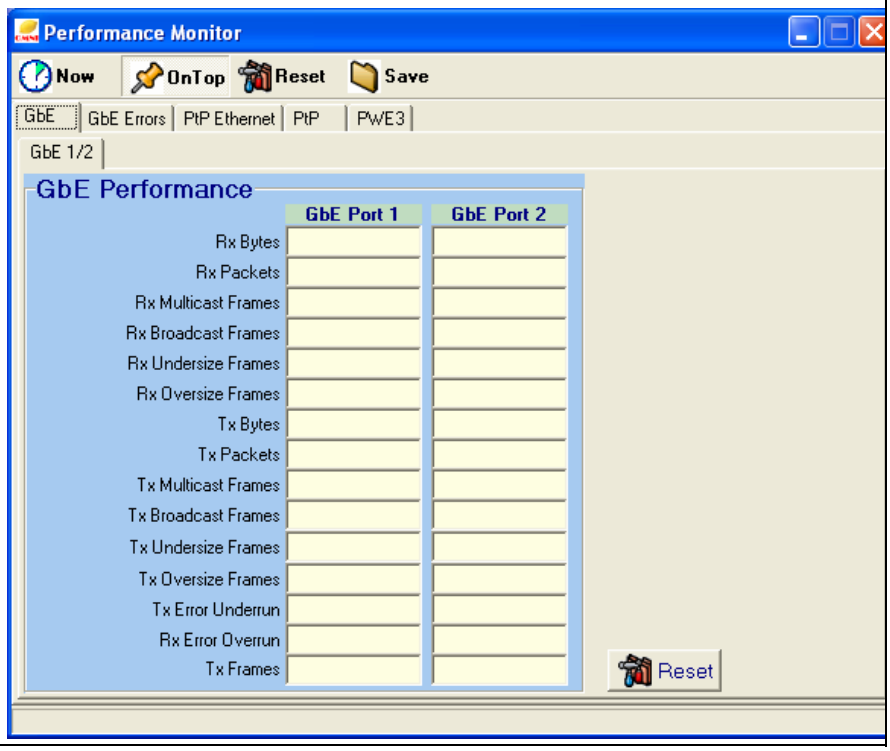
Monitoring Ethernet Traffic through Wireline L2 Ports (GbE)

Introduction

This paragraph describes how to monitor the Ethernet traffic conveying through the GbE ports of an OmniBAS node.

Monitoring GbE ports performance

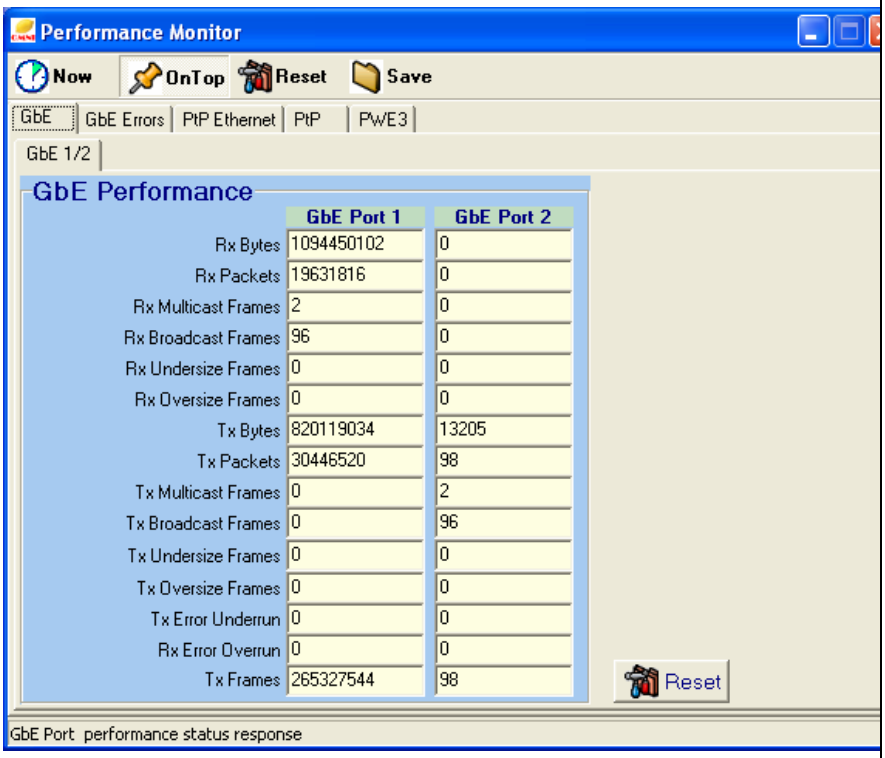
To monitor the Ethernet traffic conveying through the GbE ports of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, click the OmniBAS node you want (e.g. 192.168.57.11 OmniBAS).
2	On the *Main Menu*, select **Windows** > **Performance Monitor** (or click  , on the *Toolbar*).
3	In the *Performance Monitor* window that appears, click the **GbE** tab. The *GbE Performance* tabbed sheet appears displaying the GbE counters for the two GbE ports of the OmniBAS-4W subrack. 

Continued on next page

Monitoring Ethernet Traffic through Wireline L2 Ports (GbE), Continued

Monitoring GbE ports performance (continued)

Step	Action
4	On the *Toolbar* of the *Performance Monitor* window, click the Now button to see the statistics for both GbE ports for a time period between the completion of the last 15 min interval until the current time [(1)].  NOTE See Appendix A – Statistic Counters Description for the description of the counters displayed in the *GbE Performance* tabbed sheet.

Continued on next page

[(1)] e.g. If the time is 12.26 pm and you click the Now button, you will see the performance for the eleven min between 12.15 pm and 12.26 pm. If the time is 12.35 pm and you click the Now button, you will see the performance for the five minutes between 12.30 pm and 12.35 pm.

Monitoring Ethernet Traffic through Wireline L2 Ports (GbE), Continued

Monitoring GbE ports performance (continued)

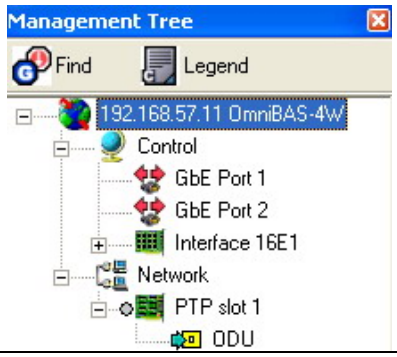
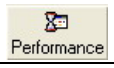
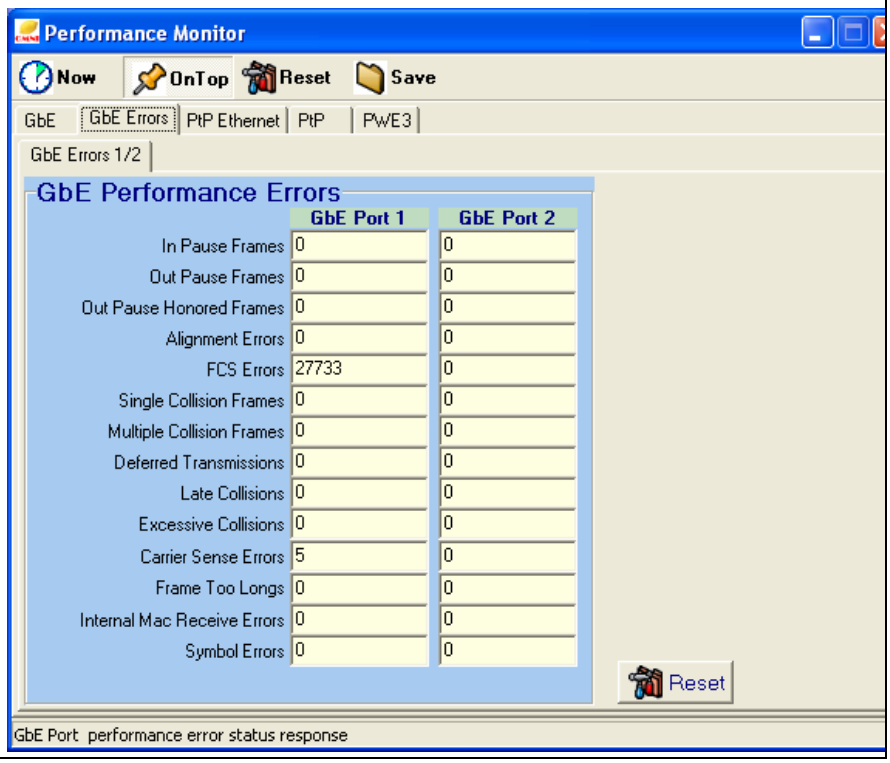
Step	Action
5	In case you want to: • Reset the collected statistics concerning the Ethernet traffic conveying through the GbE ports, click the  button of the *GbE Performance* tabbed sheet (at the bottom-right side of the *Performance Monitor* window). • Reset all the collected statistics concerning the selected OmniBAS node, click the  button in the toolbar of the *Performance Monitor* window. • Save all the collected statistics concerning the selected OmniBAS node in a text file, click the  button in the toolbar of the *Performance Monitor* window.

End of procedure.

Continued on next page

Monitoring Ethernet Traffic through Wireline L2 Ports (GbE), Continued

Monitoring GbE errors counters

Step	Action
1	 In the *Management Tree*, click the OmniBAS node you want (e.g. 192.168.57.11 OmniBAS).
2	On the *Main Menu*, select **Windows** > **Performance Monitor** (or click  , on the *Toolbar*).
3	If you want to view the GbE error counters, click **GbE Errors** tab in the *Performance Monitor* window. The *GbE Performance Errors* tabbed sheet appears displaying the GbE error counter for the two GbE ports of the OmniBAS-4W subrack. 

Continued on next page

Monitoring Ethernet Traffic through Wireline L2 Ports (GbE), Continued

Monitoring GbE errors counters (continued)

Step	Action
4	• On the *Toolbar* of the *Performance Monitor* window, click the Now button to see the error counters for both GbE ports for a time period between the completion of the last 15 min interval until the current time. • In case you want to: – Reset the collected statistics concerning the GbE error counters, click the Reset button of the *GbE Performance Errors* tabbed sheet (at the bottom-right side of the *Performance Monitor* window). – Reset all the collected statistics concerning the selected OmniBAS node, click the Reset button in the toolbar of the *Performance Monitor* window. – Save all the collected statistics concerning the selected OmniBAS node in a text file, click the Save button in the toolbar of the *Performance Monitor* window. NOTE See Appendix A – Statistic Counters Description for the description of the counters displayed in the *GbE Performance Errors* tabbed sheet.

End of procedure.

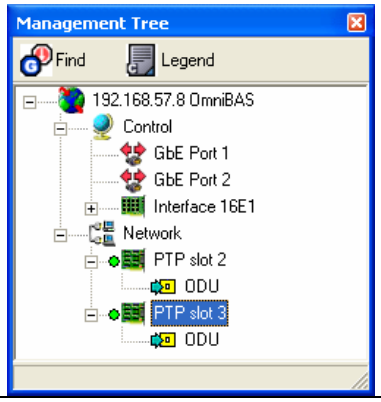
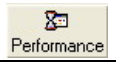
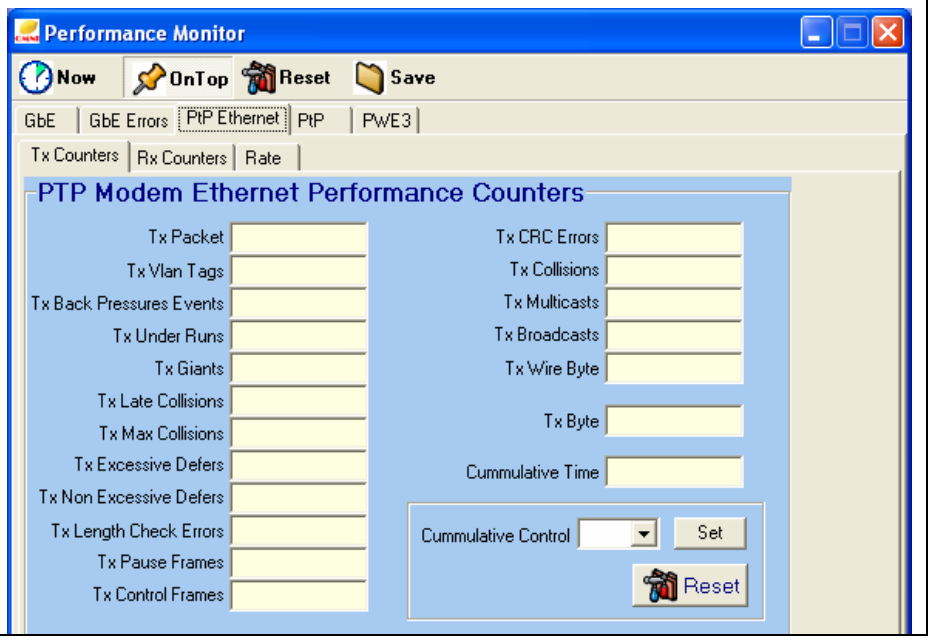
Monitoring Ethernet Traffic through Wireless L2 Ports (Modem)

Introduction

This paragraph describes how to monitor the Ethernet traffic conveying through a wireless L2 port (i.e. a modem) of an OmniBAS node.

Monitoring ETH traffic (Tx/ Rx counters)

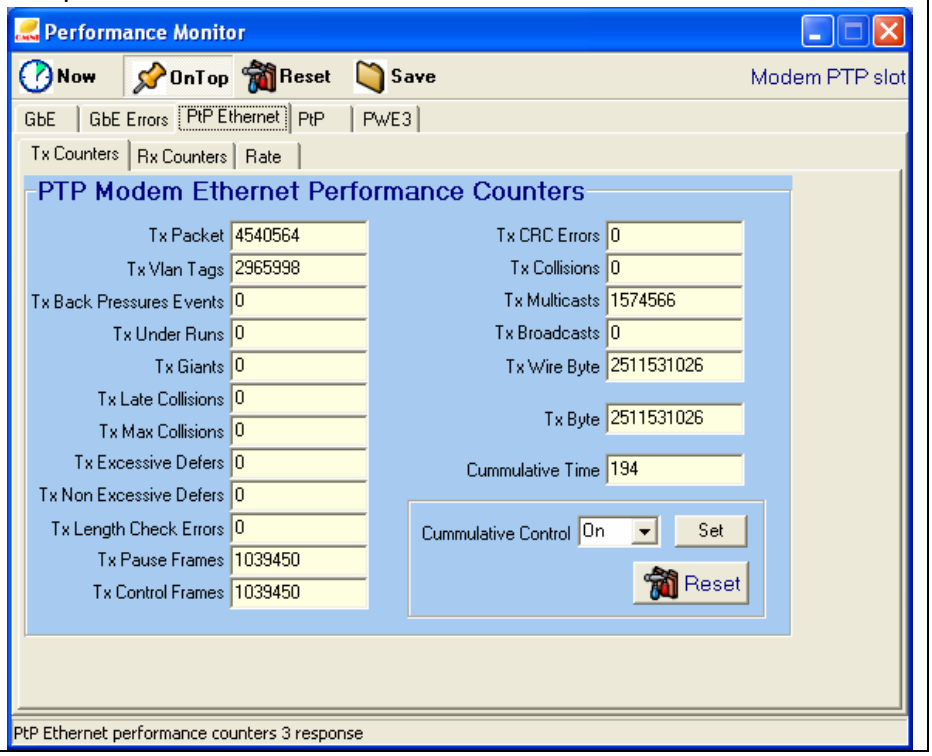
To monitor the Ethernet traffic (Tx/ Rx counters) conveying through a modem of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node and select the modem you want (e.g. PTP slot 3 of 192.168.57.8 OmniBAS).
2	On the *Main Menu*, select **Windows** > **Performance Monitor** (or click  , on the *Toolbar*).
3	In the *Performance Monitor* window that appears, click the **PtP Ethernet** tab and then click: • **Tx Counters** tab to monitor the Tx Ethernet traffic • **Rx Counters** tab to monitor the Rx Ethernet traffic 

Continued on next page

Monitoring Ethernet Traffic through Wireless L2 Ports (Modem), Continued

Monitoring ETH traffic (Tx/ Rx counters) (continued)

Step	Action
4	On the *Toolbar* of the *Performance Monitor* window, click the Now button to see the statistics for the received Ethernet traffic (through *Rx Counters* tabbed sheet) or for the transmitted Ethernet traffic (through *Tx Counters* tabbed sheet) for a time period between the completion of the last 15 min interval until the current time [(1)]. 

Continued on next page

[(1)] e.g. If the time is 12.26 pm and you click the Now button, you will see the performance for the eleven min between 12.15 pm and 12.26 pm. If the time is 12.35 pm and you click the Now button, you will see the performance for the five minutes between 12.30 pm and 12.35 pm.

Monitoring Ethernet Traffic through Wireless L2 Ports (Modem), Continued

Monitoring ETH traffic (Tx/ Rx counters) (continued)

Step	Action
5	From the **Cumulative Control** drop-down list, select: • *On*, in case you want to collect Ethernet statistics over time • *Off*, in case you want to collect real-time Ethernet statistics
6	In case you want to: • Reset the collected statistics concerning the Ethernet traffic conveying through the selected modem, click the Reset button of the *PTP Modem Ethernet Performance Counters* tabbed sheet (at the bottom-right side of the *Performance Monitor* window). • Reset all the collected statistics concerning the selected OmniBAS node, click the Reset button in the toolbar of the *Performance Monitor* window. • Save all the collected statistics concerning the selected OmniBAS node in a text file, click the Save button in the toolbar of the *Performance Monitor* window.

NOTE See Appendix A – Statistic Counters Description for the description of the counters displayed in the *PTP Modem Ethernet Performance Counters* tabbed sheets.

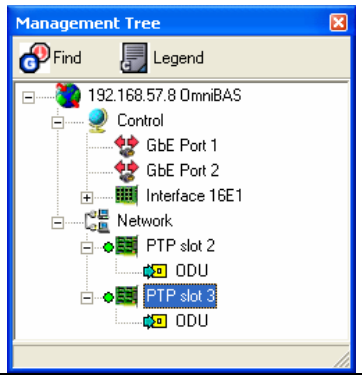
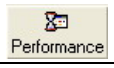
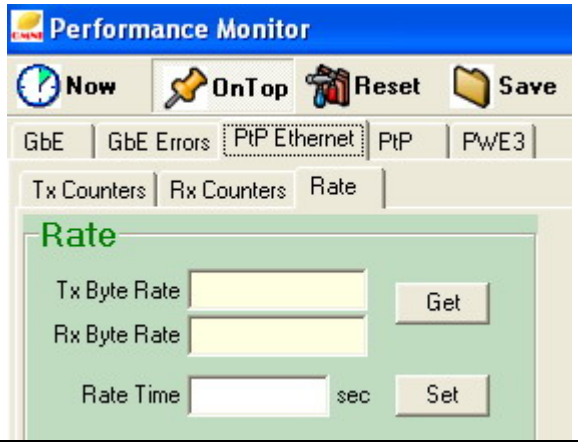
End of procedure.

Continued on next page

Monitoring Ethernet Traffic through Wireless L2 Ports (Modem), Continued

Monitoring/ Setting byte rate of ETH traffic

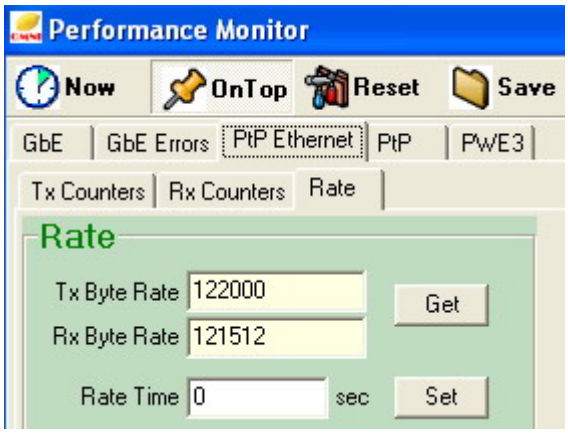
To monitor the bytes rate of the Ethernet traffic conveying through a modem of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node and select the modem you want (e.g. PTP slot 3 of 192.168.57.8 OmniBAS).
2	On the *Main Menu*, select **Windows** > **Performance Monitor** (or click  , on the *Toolbar*).
3	 In the *Performance Monitor* window that appears, click the **PtP Ethernet** tab and then click the **Rate** tab.

Continued on next page

Monitoring Ethernet Traffic through Wireless L2 Ports (Modem), Continued

Monitoring/ Setting byte rate of ETH traffic (continued)

Step	Action
4	In the *Rate* tabbed sheet, click the Get button to retrieve the bytes rate transmitted/ received by the modem.  If you want to change the rate time, type the new one (in sec) to the **Rate Time** text box and click the Set button. For example, if 1 sec is set as rate time, the **Tx Byte Rate** (or **Rx Byte Rate**) field displays the bytes per second transmitted (or received) by the modem.
5	In case you want to: • Reset all the collected statistics concerning the selected OmniBAS node, click the Reset button in the toolbar of the *Performance Monitor* window. • Save all the collected statistics concerning the selected OmniBAS node in a text file, click the Save button in the toolbar of the *Performance Monitor* window.

End of procedure.

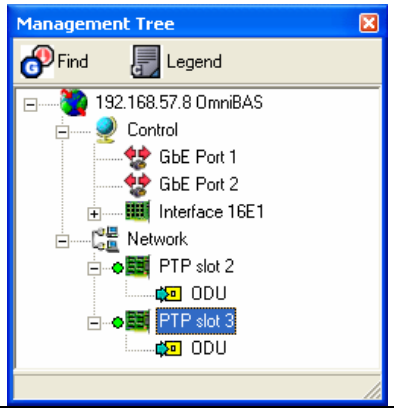
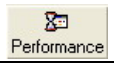
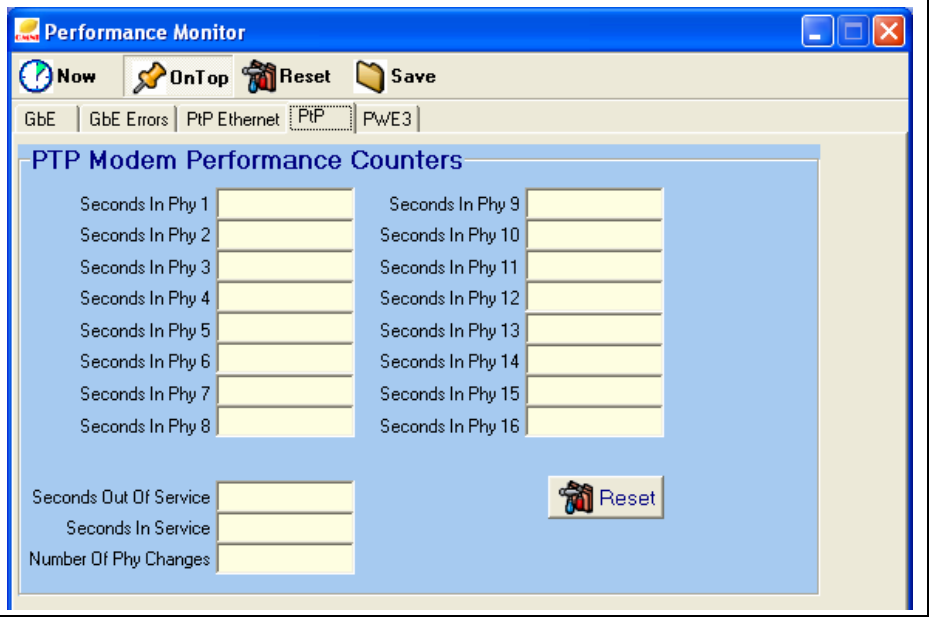
Monitoring the Performance of a Modem

Introduction

This paragraph describes how to monitor the performance of an OmniBAS node modem.

Monitoring modem performance

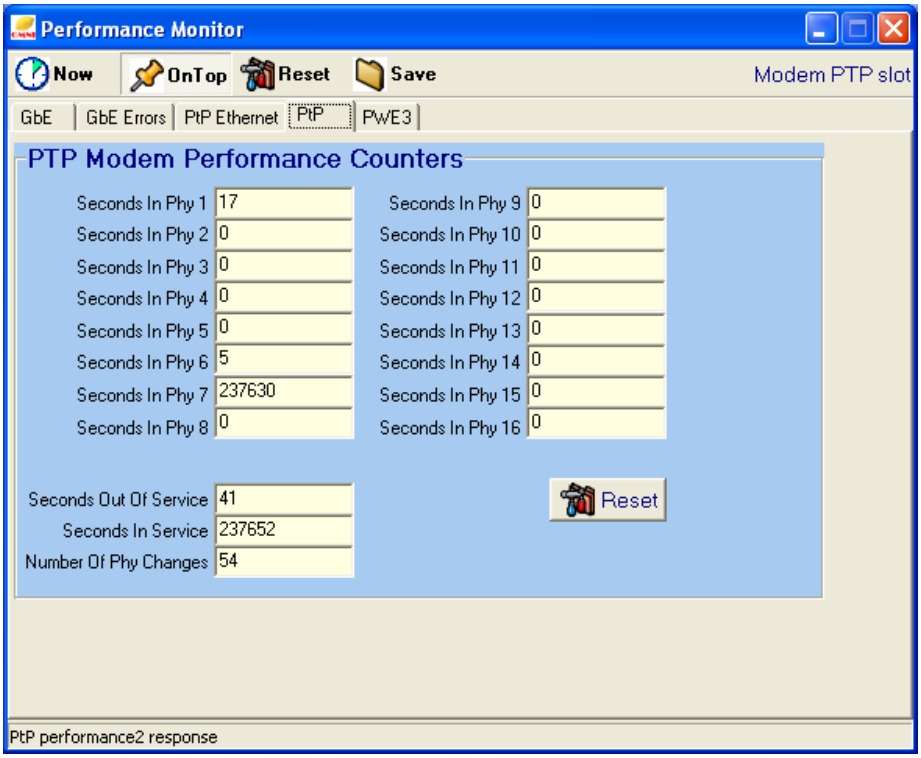
To monitor the performance of a modem for a specific OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node and select the modem you want (e.g. PTP slot 3 of 192.168.57.8 OmniBAS).
2	On the *Main Menu*, select **Windows** > **Performance Monitor** (or click  , on the *Toolbar*).
3	In the *Performance Monitor* window that appears, click the **PtP** tab. The *PTP Modem Performance Counters* tabbed sheet appears: 

Continued on next page

Monitoring the Performance of a Modem, Continued

Monitoring modem performance (continued)

Step	Action
4	On the *Toolbar* of the *Performance Monitor* window, click the Now button to see the statistics for the selected modem for a time period between the completion of the last 15 min interval until the current time(1).  Through the *PTP Modem Performance Counters* tabbed sheet, you can monitor: • *Seconds In Phy X* (2): The total time (in sec) that the Physical Modulation Profile *X* has been used by the selected modem. • *Seconds Out Of Services*: The total time (in sec) that the selected modem is out of service. • *Seconds In Service*: The total time (in sec) that the selected modem is in service. • *Number Of Phy Changes*: The number of times the Physical Modulation Profile of the modem has been change.

Continued on next page

(1) e.g. If the time is 12.26 pm and you click the Now button, you will see the performance for the eleven min between 12.15 pm and 12.26 pm. If the time is 12.35 pm and you click the Now button, you will see the performance for the five minutes between 12.30 pm and 12.35 pm.
(2) Where *X* = 1, 2, …, 16. Also, for more information about the Physical Modulation Profiles, see par. Setting manual modulation mode, on page 43.

Monitoring the Performance of a Modem, Continued

Monitoring modem performance (continued)

Step	Action
5	In case you want to: • Reset the collected statistics concerning the performance of the selected modem, click the  button of the *PTP Modem Performance Counters* tabbed sheet (at the bottom-right side of the *Performance Monitor* window). • Reset all the collected statistics concerning the selected OmniBAS node, click the  button in the toolbar of the *Performance Monitor* window. • Save all the collected statistics concerning the selected OmniBAS node in a text file, click the  button in the toolbar of the *Performance Monitor* window.

End of procedure.

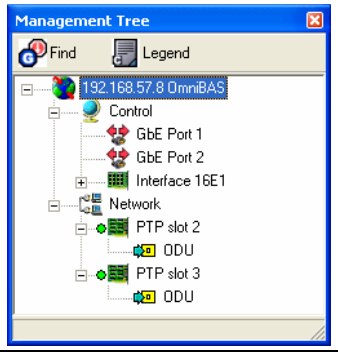
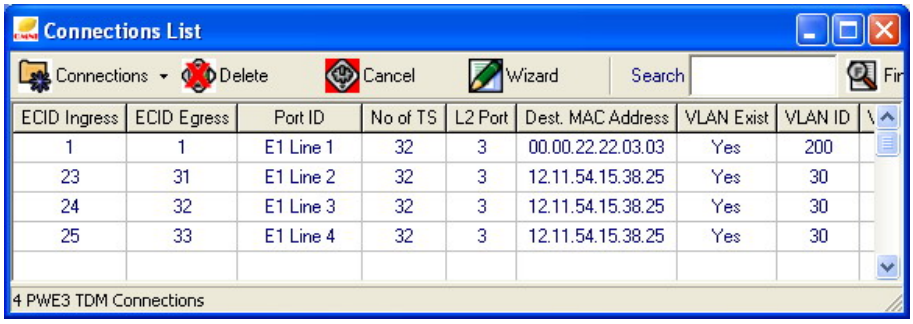
Monitoring the Performance of a PWE3 TDM Connection

Introduction

This paragraph describes how to monitor the performance for a PWE3 TDM connection of an OmniBAS node.

Monitoring the performance of a PWE3 TDM connection

To monitor the performance for a PWE3 TDM connection of an OmniBAS node, proceed as follows:

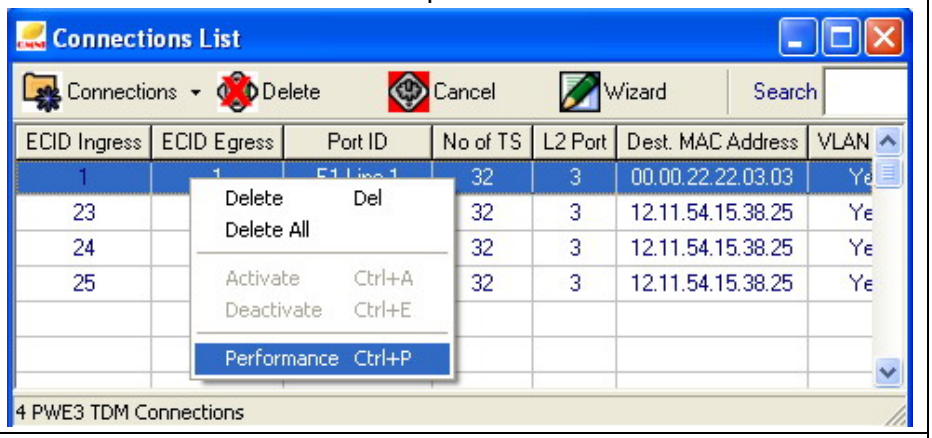
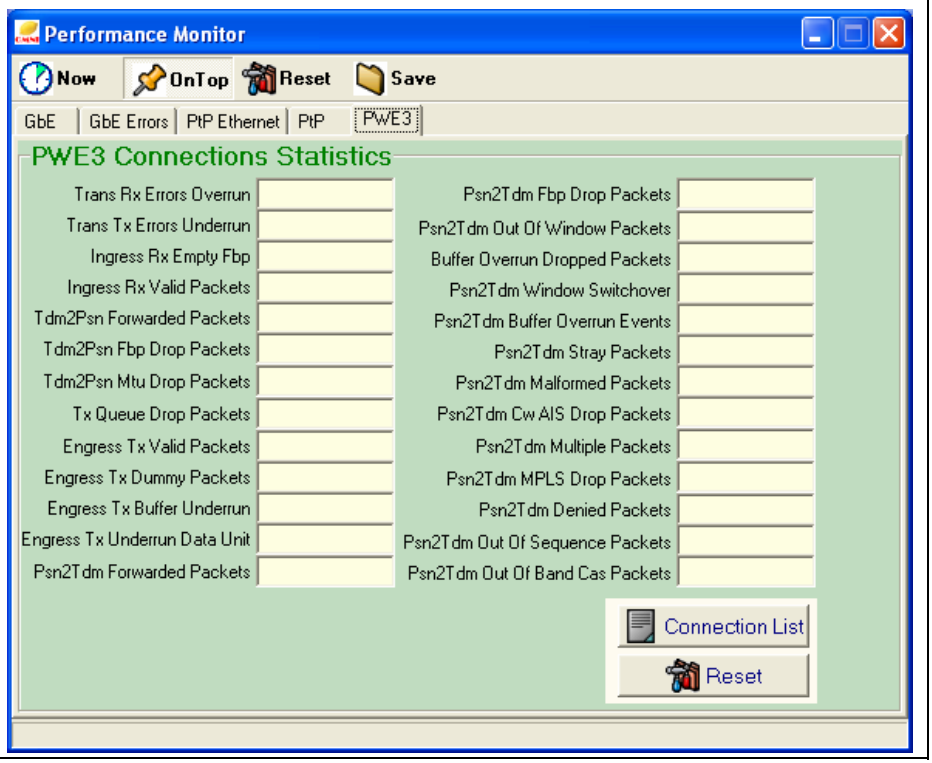
Step	Action
1	 In the *Management Tree*, click the OmniBAS node you want (e.g. 192.168.57.8 OmniBAS).
2	On the *Main Menu*, select **Tools** > **Connection List** (or click  , on the *Toolbar*)[1].
3	On the toolbar of the *Connections List* window that appears expand the  button and click **PWE3 TDM**. The PWE3 TDM connections associated with the selected OmniBAS node appear. 

Continued on next page

[1] Alternatively, you can open the *Performance Monitor* window (by selecting **Windows** > **Performance Monitor** on the *Main Menu*) and click the  button.

Monitoring the Performance of a PWE3 TDM Connection,
Continued

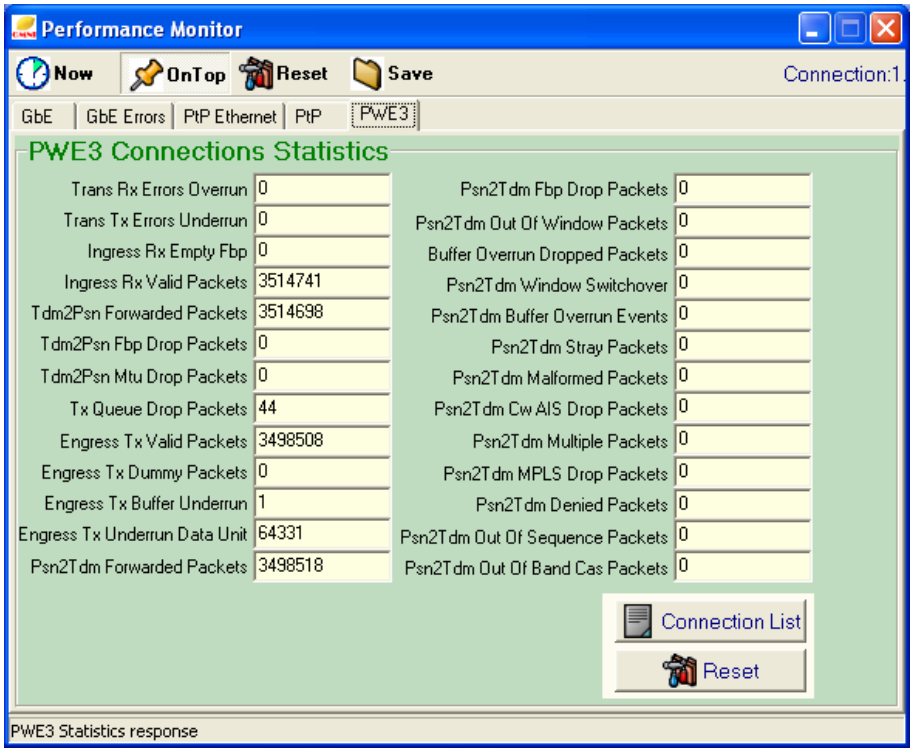
Monitoring the performance of a PWE3 TDM connection (continued)

Step	Action
4	Click the row corresponding to the PWE3 TDM connection you want to monitor and click the right mouse button. From the drop-down menu select the **Performance** option. 
5	The *Performance Monitor* window appears with the **PWE3** tab selected: 

Continued on next page

Monitoring the Performance of a PWE3 TDM Connection,
Continued

Monitoring the performance of a PWE3 TDM connection (continued)

Step	Action
6	On the *Toolbar* of the *Performance Monitor* window, click the Now button to see the statistics for the selected PWE3 TDM connection for a time period between the completion of the last 15 min interval until the current time(1). 

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(1) e.g. If the time is 12.26 pm and you click the Now button, you will see the performance for the eleven min between 12.15 pm and 12.26 pm. If the time is 12.35 pm and you click the Now button, you will see the performance for the five minutes between 12.30 pm and 12.35 pm.

Monitoring the Performance of a PWE3 TDM Connection, Continued

Monitoring the performance of a PWE3 TDM connection (continued)

Step	Action
7	In case you want to: • Reset the collected statistics concerning the performance of the selected PWE3 TDM connection, click the  button of the *PWE3 Connections Statistics* tabbed sheet (at the bottom-right side of the *Performance Monitor* window). • Reset all the collected statistics concerning the selected OmniBAS node, click the  button in the toolbar of the *Performance Monitor* window. • Save all the collected statistics concerning the selected OmniBAS node in a text file, click the  button in the toolbar of the *Performance Monitor* window.

NOTE See Appendix A – Statistic Counters Description for the description of the counters displayed in the *PWE3 Connections Statistics* tabbed sheet.

End of procedure.

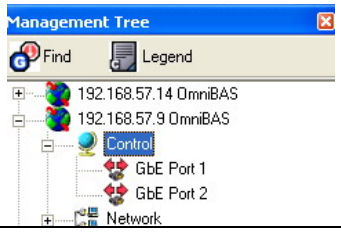
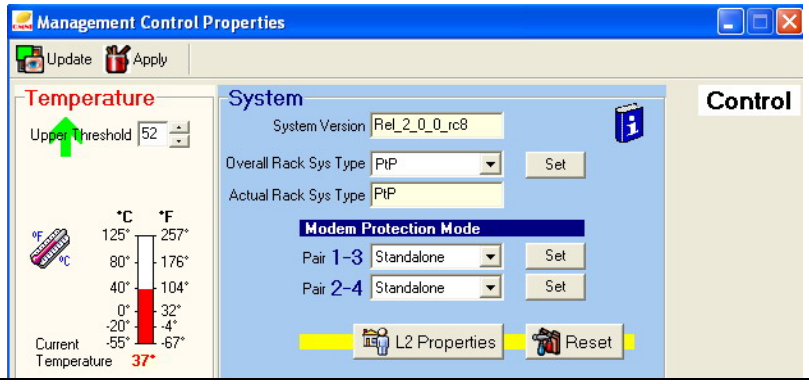
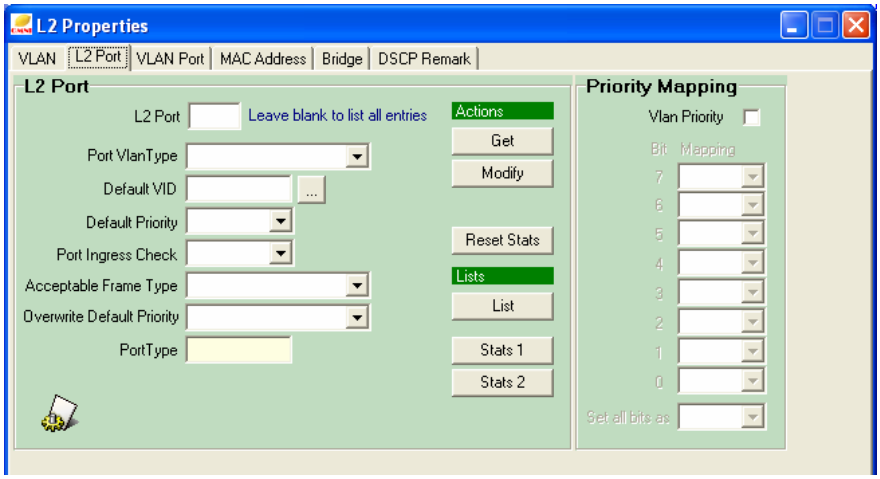
Monitoring the L2 Ports Performance

Introduction

This paragraph describes how to monitor the performance of the L2 ports of an OmniBAS node.

Monitoring L2 ports performance

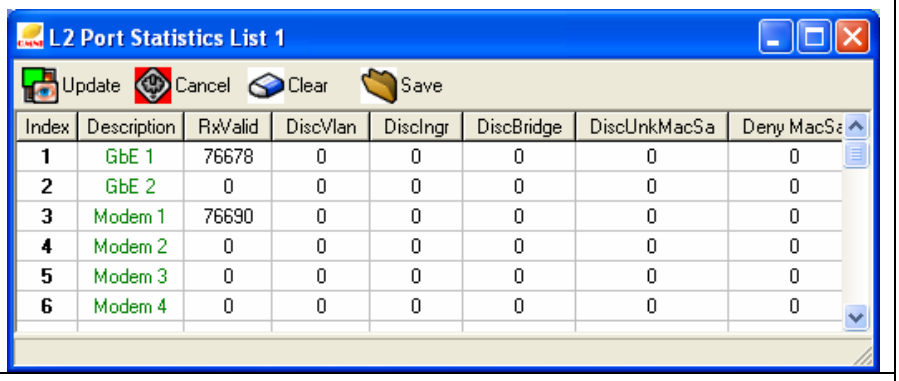
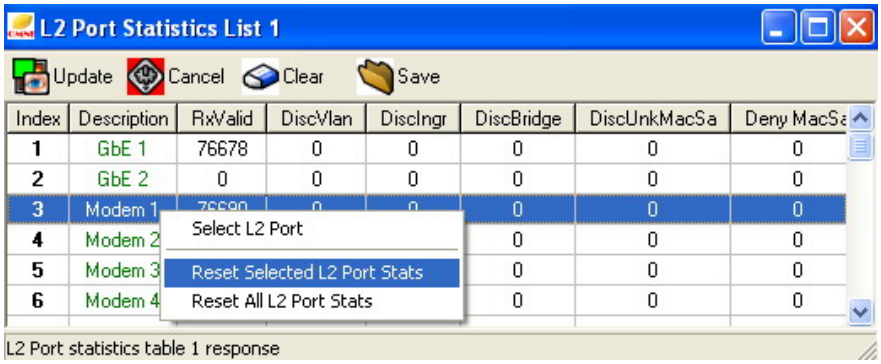
To monitor the performance of an L2 port for a specific OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window, click the **L2 Port** tab.  In the *L2 Port* tabbed sheet, click Stats 1 and/ or Stats 2 buttons to view the L2 bridge counters.

Continued on next page

Monitoring the L2 Ports Performance, Continued

Monitoring L2 ports performance (continued)

Step	Action
4	In the *L2 Port Statistic List 1* (or *2*) window that appears, click the Update button to display the statistics concerning the L2 ports of the selected OmniBAS node. 
5	If you want to reset the statistics of an L2 port, select the L2 port you want (e.g. Modem 1), click the right mouse button and from the drop-down menu select the **Reset Selected L2 Port Stats** option.  In the same way, if you want to reset the counters of all L2 ports, select an L2 port, click the right mouse button and from the drop-down menu select the **Reset All L2 Port Stats** option.

End of procedure.

7 Non-Routine Procedures

The following non-routine procedures mentioned in this chapter are carried out when required:

- Performing Store, Backup or Restore Action
- Resetting/ Restarting OmniBAS Node Modules
- Clearing OmniBAS Node Configuration
- Setting Inband Management / Changing Management VLAN

7.1 Performing Store, Backup or Restore Action

This section describes how to perform the following actions:

- **Store:** Saves the most current settings and configuration of an OmniBAS node to the OmniBAS-4W equipment.
- **Backup:** Downloads the saved configuration files from the OmniBAS-4W equipment locally to your PC/ Laptop.
- **Restore:** Uploads the configuration files from your PC/ Laptop to the OmniBAS-4W equipment.

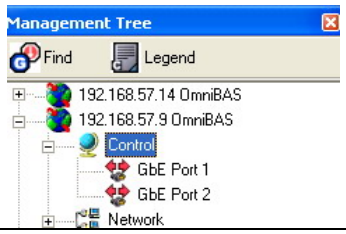
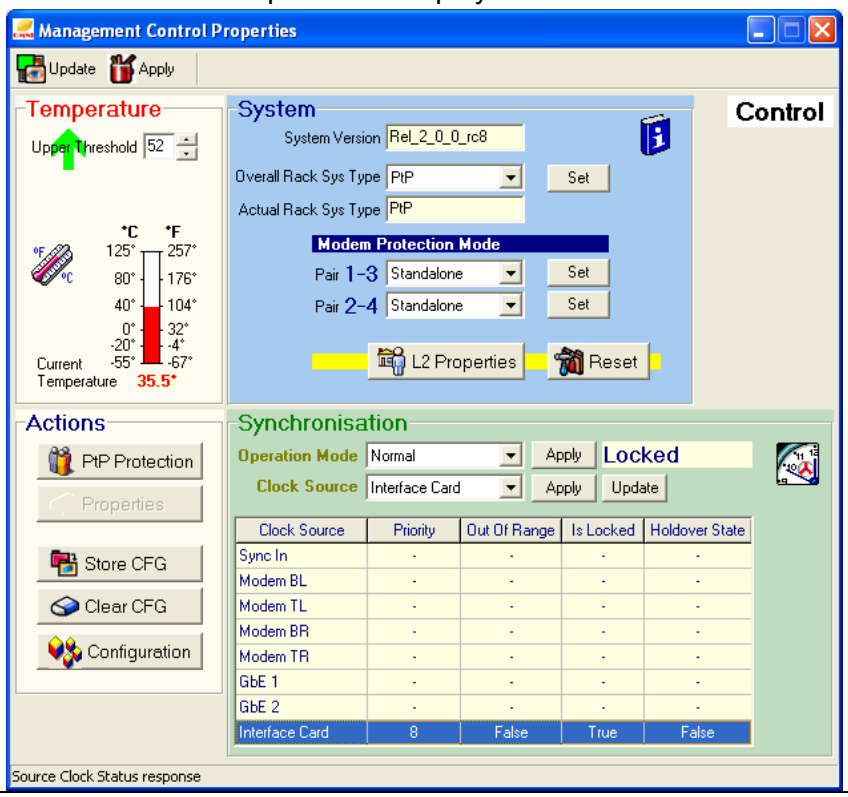
Saving the Configuration of an OmniBAS Node

Introduction

This paragraph describes how to store the configuration of an OmniBAS node in the processor module of the OmniBAS-4W equipment.

Saving OmniBAS configuration

To save the configuration of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to update the displayed data. 

Continued on next page

Saving the Configuration of an OmniBAS Node, Continued

Saving OmniBAS configuration (continued)

Step	Action
3	In the **Actions** group box, click the  button. In the confirmation message that appears click **Yes** to proceed. The settings and the configuration of the OmniBAS node is now saved.

End of procedure.

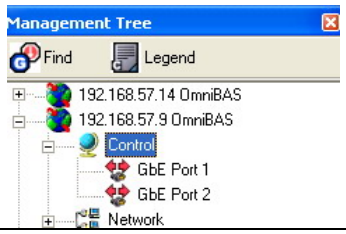
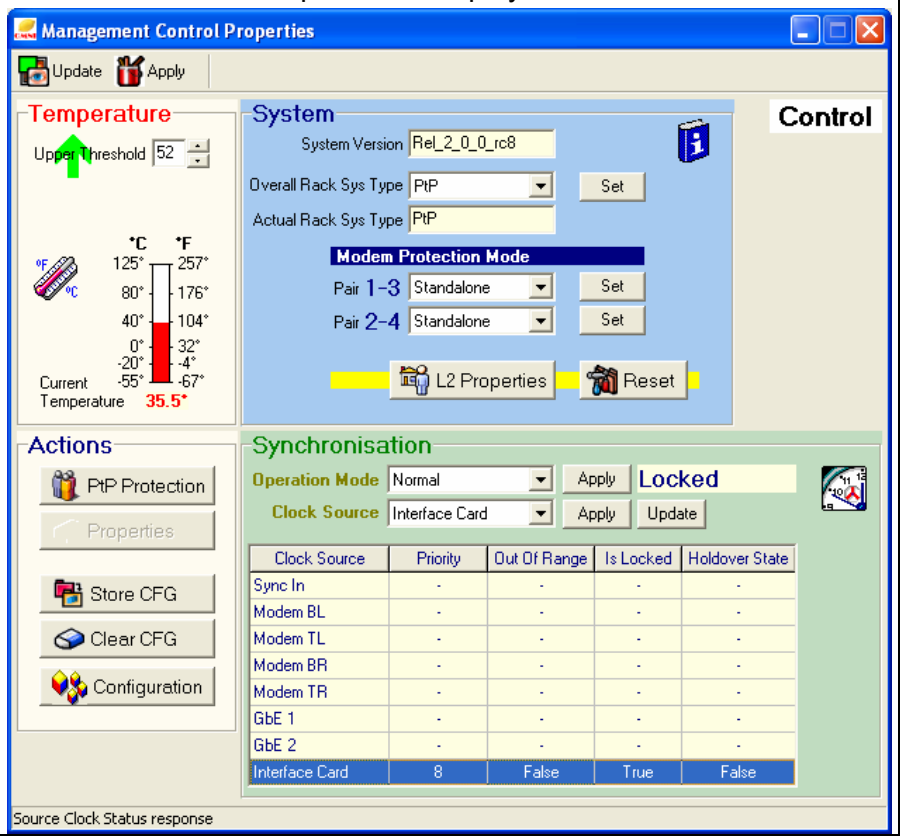
Performing a Backup Action

Introduction

This paragraph describes how to download the most recent configuration files from the OmniBAS-4W equipment locally to your PC/ Laptop.

Performing a backup action

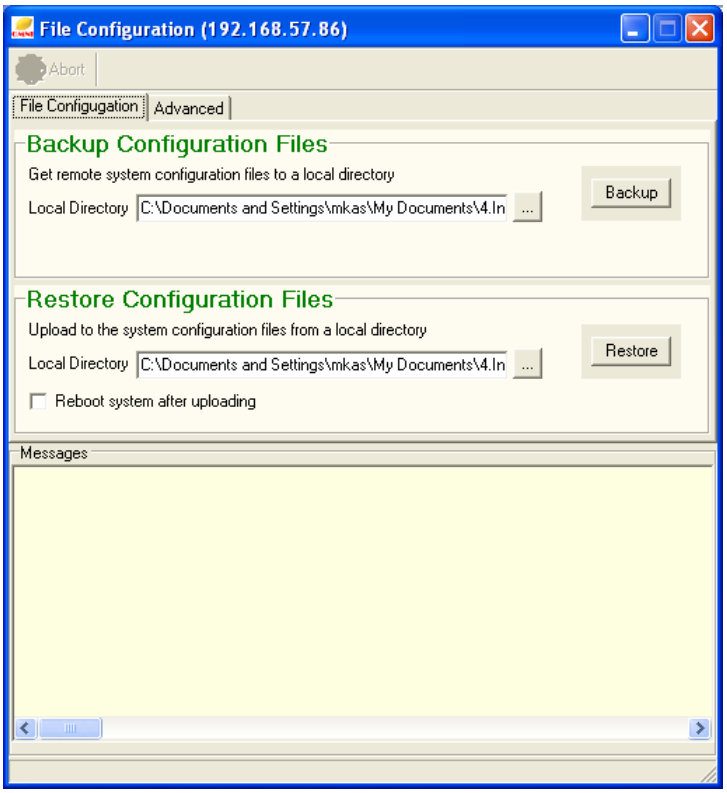
To perform a backup action, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to update the displayed data. 

Continued on next page

Performing a Backup Action, Continued

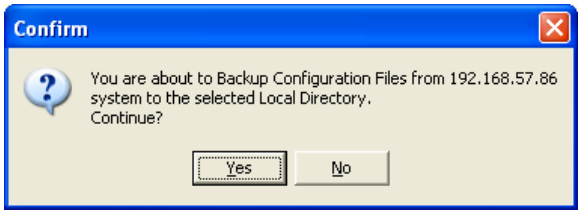
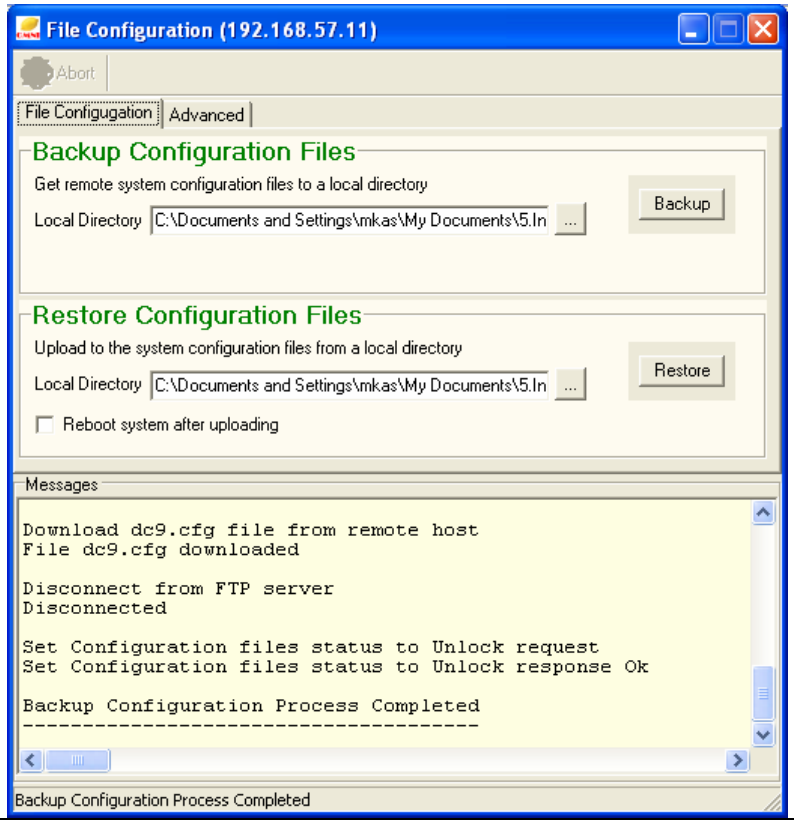
Performing a backup action (continued)

Step	Action
3	In the **Actions** group box, click the Configuration button. The following window appears: 
4	In the **Backup Configuration Files** group box of the *File Configuration* tabbed sheet, click the button ... and select the local directory to store the system configuration files.

Continued on next page

Performing a Backup Action, Continued

Performing a backup action (continued)

Step	Action
5	Click the Backup button. The following message appears:  Click **Yes** to start downloading the configuration files from the OmniBAS-4W equipment. **NOTE** When performing a backup action, first, the system saves the most current settings and configuration of the OmniBAS node to the OmniBAS-4W equipment and then downloads the configuration files to your PC/ Laptop. Thus, it is not needed to save the configuration of an OmniBAS node (i.e. to click the Store CFG button) prior to performing a backup action.
6	Wait until the “Backup Configuration Process Completed” message appears in the *Messages* area. 

End of procedure.

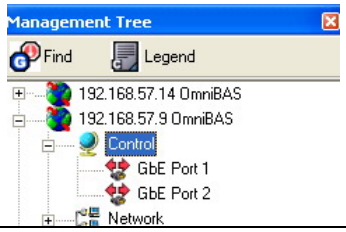
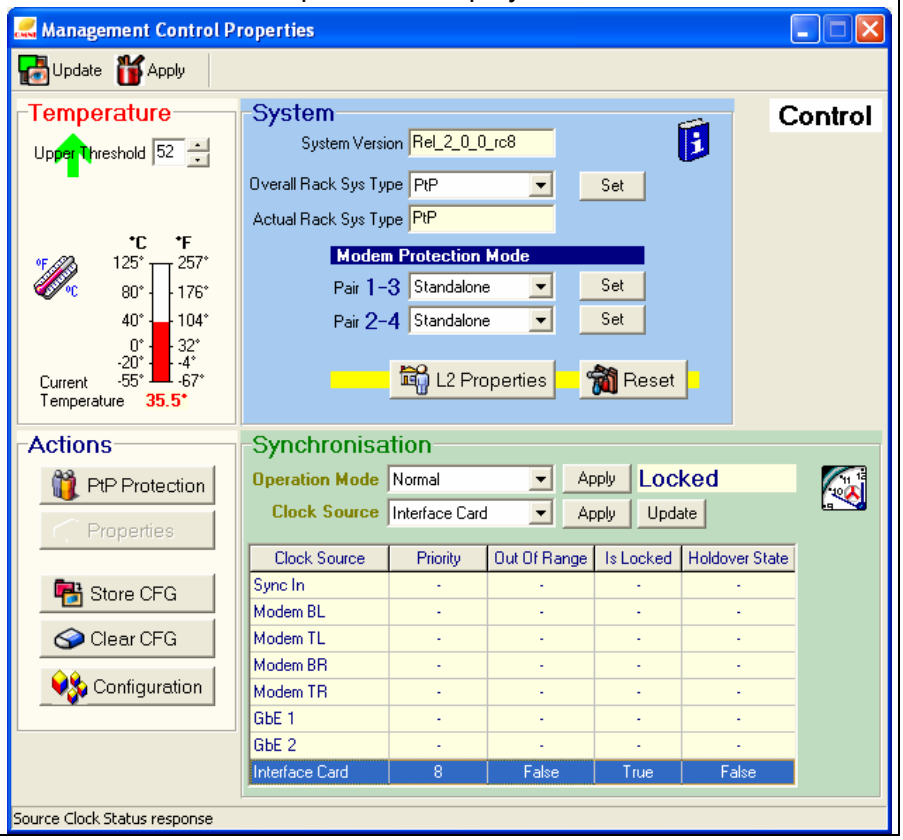
Performing a Restore Action

Introduction

This paragraph describes how to upload configuration files from your PC/ Laptop to the OmniBAS-4W equipment.

Performing a restore action

To perform a restore action, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to update the displayed data. 

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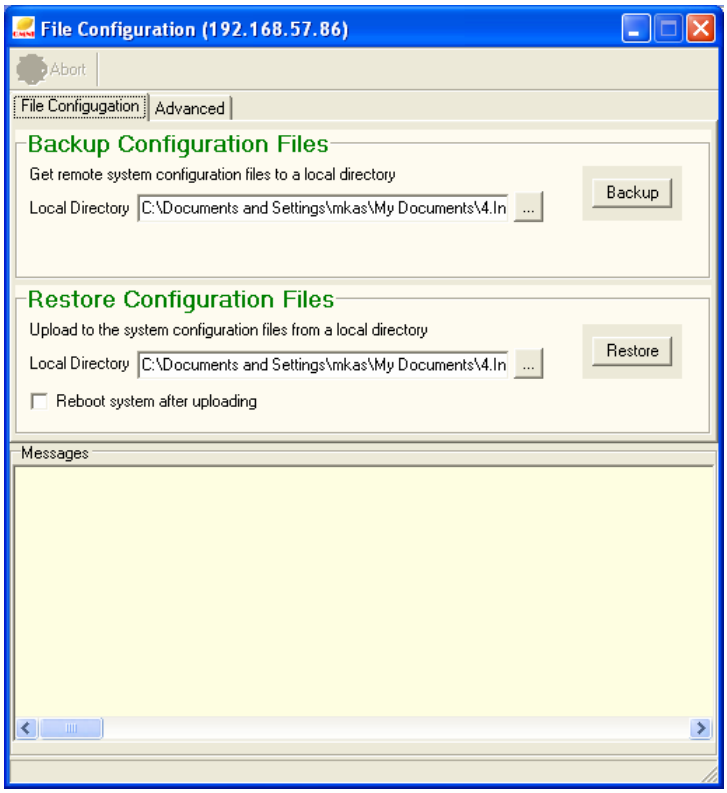
Performing a Restore Action, Continued

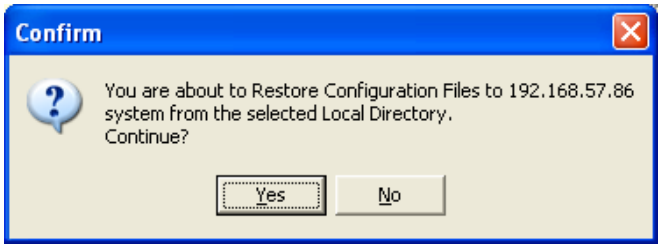
Performing a restore action (continued)

Step	Action
3	In the **Actions** group box, click the Configuration button. The following window appears: 
4	In the **Restore Configuration Files** group box of the *File Configuration* tabbed sheet, click the button ... and select the local directory where the system configuration files you want to upload are stored.
5	Select the **Reboot system after uploading** check box for automatic system reboot after configuration uploading. **NOTE** If you not select the **Reboot system after uploading** check box, you should reboot the system (by clicking the Reset button located in the **System** group box of the *Management Control Properties* window) at a convenient time for the uploaded configuration to take effect.

Continued on next page

Performing a Restore Action, Continued

Performing a restore action (continued)

Step	Action
6	Click the Restore button. The following message appears:  Click **Yes** to start uploading the configuration files to the OmniBAS-4W equipment.
7	Wait until the "Restore Configuration Process Completed" message appears in the *Messages* area. The system reboots and the uploaded configuration takes effect (if the **Reboot system after uploading** check box is selected). **NOTE** If you did not select the **Reboot system after uploading** check box, you should reboot the system (by clicking the Reset button located in the **System** group box of the *Management Control Properties* window) at a convenient time for the uploaded configuration to take effect.

End of procedure.

7.2 Resetting/ Restarting OmniBAS Node Modules

This chapter described how to reset/ restart the elements of an OmniBAS node. The chapter contains the following topics:

Resetting Processor Module

Introduction

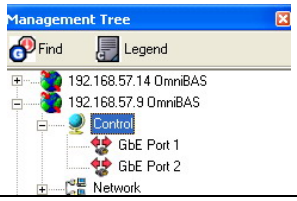
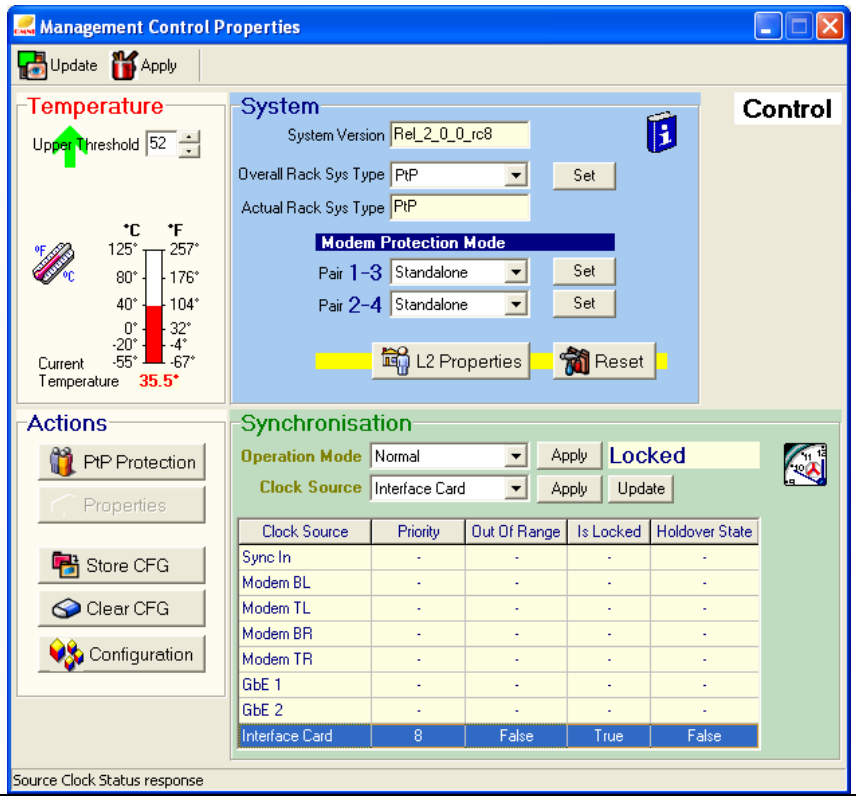
This paragraph describes how to perform a reset action to the processor module of an OmniBAS node, when needed.

When a processor reset is performed, the configuration of the OmniBAS node is saved and the processor module reboots.

It is strongly recommended to avoid performing the Reset action, because traffic loss will occur.

Resetting processor module

To reset the processor module of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to view the current properties of the *Control* element. 

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Resetting Processor Module, Continued

Resetting processor module (continued)

Step	Action
3	In the **System** group box, click the  button.
4	In the confirmation message that appears, click **Yes** to continue.
5	Wait the reset process of the processor module to complete.

End of procedure.

Resetting/ Restarting a Modem

Introduction

This paragraph describes how to reset or restart a modem, when needed.

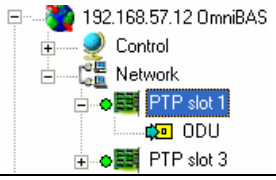
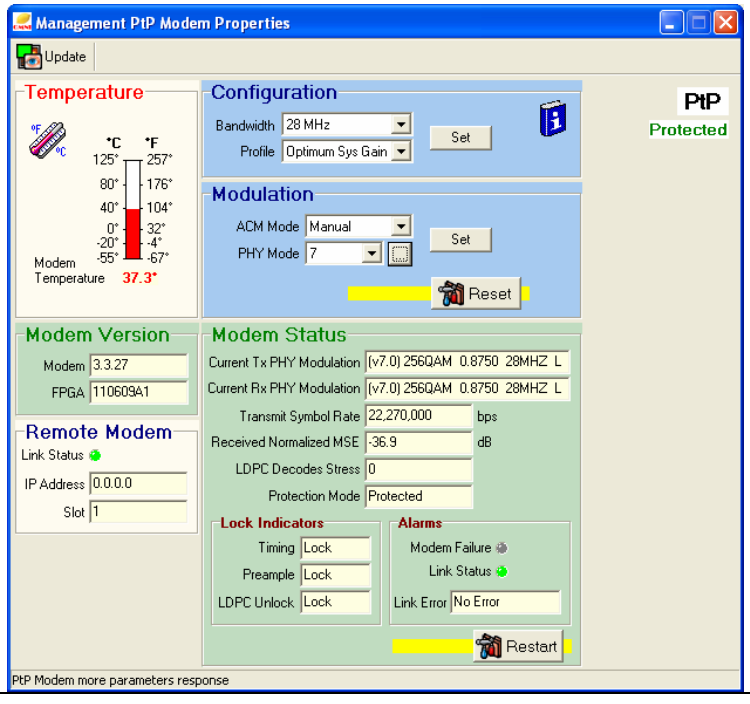
It is strongly recommended to avoid performing the Reset action. This process will cause link downtime.

NOTE When resetting a modem that is protected, an automatic switching process is initiated.

NOTE The restart action of a modem is mainly performed for debugging purposes.

Restarting/ resetting a modem

To restart or reset a modem, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element and click the modem you want (e.g. PTP slot 1).
2	In the *Management PtP Modem Properties* window, click the Update button to view the current properties of the modem. 

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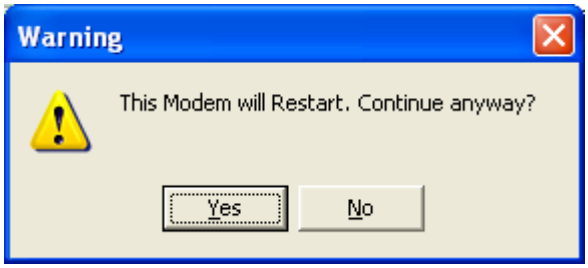
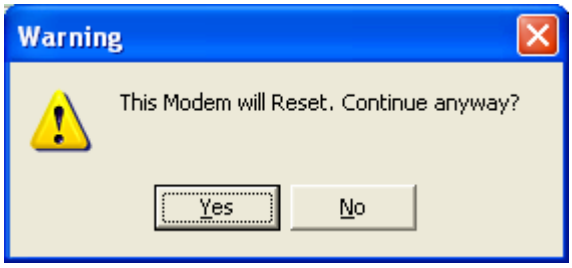
Resetting/ Restarting a Modem, Continued

Restarting/ resetting a modem (continued)

Step	Action
3	To restart the modem, click the Restart button (located in the **Modem Status** group box). In the following confirmation message that appears, click **Yes** to continue:  Wait for the modem restart process to complete.
4	To reset the modem, click the Reset button (located in the **Modem Status** group box). In the following confirmation message that appears, click **Yes** to continue:  Wait for the modem reset process to complete.

End of procedure.

Restarting an ODU

Introduction

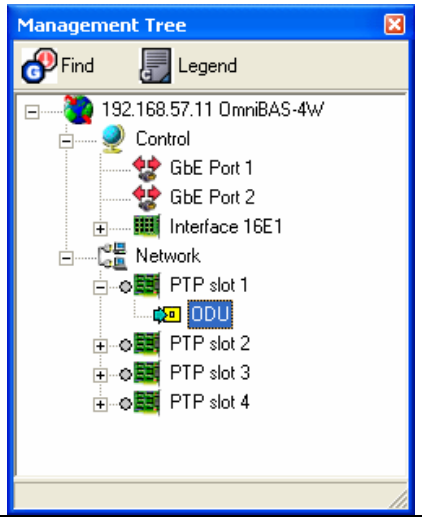
This paragraph describes how to restart an ODU, when needed.

It is strongly recommended to avoid performing the restart action. This process will cause link downtime.

NOTE When restarting an ODU that is working, an automatic switching process is initiated.

Restarting an ODU

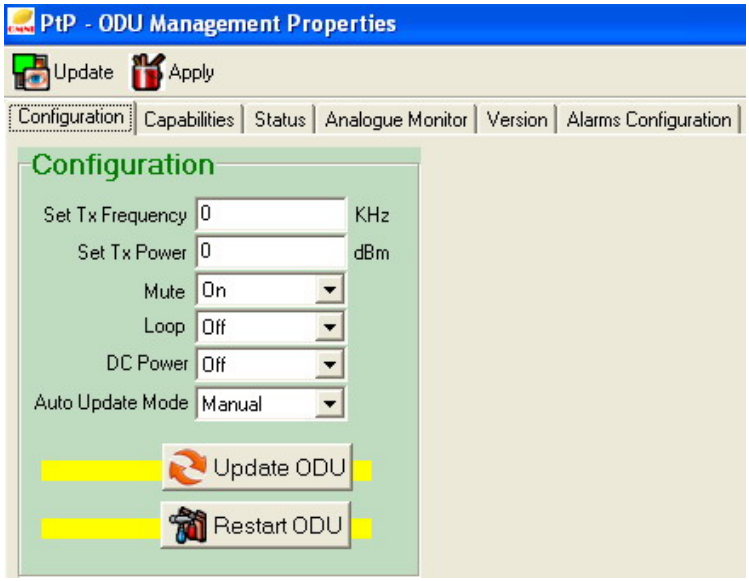
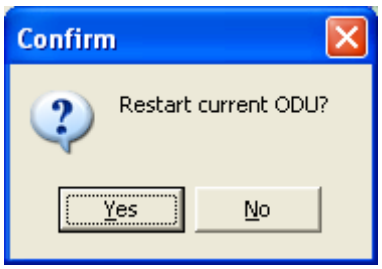
To restart the ODU of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the *Network* element of the OmniBAS node (e.g. 183.168.57.8) and click the ODU you want.

Continued on next page

Restarting an ODU, Continued

Restarting an ODU (continued)

Step	Action
2	In the *PtP -ODU Management Properties* window, ensure that the **Configuration** tab is displayed – if not, select it. In the *Configuration* tabbed sheet, click the Update button to retrieve the current properties of the ODU. 
3	Click the Restart ODU button to restart the selected ODU.
4	In the following confirmation message that appears, click **Yes** to continue:  Wait for the ODU restart process to complete and the communication between the ODU and the indoor equipment to be established.

End of procedure.

7.3 Clearing OmniBAS Node Configuration

Introduction

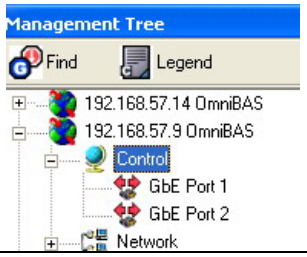
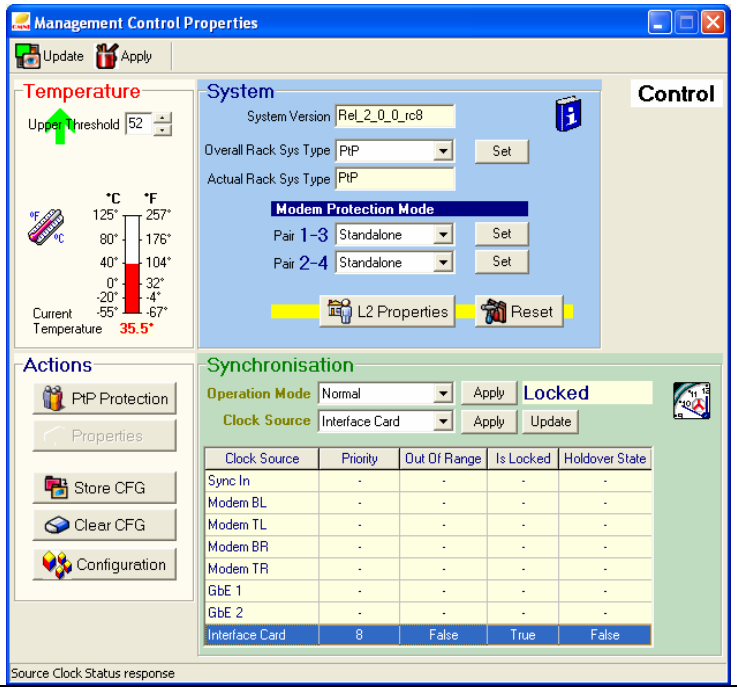
This paragraph describes how to clear the whole configuration (Clear CFG) of an OmniBAS node.

It is strongly recommended not to carry out the Clear CFG action, because:

- **The traffic is lost.**
- **The inband management is lost.**
- **The whole configuration of the OmniBAS node is cleared.**

Clearing system configuration

To clear all configuration of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the Update button to update the displayed data. 

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Clearing OmniBAS Node Configuration, Continued

Clearing system configuration (continued)

Step	Action
3	In the **Actions** group box, click the  button. In case you want to proceed, click **Yes** in the confirmation message that appears. The whole configuration of the OmniBAS node is cleared (e.g. VLANs, connections, etc.) and the system reboots.

End of procedure.

7.4 Setting Inband Management / Changing Management VLAN

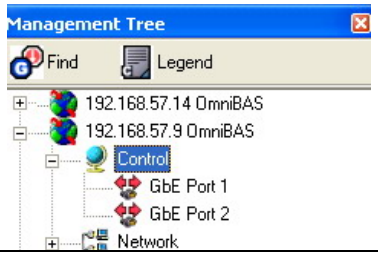
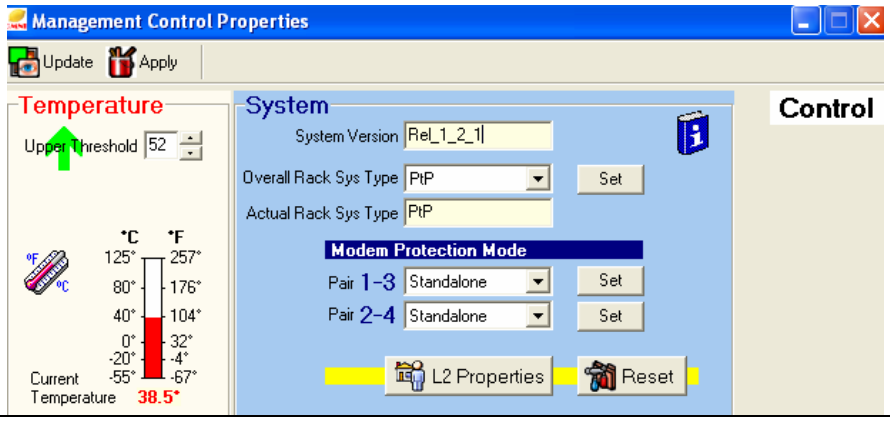
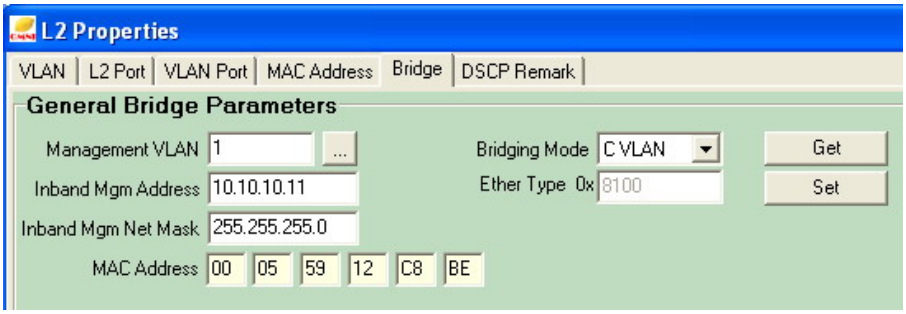
Introduction

This paragraph describes how to:

- Change the management VLAN of an OmniBAS node.
  By default, the VLAN with ID =1 is used for the management.
- Set up the inband management connection of an OmniBAS node.

Changing Management VLAN

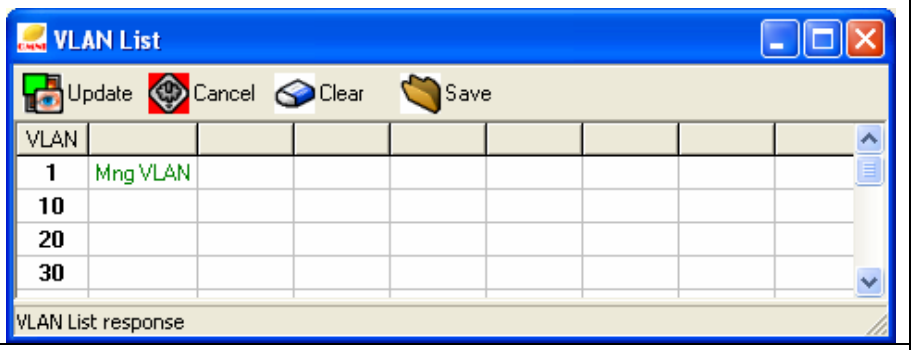
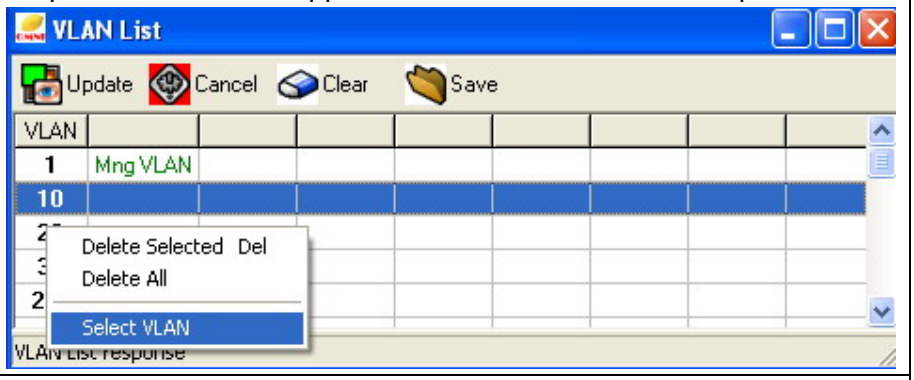
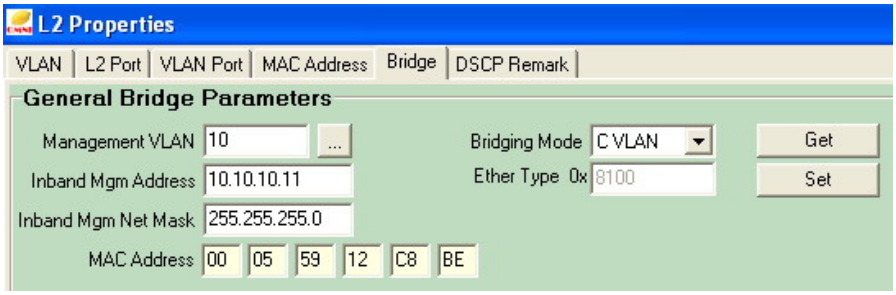
To change the management VLAN of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window, click the **Bridge** tab to display the *Bridge* tabbed sheet and then, click the Get button to retrieve the general bridge parameters.  The **Management VLAN** field displays the current management VLAN. By default, the VLAN with ID =1 is used for the management.

Continued on next page

Setting Inband Management / Changing Management VLAN, Continued

Changing Management VLAN (continued)

Step	Action
4	Click the ... button (next to **Management VLAN** field). In the *VLAN list* window that appears, click the Update button to display all created VLANs. 
5	Select the VLAN you want, click the right mouse button and from the drop-down menu that appears select the **Select VLAN** option. 
6	The selected VLAN ID is displayed in the **Management VLAN** field. 
7	Click the Set button to apply the management VLAN change.

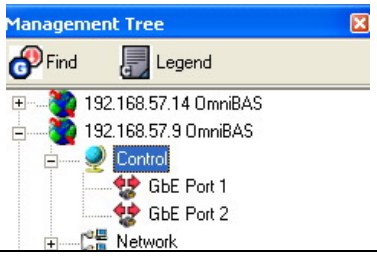
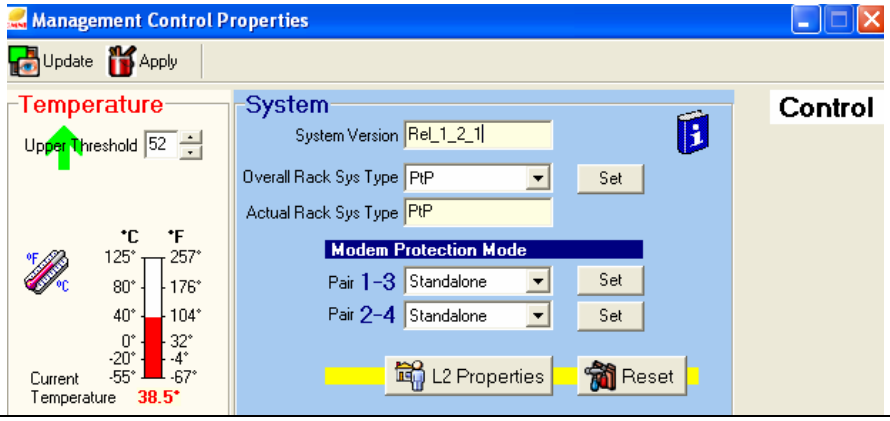
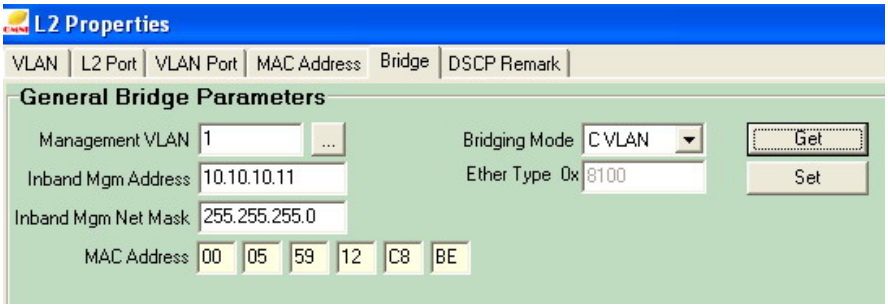
End of procedure.

Continued on next page

Setting Inband Management / Changing Management VLAN, Continued

Setting up inband management connection

To set up the inband management connection of an OmniBAS node, proceed as follows:

Step	Action
1	 In the *Management Tree*, expand the OmniBAS node you want and select the *Control* element.
2	In the *Management Control Properties* window that appears, click the L2 Properties button (located in the **System** group box). 
3	In the *L2 Properties* window, click the **Bridge** tab to display the *Bridge* tabbed sheet and then, click the Get button to retrieve the general bridge parameters.  By default, the VLAN with ID =1 is the management VLAN of the OmniBAS node. If you want to change the management VLAN, see the previous par. Changing Management VLAN (page 182).
4	In the **Inband Mgm Address** text box, type the IP address of the OmniBAS node. If unsure, contact your network administrator.

Continued on next page

Setting Inband Management / Changing Management VLAN, Continued

Setting up inband management connection (continued)

Step	Action
5	In **Inband Mgm Net Mask** text boxes, type the Net Mask of the OmniBAS node. If unsure, contact your network administrator.
6	Click the Set button to apply the new inband settings.

End of procedure.

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Appendix A – Statistic Counters Description

This Appendix provides a short description of the statistic counters displayed in the *Performance Monitor* window. The Appendix includes the following topics:

Rx/ Tx Counters (GbE Ports)

The following table describes the statistic counters about data conveying through the GbE ports. These counters are displayed in the *GbE Performance* tabbed sheet[(1)]:

Counter	Description
Rx Bytes	Total number of good or bad frames transmitted and received with size 128 to 255 bytes in length inclusive (excluding framing bits but including FCS bytes).
Rx Packets	Total number of the received packets including bad packets and all Unicast, Broadcast and Multicast packets.
Rx Multicast Frames	Total number of the multicast good frames with size 64 to 1518 (non VLAN) bytes in length or 1522 (VLAN) bytes in length (excluding broadcast frames).
Rx Broadcast Frames	Total number of the broadcast good frames with size 64 to 1518 (non VLAN) bytes in length or 1522 (VLAN) bytes in length (excluding multicast frames).
Rx Undersize Frames	Total number of the received frames that are less than 64 bytes in length and with a valid FCS value.
Rx Oversize Frames	Total number of the received frames that exceed 1518 bytes (non VLAN) or 1522 bytes (VLAN) in length and contain a valid FCS value.
Tx Bytes	Total number of bytes that were put on the wire including fragments of frames that were involved with collisions. This count does not include preamble/SFD or jam bytes.
Tx Packets	Total number of the transmitted packets including bad packets, excessive deferred packets, excessive collision packets, late collision packets and all Unicast, Broadcast and Multicast packets.
Tx Multicast Frames	Total number of the transmitted multicast frames (excluding broadcast frames).
Tx Broadcast Frames	Total number of the transmitted broadcast frames (excluding multicast frames).
Tx Undersize Frames	Total number of the transmitted frames that are less than 64 bytes in length and with a valid FCS value.
Tx Oversize Frames	Total number of the oversized transmitted frames with a valid FCS value.
Ethernet Transmitter underun	Total number of times that the Ethernet transmitter underun occurred.
Buffer Overrun Discarded frames	Total number of the received Ethernet frames discarded due to a receive buffer overrun event (no available buffers).
Tx Frames	Total number of complete good frames transmitted.

(1) Open the *Performance Monitor* window of an OmniBAS node, and click **GbE** tab > **GbE 1/2** tab.

Rx/ Tx Error-Counters (GbE Ports)

The following table describes the error-statistic counters about data conveying through the GbE ports. These counters are displayed in the *GbE Performance Errors* tabbed sheet[1]:

Counter	Description
In Pause Frames	Number of received Pause frames (i.e. control frames containing valid pause opcode[2]). Pause frames are used to pause the flow of traffic when traffic congestion occurs.
Out Pause Frames	Number of transmitted Pause frames (i.e. control frames containing valid pause opcode[2]). Pause frames are used to pause the flow of traffic when traffic congestion occurs.
Out Pause Honored Frames	Number of pause frames not transmitted.
Alignment Errors	Number of alignment errors for the received frames. An alignment error is caused when a received frame does not end on a byte boundary and the CRC does not match at the last byte boundary.
FCS Errors	Number of received valid size frames with FCS (Frame Check Sequence) error but no framing errors.
Single Collision Frames	Number of frames involved in a single collision but subsequently are transmitted successfully.
Multiple Collision Frames	Number of frames involved in more than one collision but subsequently are transmitted successfully.
Deferred Transmissions	Number of transmitted frames deferred for an excessive period of time.
Late Collisions	Number of late collisions[3] detected.
Excessive Collisions	Number of frames that, due to excessive collisions, are discarded.
Carrier Sense Errors	Number of frames transmitted with carrier sense errors. This normally occurs as a result of collisions.
Frame Too Longs	Number of received frames that exceed the maximum permitted frame size.
Internal Mac receive Errors	Number of received packets discarded because of MAC sub-layer error.
Symbol Errors	Number of symbols received but not correctly decoded.

(1) Open the *Performance Monitor* window of an OmniBAS node, and click **GbE Errors** tab > **GbE Errors 1/2** tab.

(2) Opcodes: Operational codes contained in MAC Control frames

(3) Normal collisions occur during the first 512 bits of frame transmission. If a collision occurs after 512 bit times, then it is considered an error and called a late collision. A late collision is a serious error, since it indicates a problem with the network system, and since it causes the frame being transmitted to be discarded.

Tx Counters (Wireless L2 Ports)

The following table describes the statistic counters about Ethernet traffic transmitted through the wireless L2 ports (PtP Modems). The Tx Ethernet counters are displayed in the *PTP Modem Ethernet Performance Counters* (Tx Counters) tabbed sheet[1]:

Counter	Description
Tx Packet	Number of transmitted Ethernet frames.
Tx VLAN Tags	Number of transmitted VLAN-tagged frames.
Tx Back Pressures Events	Number of carrier-sense-method back-pressure previously applied.
Tx Under Runs	Number of frames not transmitted due to under-run errors.
Tx Giants	Number of frames discarded as they have length size greater than the Max Frame Size of 1518 bytes (excluding preamble).
Tx Late Collisions	Number of late collisions[2] detected.
Tx Max Collisions	Number of frames aborted after number of collisions exceeded the Retransmission Maximum parameter.
Tx Excessive Defers	Number of transmitted frames deferred for an excessive period of time.
Tx Non Excessive Defers	Number of frames successfully transmitted after transmission has been deferred at least once.
Tx Length Check Errors	Number of transmitted frames with length that does not match the actual data byte length.
Tx Pause Frames	Number of transmitted Pause frames (i.e. control frames containing valid pause opcode[3]).
Tx Control Frames	Number of transmitted Control frames (i.e. frames contain a valid hex 0x8808 value in the type field).
Tx CRC Errors	Number of transmitted frames with invalid CRC (Cyclic Redundancy Check) value.
Tx Collisions	Number of collisions the current frame incurred during transmission attempts. It applies to successfully transmitted packets.
Tx Multicasts	Number of transmitted multicast frames (i.e. frames including multicast destination address).
Tx Broadcasts	Number of transmitted broadcast frames (i.e. frames including broadcast destination address).
Tx Wire Byte	Number of transmitted bytes, counting also all bytes from collided attempts.
Tx Byte	Number of transmitted bytes, not counting collided bytes.
Cumulative Time	Time in sec that the current Tx Ethernet statistics collected.

[1] Open the *Performance Monitor* window of a modem, and click **PtP Ethernet** tab > **Tx Counters** tab.

[2] Normal collisions occur during the first 512 bits of frame transmission. If a collision occurs after 512 bit times, then it is considered an error and called a late collision. A late collision is a serious error, since it indicates a problem with the network system, and since it causes the frame being transmitted to be discarded.

[3] Opcodes: Operational codes contained in MAC Control frames

Rx Counters (Wireless L2 Ports)

The following table describes the statistic counters about Ethernet traffic received by the wireless L2 ports (PtP Modems). The Rx Ethernet counters are displayed in the *PTP Modem Ethernet Performance Counters* (Rx Counters) tabbed sheet[1]:

Counter	Description
Rx Packet	Number of received Ethernet frames.
Rx CRC Errors	Number of received frames with invalid CRC (Cyclic Redundancy Check) value.
Rx Truncated Frames	Number of truncated received frames.
Rx Long Events	Number of received overlong frames (i.e. frames having byte count greater than the maximum frame size).
Rx VLAN Tags Detected	Number of received VLAN-tagged frames.
Rx Unsupported OpCodes	Number of received frames recognized as control frames but contain unknown opcodes[2].
Rx Pause Frames	Number of received Pause frames (i.e. frames recognized as control frames containing valid pause opcode[2] and also have valid destination address).
Rx Control Frames	Number of received Control frames (i.e. frames contain a valid hex 0x8808 value in the type field).
Rx Dribble Nibbles	Number of received frames including dribble nibble (i.e. including extra 1 to 7 bits at the end of the frame). The extra bits are thrown away.
Rx Broadcasts	Number of received broadcast frames (i.e. frames including broadcast destination address).
Rx Multicasts	Number of received multicast frames (i.e. frames including multicast destination address).
Rx Out Of Range Errors	Number of received frames with length field that exceeds the 1518 bytes.
Rx Length Check Errors	Number of received frames with length that does not match the actual data byte length.
Rx Code Errors	Number of received frames including one or more nibbles signalled as errors.
Rx False Carrier Errors	Number of false carrier events detected (i.e. a false carrier event detected after the last receive of a frame and it is not associated with this packet).
Rx Dv Event	Number of last received events that are too short to be valid packets.
Rx Previous Packet Drop	Number of packets dropped since the last receive.
Rx Byte	Number of received bytes, not counting collided bytes.
Cumulative Time	Time in sec that the current Rx Ethernet statistics collected.

[1] Open the *Performance Monitor* window of a modem, and click **PtP Ethernet** tab > **Rx Counters** tab.
[2] Opcodes: Operational codes contained in MAC Control frames

L2 Port Counters

L2 Port Statistics List 1

The following table describes the statistic counters of the L2 ports. These counters are displayed in the *L2 Port Statistics List 1* window[(1)]:

Counter	Description
RxValid	Number of frames that passed all input filters.
DiscVLAN	Number of frames that were discarded by the VLAN acceptable filtering.
DiscIngr	Number of frames that were discarded by the ingress filtering.
DiscBridge	Number of frames that were discarded by the classifier (DFC deny).
DiscUnkMACSa	Number of frames that were discarded because their source MAC address was unknown.
Deny MACSa	Number of frames that were discarded because their source MAC address was denied
Deny MACDa	Number of frames that were discarded because their destination MAC address was denied.
rxBcValid	Number of broadcast valid packets were received
rxMcValid	Number of multicast valid packets were received
ForwUc	Number of unicast frames that were forwarded.
ForwBc	Number of broadcast frames that were forwarded.
ForwMc	Number of multicast frames that were forwarded.
ProtErr	Number of packets dropped due to protocol error.

L2 Port Statistics List 2

The following table describes the statistic counters of the L2 ports. These counters are displayed in the *L2 Port Statistics List 2* window[(1)]:

Counter	Description
Forward	Number of valid packets forwarded by L2 port.
Fbp Drop	*Not used*
Mtu Drop	*Not used*
Ttl Drop	*Not used*
Tx Queue Drop	Number of packets dropped due to a congestion in the transmit queue.
Mpls Drop	*Not used*
Denied	*Not used*
Group Filtered	*Not used*
Forwarded Bytes	*Not used*

Continued on next page

(1) To open the *L2 Port Statistics List 1*or *2* window, see par. Monitoring the L2 Ports Performance, on page 162.

L2 Port Counters, Continued

L2 Port Statistics List 2 (continued)

Counter	Description
Gtp Bad Headers	*Not used*
Policer NonConforming	*Not used*

PWE3 TDM Counters

The following table describes the statistic counters concerning a selected PWE3 TDM connection. PWE3 TDM counters are displayed in the *PWE3 Connections Statistics* tabbed sheet[(1)]:

Counter	Description
Trans Rx Errors Overrun	*Not used*
Trans Tx Errors Underrun	Number of invalid buffers received from PSN side.
Ingress Rx Empty Fbp	*Not used*
Ingress Rx Valid Packets	Number of received (from TDM side) packets forwarded to PSN side.
Tdm2Psn Forwarded Packets	Number of successfully forwarded packets to PSN side.
Tdm2Psn Fbp Drop Packets	*Not used*
Tdm2Psn Mtu Drop Packets	*Not used*
Tx Queue Drop Packets	Number of packets dropped due to a congestion in the transmit queue on PSN side.
Egress Tx Valid Packets	Number of packets successfully transmitted to TDM side.
Egress Tx Dummy Packets	*Not used*
Egress Tx Buffer Underrun	*Not used*
Egress Tx Underrun Data Unit	Number of times that transmit underrun occurred due to no packets received from PSN side, so no Rx buffers available exist to handle the Tx requests to TDM side.
Psn2Tdm Forwarded Packets	Number of successfully forwarded packets to TDM side.
Psn2Tdm Fbp Drop Packets	How many times received packets were rejected due to no available buffers on TDM side.
Psn2Tdm Out of Window Packets	*Not used*
Buffer Overrun Dropped Packets	*Not used*
Psn2Tdm Window Switchover	*Not used*
Psn2Tdm Buffer Overrun Events	*Not used*
Psn2Tdm Stray Packets	*Not used*
Psn2Tdm Malformed Packets	*Not used*
Psn2Tdm Cw AIS Drop Packets	*Not used*

Continued on next page

(1) Open the *Performance Monitor* window of a modem, click the **PWE3** tab and then click the Connection List button. In the *Connection List* window that appears, select the PWE3 TDM connection you want. The corresponding statistic counters appear in the *PWE3 Connections Statistics* tabbed sheet.

PWE3 TDM Counters, Continued

Counter	Description
Psn2Tdm Multiple Packets	*Not used*
Psn2Tdm Mpls Drop Packets	*Not used*
Psn2Tdm Denied Packets	*Not used*
Psn2Tdm Out of Sequence Packets	*Not used*
Psn2Tdm Out of Band Cas Packets	*Not used*

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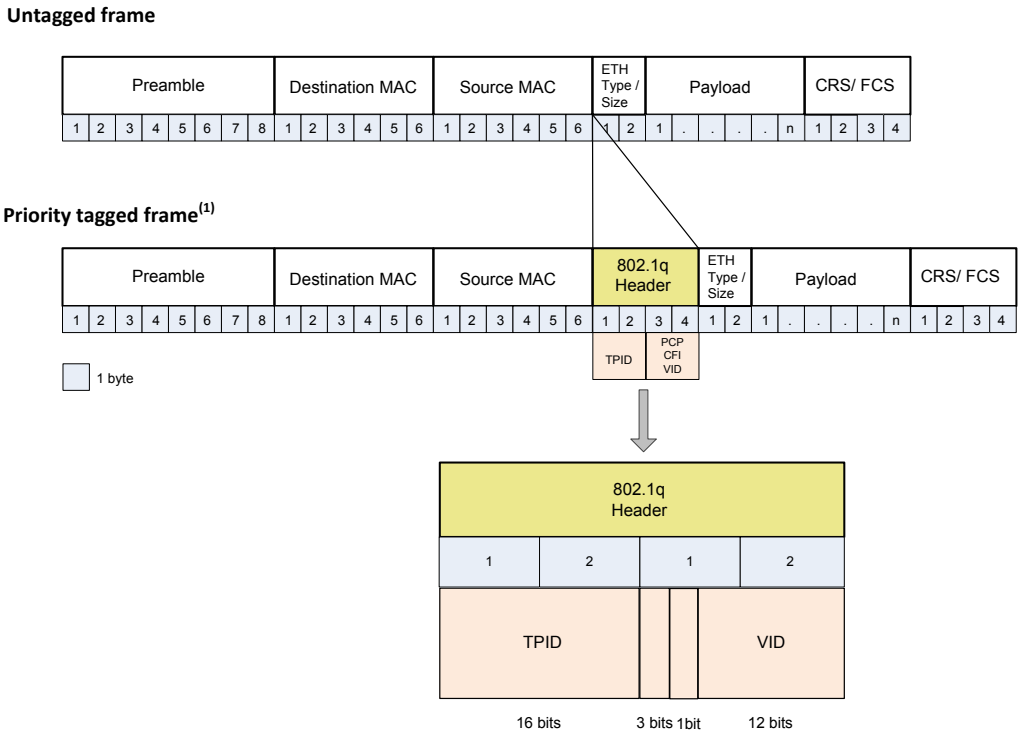
Appendix B – 802.1Q Ethernet Frame

About Ethernet MAC frame

According IEEE 802.1Q specification, the Ethernet MAC frames are tagged as the following schematic shows:



(1) Tagged frame (when PCP=0)

About 802.1Q header

- **TPID (Tag Protocol Identifier)** – Indicates that the frame is an IEEE 802.1Q tagged frame. This field is located at the same position as the ETH Type/Size field in untagged frames, and thus it is used to distinguish the frame from untagged frames.
- **PCP (Priority Code Point)** – Refers to the IEEE 802.1p priority that indicates the frame priority level from 0 (lowest) to 7 (highest), allowing packets to be grouped into various classes of traffic (voice, video, data, etc).
- **CFI (Canonical Format Indicator)** – Indicates whether the MAC address is in canonical (CFI=1) or non-canonical format (CFI=0). It is always set to zero(1) for Ethernet switches.
- **VID (VLAN ID)** – Indicates the VLAN to which the frame belongs. It takes values from 1 to 4096. VID= 1, by default, is reserved for management. The frame does not belong to any VLAN, when VID=0 (in this case the 802.1Q tag specifies only a priority and is referred to as a priority tag).

(1) CFI is used for compatibility reason between Ethernet type network and Token Ring type network. If a frame received at an Ethernet port has CFI=1, then that frame should not be forwarded as it is to an untagged port.

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