DIGITAL
MICROWAVE SYSTEM
Network Management System
NMS v2.0

USER MANUAL

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Technical Writing
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0.4 HISTORY

Change No.	ENU	Details Of Change
1	1-1-0	User Manual initially created and issued in Feb 2008.

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0.5 ISSUE CONTROL

Date	01 Feb 08
Section	
All	all

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0.6 READERS COMMENTS

Whilst every endeavour is made to ensure the accuracy of this and all Comba documents, there is always the possibility that an inaccuracy or omission could occur.

In order that any amendment/remedial action can be carried out promptly, we would appreciate your co–operation in filling out and returning a photocopy of this customer reply sheet as soon as possible.

Customer Information:

Name	
Title	
Company	
Date	
Address	
Telephone Number	

Customer Comments:

Equipment title	
ENU	1-1-0
Page number	
Paragraph number	
Line number	
Figure number	
Details of inaccuracies	
Other comments	

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0.7 GLOSSARY OF TERMS

NMS
Abbreviation of "Network Management System", is specified as Comba Digital Microwave Network Management System

SNMP
Abbreviation of "Simple Network Management Protocol"

MIB
Abbreviation of "Managed Information Base", is used for the elements that support the SNMP protocol

MIB Tree
Displays the hierarchy between the MIB components in the form of tree structure

OID
Abbreviation of "Object Identity", is the exclusive identity of the objects managed by MIB

Get
One of the commands of SNMP protocol, is used to query the OID value of one object directly

Get Next
One of the commands of SNMP protocol is used to query the OID value of the next object.

Set
One of the commands of SNMP protocol, is used to set the OID value of one object directly

Trap
One of the commands of SNMP protocol, normally, it is used as a notice sent to the port #162 of NMS platform by the managed element. Trap functions to inform the alarm activities as Alarm Generation and Alarm Cessation to NMS automatically. Without replying, the NMS user can clearly view the notice type and the latest value of the monitored parameter from the Trap notice.

Multi Instance Parameter
One type of parameter is a collection of parameters with multiple values to stand for. But the parameter count is not stable and needs to be queried by the "Get Next" command of SNMP protocol. It is applicable for the queries on the variation of route information, router information, element records information, etc.

Network element
The smallest unit in a network, it is considered to be element in this document.

Monitored Network element
The element that could be monitored. In a topology view, the antenna is used to achieve a complete topology construction, so it is not considered to be a monitored network element in the network.

Active Alarm
Displays the alarm generated currently to the monitored element.

Parameter
The general designation of the property and monitored data of an element. It is presented with parameter Name, value, and configurable properties as description, password, and the monitored data that could be read and set. The property of network and site can also be considered as a parameter.

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Monitored parameter
One part of element parameter that could be read and set.

BER
Abbreviation of Bit Error Rate is a monitored parameter used commonly for microwave elements. A statistic can be made on this parameter, called BER statistic.

RF Hop
The wireless transmitting path for traffic. It can be considered as an element collection.

Access IP
The IP address for element parameter query/set through SNMP protocol. For the network elements with multiple IP ports, select one IP address that is reachable by NMS.

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0.8 REFERENCE

0.7.1	NMS v1.10 QU 1-0-0	User manual released in November 2005.
0.7.2	NMS v2.0 QU 1-0-0	On-line Help released in September 2007.
0.7.3	ML-NMSV200-1001YH	Original user manual released in September 2007.

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0.9 SAFETY NOTICES AND ADMONISHMENTS

This document contains safety notices in accordance with appropriate standards. In the interests of conformity with the territory standards for the country concerned, the equivalent territorial admonishments are also shown.

Any installation, adjustment, maintenance and repair of the equipment must only be carried out by trained, authorized personnel. At all times, personnel must comply with any safety notices and instructions.

Specific hazards are indicated by symbol labels on or near the affected parts of the equipment. The labels conform to international standards, are triangular in shape, and are colored black on a yellow background. An informationmative text label may accompany the symbol label.

Hazard labeling is supplemented by safety notices in the appropriate equipment manual. These notices contain additional information on the nature of the hazard and may also specify precautions.

Warning:

These draw the attention of personnel to hazards which may cause death or injury to the operator or others. Examples of use are cases of high voltage, laser emission, toxic substances, point of high temperature, etc.

Alert:

These draw the attention of personnel to hazards which may cause damage to the equipment. An example of use is the case of static electricity hazard.

Caution notices may also be used in the handbook to draw attention to matters that do not constitute a risk of causing damage to the equipment but where there is a possibility of seriously impairing its performance, e.g. by mishandling or gross maladjustment. Warnings and Cautions within the main text do not incorporate labels and may be in shortened form.

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0.10 SERVICING POLICY AND RETURN OF EQUIPMENT

The repair of individual units and modules of this equipment is not considered practicable without factory facilities. It is, therefore, the policy of Comba whereby faulty units or modules are returned to the local agent for repair. To enable an efficient, prompt after sales service to be provided for the diagnosis, repair and return of any faulty equipment, please comply with the following requirements. Items to be sent for repair should be packaged so as to provide both electrostatic and physical protection and a Repair Material Authorization (a sample of this is in the appendix) completed giving the required information.

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1 NMS OVERVIEW

1.1 INTRODUCTION

Comba Microwave Digital Network Management System v2.0 (hereafter called “NMS”) is an integragted management platform developed by Comba Telelcom, which is a management platform for the digital microwave equiptments. This NMS v2.0 is designed for performance monitoring and parameter configuring of microwave equipments developed not only by Comba but also from other manufacturers.

The NMS provides customer with a Graphical User Interface (hereinafter called “GUI”) for centralized management and data reporting for MASELink SDH, PDH, Super-PDH, ADM, etc.

1.2 SYSTEM FEATURES

The NMS v2.0 is with the following features:

- GUI interface makes operation and management easy.
- Adopts the SNMP protocol to ensure the reliability of data transmission.
- Utilizes ekectronic map with changeable backgrounds.
- Achieves multiple view methods for element monitoring, such as TOPOLOGY VIEW, PANEL VIEW, LIST VIEW, ALARM VIEW, etc.
- Hierachical operator access levels prevent unauthorized operations.
- With multiple information search and powerful statistic function, the records can be exported in different formats.
- Functions to repel malicious or invalid commands.
- Adopts SQL SERVER 2000 or MS Access as the storage database.
- Supports poll function with user-configurable settings as poll interval, individual parameter poll, etc.
- Ensures the online query for element performance.
- Provides the functions of link setting and BER statistics.
- With powerful alarm management function to respond the alarms in different levels of sound.

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1.3 NMS COMMUNICATION INTERFACES

Communications between the NMS and the Microwave Equipments can be:

- Via Serial Port
- Via Modem (dial up modem or wireless modem)
- Via Ethernet port

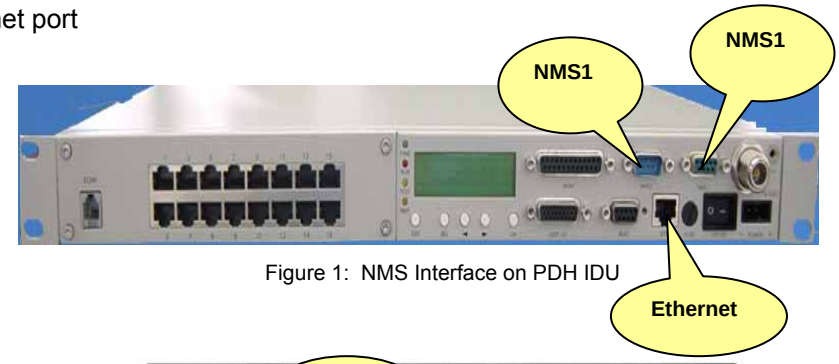

Figure 1: NMS Interface on PDH IDU

Figure 2: NMS Interface on SDH IDU

Figure 3: NMS Interface on SuperPDH IDU

NMS1	NMS Serial Port, connect PC or NMS2 Port (Cascade).
NMS2	NMS Serial Port, connect Modem or NMS1 Port (Cascade).
Ethernet	10 Base-T Ethernet Port, connect PC.
NMS	RJ-45 Ethernet management port for NMS connection. Half-duplex 10Mbps Ethernet interface (10Base-T).

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1.4 THREE TYPES OF CONNECTION BETWEEN NMS PC AND MICROWAVE EQUIPMENT

Comba NMS provides operatorss with three types of connections between Microwave equipments and PC:

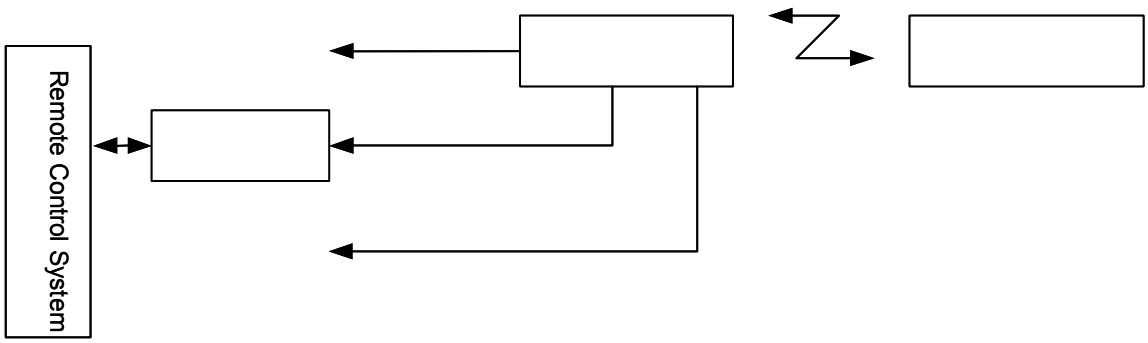

Figure 4: Connection Block Diagram

1.4.1 Connection via Serial Port

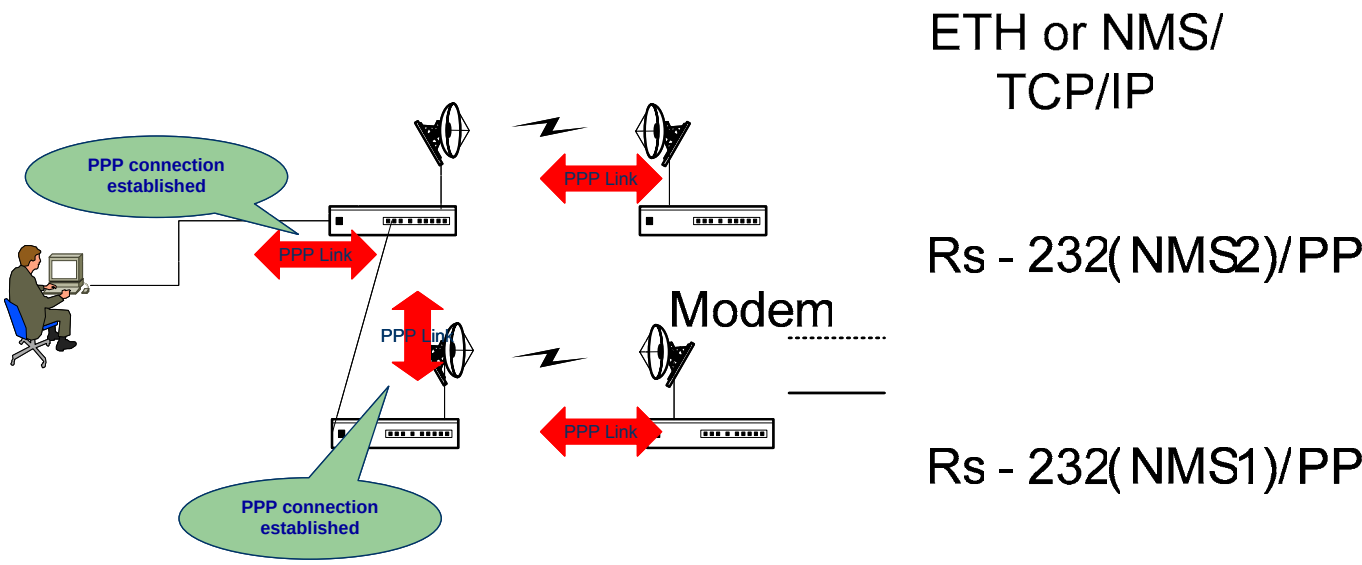

Figure 5: Connections via NMS1 Port

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1.4.2 Connection via Modem

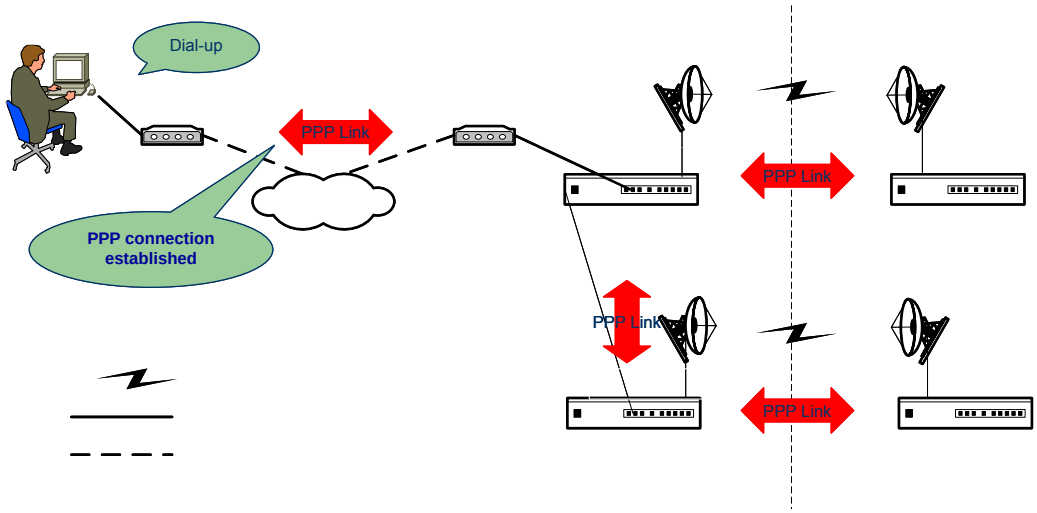

Figure 6: Connections via Modem

1.4.3 Connection via Ethernet Port

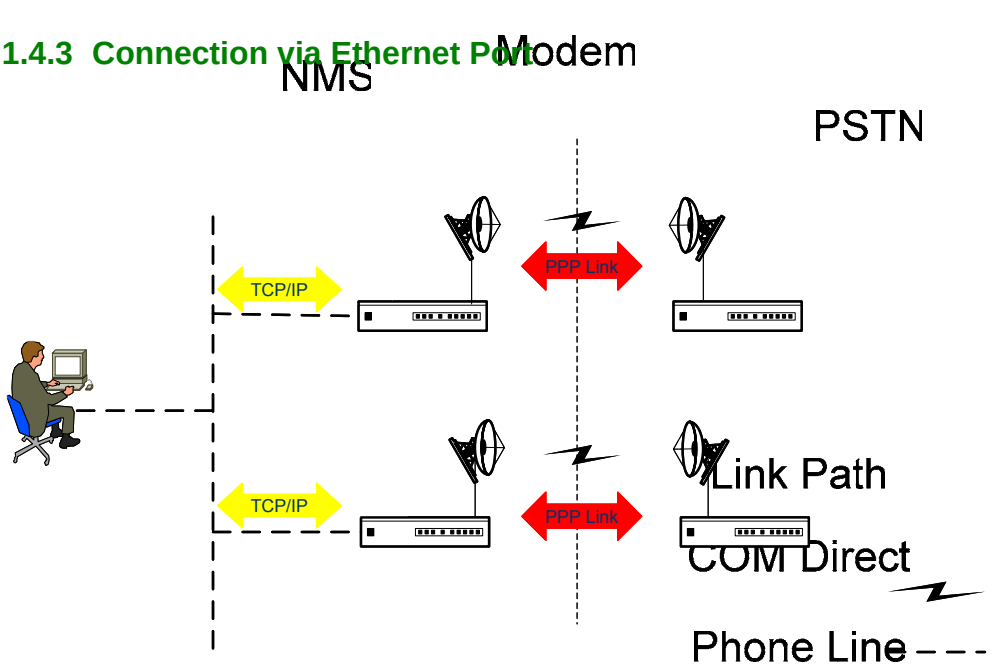

Figure 7: Connections via Ethernet Port

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2 NETWORK MANAGEMENT PLATFORM

2.1 RECOMMENED NMS PC CONFIGURATION

2.1.1 PC Hardware Configuration

CPU	P4 2.8GHz
RAM	512Mb
HDD	80 GB
Multi Serial Card	CT320
CD-ROM	50X
Network Card	100 Base-T

2.1.2 PC Software Configuration

Operating System:	Microsoft Windows 2000(or XP)
Application programs:	MS SQL Server 2000
	MS Access Server
	NMS Software

2.2 DATA COMMUNICATION NETWORK

SNMP Mode:	Crossover Net Cable ×1
Modem Mode:	Modem (dial up or wireless) 1 set
	SIM Card (for wireless modem) ×1

--End of Section

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3 SYSTEM START

3.1 NMS INSTALLATION

Open the installation package, and double click “combaNMS_V2_00_CN.exe” application, then follow the installation instruction. (This application doesn’t include the database file, which shall be supplied by software supplier in addition. If “SQL server” is chosen, please install SQL server for Enterprise Edition in advance.)

After successfully installed NMS application and database applications, double click the NMS icon on the desktop or start it from start menu. It is required to configure the database application the first time the NMS is executed.

3.2 DATABASE CONNECTION

A “Database Setting” interface as following will prompt, and select “SQL Server” or “Access”. The database connection setting is different according to the different database configured.

SQL Server Database Connection

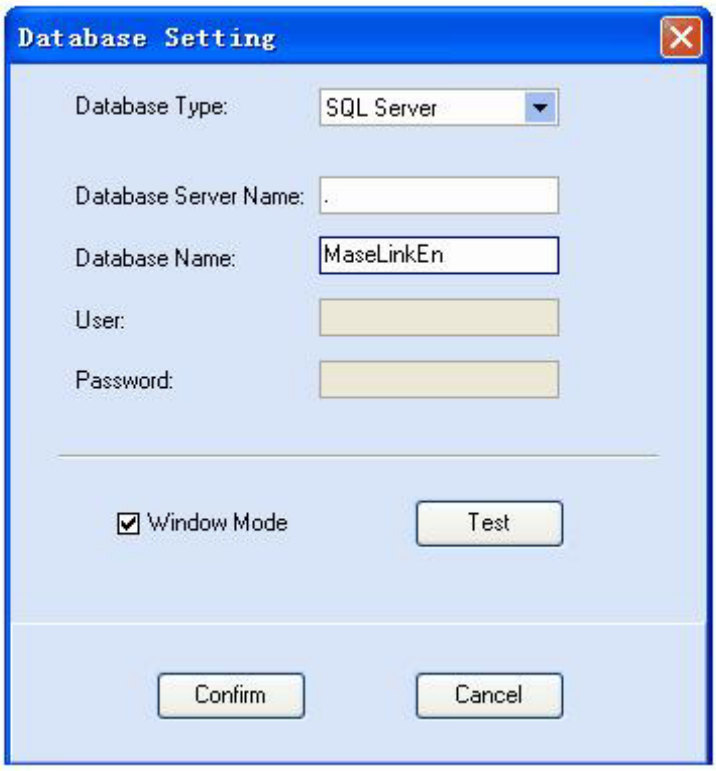

Figure 8: SQL connetion

Select “SQL Server” at the sub-menu of “Database Type”.
Input the NMS PC Name or a solid full stop instead in the “Database Server Name”.
Input the database Name in the “Database Name”.

At this step, the configuration should be finished if the user login the PC through Windows, or else,

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user needs to input the correct user Name and password, which should be the ones when installing SQL SERVER 2000.

After entering all the information, press <test> to start testing whether the input information is correct. An indication message will appear after successful connection, which indicates that the database has been connected to NMS successfully.

Then press “Confirm” to save the settings.

MS Access Database Connection

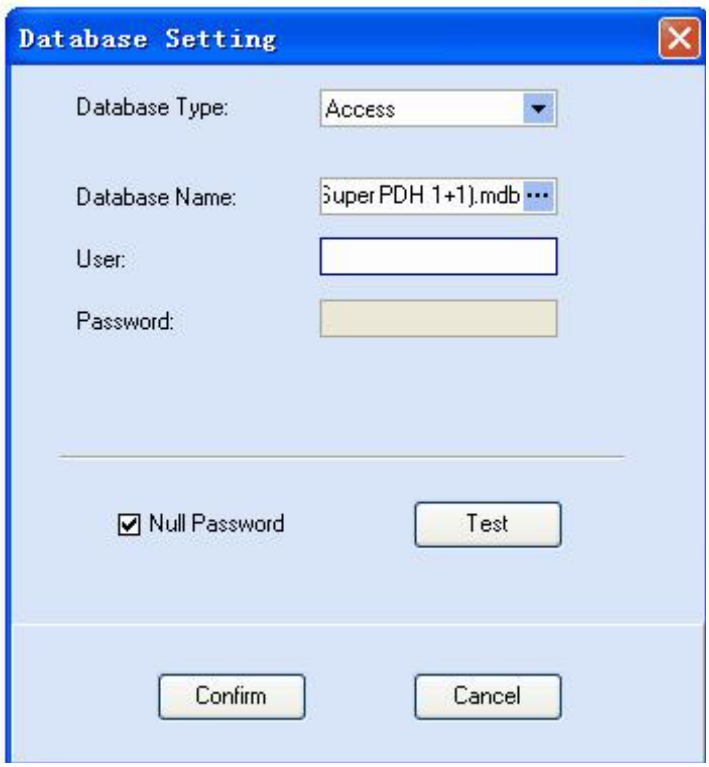

Figure 9: Access connetion

Select “Access” at the sub-menu of “Database Type”.
Select the Access database used for system connection at the sub-menu of “Database Name”.

At this step, the configuration should be finished if the user login the PC through Windows, or else, user needs to input the correct user Name and password, which should be the ones when installing Access SERVER.

After entering all the information, press <test> to start testing whether the input information is correct. An indication message will appear after successful connection, which indicates that the database has been connected to NMS successfully.

Then press “Confirm” to save the settings.

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3.3 REGISTRATION

After successful initiation, the registration interface as following will be shown:

Figure 10: Registration 1

Register User: Insert the customized user Name.
Computer ID: Computer ID of the user PC, this ID will be generated automatically when the registration interface pops up.
License File: It is provided by Software Supplier. To obtain the License File, the generated "Computer ID" is needed to send to the software supplier. Each user PC owns a unique License File, which is based on customer's requirements on network and element numbers.
If all information inputted is correct, the "Register" button will become available to be operated. The authorized user information will be presented in the dialogue box below.

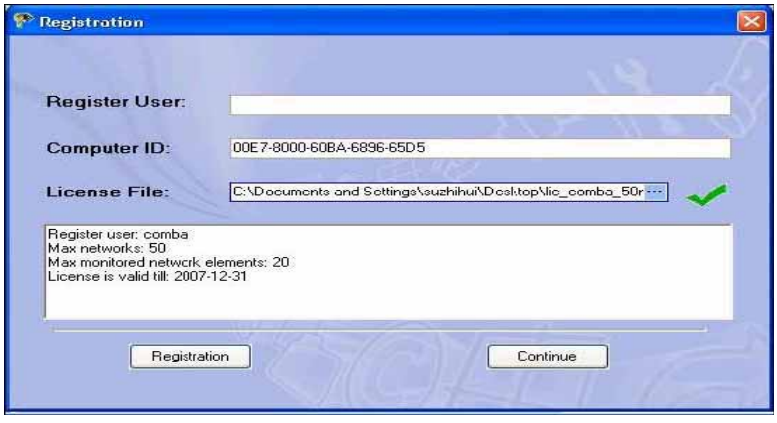

Figure 11: Registration 2

If registration isn't applied at this moment, user can press "Continue" to access the GUI of NMS v2.0 at first. Without entering license file, the limitations are as following:

The number of network ≤1
The number of Element in the network ≤10
User can only read the all parameters and can't set.

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3.4 USER LOGIN

After registration, the system enters into the GUI of NMS automatically. The user login window below will pop up:

Figure 12: Login

There are three default users, which are identified from their levels of power in management.
User Name: Super Password: 123456
“Super” is the most powerful user of NMS in Supervisor Group, who can operate all functions of NMS, including add user group, add user, assign user privileges for each group, etc. Default user “Super” and Supervisor Group can’t be deleted and renamed.

User Name: Admin Password: 123456
“Admin” owns all functions of “super” in Admin Group, except for the user management privileges.

User Name: Monitor Password: 123456
“Monitor” is in Monitor Group, who can only read all the setting or logs of NMS and can’t change.

If “User Login” isn’t applied at this moment, user can press “cancel” to access the GUI of NMS. After then, click the “Login” button at the submenu of “User” in main toolbaror the quick launch bar, and then inserts user name and password for NMS operation.

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4 INTRODUCTION OF GUI INTERFACES

For the illustration purpose, the GUI layout is divided into the different parts shown below in the NMS GUI interface:

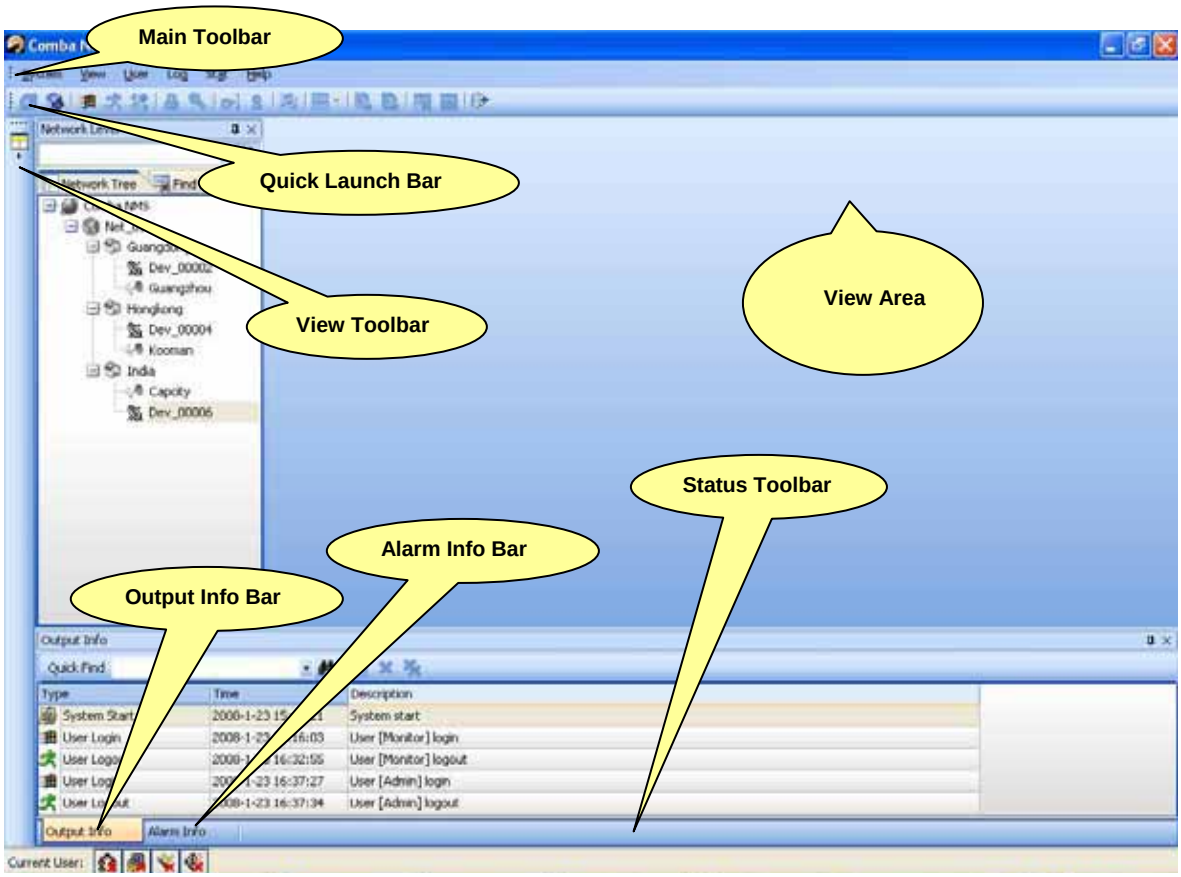

Figure 13: The Main Screen

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4.1 MAIN TOOLBAR

The main toolbar of the window presents the options, which illustrates the commands that can be executed from the various options.

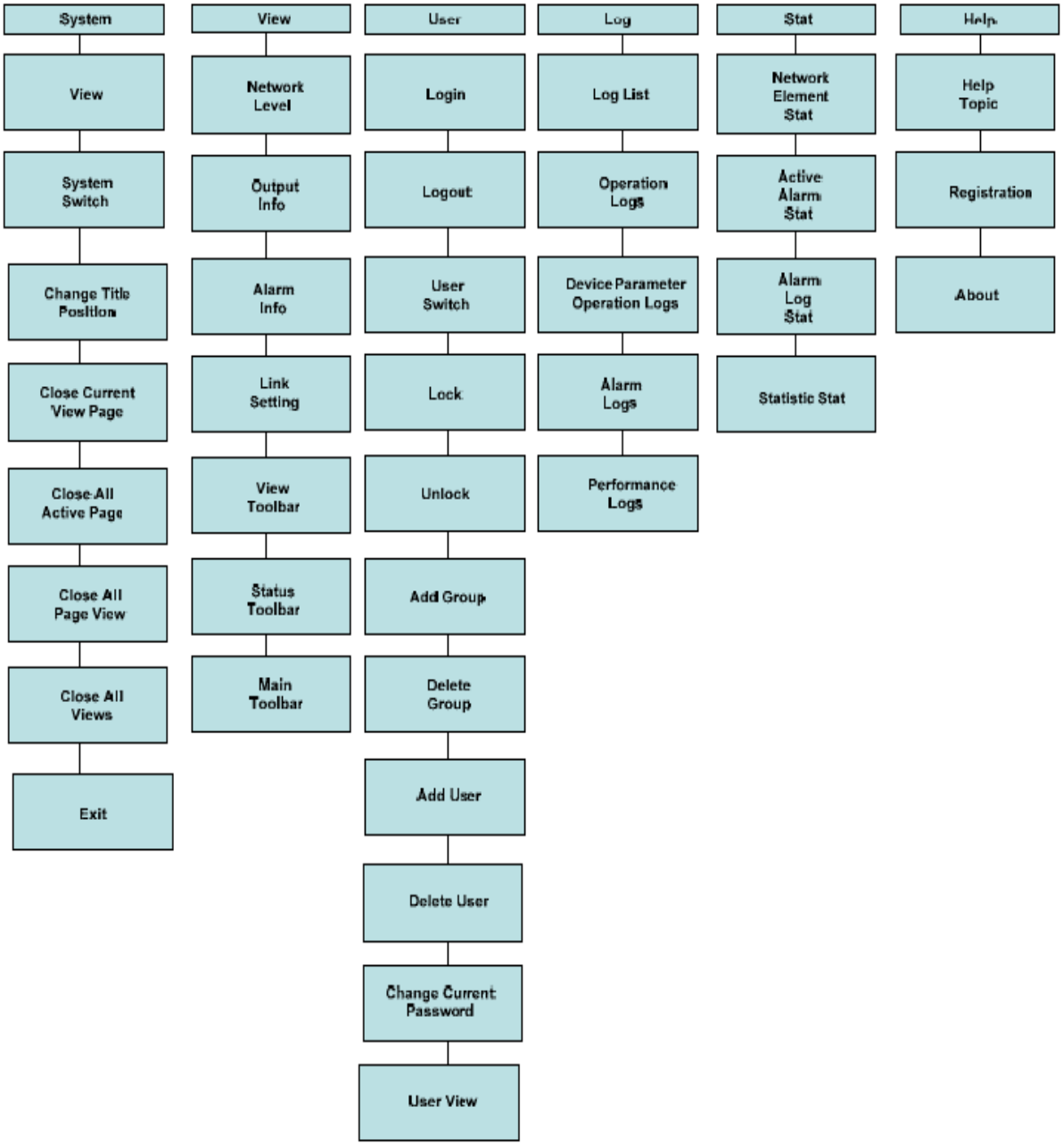

Figure 14: Command Tree

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4.2 QUICK LAUNCH BAR

Quick launch bar lists the tool buttons used frequently for system operation. A number of commands can be launched rapidly from the Toolbar which includes:

Figure 15: Quick launch bar

No.	Name	DISCRIPTION
1	Save All Network	Save all the changes made to the NMS
2	Add Network	Add a new network
3	User Login	Open the user login interface
4	User Logout	Current user logout
5	Switch User	Open the user switch interface
6	Lock	Lock the NMS GUI
7	Unlock	Unlock the NMS GUI
8	Change Current User Password	Open the password change interface
9	Current User Information	Display the current user information
10	Ignore Alarm Sound	Stop the alarm sound temporarily
11	Page Title Position	Click to position the view page title at top, bottom, left or right of the page
12	Close Current View Page	Close the page of the current view
13	Close all View Pages	Close all the page of the current view
14	Close Active View	Close the current view
15	Close all views	Close all the views
16	Exit	Exit the NMS

The "Quick Launch Bar" is visible all the time whatever operations made to the system, other view toolbars are displayed/hidden when open/close the separate view mode.

4.3 VIEW TOOLBAR

In all, there are seven view modes supported by the NMS v2.0. Theya are presented separately when switching to relevant view mode. When open or close a view mode, a shortcut icon of it will be added to the View Toolbar.

The view modes can be switched quickly by clicking the icons on the View Toolbar or selecting from the sub-menu of “View” button. Click the icon on the View Toolbar will open the previous view page of this view mode.

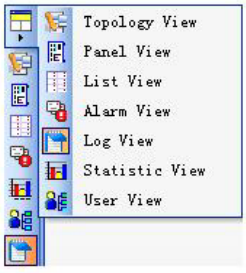

Figure 16: Command Tree

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4.3.1 Topology View

Topology view consists of Topology View Area and Drawing Bar as shown in the figure below:

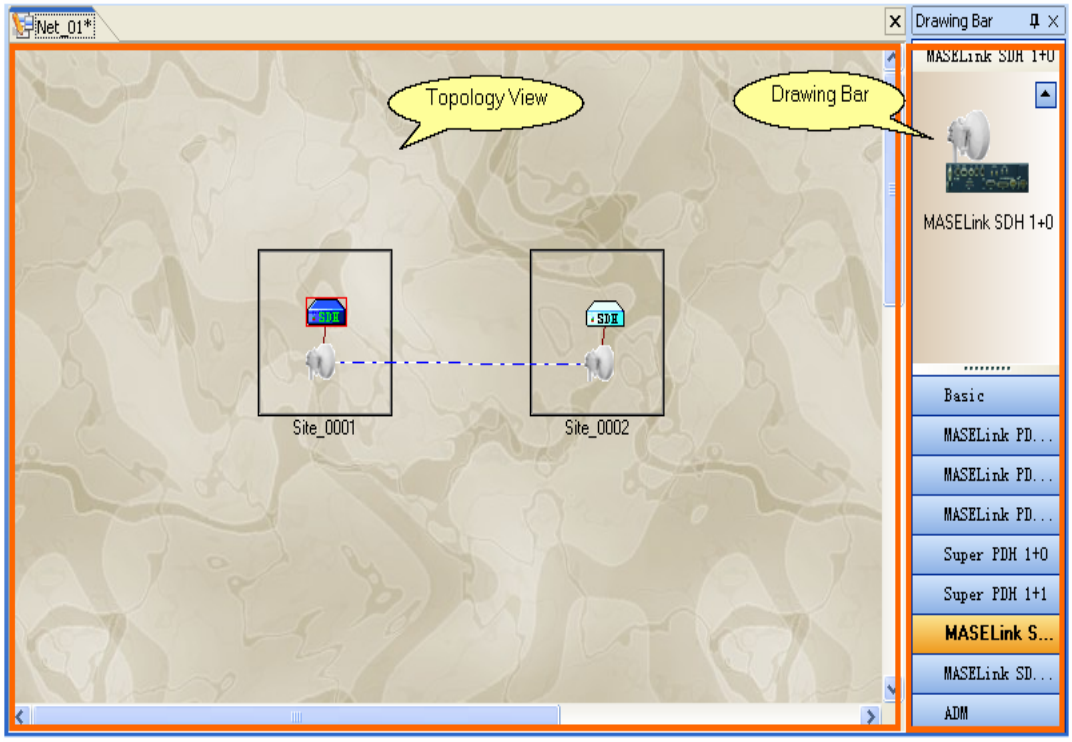

Figure 17: Topology View

Topology View Area displays the topology hierarchy of the network, provides the function of construction of topology views and operations on the network element involved.

Drawing Bar provides operators with a quick topology construction of site layer and element layer. It is located on the right of the topology view and functions as a toolbar for topology construction. The compatible sites and element types of this system are presented in columns. Operators can easily Click at the selected site or element and drag it onto the “Topology View Area” to construct a topology for site or element layer.

By default, the first column of the Drawing Bar is Site column, followed with the columns of different element models classified. For the additional element model column, it will be shown by smaller icons at the bottom of the Drawing Bar.

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4.3.2 Panel view

Panel view consists of Panel View Area and Area Property as shown in the figure below:

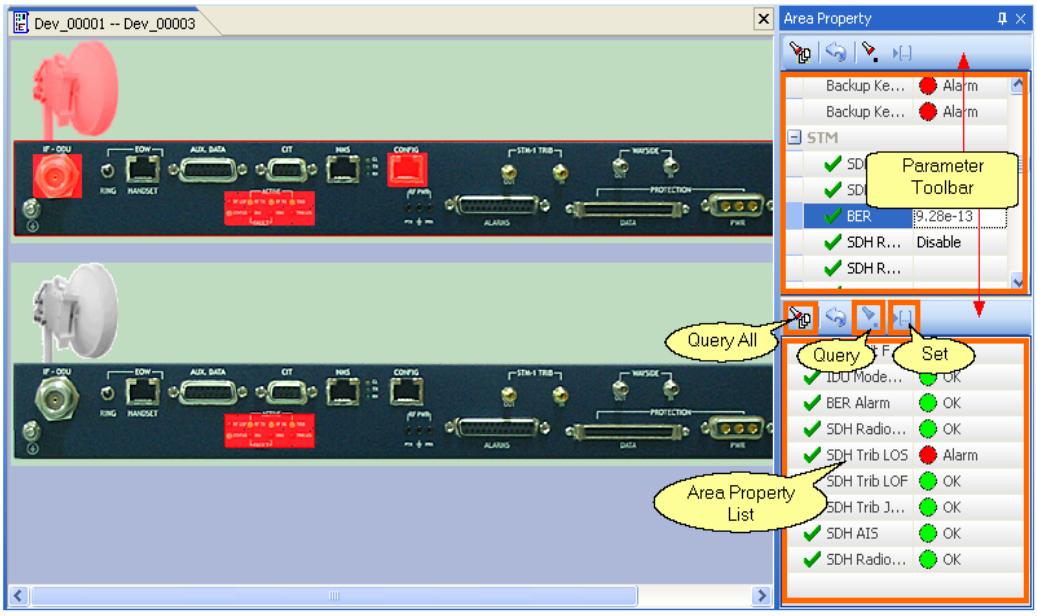

Figure 18: Panel view

Panel View Area displays the element or element panel. Move the mouse to one equipment area on the panel view, the selected area will be marked in green.

Area Property lists all the parameters of the selected equipment area on the panel view. User can click on the toolbar or right click at this column to query or set the element in real-time.

- Query: query the selected equipment parameters
- Set: set the desired parameter to the element
- Reset: reset the selected the parameters.
- Query all: query all the listed element parameters of the selected equipment area

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4.3.3 List View

List View consists of Parameter Class, Parameter List, Key Parameter, Parameter Remark, and Status Bar as shown in the figure below.

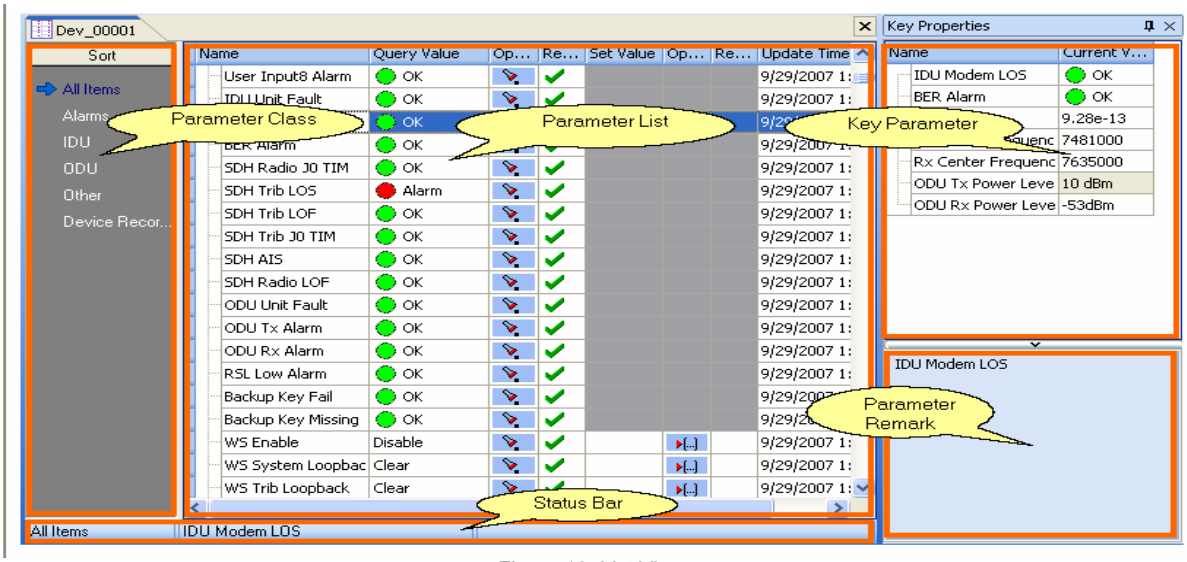
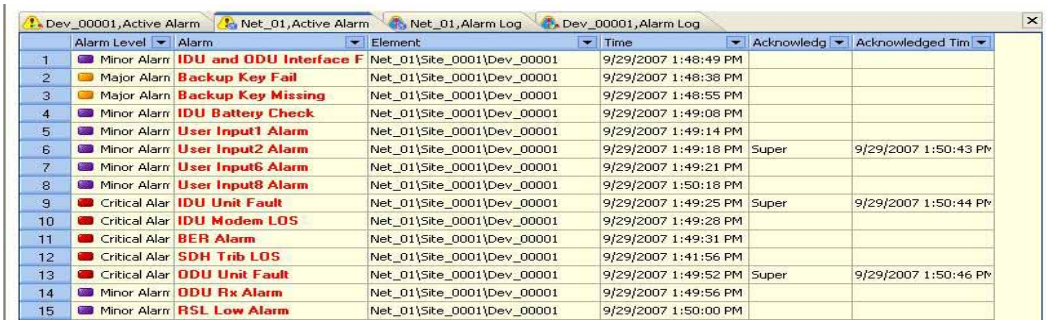


Figure 19: List View

- Parameter Class: list the monitored parameters in classes
- Parameter List: Lists all the monitored parameters of the selected parameter class. User can achieve real-time query or set for the parameters in the list.
- Key Parameter: lists the key parameters of the element
- Parameter Remark: remarks on the selected parameter.
- Status Bar: shows the selected parameter class and parameter information.

4.3.4 Alarm View

Alarm View consists of Active Alarm (current element alarm, current network alarm) and Real-time Alarm Log (Real-time Alarm Log of the active element, Real-time Alarm Log of the active network), right-click on the list to read the alarm records.



	Alarm Level	Alarm	Element	Time	Acknowledg	Acknowledged Tim
1	Minor Alarm	IDU and ODU Interface F	Net_01\Site_0001\Dev_00001	9/29/2007 1:48:49 PM		
2	Major Alarm	Backup Key Fail	Net_01\Site_0001\Dev_00001	9/29/2007 1:48:38 PM		
3	Major Alarm	Backup Key Missing	Net_01\Site_0001\Dev_00001	9/29/2007 1:48:55 PM		
4	Minor Alarm	IDU Battery Check	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:08 PM		
5	Minor Alarm	User Input1 Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:14 PM		
6	Minor Alarm	User Input2 Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:18 PM	Super	9/29/2007 1:50:43 PM
7	Minor Alarm	User Input6 Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:21 PM		
8	Minor Alarm	User Input8 Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:50:18 PM		
9	Critical Alar	IDU Unit Fault	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:25 PM	Super	9/29/2007 1:50:44 PM
10	Critical Alar	IDU Modem LOS	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:28 PM		
11	Critical Alar	BER Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:31 PM		
12	Critical Alar	SDH Trib LOS	Net_01\Site_0001\Dev_00001	9/29/2007 1:41:56 PM		
13	Critical Alar	ODU Unit Fault	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:52 PM	Super	9/29/2007 1:50:46 PM
14	Minor Alarm	ODU Rx Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:49:56 PM		
15	Minor Alarm	RSL Low Alarm	Net_01\Site_0001\Dev_00001	9/29/2007 1:50:00 PM		

Figure 20: Alarm View

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4.3.5 Log View

Log view consists of Log View Area and Customized Search as shown in the figure below:

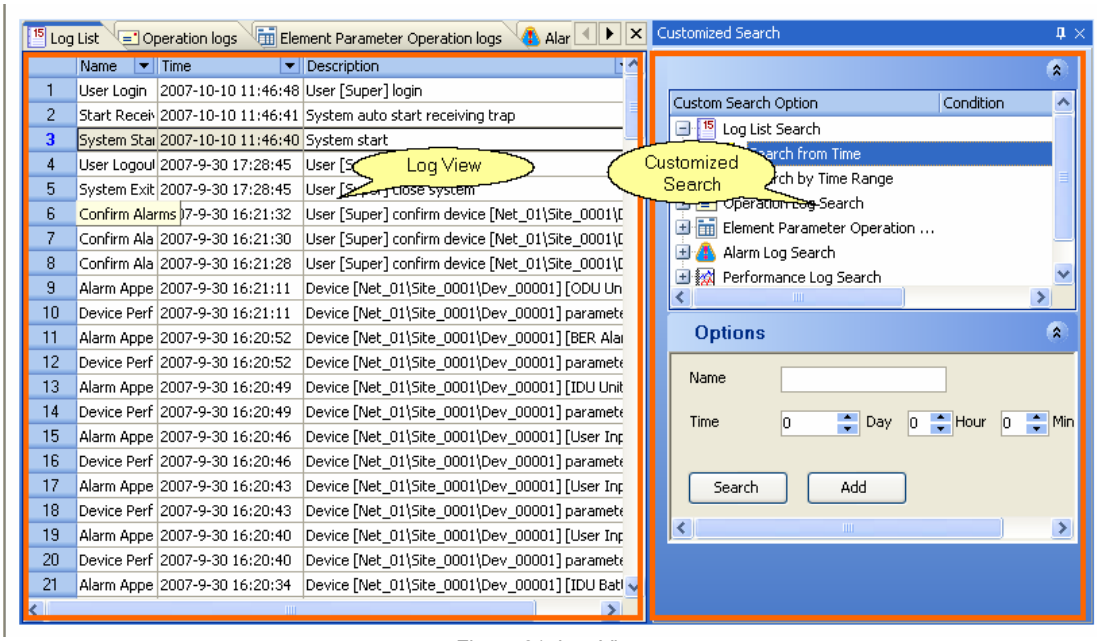

Figure 21: Log View

Log View Area displays five kinds of log page, including log list, operation log, Element Parameter Operation Log, Alarm Log and Performance Log.

Customized Search is for searching the logs that correspond to the customized terms. User can also designate and save the term options for future quick search.

4.3.6 Statistic View

Statistic View consists of Statistic View Area and Customized Statistic shown in the figure below:

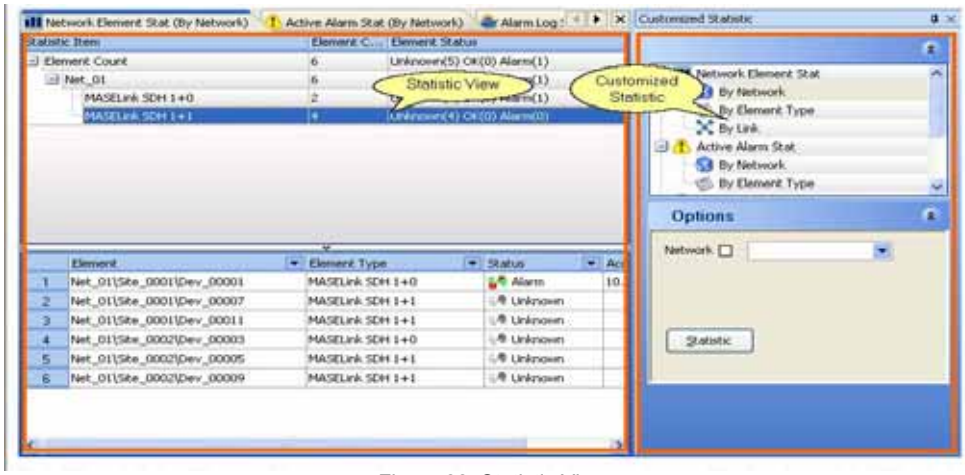

Figure 22: Statistic View

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Statistic View Area includes different statistic pages such as network element statistic, current alarm statistic, alarm log statistic, BER statistic, etc.

Customized Statistic is for searching the statistics that correspond to the customized terms.

4.3.7 User View

User view consists of User Configure View Area and User Tree shown in the figure below:

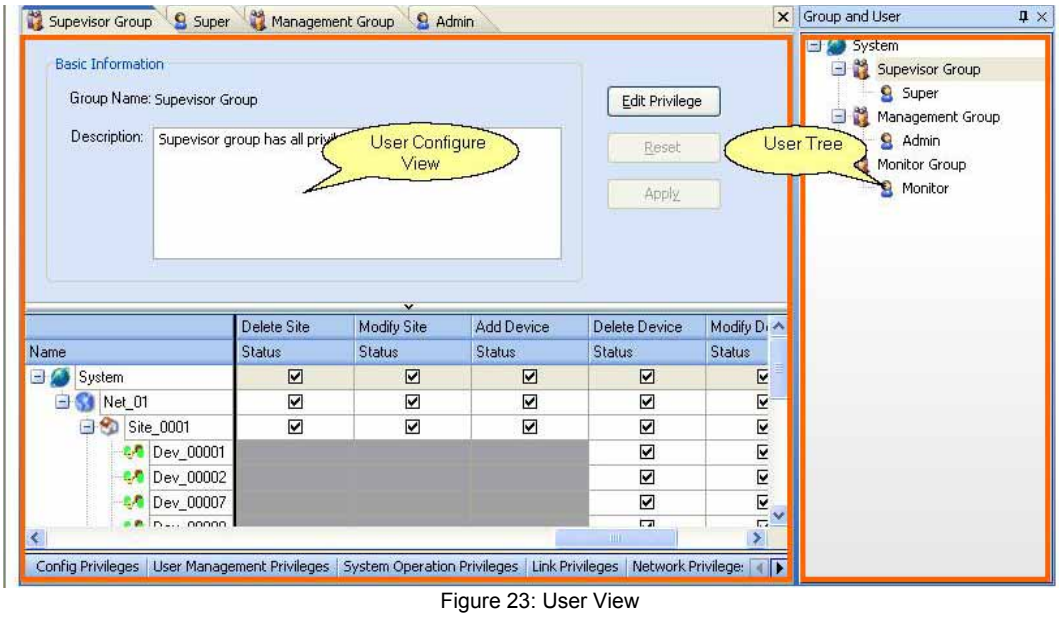

Figure 23: User View

User Configure View Area consists of User Group Configure and User Privilege Configure page. User Group Configure guide the operations on basic group information and user privilege information.

User Tree shows the user groups to which each user is attributed in the format of a tree structure.

4.4 TOPOLOGY TREE VIEW

4.4.1 Topology Tree

It includes “System Layer”, “Network Layer” and “Element Layer”, the relation hierarchy between each network elements is displayed.

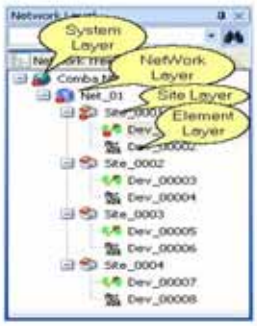

Figure 24: Topology Tree View

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Network tree displays the hierarchy between network, site and elements in the order of system -> network -> site -> element. This makes it convenient for users to locate the site or element just by clicking the tree node, and this makes it available for users to implement the same operation at the same layer for flexible secure management. Find Result displays the list of searching elements.

4.5 OUTPUT INFO BAR

Output Info Bar records all the system operations and performance during system run dynamically.

Each record consists of operation time, type, and description

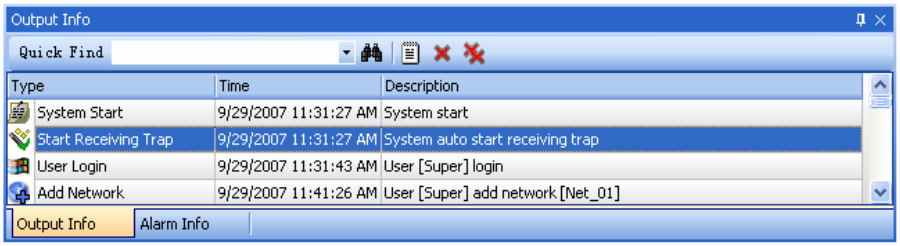
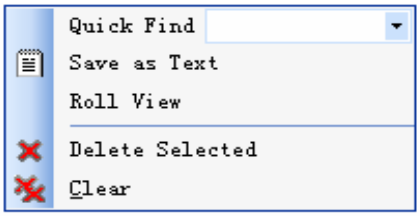


Figure 25: Output Info Bar

The output Info status supports list output function by clicking on the toolbar or right-click on the list:



- Quick Find: provides the function of designated operations search.
- Save as Text: records the operations into a Text file for information output.
- Roll View: select to make sure the latest operation record is always marked on the bottom row, or else, user has to roll down the list to view the latest record.
- Delete selected: delete the selected operation record.
- Clear: clear all the records.

4.6 ALARM INFO BAR

Alarm Info Bar records the alarm information in real time. It is displayed by switching with the Output Info Bar. The real-time alarm information will be displayed at the alarm info bar, including alarm generation and alarm cessation.

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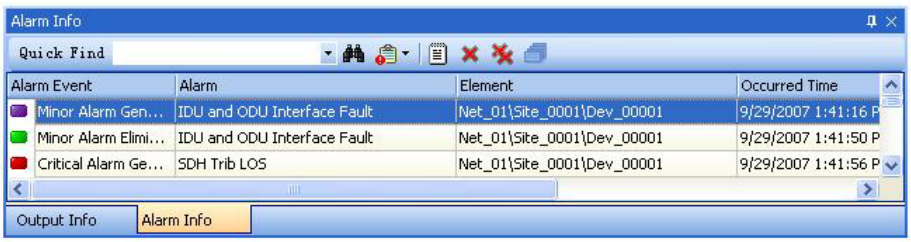

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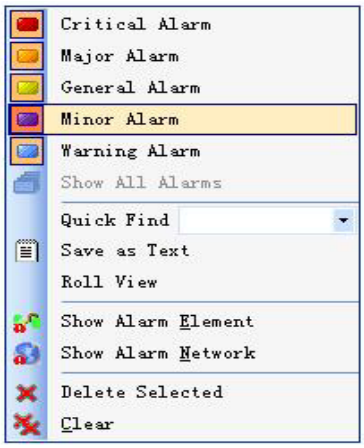
Figure 26: Alarm Info Bar

The right-click menu at the list area is:



- Alarm level filter: the first five items presents the five alarm levels from managed elements, click to choose whether to show the alarm level into the alarm list.
- Show all the alarms: click to shown all the five alarm levels. This button will not become available until some alarm level is filtered.
- Quick Find: refer to the “Quick Search” of “Current Alarm” section.
- Save as Text: records the operations into a Text file for information output.
- Roll View: select to make sure the latest alarm record is marked on the bottom row, or else, user has to roll down the list to view the latest record. The system is default as “non-roll” mode.
- Show alarming element: select to switch to the Panel view of the selected alarming element.
- Shown alarming network: select to switch to the topology view of the selected alarming network
- Clear All: delete all the records in the alarming status bar.
- Delete selected: delete the selected records.
- Clear: clear all records.

NOTE:

1. For “Manual Query”, the alarm information of the parameter that has been queried already will not be re-recorded until its alarming status changes.
2. The alarm status list can support 2000 records at most
3. Double click on one alarm list will switch to the current alarm window of the alarming element.

4.7 STATUS BAR

Status Bar displays the current NMS information as operating status, current user, etc.

Figure 27: Status Bar

The current user is displayed on the “Status Bar” as above, the four icons represents “Online Poll Switch”, “Parameter Poll Switch”, “Trap Switch” and “Alarm Sound Switch” separately. These icons

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indicate the “On/Off” status graphically. Left or right click the mouse to switch on or off the selected switch.

4.8 MIB TREE WINDOW

MIB tree adopts the MIB mode of SNMP protocol to query and set all the element-related information. This is applicable for professional operators who are familiar with the SNMP protocol.

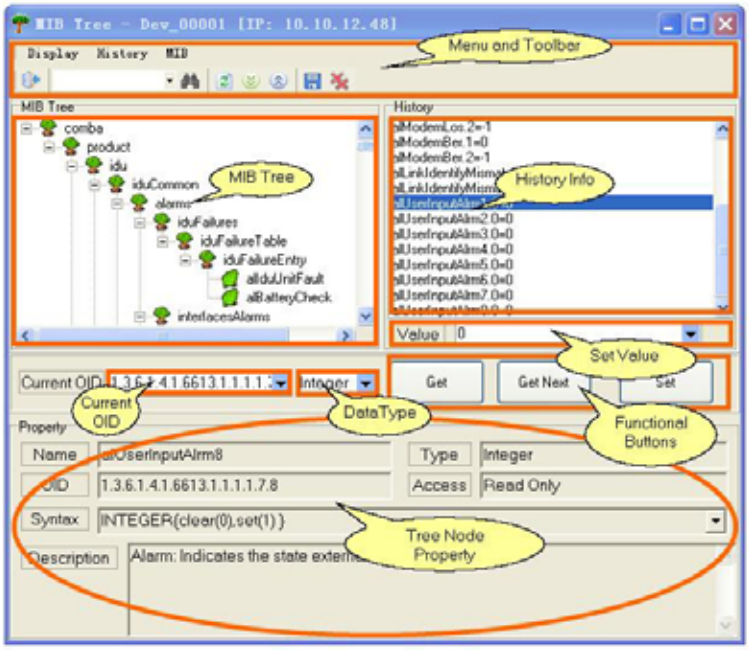

Figure 28: MIB Tree Window

The functions of MIB tree is illustrated below together with menu introduction:

1. <Display> menu:

- Expand Tree: Open to view all the nodes included
- Collapse Tree: Close to hide all the nodes included.
- Refresh Tree: Refresh the current MIB tree
- Exit: Exit from the current tree interface

2. <History> menu:

- Save History: save the element operation records into a TXT document
- Clear History: clear all the element operation records

3. <MIB> menu:

- Get: Corresponds to the “Get()” command of SNMP protocol, is shown as a functional button [Get] on the MIB Tree interface；
- Get Next: Corresponds to the “GetNext()” command of SNMP protocol, is shown as a

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functional button [Get Next] on the MIB Tree interface ;

- Set: Corresponds to the “Set()” command of SNMP protocol, is shown as a functional button [Set] on the MIB Tree interface ;

The functions of MIB tree is illustrated below together with the MIB Tree interface introduction.

1. MIB Tree: generated by translating and editing the MIB database of SNMP protocol;
2. History: The operating records as read or set to the element
3. Current OID: the OID of the selected node of the MIB tree, or the OID set for element parameter read.
4. Functional Buttons:
- Get: read the current OID information, Corresponds to the “Get()” command of SNMP protocol
- Get Next: read the OID information of the next node, Corresponds to the “GetNext()” command of SNMP protocol
- Set : set the current OID, Corresponds to the “Set()” command of SNMP protocol

5. Property:
- Name: the Name of the element parameter displayed by the current OID
- Type: the type of the element parameter displayed by the current OID, such as string, integer, etc.
- OID: the location of the selected node at the MIB tree
- Readability: indicates whether a element parameter can be read or set
- Grammar: details the operation rule of a element parameter

4.9 NMS CONFIGURATION WINDOW

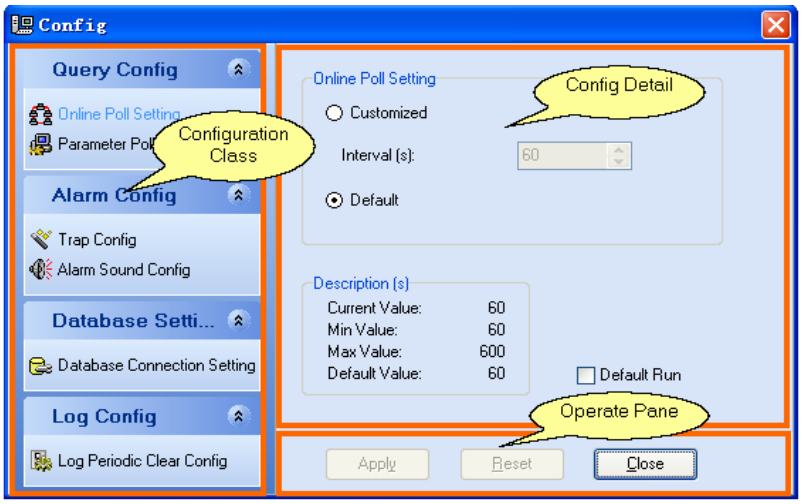

Figure 29: NMA Configuration Window

The NMS Configuration window consists of Config Classes, Config Items Displaying Area and Operation Area.

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Config Classes: includes Query Configure, Alarm Config, Database Config and Log Config.

Config Items Displaying Area: the sub-items of the selected config class, the configurable items will be displayed

Operation Area: contains the following operational buttons for NMS configuration.

Apply: save the modification to the config item

Reset: cancel modifications to get back to the default value

Cancel: close the current config interface

4.10 ABOUT WINDOW

About window includes Product Information and Registration Information.

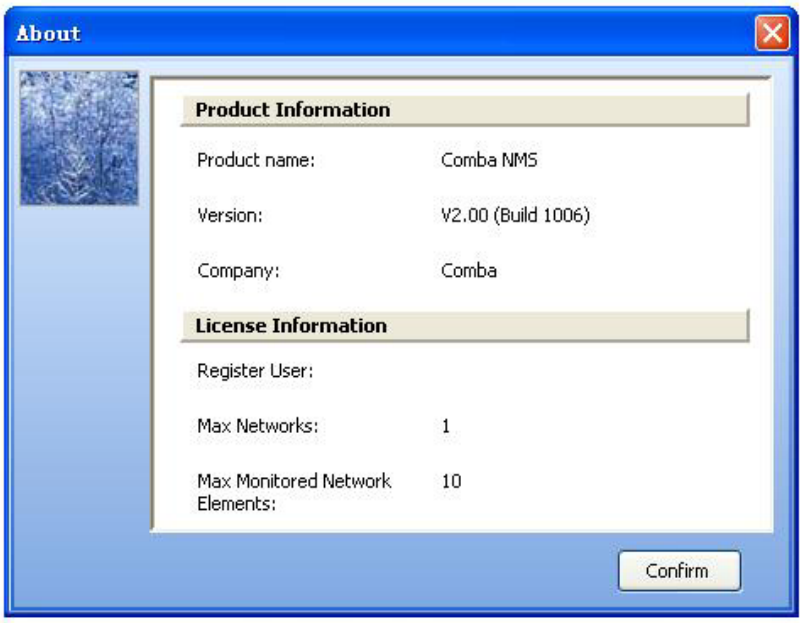

Figure 30: About Window

Product Information:

- Product Name: the full Name of the NMS
- Version No.: the version number of the NMS
- Company: the Name of the software supplier

Registration Information:

- Register user: the user Name of the registered user, blank entering shows no user registered.

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- Max. Network: the Max. network count authorized, 1 for unregistered user
- Max. Element: the Max. element count authorized, 10 for unregistered user

4.11 REGISTRATION WINDOW

There are two methods to launch the NMS registration:
1. When each NMS starts but without registration: a <Registration> window will pop up to indicate user of registration requirement
2. Probation period: launch the <Registration> interface from <Help> menu at the Main toolbarBar
More information about NMS registration, please refer to the “System Login” section.

End of Section

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5 SECURITY MANAGEMENT

Security management functions to protect the NMS from unauthorized access or modification, and emphasizes query, set and Trap management for the elements adopts SNMP protocol.

5.1 USER MANAGEMENT

User management functions to manage users in pre-defined user groups. The user group information includes group Name, description and User Privileges; the user information includes user Name, password, user group Name, department Name, position, contacts, description, etc.

NOTE:
1) For the first run of the NMS, a default System Management Group with a default System Administrator “Admin” is attributed.
2) The default System Management Group with System Administrator “Admin” can not be deleted.
3) Only Administrators has the management privileges as add user group and users.

5.1.1 User Tree

The user group and user tree represents the hierarchy between system, user group and user. User can implement operations as add, modify or delete at this user tree. This makes it available for users to implement the same operation at the same layer for flexible secure management.

5.1.2 User Group Operations

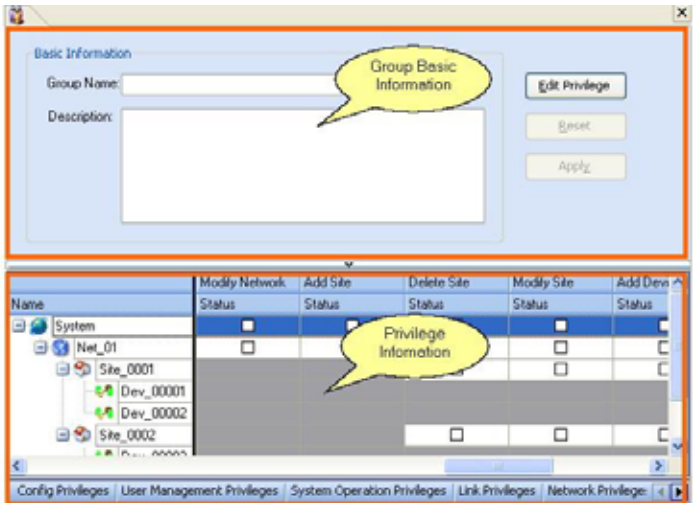

Figure 31: User Group Operations

There are three default user groups, which are supervisor group, admin group and monitor group. Only the user in supervisor group can add, modify and delete user group. For the first time to login, please login with the user name of “super” and password “123456”to do the user group operations.

Add User Group

There are three methods to add user group:

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Select the “Add Group” option under “User” menu from the Main Toolbar.
Click the “Add Group” icon at the “Quick Launch Bar”.
Right click “System” at the root node of the user tree.

After launch the “Add Group” window as below, it consists of “Group Information” and “Group Privilege” areas. The “Group Information” lists the group Name and descriptions of the user group; the “Group Privilege” shows the available group privileges.

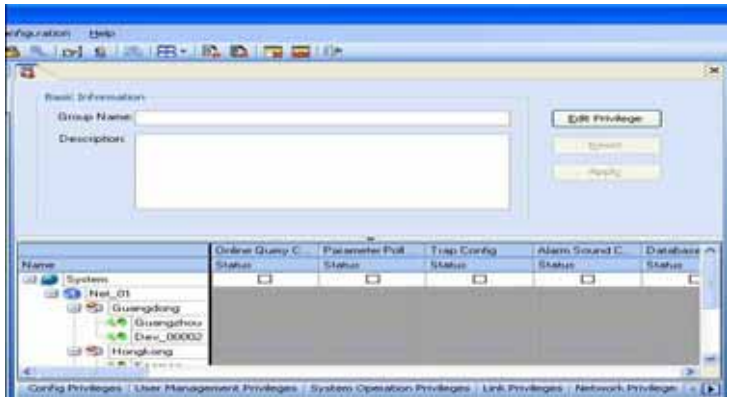

Figure 32: Add User Group

The following operations need to be done when open the “Add User Group” window:

Enter the Group Name and Description at the “Group Information” area.
Click “Edit Privilege”, the table that lists the group options at “Group Privilege” area is divided into two columns: “status” column and “set” column. User can choose “Yes” or “No” at the set column for each privilege and then status column will be shown as Ticked on or off.
Click “Apply” to save the group information edited.

Modify Group

If user wants to change the Group Description or privileges that assigned to a user group, the following steps need to be done to modify user group information. Please note that the user group Name is not permitted to be modified and the user privilege of supervisor group is not permitted to be modified.

Double click at the user group at the root node of user tree to launch the “Add User Group” window for modification.
Make changes on the group description or group privilege as what was done for “Add Group”.
Click”Apply” to save the group information modified.

Delete Group

If the user group is useless, operator can delete this user group and the users under the user group to be deleted will be deleted together. The supervisor group can not be deleted and default user “super” under the supervisor group can not be deleted.
There are three methods to delete group:

Select the “Delete Group” option under “User” menu from the Main Toolbar.
Click the “Delete Group” icon at the “Quick Launch Bar”.
Right click “System” at the root node of the user tree.
A dialogue box will prompt, click “Yes” to confirm deleting the selected group and the users under it, “No” to cancel the delete operation.

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5.1.3 User Operations

There are three default users, which are “super”, “admin” and “monitor” and their passwords are all “123456”.

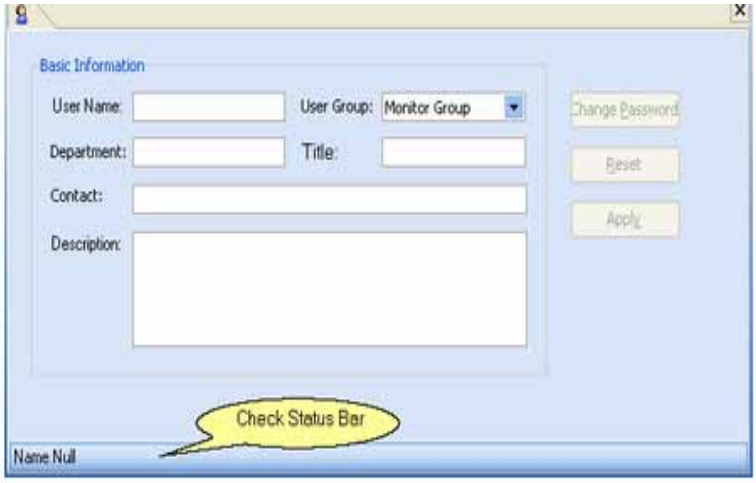

Figure 33: Add User

Add User

There are three methods to add user:

Select the “Add User” option under “User” in Main Toolbar.
Select the “Add User” icon at the quick launch bar.
Right click the user group at the root node of the user tree.

After launch the “Add User” window as below, which consists of “Basic Information” and Check Status Bar” of each user, then the following operations need to be done:

Input the user name, password, user group, description, title, contact etc. at the “Basic Information” area.
Click “Change Password” to enter the new password for the added user. A password must be defined when add a new user.
Click “”Apply” to save the group information edited and continue the add user operation if in need.

“Check Status Bar” indicates the unfinished information for add user and the “Apply” button will not become operation-available until all the required information is in place.

Modify User

If any information changed to the user, such as the department, title, or contact, etc, the following operations need to be done to modify user. The user Name is not permitted to be modified.
Double click the user at the root node of the user tree to launch the “Add User” window for modification.
Make changes on group information or password as what was done for “Add User”.
Click “Apply” to save the user information modified.

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Delete User

To delete the useless user, there are three methods, but the “Super” can’t be deleted.
Select the “Delete User” option under “User” in Main Toolbar.
Select the “Delete User” icon in the quick launch bar.
Right click the user at the root node of the user tree.

A dialogue box will prompt, click “Yes” to confirm deleting the selected user, “No” to cancel the delete operation.

5.1.4 Change User Password

The function of user password change provides users the privilege to set the password personally, which ensures the secured system management. Each valid user is assigned with the unique user privilege on password change. The password is relatively independent, which means, even the “super” can not obtain other user’s password at will. In the case that the password is forgotten, user can apply for the privilege of reset a password from the “Super”, or delete the current user account for another new account with initial password.

The user password can only be changed after the user has login to NMS. Follow the steps below to reset the user password:

Enter the sub-menu “Change Password” of “User” menu at the Main Toolbar after login.
Enter the current password once and a new password twice for confirmation
Click “Confirm” and the new password will be valid.

Figure 34: Change Password

5.1.5 User Login

After launch the NMS, user must login in order to manage the network and the elements with the authorized privileges.

There are two methods to implement NMS login:

Copyright - refer to title page

Select the “Login” sub-menu of “User” menu at the Main Toolbar.
Click “Login” icon at the Quick Launch Bar.

Input the correct user Name and password and click “Login”. Each login operation will be recorded into the Operation Log. For the first NMS login, the default user name is “Super”, the default password is “123456”. It is strongly recommended to change the password after successful login, and add group or user is also recommended.

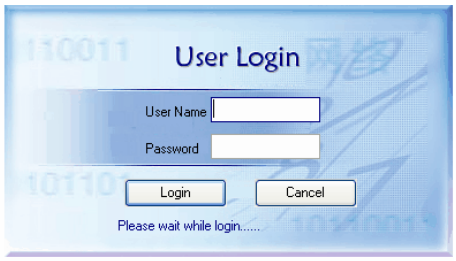
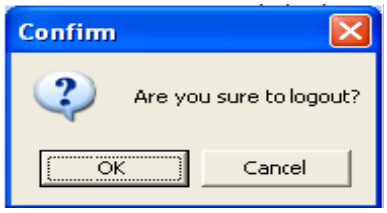


Figure 35: User Login

5.1.6 User Logout

After the required tasks have accomplished, user can logout the NMS to avoid undesired operation. When a user is logout, the NMS still remains operating and other users can login for NMS operation.

There are two methods to logout the NMS:
Click the <Logout> sub-menu of <User> menu at the Main Toolbar.
Select the <Logout> icon at the Quick Launch Bar.
An indication will pop up,



Click “Yes” to confirm the logout of the user. If no users exist, the system will go back to the initial NMS GUI interface.
Click “No” to cancel the logout operation.

5.1.7 User Switch

When another user needs to login while the current user has already in place, the new user can select “User Switch” to make it as the current user, by which, the previous user will log out automatically.

There are two methods for “User Switch”:
Click the <User Switch> sub-menu of <User> menu at the Main Toolbar.
Select the < User Switch > icon at the Quick Launch Bar.

5.2 USER PRIVILEGE CLASSIFICATION

User Privilege management is a summary of the system functions available for each user group.

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The User Privilege is divided into seven classes, which can be grouped flexibly for system anagement. Based on the option classes grouped for each group, user groups of different management levels are generated, and the users attributed to the groups are assigned with the operation authorities of this group.

The Admin under System Management Group can operate on all the NMS functions, while other users can only operate the NMS as per the defined privileges.This greatly ensures the system security.

5.2.1 User Privilege Classification

The User Privileges are divided into seven classes as Configure Privileges, User Management Privileges, NMS Operation Privileges, Link Privileges, Network Privileges, Site Privileges and Element Privileges.

The NMS is assigned initially with a System Management Group which obtains all the seven User Privileges. The Administrator of this group can operate all functions, can add user group, such as Operation Group, Monitoring Group, etc., and can assign User Privileges for each group as well.

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Class Name	User Privileges	Supervisor Group Attribution	Admin Group Attribution	Monitor Group Attribution
Configure Privileges	Online Poll Config	√	√	
	Poll Config	√	√	
	Trap Config	√	√	
	Alarm Sound Config	√	√	
	Database Config	√	√	
	Periodic Log Clear Config	√	√	
User Management Privileges	Add User	√	Only Supervisor Group can implement the user managemen t operations	Only Supervisor Group can implement the user managemen t operations
	Delete User	√		
	Modify User	√		
	Add User Group	√		
	Delete User Group	√		
	Modify User Group	√		
NMS Operation Privileges	Save As	√	√	
	Lock/Unlock	√	√	
	Clear Log	√	√	
	Edit Log	√	√	
	Edit Customized Search	√	√	
	Connection Mode	√	√	
	Move Mode	√	√	
	Add Network	√	√	
Link Privileges	Add Link	√	√	
	Modify Link	√	√	
	Delete Link	√	√	
Network Privileges	Delete Network	√	√	
	Modify Network	√	√	
	Add Site	√	√	
Site Privileges	Delete Site	√	√	
	Modify Site	√	√	
	Add Element	√	√	
Element Privileges	Delete Element	√	√	
	Modify Element	√	√	
	Query Parameter	√	√	√
	Set Parameter	√	√	
	Confirm Alarm	√	√	

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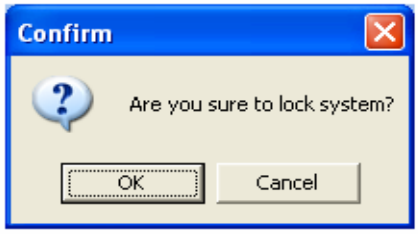
5.3 NMS LOCK AND UNLOCK

NMS lock and unlock function is used to protect NMS from unprivileged operation by unprivileged users. User can lock the system temporarily, during which the NMS still remains operation while other user are isolated from NMS access. The NMS lock or unlock operations are also configurable through the “User Privilege” assignment.

5.3.1 NMS Lock

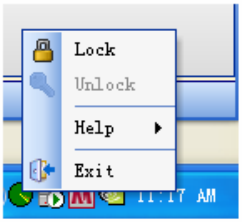
To lock the NMS, user can either select the <Lock> sub-menu under <User> from the Main toolbarBar or click the <Lock> icon on the Toolbar. The following message will be prompt:



Click “yes”, the NMS will be locked and minimized to the task bar, the NMS is locked.

5.3.2 NMS Unlock

To unlock the NMS, double click or right click the minimized NMS icon on the task bar,



The following “NMS Unlock” interface will pop up for password confirming:

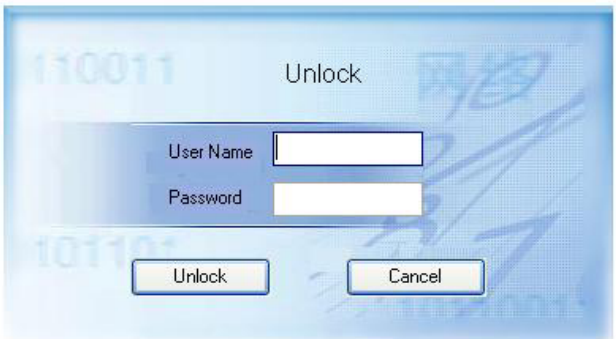


Figure 36: NMS Unlock

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Only current user who has locked the NMS or system administrator can unlock the NMS. Password needs to be entered to unlock the NMS.

After inserting the password, the NMS will be unlocked, and the current user is still the one locked the NMS.

5.4 SNMPAGENT COMMAND MANAGEMENT

SNMP Agent Command Management emphasizes query, set and Trap management for the elements adopts SNMP protocol. This protocol and the SNMP agent commands implement relative communication between the NMS and the managed network elements.

There are two methods to access the SNMP agent:

1. At Topology View, right click on the selected element to view the “Property” interface.
2. At the Network Tree, right click on the selected element to view the “Property” interface.

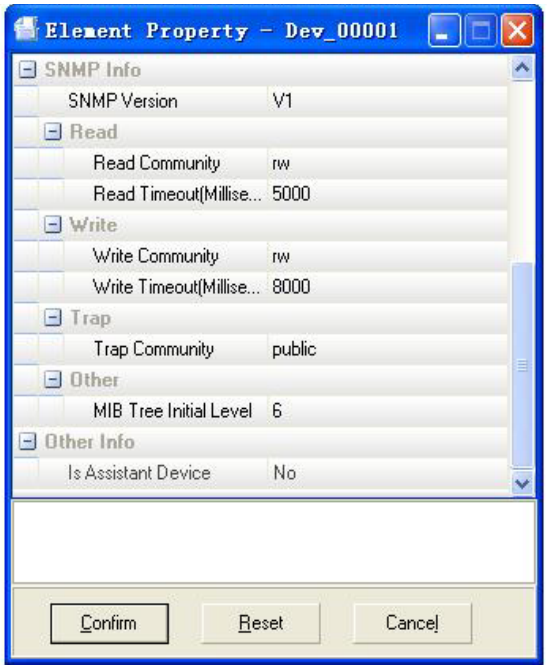

Figure 37: Element Property

Set or modify the items under “SNMP Environment” as Read, Set, Trap, etc. Select “Confirm” to confirm the modifications or changes made.

5.4.1 Element Query Command

As it is shown in the above figure, Element Query Command corresponds to “Read Command” of SNMP command. The monitored parameters can not be read if the Element Query command is incorrect. The “Time out” imposes a time-out on information queried on the element.

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5.4.2 Element Set Command

The monitored parameters can not be set if the Element Query command is incorrect. The “Time out” imposes a time-out on responses from the element following a set command.

5.4.3 Element Trap Command

This command receives SNMP Trap from the element. The NMS will validate the Trap command, therefore forwarding the Trap to NMS. An indication as “Invalid Trap Command” will pop up and be recorded to the Output Bar.

User can go to the “Trap Configure” of <System Configure> sub-menu from <Configure> menu on the Main toolbarBar to select whether to validate the Trap command.

End of Section

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6 TOPOLOGY MANAGEMENT

Topology management can provides user with a graphic view of network topology. With topology view, network tree, Link tree, etc, users can operate flexibly.

Topology management includes the functional operations on network layer, site layer, element layer, Link management and topology construction.

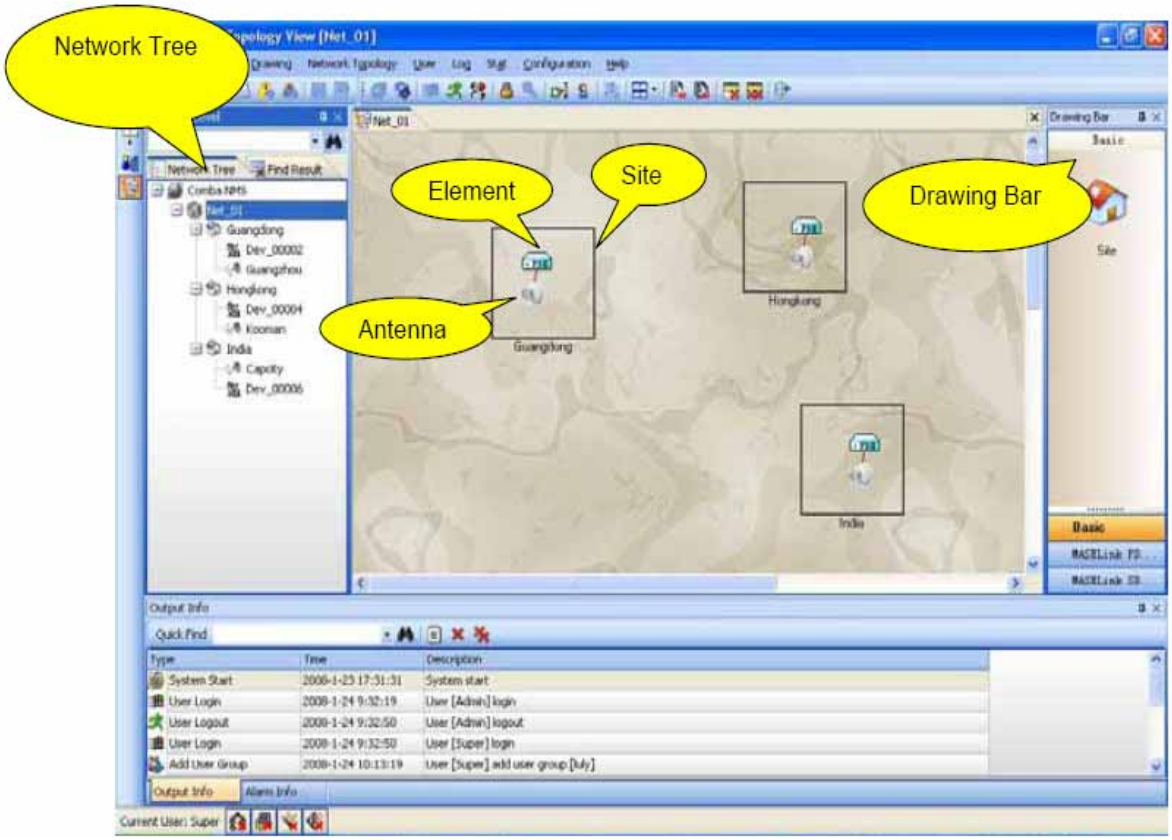

Figure 38: Topology View Area

The color of the element under Topology View indicates status of this element, as shown in the table below:

ICON	Element Status
	Element offline
	Element online
	Element with alarm

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Network Tree

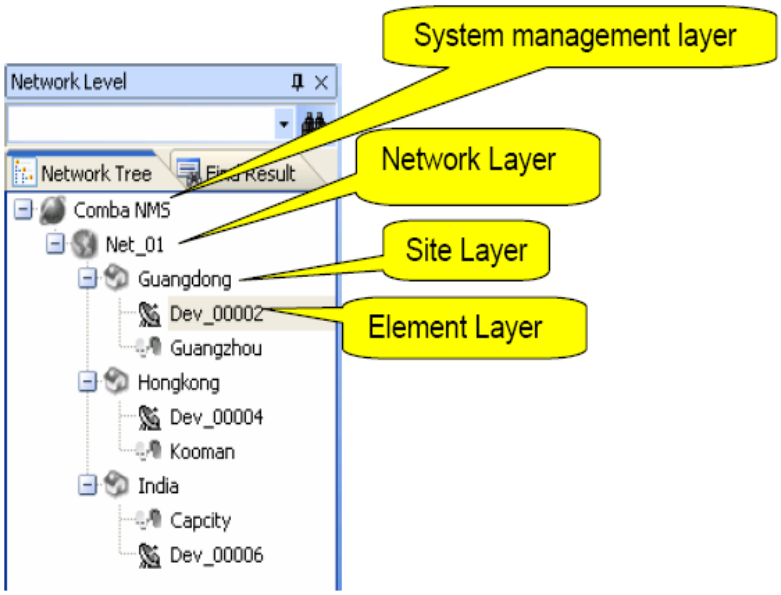

Figure 39: Network Tree

Network Tree displays the relationships among network, site and element through a tree diagram. The root node is Comba NMS system management layer, the following node is the network layer under this system, and the following is the site under this network, so as for element layer.

This kind of topology tree display is more convenient for operator to find site or element under the same layer.

Drawing Bar

Drawing bar is on the right of topology view area, which lists the site, different models of elements. By default, the first column is site column and columns below are various element models.

Operator only needs to drag the site, or element to topology view area to finish the construction of site and element.

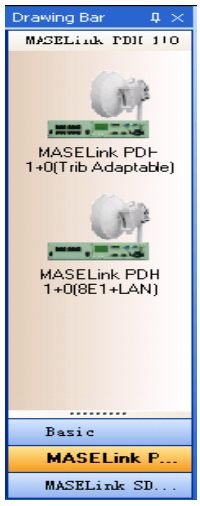

Figure 40: Drawing Bar

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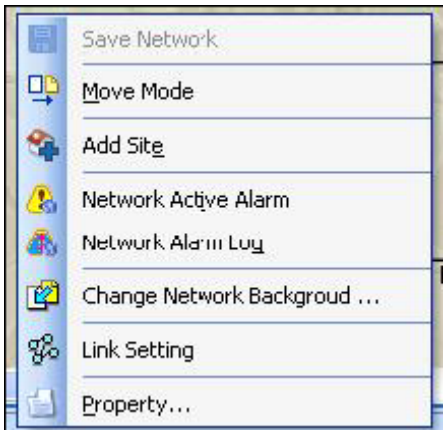
6.1 TOPOLOGY RELATION MANAGEMENT

To construct a network topology relation on the topology view, the following operations are requiredn step by step:

- Add network on the network layer
- Add site and element on the site layer
- Add the element relations
- Add Link

6.2 NETWORK LAYER

In this section, how to add, modify and delete of network layer is focused on. Right click on of the topology view, it will be shown as:



- Save Network: save modifications to the network layer
- Move Mode: click to be switched between “Move” Mode for element connection set-up.
- Add Site: add a new site at the right-clicked location
- Network active alarm: click to open the current alarm view of the selected network
- Network Alarm Log: click to open the Real-time Alarm view of the network layer
- Change Network Background: click to browse other pictures to change the network background
- Link Setting: set link
- Property: click to open the network property interface

6.2.1 Add Network

Choose “Add network” icon at Quick Launch Bar or right click the <Comba NMS> at the network tree.
A topology view will be open automatically for new network layer construction; the added network is identified in the format as “Net_XX”. “XX” is available from 01 to 99.
Choose “Save Network” from Main Toolbar.

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6.2.2 Modify Network

It includes to modify network property and to change background picture.

Modify Network Property

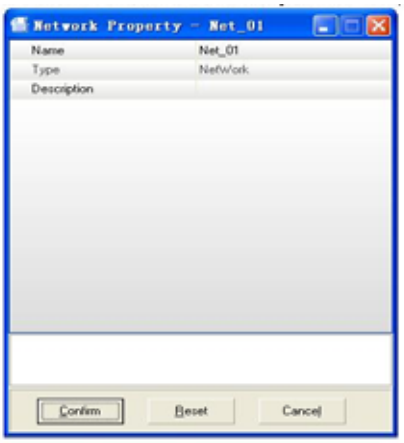

Figure 41: Network Property

Double click the network node and then right click on the topology view to open the “Network Property” window.
Click each item on the left to modify the values displayed on the right. The grey value indicates un-modifiable values.
After modification, click “Confirm” to save and exit from the network property window.

Change Background Picture

The added network adopts the default background automatically, to have a better effect, operator can change background picture at will.

Right click on the network node to open the <Change Network Background> dialogue box.
After selecting the desired background, click “Confirm” to save modification.

Figure 42: Change background picture

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6.2.3 Delete Network

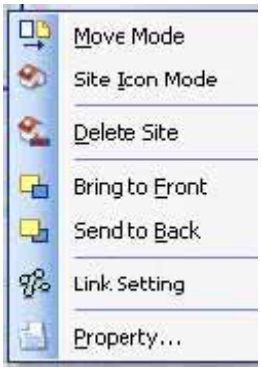
To delete the useless network, right click on the selected network node at the network tree and choose “Delete Network”. The delete operation can not be reserved. It is recommended to well assign the User Privilege on delete operation to prevent unwanted removal.

A system message will be pop up,

Select “Yes” to delete the network, including all the sites and elements under it.
Select “No” to cancel the delete operation.

6.3 SITE LAYER

In this section, add, modify and delete of site layer is focused on. Right click on the site of the topology view, it will be shown as:



- Move Mode: can be switched between “Move” Mode menu. “Connection” Mode can make linear connections, while “Move” Mode can make changes on site or element position on the view page.
- Site Icon mode: can be switched between Site Detail Mode. Site Icon mode displays the site as a cartoon house in the topology view.
- Delete Site: delete the site layer
- Bring to front: move the selected site onto front of the overlapped sites
- Send to back: move the selected site onto back of the overlapped sites
- Link Setting: set link.
- Property: click to open the site property interface

6.3.1 Add Site

There are two methods to add site:

Method 1:
Open a network topology view and select <Add Site> either by right clicking at <Topo Drawing> at Main Toolbar.
A new site will be added at the clicked location under “Site” node. To change the site location or size, select the <Move Mode>, drag the site with mouse for location or size change.
Select “Save Network” from the Main Toolbar or Quick Launch Bar.

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Method 2:
Select the site icon from the <Basic> column at the drawing bar and drag the site with mouse to the topology view area.
A new site will be added at the dragged position. To change the site location or size, select the <Move Mode>, drag the site with mouse for location or size change.
Select “Save Network” from the Main Toolbar or Quick Launch Bar.

6.3.2 Modify Site

Figure 43: Site Property

The same as modify network property, to modify site, the following steps needed to be done:
Right-click the selected site icon or double click the site node, and then right click “Site Property” to launch the “Site Property” window.
Modify the values displayed in the above window. The grey value indicates un-modifiable values.
After modification, click “Confirm” to save and exit from the site property window.

6.3.3 Delete Site

The same as modify network property, to modify site, the following steps needed to be done:
Right click on the selected site node at the network tree and choose “Delete Site”, or delete it from the topology view directly.

A system message will be pop,
Select Yes to delete the site, including all the sites and elements under it.
Select No to cancel the delete operation

6.4 ELEMENT LAYER

In this section, add, modify and delete of element layer is focused on. Right click on the element of the topology view, it will be shown as:

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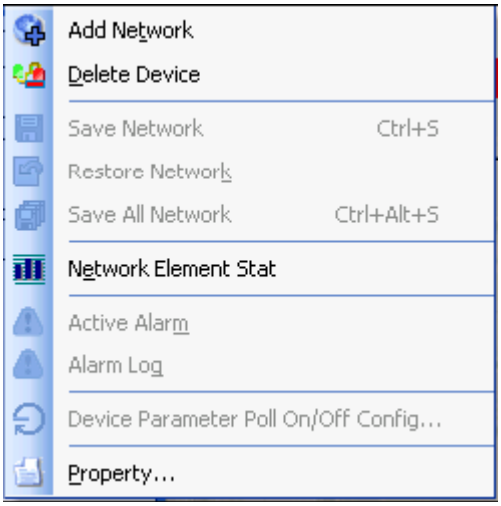

- Add Network: add a new network.
- Delete Device: delete the element.
- Save Network: save all modification of network.
- Restore Network: restore a new network.
- Save all network: save all modification of networks.
- Network Element stat: the statistics of the element.
- Active Alarm: the current alarm information.
- Alarm log: the record of alarms.
- Property: click to open the network property interface

6.4.1 Add Element

Select the desired element at the Drawing Bar and drag it onto the topology view area.
The added element will be displayed at within site. Operator can right click at the element and select <Move Mode> to change the location of the element by dragging it to other location within the site. At the same time, an antenna marked by a solid line to the element icons will also be added. This is just used to shown the overall topology view effect.
Select “Save Network” on the Main Toolbar or the Quick Launch Bar.

6.4.2 Modify Element

Right click the selected element node or click element icon in the topology view area and select property, the element property window will be shown as below:

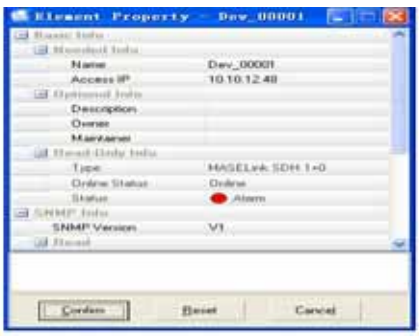

Figure 44: Element Property

Modify the values displayed in the above figure. The grey value indicates un-modifiable The values

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include the items under Basic information, Status Information, SNMP among which Access IP and Access Password are the main items to be modified.
After modification, click “Confirm” to save and exit from the property interface.

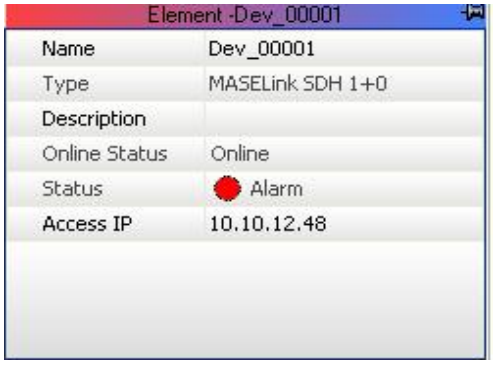
6.4.3 Delete Element

Right click on the selected element node at the network tree and choose “Delete Element”; or easily delete it from the topology view directly.

A system message will be pop up,

Select Yes to delete the element
Select No to cancel the delete operation

The element without property settings as Access IP can neither be monitored by the NMS system, nor be considered as one part of the network element statistic and registered elements. Place mouse on the site icon on the topology view, a semi-transparent windows box will pop up to show the site property.



6.5 LINK OPERATIONS

Link refers to the elements group for microwave transmission. The figure below presents the “Link Setting” interface:

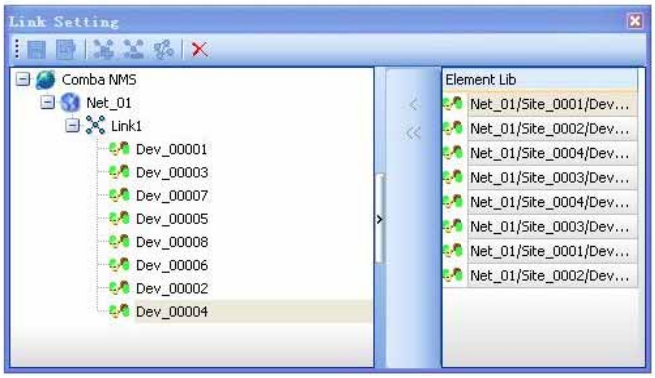


Figure 45: Link Setting

Copyright - refer to title page

6.5.1 Add Link

Select the <Link Setting> from the <View> sub-menu at the Main Toolbar.
Select one network layer from the Link tree, select <Add Link> from the right-click menu or from the Link Toolbar, then a new Link node will be added to the network tree.
Add element from the Element Lib to the Link.
Press CTRL on the keyboard and click on the element from the topology view simultaneously to add the selected element to the <Element Lib>.
Select the Link node from the network tree and press the “Add Element” button, then the elements in the <Element Lib> will be added to the Link.
Select the “Save Network” from the right-click menu or from the Toolbar.

6.5.2 Modify Link

Select the Link need to be modified on the Link tree, select the <Modify Link> from the rightclick menu to open the <Link Property>interface.
During modification, the Link node together with the network node are shown with a “*” seen from the Link tree.
Click “Confirm” to confirm the modification.

6.5.3 Delete Link

Select the Link need to be deleted on the Link tree, select the <Delete Link> from the rightclick menu to open the <Link Property>interface.

A system message will be pop up to confirm with operator whether to delete the Link or not,
Select Yes to delete the Link
Select No to cancel the delete operation

After delete the Link, the network node the Link attributed to is shown with a “*” seen from the Link tree to indicate that some modification has made.
Click “Confirm” to confirm the modification.

End of Section

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7 ELEMENT MANAGEMENT

The following will be introduced in this section:

- Manual Query on Element
- Manual Set on Element
- Online Status Query
- Parameter Poll

The element management functions to monitor elements through operating on multiple view modes and NMS modules.

7.1 MANUAL QUERY ON ELEMENT

7.1.1 Query by List View

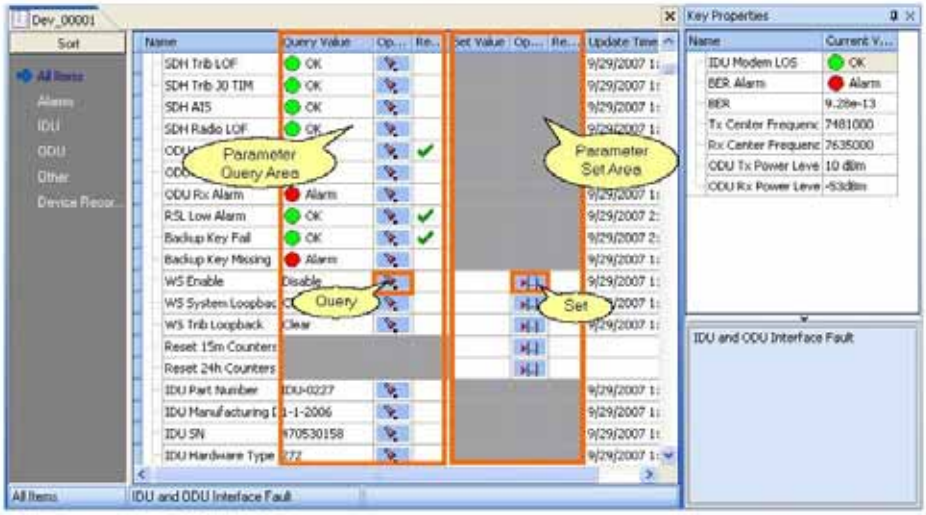
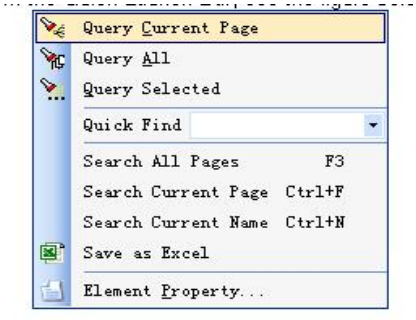


Figure 46: Quert by List View

Select the parameter class to be operated on from the Sort Item List
Click the “Query” button at the “Query Operation Area” to query the selected parameter class; Real-time query can also be implemented through the right-click menu and from the Toolbar, see the figure below:



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Query Current Page: query all the parameters of the selected parameter class
Query All: query all element parameters, say, and all the parameter classes in the sort item list.
Query Selected: query the selected parameter
The query results will be displayed at the <Read Value> column and the operation status at the <Result> column of the “Query Operation Area” in real time. “Tick-on” icon shows successful operation, while the “Tick-off” icon shows operation failure.

7.1.2 Query by Panel View

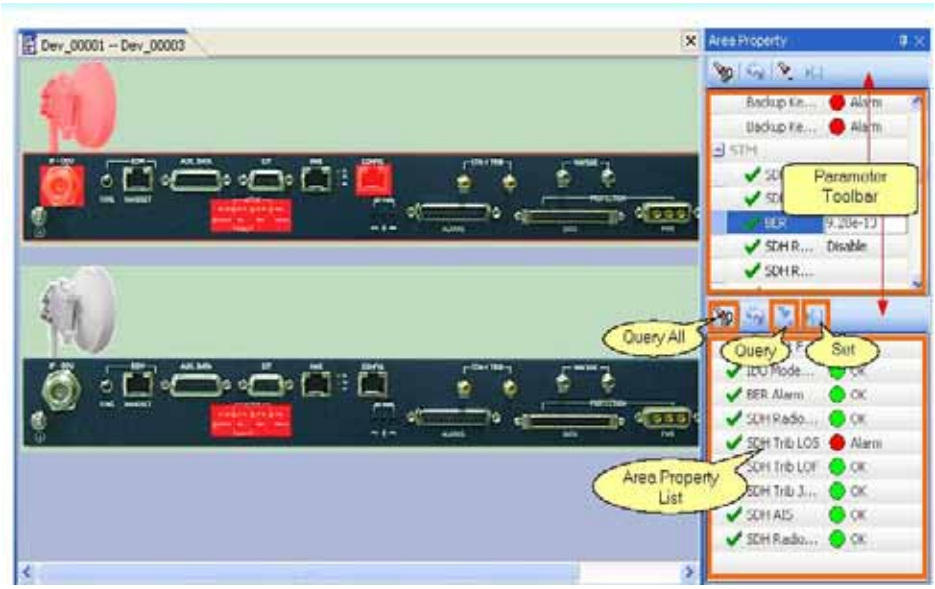

Figure 47: Quert by Panel view

Select one part of the element on the Panel view, the relevant element parameter will be shown at the “Area Property List”.
Select the parameter to be queried at the “Area Property List”, click the “Query” button on the “Parameter Operation Toolbar” or from the “Right-click” menu to query the selected parameter separately, or “Query All” button to query all the listed parameters.
The query status will be displayed with icons, the parameter will be ticked on to indicate successful query, while ticked off to indicate failed query; the query result will also be marked with green or red colours.

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7.1.3 Query by MIB View

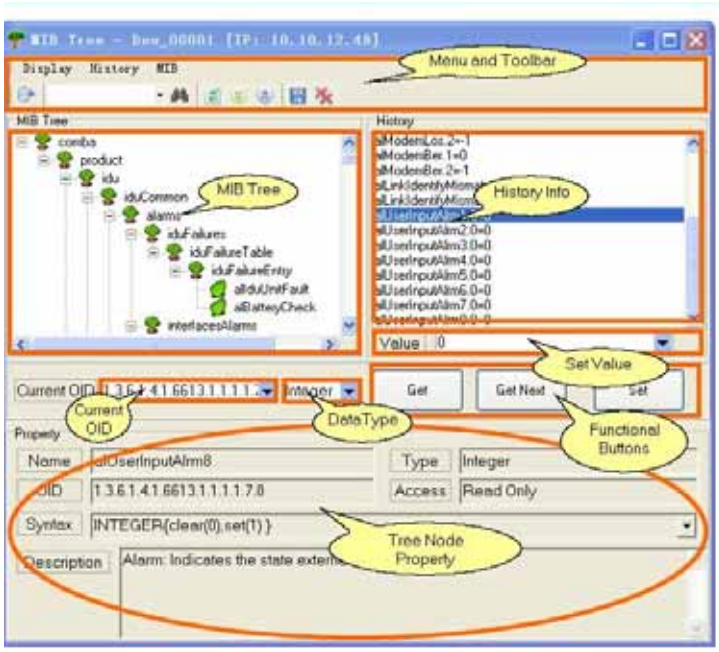

Figure 48: Quert by MIB View

Select the node to be queried at the MIB tree, or locate the node through the “Quick Find” option of the Toolbar with the OID information.
Click the “Get” or “Get Next” button from the Query Set Buttons.
The query results will be displayed at the <History>column.

7.2 MANUAL SET ON ELEMENT

7.2.1 Set by List View

1. Select the parameter class to be operated from the “Sort Item List”
2. Insert or select the value at the “Set Value” column of the “Set Operation Area”, and then click the “Set Button” for element set
3. The value after successful set will be configured to the element, or else, the “Tick-off” icon will indicate the set failure operation at the “Result” column,

NOTE: The grey marked area indicates the read-only parameters

7.2.2 Set by Panel view

1. Select one equipment panel area, the relevant element parameter will be shown at the “Area Property List”.
2. Select the parameter to be set at the “Area Property List”, insert or select the value, click the “Set” button on the “Parameter Operation Toolbar” or from the “Right-click” menu to set the selected parameter separately.
3. The value after successful set will be set to the element, or else, the “Tick-off” icon will indicate the set failure operation.

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NOTE:

1. When select the parameter but with the “Set” button changed to be unavailable, it is indicated that the selected parameter is read-only
2. When the set value is blanked, a system message will pop up to confirm with user whether to set a blanked value.

7.2.3 Set by MIB View

1. Select the node to be set at the MIB tree or locate the node through the “Quick Find” option of the Toolbar with the OID information.
2. Select or insert a value at the “Query/Set Value” menu.
3. Click the “Set” button from the Query/Set Buttons.

7.3 TRAP RECEIVER

Trap receiver listens out for message over the SNMP protocol. These messages are generated by the network elements under fault conditions.

In NMS, port #162 will default to be open to receive the Trap information from network element when NMS starts. Trap information received can cause variety of system interfaces.

If a Trap password is configured during Trap setting, a message indicating that Trap information is received will pop up after password verification, and the alarm information can be seen in the relevant windows. Refer to the section “Trap Command Management” for detail.

End of Section

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8 POLL MANAGEMENT

Poll functions to query the network element performance periodically. Generally, poll management consists of:

- Parameter Poll: periodically query the element parameters
- Online Poll: query whether the element is online or not.

Ordinarily, poll is implemented on the element parameters only

8.1 PARAMETER POLL

User can set the NMS to poll the element parameter to obtain the element information in time.

Due to the different poll interval requirements for different parameters, user can set the “Poll Enable” and “Poll interval” on the ‘Poll Configuration” window.

Parameter poll is launched through the “Configuration” menu on the Main toolbarBar or from the Status Bar.

In addition to the individual parameter poll configuration, user can configure the poll setting for each element, in other words, one parameter of one element model can be defined as non-poll, but can be configured to be poll for an individual element of this model, or all the elements can be defined to be poll except one of them. Please refer to the “Individual Element Parameter Poll Setting” and “Individual Element Poll Setting” in section “Advanced Functionalities”.

8.2 ONLINE POLL

Use can set the NMS to regularly query (poll) the communication status between the element and NMS. The element can not be accessed for parameter poll until at the “online” state. In order to distinguish whether the element is working online, use the online poll function to check the online status of the monitored network element.

If the element is not “online”, it will be seen grey at the network tree or on the topology view.

For the online element, the alarm status can be viewed from the topology view: the element icon will be red marked to indicate an alarm is generated, while green marked to indicate the element is working normally and online.

The online poll interval can be set as one minute at least. Then the online status of the element can be queried once after each predicted interval.

Online poll configuration is launched through the “Configuration” menu on the Main toolbarBar or from the Status Bar.

End of Section

Copyright - refer to title page

9 ALARM MANAGEMENT

In the alarm view, alarms presented by NMS includes network element fault, Trib Alarm, IF Interface Alarm,

9.1 ALARM LEVEL AND SOUND

To raise the attention of the operator, the alarms classified into different alarming levels. To better to reflect different alarming levels, different alarms are with different alarm sounds.

The alarm of the highest level that has not been acknowledged will alert until been acknowledged. The alarm sound will alert until all the alarms are acknowledged, to stop the alarm sound temporarily, user can select the “Ignore Alarm Sound” on the Toolbar, but this is only a temporary operation, the alarm sound will re-generate if the alarm have not been acknowledged yet.

- Critical Alarm
- Major Alarm
- General Alarm
- General Alarm
- Warning Alarm

The alarm level will be shown in the alarm view and statistic view. The alarm sound for different levels of alarm is different, the alarm of the highest level that has not been acknowledged will remain alerting until been acknowledged.

Right click on the “Alarm Status Bar”, it is shown as:

Alarm sound is set to be user-configurable to reflect the variation of the system alarms. Each alarm level is configured with different alarm sound. The alarm of the highest level that has not been acknowledged will alert until been acknowledged.
There are two kinds of voice file format: WAV and PCS. The former requires the NMS PC to be installed with Audio Element and connected with players; the latter easily uses the integrated PC speaker.

The alarm sound will alert until all the alarms are acknowledged, to stop the alarm sound temporarily, user can select the "Ignore Alarm Sound" on the Quick Launch Bar, but this is only a temporary operation, the alarm sound will re-generate if the alarm have not been acknowledged yet.

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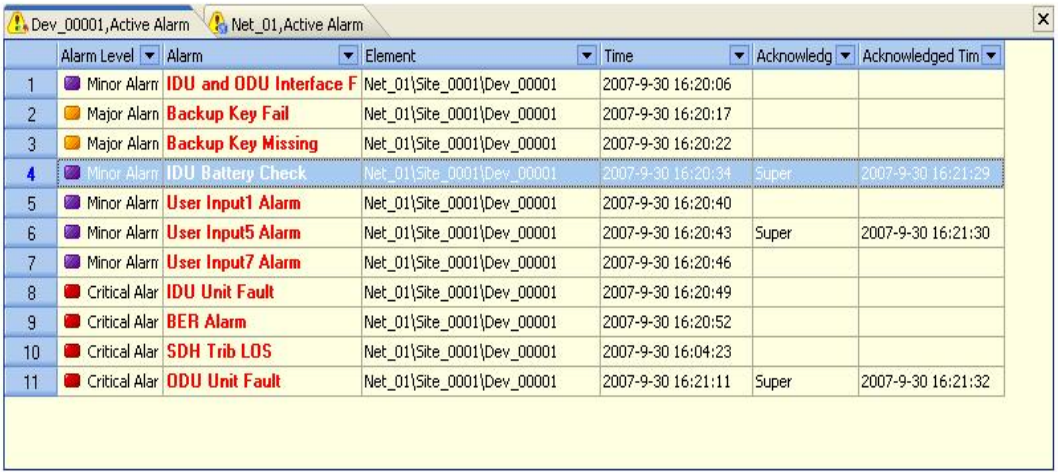
9.2 CURRENT ALARM

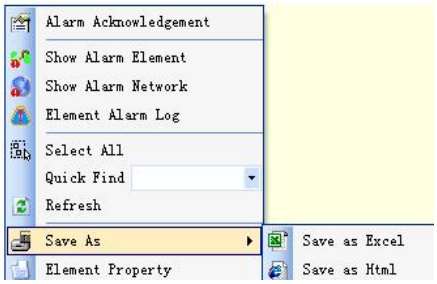
To know the current alarm status of all the network elements trapped by NMS, right-click on the list to read the alarms, it including “current element alarm” and “current network alarm”.



	Alarm Level	Alarm	Element	Time	Acknowledg	Acknowledged Tim
1	Minor Alarm	IDU and ODU Interface F	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:06		
2	Major Alarm	Backup Key Fail	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:17		
3	Major Alarm	Backup Key Missing	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:22		
4	Minor Alarm	IDU Battery Check	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:34	Super	2007-9-30 16:21:29
5	Minor Alarm	User Input1 Alarm	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:40		
6	Minor Alarm	User Input5 Alarm	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:43	Super	2007-9-30 16:21:30
7	Minor Alarm	User Input7 Alarm	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:46		
8	Critical Alar	IDU Unit Fault	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:49		
9	Critical Alar	BER Alarm	Net_01\Site_0001\Dev_00001	2007-9-30 16:20:52		
10	Critical Alar	SDH Trib LOS	Net_01\Site_0001\Dev_00001	2007-9-30 16:04:23		
11	Critical Alar	ODU Unit Fault	Net_01\Site_0001\Dev_00001	2007-9-30 16:21:11	Super	2007-9-30 16:21:32

Figure 49: Current Alarm

As it is shown in the above figure, all the element or network alarms are displayed, refer to the figure below for the relevant alarm operations:



- Alarm Acknowledgement: Only the alarms queried by ‘Auto Trap” need to be acknowledged by users. By default, the NMS does not require any acknowledgement made to the alarms queried by “manual query”, user can choose to auto-config these alarms by NMS through Alarm Configuration operation. Operators must acknowledge the alarms that are trapped by the NMS software automatically. Or else, the alarm sound will alert all the time until being acknowledged. Only privileged user can implement the alarm acknowledgement operation.

- Show Alarming Element: Click to switch to the Panel view of the alarming element.

- Show Alarming Network: Click to switch to the network topology view of the alarming element

- Element Alarm Log: Click to switch to the Real-time Alarm Log of the alarming element

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- Select All: select all the records on the current page.
- Quick Find: find the corresponding records on the current page by inserting a relevant character. Press F3 to find next record. Repeated finding mode is supported.
- Save As: export the alarm record and save it in the format as Excel, Html, Text. (Privileged User)
- Element Property: Click to switch to the “Element Property” window of the selected element

9.3 ALARM LOG

To read the the variation history of element and network parameters, “Element Real-time Alarm” and “Network Real-time Alarm” can be viewed on the Alarm Status Bar, which can be saved as Excel, Html and Text.

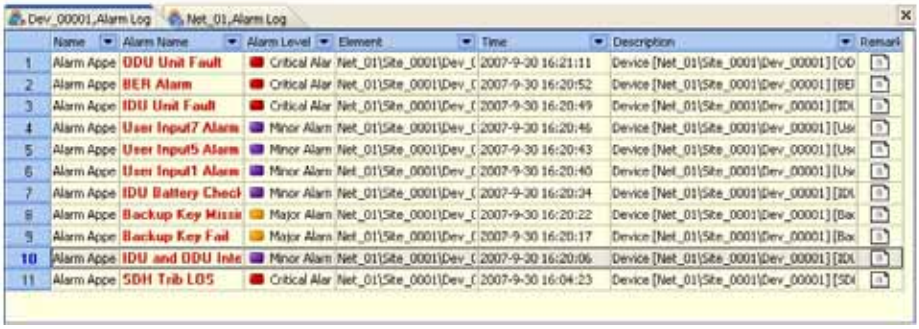
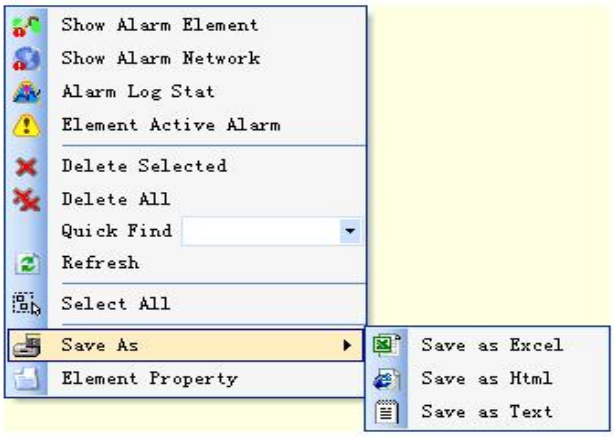


Figure 50: Alarm Log

The right-click menu is as following:



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- Display Alarming Element: Click to switch to the Panel view of the alarm element.
- Displaying Alarming Network: Click to switch to the network topology view of the alarming element
- Alarm Log Statistic: displays the network alarm log
- Delete Selected: deleted the selected records
- Delete All: delete the real-time alarm logs of the element or the network

NOTE:

Some potential problems might be caused by deleting the alarm log entry, for example, the alarm log entry is deleted while the alarm is still alarming, then the records could not be find in the real-time alarm log but still exist in the current alarm window; or when an alarm is ceased, only the Alarm Cessation information can be viewed form the alarm log but not the Alarm Generation information.

- Quick Find: find the corresponding records on the current page by inserting a relevant character. Press F3 to find next record. Recycle find mode is supported.
- Select All: select all the records displayed
- Save As: Export the alarm record and save it in the format as Excel, Html, Text.
- Element Property: Click to switch to the “Element Property” interface of the selected element

End of Section

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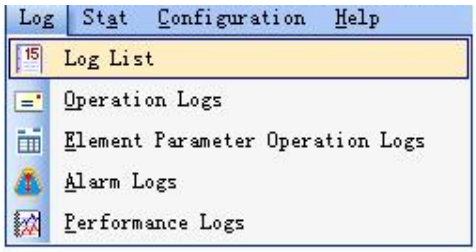
10 LOG MANAGEMENT

Log functions to record NMS performance and user operations. According to the different property, log is classified into five categories:

1. User Operation Log: records the system operations user made, including network operation, system configuration, system resource operation, etc.
2. Element Parameter Operation Log: records the element parameter operation, including element parameter query or set and alarm confirm.
3. Alarm Log: records the alarm status of the element, including the alarm activities as Alarm Generation and Alarm Cessation.
4. Performance Log: Records the element parameter values, including the parameters queries either by “Manual Query” or “Auto Trap”. NOTE: The query value might be a null value, so the “value” column of Performance Log is blank-presented by default.
5. NMS Log: records the automatic NMS activities without any user participations, including NMS start, NMS auto poll, etc.

To view each log, user can access from the <Log> menu of Main toolbarBar:



The <Log List> shows all the logs of the NMS

The other four kinds of logs can also be viewed from the separate log view pages in Log View Mode.

In Log View mode, besides log query, user can edit log remarks, delete, save logs, or search designated logs. The logs can be configured to be deleted periodically.

10.1 LOG LIST

Log list shows all the log records in the log view mode, there are two methods to access the Log

List:

1. Access from the <Log list> of <Log> menu at the Main toolbarBar.

2. In the opened log view, click the “Log List Search” node of the <Customized Search Tree>.

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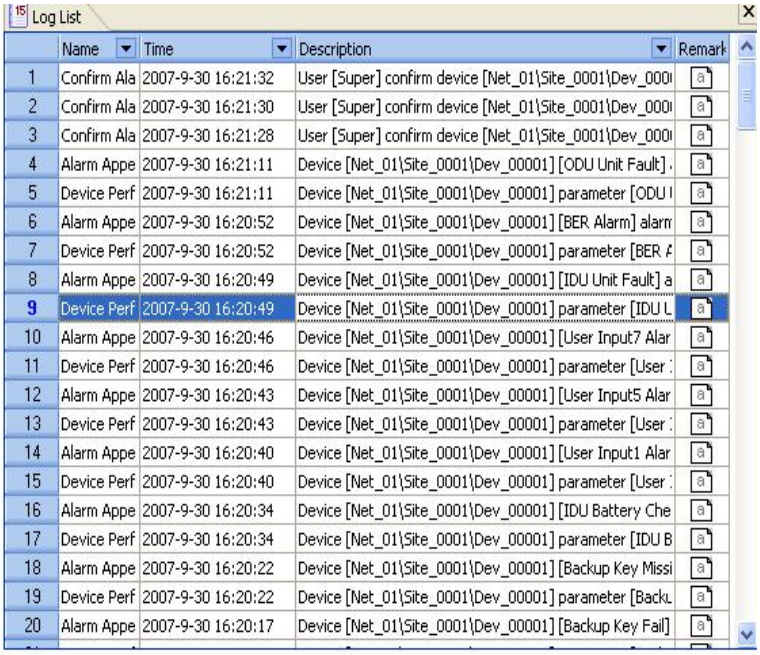

Figure 51: Log List

As it is shown in the above figure, each log is listed with its Log Type Name, Generation Time, Description and Remarks. Right click on each log, user can choose to save, search, delete or refresh the log.

There are two search options listed as the sub-node of “Log List Search” node at the <Customized Search Tree>:

- Search from time
- Search by time range

10.2 USER OPERATION LOG

User Operation Log is presented at the Log View page. There are two methods to open the User Operation Log:

1. Access from the < User Operation Log > of <Log> menu at the Main toolbarBar.
2. On the opened log view, click the “User Operation Log Search” node of the <Customized Search Tree>.

Each log is listed with its Operation User Name, Operation, Object, Time, Description and Remarks. Right click on each log, user can choose to save, search, delete or refresh the log.

There are three search options listed as the sub-node of “User Operation Log Search” node at the <Customized Search Tree>:

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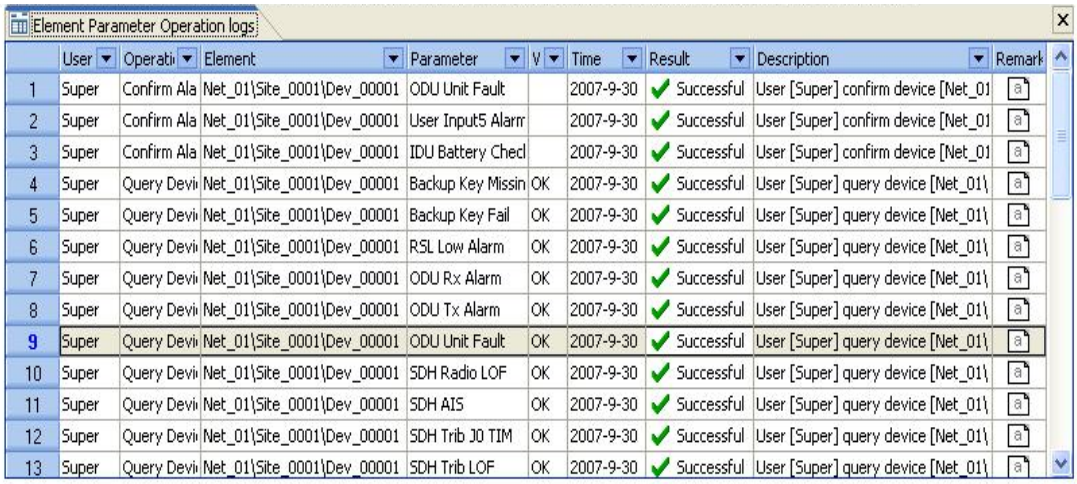
- Search from time
- Search by user
- Search by time range

10.3 ELEMENT PARAMETER OPERATION LOG

Element Parameter Operation Log is presented at the Log View page, there are two methods to open the Element Parameter Operation Log:

1. Access from the <Element Parameter Operation Log> of <Log> menu at the Main toolbarBar.
2. On the opened log view, click the “Element Parameter Operation Log Search” node of the <Customized Search Tree>.



	User	Operati	Element	Parameter	V	Time	Result	Description	Remark
1	Super	Confirm Ala	Net_01\Site_0001\Dev_00001	ODU Unit Fault		2007-9-30	Successful	User [Super] confirm device [Net_01	
2	Super	Confirm Ala	Net_01\Site_0001\Dev_00001	User Input5 Alarm		2007-9-30	Successful	User [Super] confirm device [Net_01	
3	Super	Confirm Ala	Net_01\Site_0001\Dev_00001	IDU Battery Checl		2007-9-30	Successful	User [Super] confirm device [Net_01	
4	Super	Query Devi	Net_01\Site_0001\Dev_00001	Backup Key Missin	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
5	Super	Query Devi	Net_01\Site_0001\Dev_00001	Backup Key Fail	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
6	Super	Query Devi	Net_01\Site_0001\Dev_00001	RSL Low Alarm	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
7	Super	Query Devi	Net_01\Site_0001\Dev_00001	ODU Rx Alarm	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
8	Super	Query Devi	Net_01\Site_0001\Dev_00001	ODU Tx Alarm	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
9	Super	Query Devi	Net_01\Site_0001\Dev_00001	ODU Unit Fault	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
10	Super	Query Devi	Net_01\Site_0001\Dev_00001	SDH Radio LOF	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
11	Super	Query Devi	Net_01\Site_0001\Dev_00001	SDH AIS	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
12	Super	Query Devi	Net_01\Site_0001\Dev_00001	SDH Trib J0 TIM	OK	2007-9-30	Successful	User [Super] query device [Net_01\	
13	Super	Query Devi	Net_01\Site_0001\Dev_00001	SDH Trib LOF	OK	2007-9-30	Successful	User [Super] query device [Net_01\	

Figure 52: Element Parameter Operation Logs

Each log is listed with its Operation User Name, Operation, Element Name, Parameter, Value, Time, Result, Description and Remarks. Right click on each log, user can choose to save, search, delete or refresh the log.

There are four search options listed as the sub-node of “Element Parameter Operation Log Search” node at the <Customized Search Tree>:

- Search from time
- Search by user
- Search by element
- Search by time range

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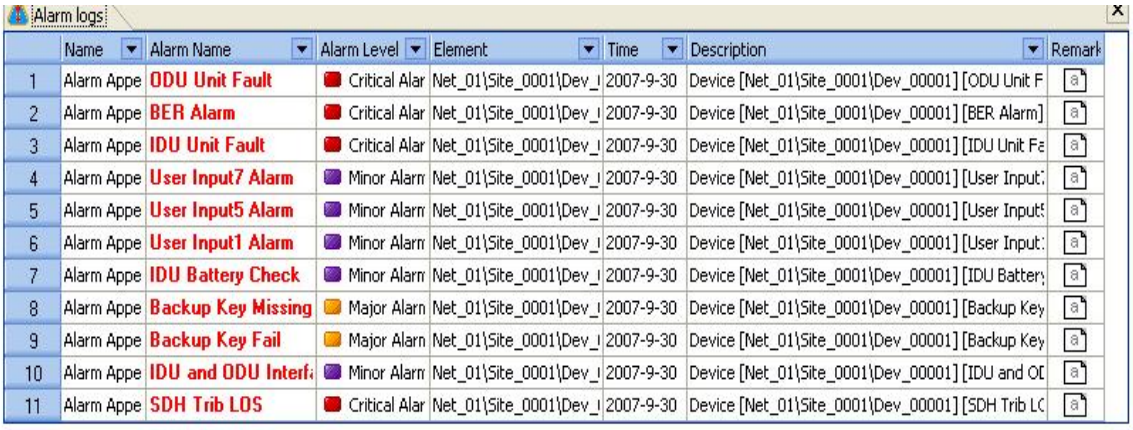
10.4 ALARM LOG

Alarm Log is presented at the Log View page. There are two methods to open the Alarm Log:

1. Access from the <Alarm Log> of <Log> menu at the Main toolbarBar.
2. On the opened log view, click the “Alarm Log Search” node of the <Customized Search Tree>.



	Name	Alarm Name	Alarm Level	Element	Time	Description	Remark
1	Alarm Appe	ODU Unit Fault	Critical Alar	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [ODU Unit F	
2	Alarm Appe	BER Alarm	Critical Alar	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [BER Alarm]	
3	Alarm Appe	IDU Unit Fault	Critical Alar	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [IDU Unit Fa	
4	Alarm Appe	User Input7 Alarm	Minor Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [User Input7	
5	Alarm Appe	User Input5 Alarm	Minor Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [User Input5	
6	Alarm Appe	User Input1 Alarm	Minor Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [User Input1	
7	Alarm Appe	IDU Battery Check	Minor Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [IDU Battery	
8	Alarm Appe	Backup Key Missing	Major Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [Backup Key	
9	Alarm Appe	Backup Key Fail	Major Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [Backup Key	
10	Alarm Appe	IDU and ODU Interfa	Minor Alarm	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [IDU and OD	
11	Alarm Appe	SDH Trib LOS	Critical Alar	Net_01\Site_0001\Dev_	2007-9-30	Device [Net_01\Site_0001\Dev_00001] [SDH Trib LO	

Figure 53: Alarm Logs

Each log is listed with its Alarm Activity Name, Alarm Name, Alarm Level, Element, Time, Description and Remarks. Right click on each log, user can choose to save, search, delete or refresh the log.

There are four search options listed as the sub-node of “Alarm Log Search” node at the <Customized Search Tree>:

- Search from time
- Search by element
- Search by element model
- Search by time range

10.5 PERFORMANCE LOG

Performance Log is presented at one of the Log View page, there are two methods to open the Alarm Log:

1. Access from the <Performance Log> of <Log> menu at the Main toolbarBar.
2. On the opened log view, click the “Performance Log Search” node of the <Customized Search Tree>.

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Performance Logs

	Element	Parameter	Value	Time	Description	Remark
1	Net_01\Site_0001\Dev_0	ODU Unit Fault	Alarm	2007-9-30 16:21:11	Device [Net_01\Site_0001\Dev_00001] parameter [ODU Unit Fa	
2	Net_01\Site_0001\Dev_0	BER Alarm	Alarm	2007-9-30 16:20:52	Device [Net_01\Site_0001\Dev_00001] parameter [BER Alarm],	
3	Net_01\Site_0001\Dev_0	IDU Unit Fault	Alarm	2007-9-30 16:20:49	Device [Net_01\Site_0001\Dev_00001] parameter [IDU Unit Fa	
4	Net_01\Site_0001\Dev_0	User Input7 Alarr	Alarm	2007-9-30 16:20:46	Device [Net_01\Site_0001\Dev_00001] parameter [User Input7	
5	Net_01\Site_0001\Dev_0	User Input5 Alarr	Alarm	2007-9-30 16:20:43	Device [Net_01\Site_0001\Dev_00001] parameter [User Input5	
6	Net_01\Site_0001\Dev_0	User Input1 Alarr	Alarm	2007-9-30 16:20:40	Device [Net_01\Site_0001\Dev_00001] parameter [User Input1	
7	Net_01\Site_0001\Dev_0	IDU Battery Chec	Alarm	2007-9-30 16:20:34	Device [Net_01\Site_0001\Dev_00001] parameter [IDU Battery	
8	Net_01\Site_0001\Dev_0	Backup Key Missi	Alarm	2007-9-30 16:20:22	Device [Net_01\Site_0001\Dev_00001] parameter [Backup Key	
9	Net_01\Site_0001\Dev_0	Backup Key Fail	Alarm	2007-9-30 16:20:17	Device [Net_01\Site_0001\Dev_00001] parameter [Backup Key	
10	Net_01\Site_0001\Dev_0	Net Subnet Mask	1	2007-9-30 16:20:13	Device [Net_01\Site_0001\Dev_00001] parameter [Net Subnet	
11	Net_01\Site_0001\Dev_0	Voice EOW Enabl	Enable	2007-9-30 16:20:08	Device [Net_01\Site_0001\Dev_00001] parameter [Voice EOW I	
12	Net_01\Site_0001\Dev_0	IDU and ODU Int	Alarm	2007-9-30 16:20:06	Device [Net_01\Site_0001\Dev_00001] parameter [IDU and OD	

Figure 54: Performance Logs

Each log is listed with Element, Parameter, Value, Time, Description and Remarks. Right click on each log, user can choose to save, search, delete or refresh the log.

There are four search options listed as the sub-node of “Performance Log Search” node at the <Customized Search Tree>:

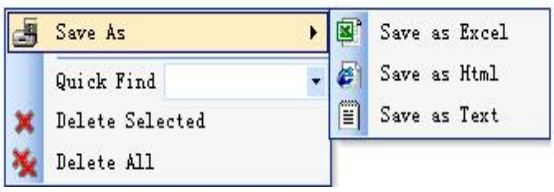
- Search from time
- Search by element
- Search by time range
- Search by element parameter

10.6 LOG OPERATION

Log operations includes save, search, edit or delete logs.

10.6.1 Right-click Menu Operation

In the log view mode, right click on each log view page, the following could be seen:



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- Save as Excel: export the log list to save it as an Excel file. Shortcut key of “Ctrl+S” can achieve the same save operation
- Save as Excel: export the log list to save it as an Html file.
- Save as Txt: export the log list to save it as a Txt file.
- Delete Selected: delete the selected log records on the current view page
- Delete All: delete all the log records on the current view page
- Quick Search: insert the search character at the “Search column”, press enter, the system search can be activated. Press F3 for the next search item.
- Refresh: Refresh the current page to view the latest log records.

NOTE: Only privileged user can implement “Save AS” and “Delete” operations.

10.6.2 Remark Edit

A “Remark” column is positioned on each log view page. “ ” indicates blanked remark, while “ ” indicates a remark exists. User can click on the icons to edit the remarks and press “OK” to confirm edit.

NOTE: The remark is limited to be no more than 200 characters. Only privileged user can implement the remark edit operation, while other user can only read the remarks.

10.6.3 Periodic Log Clear

As long as the NMS operation lasts, the count of log records will be accumulated accordingly, this may continuously enlarge the database volume. The logs can be configured to be auto-cleared periodically or be cleared manually at anytime.

10.6.4 Customized Log Search

Customized Log Search functions to search the logs that meet the search requirement.

The advantage of doing so is: The Log records are accumulated with the NMS operation, by using the Customized Log Search function, user can easily search out the desired logs from the log list.

The search objectives are:

- Log List
- User Operation Log
- Element Parameter Operation Log
- Alarm Log
- Performance Log

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In all, there are six kinds of search options supported:

- Search from time
- Search by user
- Search by element
- Search by element model
- Search by time range
- Search by element parameter

Customized Search Tree

Operations on Customized Search Tree:

- Expand Tree
- Collapse Tree:

As shown in the following figure: the customized search record at the Customized Search Tree can be deleted by user through right-click menu; Click on the “xx search” node at the customized search tree, such as “Performance Log Search”, the selected log view page will be shown accordingly.

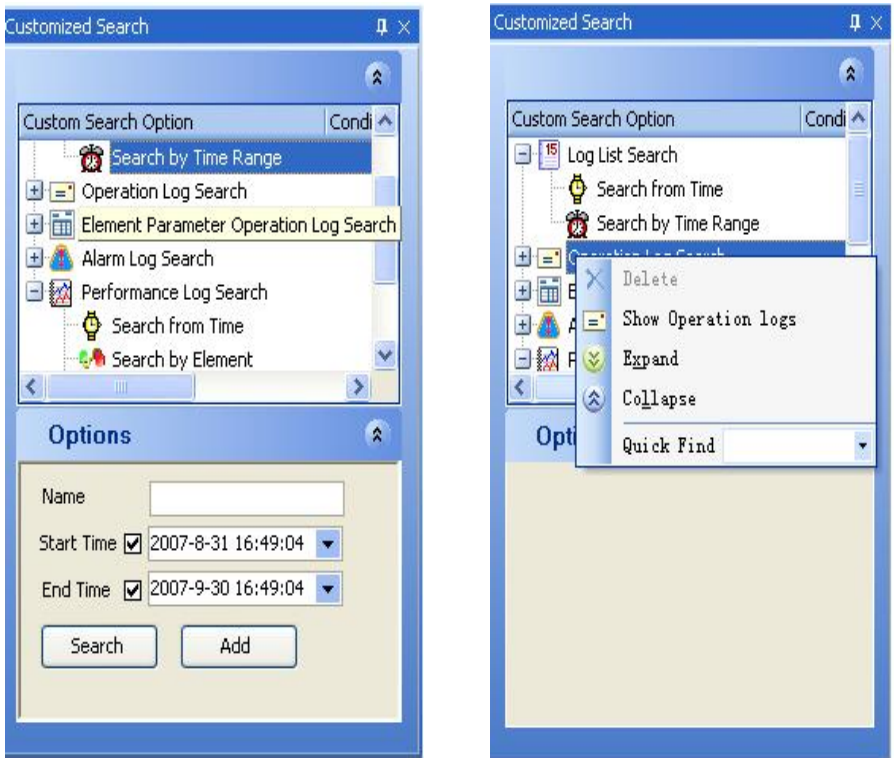

Figure 55: Customized Search

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"Option" column operation:

1. Search: search the log based on the search requirement, the search result will be shown at the "Log Displaying Area". User could define an Name for the searched logs, this Name would become the search result title displayed at the "Log Displaying Area"
2. Add customized search: save the search requirement, a title must be provided. Click the "xx search" node at the customized search tree to add customized search
3. Modify customized search: click the customized search option node to modify the customized search requirement.

Search by Time

Search form time defines the search time started from a designated history time to the operating time.

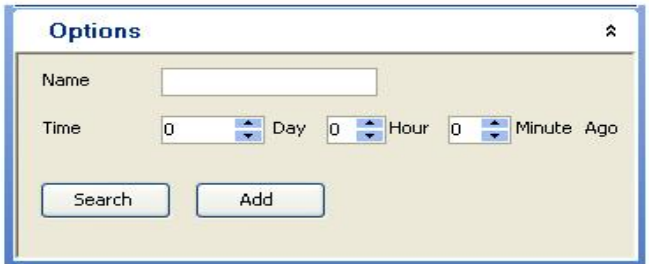

Figure 56: Search by Time

- Name: search Name defined for the search result, this column should be kept blank if user plans to save/export the search result.
- Time: the time range defined by user.

NOTE: The "Day" is limited to be no more than 10000, or else, it is considered to be an invalid value.

Search by Time Range

Search by time range refers to the search option of searching form "start time" to 'end time".

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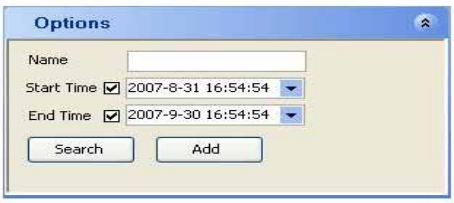

Figure 57: Search by Time Range

- Name: search Name defined for the search result, this column should be kept blank if user plans to save/output the search result.
- Start Time: the start time defined by user, it should be a history time. The search result will be started from this defined start time
- End time: the start time defined by user. The search result will be end by this defined end time

NOTE: The 'Start Time" should be less than the "End Time". Both of them should be "tick-on" to take effects.

Search by User

Search by user searches the operation logs of one user.

Figure 58: Search by User

- Name: search Name defined for the search result, this column should be kept blank if user plans to save/output the search result.
- User: the user defied to search for his/her operation logs.

Search by Element

Search by element searches the log of one element, includes specific search and wildcard search

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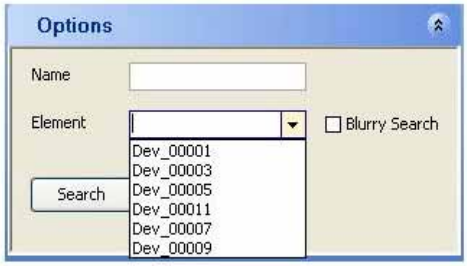

Figure 59: Search by Element

- Name: search Name defined for the search result, this column should be kept blank if user plans to save/output the search result.
- Element: the element Name defined for the log search.
- Specific Search: select the element Name from the sub-menu of “element”, such as “Dev_001”.
- Wildcard Search: Tick on the “Wildcard Search” to switch to the Wildcard Search, which support the wildcard character “%” of SQL Language. e.g., insert “SDH%” as the search requirement, then all the relevant SDH elements as “SDH_1+0_ Dev_001”, “SDH_1+1_ Dev_002” would appear at the search result area.

Search by Element Model

Search by element model searches the logs for one element model.

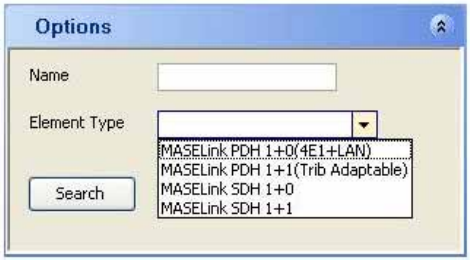

Figure 60: Search by Element Model

- Name: the search Name defined for the search result, this column should be kept blank if user plans to save/export the search result.
- Element Model: the element model defined for the log search, it can be selected fro the sub-menu of “Element Model”.

Search by Element Parameter

Search by element parameter searches logs for one element parameter.

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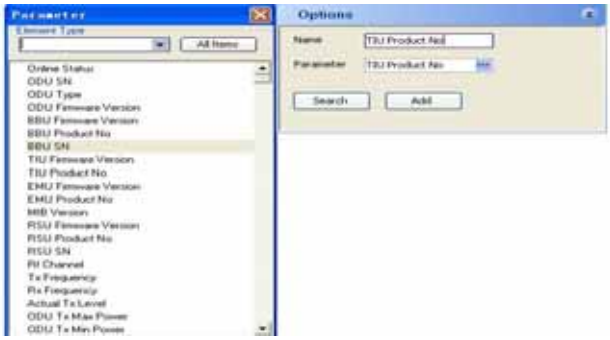

Figure 61: Search by Element Parameter

- Name: search Name defined for the search result, this column should be kept blank if user plans to save/output the search result.

- Parameter: the parameter Name defined for log search. User can choose to insert the parameter directly or select it from the sub-menu of “Parameter”

End of Section

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11 STATISTIC MANAGEMENT

In this section, the statistic on the following items will be introduced:

- Network element count
- Current Alarm count of different level
- The generated alarm count
- Link BER value

The statistic window consists of two parts: Statistic Result Area and Customized Statistic Area.

Seen in the figure below, the Statistic Result Area is divided into the “Statistic Result Tree” located at the top, and the “Statistic Data Source” located at the bottom.

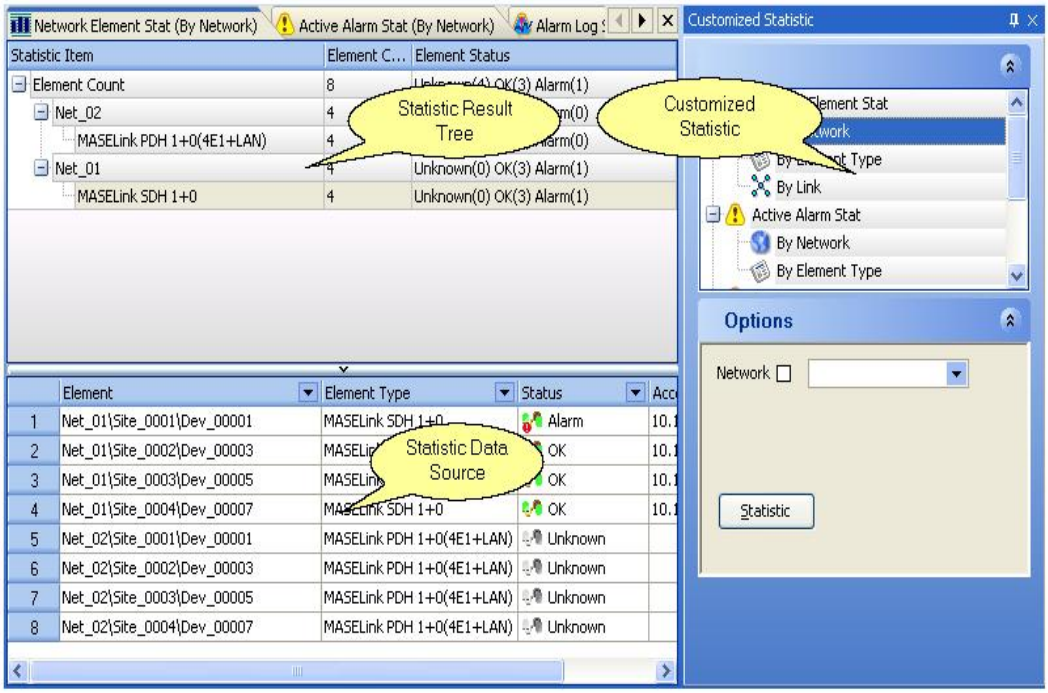

Figure 62: Statistic Mangement

The operations on “Statistic Result Tree” include: Refresh and Save as TXT

The figure below presents the right-click menu.

- Auto Refresh is not available for statistic management; user needs to refresh the current statistic page manually to get the latest result.

- Only privileged users can implement the “Save as TXT” option.

- The statistic result will be displayed at the “Statistic Data Source” by double clicking one statistic node at the “Statistic Result Tree”

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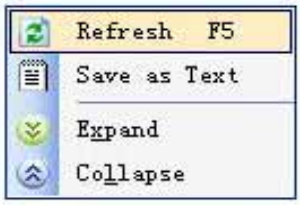
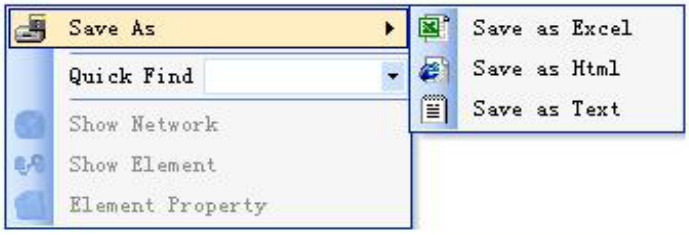


NOTE: Provided that the statistic objective varies, such as elements are added, deleted or duringt he statistic process, user should click to refresh the current statistic page, or else, incorrect statistic result might be captured.

The operations on “Statistic Data Source” include: Save as TXT, HTML or Excel, Quick Find, Show Network, Show Element, Element Property. Only privileged user can implement the “Save As” operation:



NOTE: After deleting one element but without refreshing the current statistic page, the three items “Show Network”, “Show Element” and “Element Property” will become unavailable when right click the deleted element at the “Statistic Data Source” area.

The operations on “Customized Statistic Area” include: Expand and Collapse the statistic tree at the “Customized Statistic Area”. Press the “Statistic” button at the “Option” column or double click one node “By **”, such as “By Network”, to open and view the statistic result.

11.1 NETWORK ELEMENT STATISTIC

Network Element Statistic aims at the statistic on network element. On the “Statistic Result Tree”, the network element count and status, such as “unknown”, “normal”, “alarming” are shown. On the “Statistic Data Source” area, the element relevant information such as element Name, element model, and element access IP are shown.

Statistic Result Tree

- By network: the first layer shows the sum of the network element monitored by the NMS, the second layer shows the network element count of each network, the third layer shows the network element count of each element model in each network.

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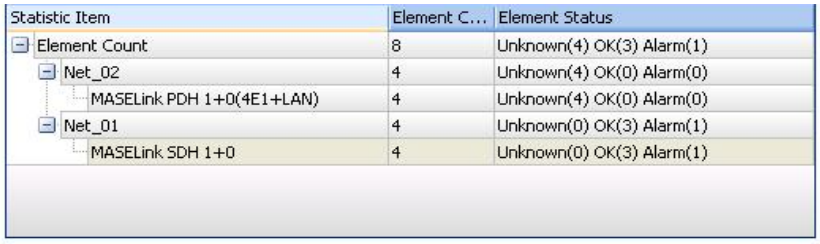
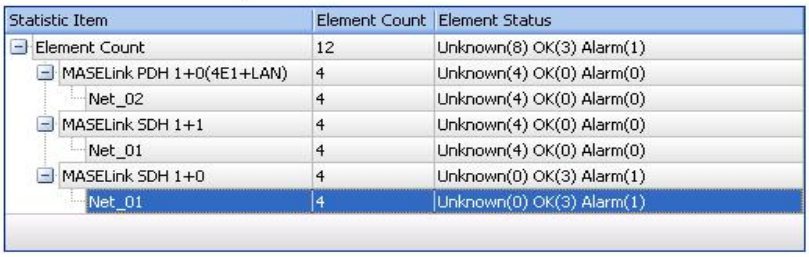


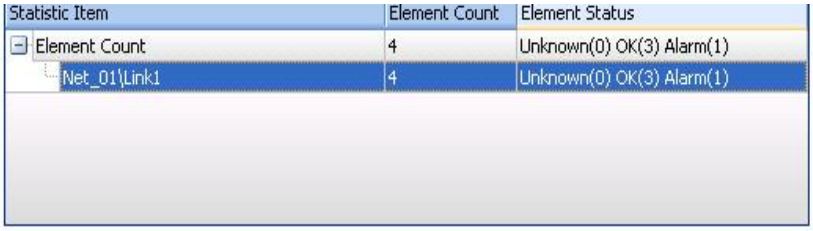
Statistic Item	Element C...	Element Status
Element Count	8	Unknown(4) OK(3) Alarm(1)
Net_02	4	Unknown(4) OK(0) Alarm(0)
MASELink PDH 1+0(4E1+LAN)	4	Unknown(4) OK(0) Alarm(0)
Net_01	4	Unknown(0) OK(3) Alarm(1)
MASELink SDH 1+0	4	Unknown(0) OK(3) Alarm(1)

- By element model: the first layer shows the sum of the network element monitored by the NMS, the second layer shows the network element count of each element model, the third layer shows the network element count of each network of each element model.



Statistic Item	Element Count	Element Status
Element Count	12	Unknown(8) OK(3) Alarm(1)
MASELink PDH 1+0(4E1+LAN)	4	Unknown(4) OK(0) Alarm(0)
Net_02	4	Unknown(4) OK(0) Alarm(0)
MASELink SDH 1+1	4	Unknown(4) OK(0) Alarm(0)
Net_01	4	Unknown(4) OK(0) Alarm(0)
MASELink SDH 1+0	4	Unknown(0) OK(3) Alarm(1)
Net_01	4	Unknown(0) OK(3) Alarm(1)

- By Link: the first layer shows the network element sum of the entire Link, the second layer shows the network element count of each Link



Statistic Item	Element Count	Element Status
Element Count	4	Unknown(0) OK(3) Alarm(1)
Net_01\Link1	4	Unknown(0) OK(3) Alarm(1)

NOTE: For the statistic by Link, the elements included in the Link should be taken as the object of network element statistic, because not all the network elements are included in the Links, or one network element may exist in multiple Links, so the network element count of every layers may not be consistent with the network element sum of the entire Link, this number may be less than the sum of the network element monitored by the NMS.

11.2 CURRENT ALARM STATISTIC

The Current Alarm Statistic aims at the statistic on alarms of different levels generated currently. On the “Statistic Result Tree”, the current alarm sum of different levels is listed; On the “Statistic Data Source” area, the basic information on the current alarm is listed.

Customized statistic consists of the statistic by network and by element model:

By Network

The results are shown as four layers at the “Statistic Result Tree”. The first layer shows the current alarm count of different levels of every network elements, the second layer shows the current alarm count of different levels of each network, the third layer shows the current alarm

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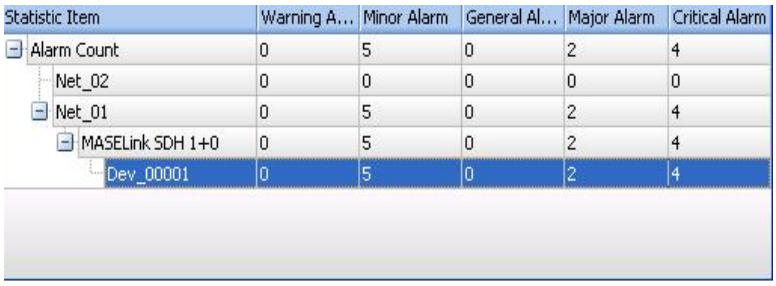
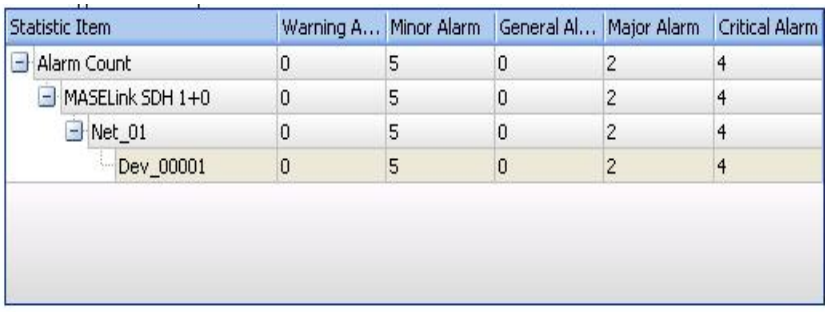
count of different levels of each element model in each network, (blanked indicating no current alarms generated to the element model), the forth layer shows the current alarm count of different levels of each element (blanked indicating no current alarms generated to the element).



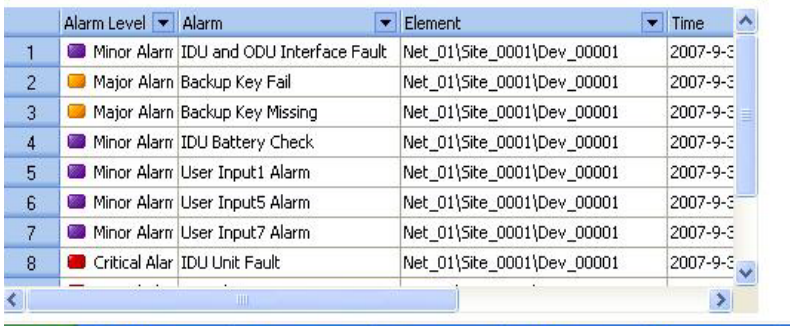
Statistic Item	Warning A...	Minor Alarm	General Al...	Major Alarm	Critical Alarm
Alarm Count	0	5	0	2	4
Net_02	0	0	0	0	0
Net_01	0	5	0	2	4
MASELink SDH 1+0	0	5	0	2	4
Dev_00001	0	5	0	2	4

By Element Model

The results are shown as four layers at the “Statistic Result Tree”. The first layer shows the current alarm count of different levels of the entire network element, the second layer shows the current alarm count of each level under each element model, (blanked indicating no current alarms generated to the element model), the third layer shows the current alarm count of different levels under each network of each element model (blanked indicating no current alarms generated to the network), the forth layer shows the current alarm count of each level under each element (blanked indicating no current alarms generated to the element).



Statistic Item	Warning A...	Minor Alarm	General Al...	Major Alarm	Critical Alarm
Alarm Count	0	5	0	2	4
MASELink SDH 1+0	0	5	0	2	4
Net_01	0	5	0	2	4
Dev_00001	0	5	0	2	4



	Alarm Level	Alarm	Element	Time
1	Minor Alarm	IDU and ODU Interface Fault	Net_01\Site_0001\Dev_00001	2007-9-3
2	Major Alarm	Backup Key Fail	Net_01\Site_0001\Dev_00001	2007-9-3
3	Major Alarm	Backup Key Missing	Net_01\Site_0001\Dev_00001	2007-9-3
4	Minor Alarm	IDU Battery Check	Net_01\Site_0001\Dev_00001	2007-9-3
5	Minor Alarm	User Input1 Alarm	Net_01\Site_0001\Dev_00001	2007-9-3
6	Minor Alarm	User Input5 Alarm	Net_01\Site_0001\Dev_00001	2007-9-3
7	Minor Alarm	User Input7 Alarm	Net_01\Site_0001\Dev_00001	2007-9-3
8	Critical Alar	IDU Unit Fault	Net_01\Site_0001\Dev_00001	2007-9-3

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11.3 ALARM LOG STATISTIC

Alarm log statistic aims at the statistic on the alarm generation activity listed in the alarm log of the monitored network.

NOTE: There are not statistics on Alarm Cessation activity and alarm logs of the deleted element.

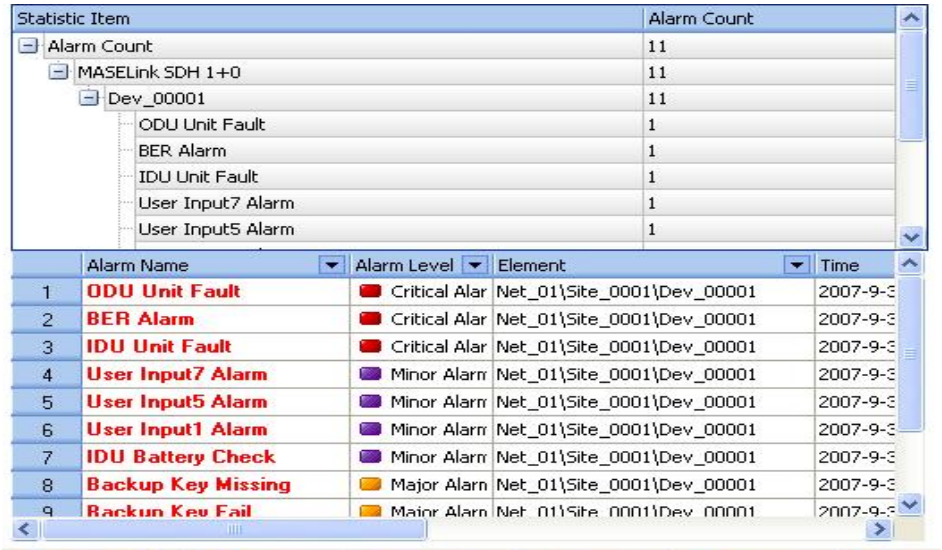
Customized statistic consists of the statistic by network and by element model.

By Network

The results are shown as four layers at the “Statistic Result Tree”. The first layer shows the alarm log sum of the entire network element, the second layer shows the alarm log count of each network, the third layer shows the alarm log count of the elements in each network, the forth layer shows the alarm count of each element parameter.

By Element Model

The results are shown as four layers at the “Statistic Result Tree”. The first layer shows the alarm log sum of the entire network element, the second layer shows the alarm log count of each element model, the third layer shows the alarm log count of each element, the forth layer shows the alarm count of each element parameter.



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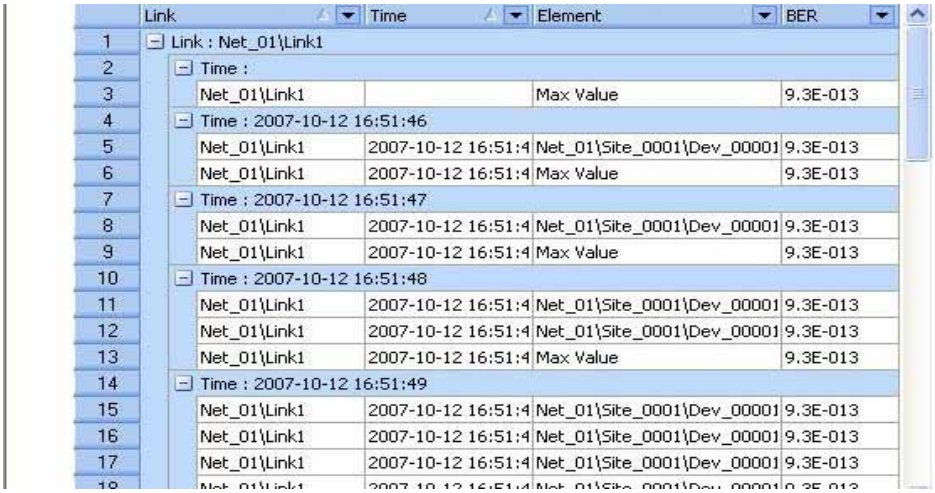
11.4 BER STATISTIC

BER statistic generates the statistics on element BER value.

At the Customized Statistic Area, there are three options to be operated on for the BER statistic: Link, Start Time, and End Time.

Click the sub-menu of “Link” to select the Link to implement the BER statistic. After each operation, this Link should be saved beforehand, if the Link had been deleted, the statistic result would not be available. The statistic data source is defined by the period from Start Time to End Time. By default, it is defined as one month before

On the statistic result tree, the biggest BER value of each Link is list by different time period.



	Link	Time	Element	BER
1	Link : Net_01\Link1			
2	Time :			
3	Net_01\Link1		Max Value	9.3E-013
4	Time : 2007-10-12 16:51:46			
5	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013
6	Net_01\Link1	2007-10-12 16:51:4	Max Value	9.3E-013
7	Time : 2007-10-12 16:51:47			
8	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013
9	Net_01\Link1	2007-10-12 16:51:4	Max Value	9.3E-013
10	Time : 2007-10-12 16:51:48			
11	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013
12	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013
13	Net_01\Link1	2007-10-12 16:51:4	Max Value	9.3E-013
14	Time : 2007-10-12 16:51:49			
15	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013
16	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013
17	Net_01\Link1	2007-10-12 16:51:4	Net_01\Site_0001\Dev_0000	9.3E-013

End of Section

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12 NMS CONFIGURATION MANAGEMENT

NMS Configuration functions to configure the NMS functions and options, including element poll config, alarm config, database connection config and log config. An appropriate system configuration can improve the NMS performance to be more efficient and convenient. Refer to the following configuration interface:

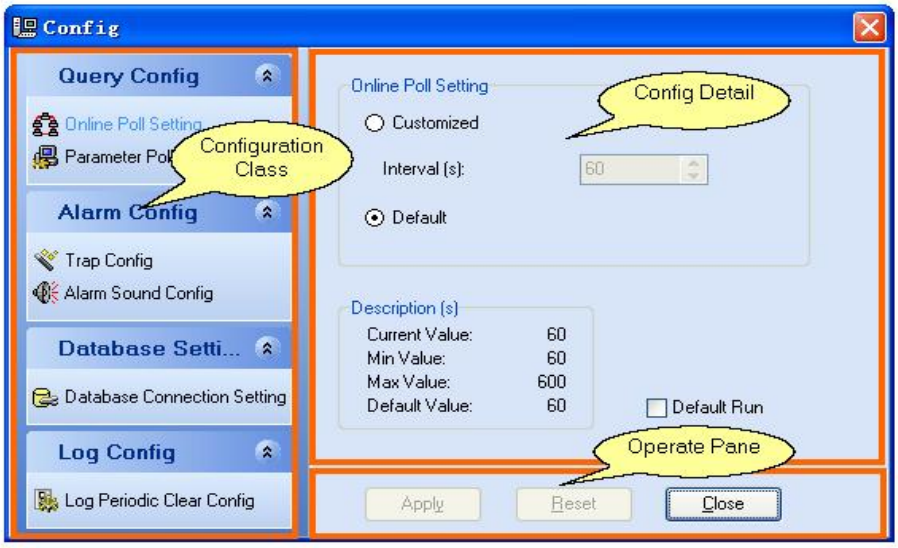

Figure 63: Configuration Management

In summary, the system configuration consists of: Online Poll Config, Parameter Poll Config, Trap Config, Alarm Sound Config, Database Connection Config, and Purge Log Clear Config

NOTE: After each configuration, user must save to make the value take effect, otherwise, a message will pop up for save indication.

12.1 ONLINE POLL CONFIG

Online Poll config consists of the configurations on online poll interval and online poll enabled.

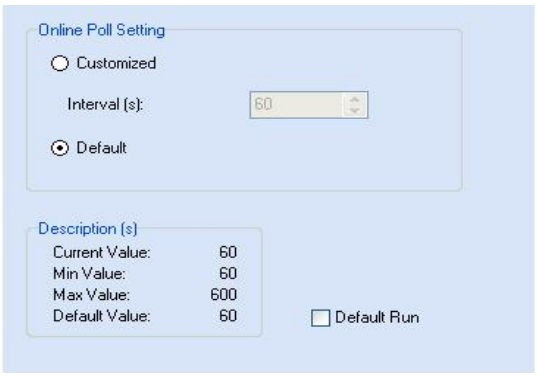

Figure 64: Online Poll Config

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- By default, the Online Poll interval is 60 seconds; this is user configurable within the range of 60~600 seconds.
- By default, the NMS is set to be Online Poll Switch off; user can configure it as being switched on when the system starts.

12.2 PARAMETER POLL CONFIG

Parameter Poll Config includes the configurations on parameters poll for each element model and the poll interval for each parameter, and on parameter poll enabled with the NMS starts. In addition, user can configure the parameters to be polled as element or site specific.

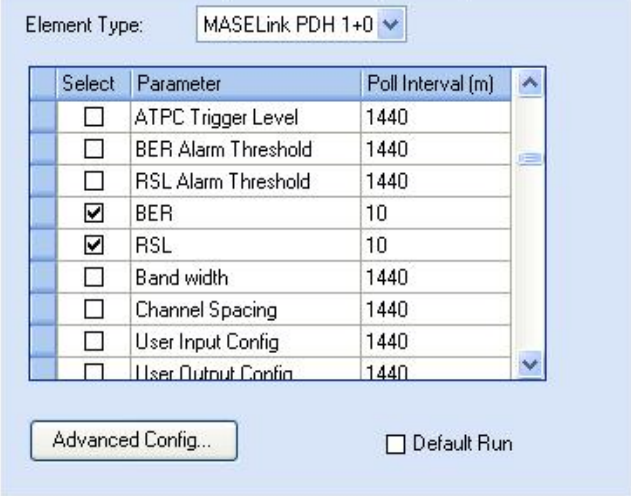

Figure 65: Parameter Poll Config

12.2.1 Parameter Poll Interval Setting

1. Click to select one element at the sub-menu of “Element Model”
2. In the parameter list, select the parameter (s) to be polled.
3. Set the interval time at the “Poll Interval” column.
4. Click “Apply” to save the configuration.

12.2.2 Poll On/Off Setting for Single Parameter

1. Click the “Advanced Setting...” to open the “Poll Run Config” window as below:

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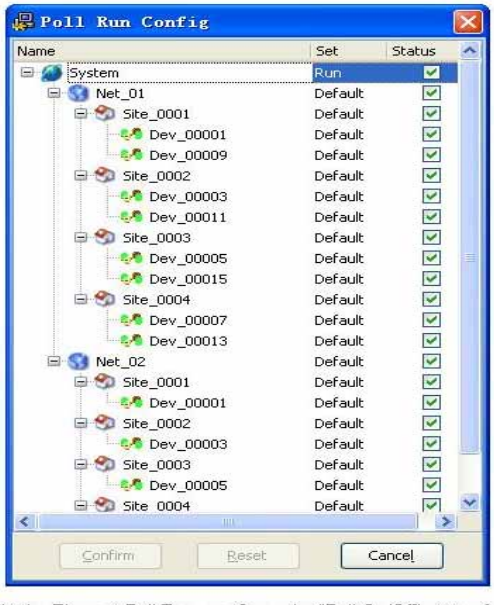

Figure 66: Poll Run Config

2. At the Element Poll Tree, configure the “Poll On/Off” status for the system, network, element in the “Set” column individually. The “Default” operation means it is consistent with the previous item. The configuration status is displayed at the “Status” column: “Tick-on” to be “Poll On”, while “Tick-off” to be “Poll Off”.

3. Click “Confirm” to save the configuration.

NOTE: The configurable range of parameter poll interval is 1~30 minutes. If the count of elements or element parameters need to be polled is large, it is recommended to increase the poll interval for each parameter or choose the “Key Parameter Poll” option.

12.3 TRAP CONFIG

Trap configure includes the configurations on basic parameter setting for Trap of SNMP protocol and Trap port switch on when the NMS starts

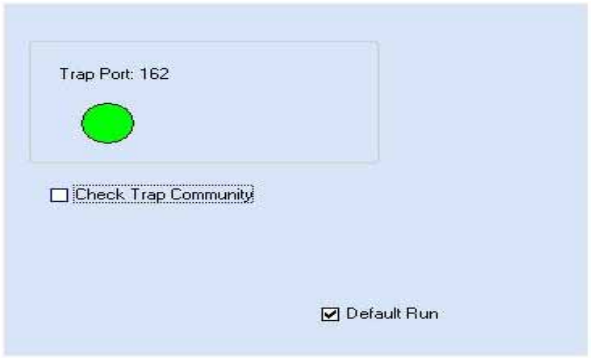

Figure 67: Trap Config

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- The default trap port for the system is #162. When the port #162 is switched on and under formal NMS configuration, the Trap information from the element can be transmitted to the NMS automatically. As seen in the above figure, the green ball indicates normal Trap port switch on, while grey ball indicates port.#162 is occupied
- Tick-on the “Check Trap Community” option to enable the Trap password testing when receiving Trap information. Refer to the element property setting in the topology management section for password setting in detail.
- By default, the NMS is configured as Trap port switch on, meaning the Trap information can be received once the NMS starts.

12.4 ALARM SOUND CONFIG

Alarm sound config consists of the configurations on Alarm Sound Type and the configurable options for each alarm level, including alarm sound file, sound On/Off, alarm interval for the unacknowledged alarms. The setting range of this interval is 10~600 seconds.

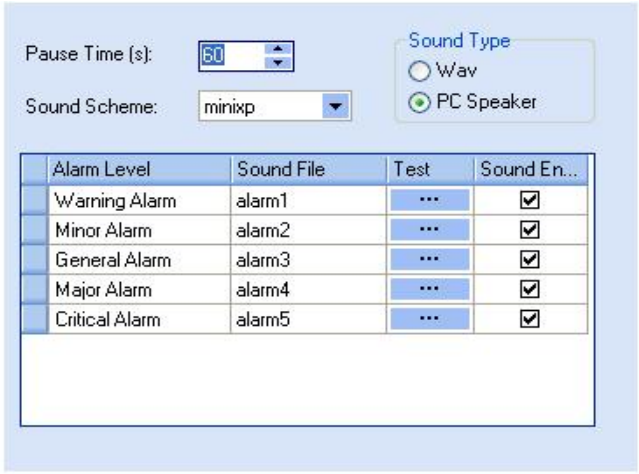

Figure 68: Alarm Sound Config

1. Select Alarm Sound Type: WAV and PCS. The former requires the NMS PC to be installed with audio device and connected with players; the latter easily uses the integrated PC speaker.

2. In the alarm sound list, select the sound file at the “Sound File” column and click “Test” for audition.

3. In the alarm sound list, tick on or tick off at the “Sound Enable” column.

4. Set the alarm interval for the unacknowledged alarms, it is default as 60 seconds, the alarm sound will re-generate until being acknowledged.

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12.5 DATABASE CONNECTION CONFIG

Figure 69: Database Connection Config

Database configure is used to configure the connection between the NMS and database. This is implemented by Administrator. Connection test should be implemented after each connection config, and each configuration should be saved for next use. With each NMS starts, the connection config window will pop up if no database configurations have been made. Either “SQL Server” or “Access” database can be selected as shown in the following figure:

For More information, please refer to “System Login” Section.

12.6 PERIODIC CLEAR LOG CONFIG

Periodic Clear Log Config consists of the configurations on the log clear interval, start time, clear range. Manual clear option is provided as well, and the option “Log Backup Directory” can backup the logs in case of any important information lost during clear process.

12.6.1 Periodic Clear Log Config

1. Tick-on the “Log Auto-clear” option
2. Set the ”Clear Interval (Day)” and “Clear Start time”, it is recommended to select a vacancy time, such as mid-night or morning time, or else, additional system resource might be occupied during system operation during heavy-time.
3. Set the “Clear Range” according to the customer specific requirement, then the logs attributed to this range will be deleted accordingly.
4. Click “Apply” to save the configurations made.

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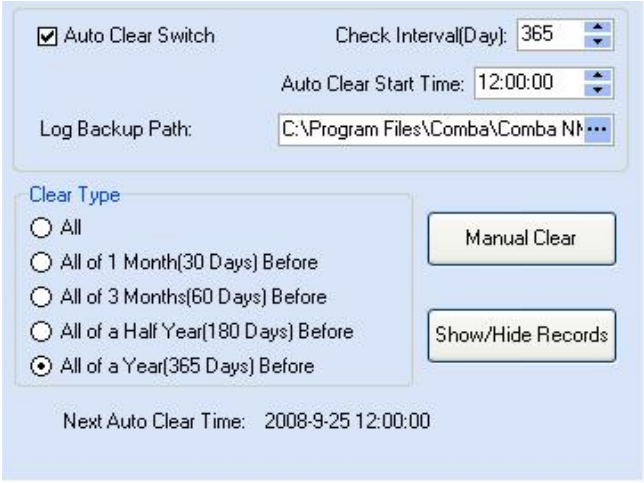

Figure 70: Periodical Clear Log Config

12.6.2 Log Manual Clear Setting

1. Set the “Clear Range” according to the customer-specific requirement, then the logs attributed to this range will be deleted accordingly.
2. Select the “Manual Clear” button, an indication will pop up to confirm the clear operation with user.
3. Click “Show/Hide Records” button to view the clear history records.

NOTE: The clear interval range is 1~100 days, during the period that a great number of logs are generated, it is recommended to decrease the clear interval, in this way, the log query can become more effective.

End of Section

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13 ADVANCE FUNCTIONALITIES

In this section, the following sections will be introduced:

- Individual User Privilege setting
- Individual Element Poll Setting
- Individual Element Parameter Poll Setting

13.1 INDIVIDUAL USER PRIVILEGE SETTING

This section focuses on the advanced configuration on user privileges. For user privilege configuration, it is achieved though configuring the privileges of the user group to which the user is attributed.

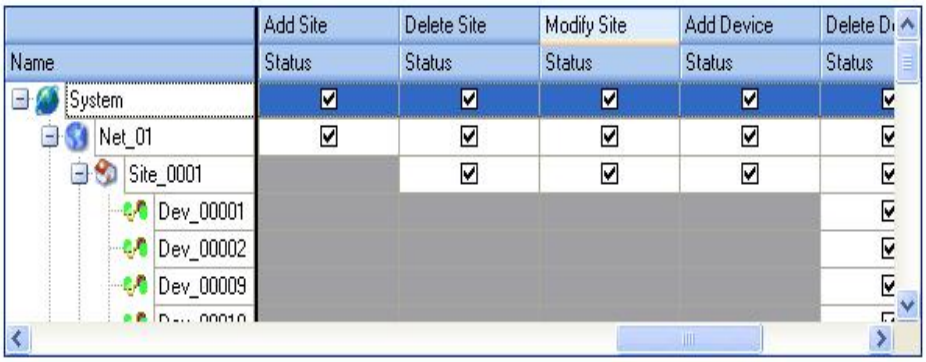

Figure 71: Individual User Privilege Setting

The network tree includes four hierarchy layers for configuration: system layer, network layer, site layer and Element Layer. The user privileges of each network element in the four layers can be configured individually. The user privileges for each system layer could be authorized or unauthorized; the user privileges for network layer, site layer and element layer could be authorized, unauthorized, or defaulted. The default user privilege of one layer depends on the privileges of the higher layer. Take the example that the user privilege for one user is limited to network “Net_01”only, the following options can be implemented by the user group the user attributed to:

1. Double click the user group node at the user tree to view the “Group Information” interface
2. Click “Edit Privilege” button to view and active the configurable options at the “Group Privilege” area.
3. By default, the user privileges of a new user group is empty configured, user can set each privilege to be “available” or “unavailable” at the setting column for row. “Net_01 ”.
4. Click “Apply” to save the configurations.

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With the configuration as above, the users of this user group are assigned with the relevant operation privileges specified on “Net_01” but not on other elements. In this way, Individual User Privilege setting is realized.

13.2 INDIVIDUAL NETWORK ELEMENT POLL SETTING

In this section, the advanced configuration on separate network element poll is focused on.

1. At the “Parameter Poll Configure” window of “System Configure”, click “Advanced Setting...” to view the “Poll Run Config” window as shown below. Each network element of the four hierarchy layers can be set individually.

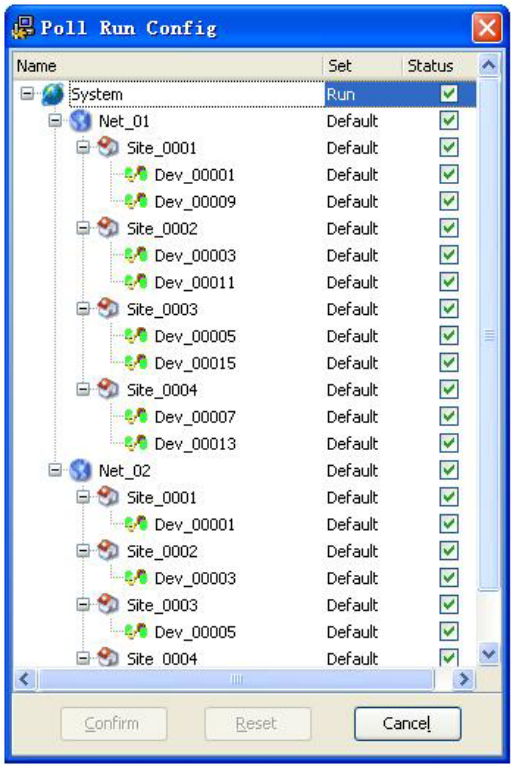

Figure 72: Individual Network Element Poll Setting

There are three options provided in the “Setting” column:

- Start: enable the element o be “poll”
- End: disable the element poll
- Default: default setting as the setting made to the higher hierarchy layer

2. Set the element poll accordingly,”Tick-on” or “Tick-off” icon in the “Status” column indicates the poll status of each element.
3. Select “Confirm” to save the settings made.

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With the settings as above, user can set the poll operation for individual network element, such as site, element. In this way, the system can performs more effectively to get rid of the heavy load resulted by frequent poll when a great number of elements are under management.

13.3 INDIVIDUAL ELEMENT PARAMETER POLL SETTING

In this section, the configuration on the individual element parameter poll will be introduced.

1. Right click the element at the network tree or on the topology view, select the <Element Parameter Poll Setting> option to view the “Element Parameter Poll Status Config” window seen below:

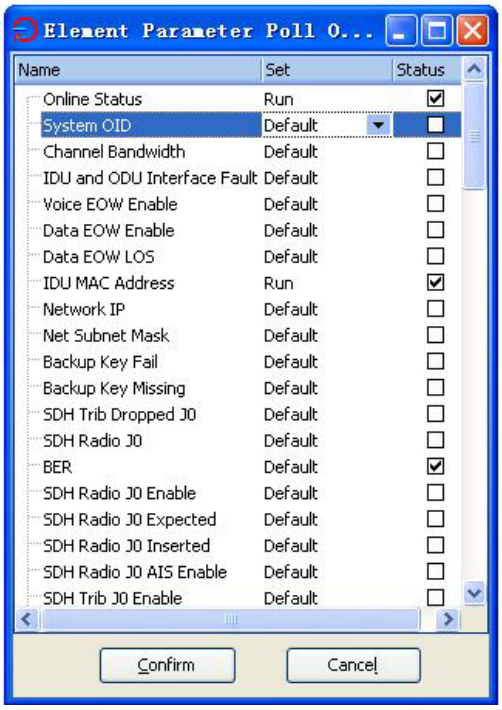

Figure 73: Element Parameter Poll Setting

There are three options provided in the “Setting” column:

- Start: enable the element parameter to be “poll”
- End: disable the element parameter poll
- Default: default setting as the element poll setting

2. Set the element parameter poll accordingly,”Tick-on” or “Tick-off” icon in the “Status” column indicates the poll status of each parameter.
3. Select “Confirm” to save the settings made.

With the settings as above, user can set the poll operation to those element parameters that matters the most to a positive system performance. In this way, the system can perform more effective to get rid of the load resulted by frequent poll when a great number of elements are under management.

End of Section

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14 FREQUENT QUESTIONS & ANSWERS

Question	Reason	Solution
Set/Query overtime or error to the parameter	● The communication between element and the NMS is disconnected. ● The Access IP or password is incorrect. ● Select an element of wrong model. ● the read/set waiting time is too short	● Ensure the successful communication between element and NMS. ● Insert correct Access IP and password, select correct element type. ● Enter correct read/set password ● Set an appropriate Read/Set waiting time (default value is applicable).
Set and query error for some parameters	● The element model selected is not suited to the NMS. ● The database is not updated with the upgrading of the NMS software	● Select correct element type, ● Contact the “NMS Supplier’, in this case, Comba, to obtain the latest database.
Database connection fails during NMS running, NMS is closed automatically	● The connection between the NMS and the database is disconnected. ● The server of SQL Server might be stopped. ● The database files of Access database might be destroyed or lost.	● For SQL Server database, ensure the normal operation of “SQL Server”. ● For Access database, reinstall the NMS or contact Comba directly.
Database operation error, NMS is closed automatically	● The database is destroyed. ● The database file of Access database is configured to be “Read-only”.	● For the destroyed database, reinstall the NMS or contact Comba directly. ● Tick-off the “Read-only” option in the property interface.
Delayed log clear operation	● Over-sized log records	● Select “delete all” option
Trap receiving disabled	● The Trap port is switched off. ● The Trap port is occupied.	● Ensure the trap port is switched on. ● Make sure the availability of the Trap port.
Unreal statistic result	● The statistic data source is changed after exporting the statistic result.	● Refresh the Statistic Result page.
Blanked alarm status bar	● Some levels of alarms are filtered	● Select “show all the alarm levels” at the alarm status bar.
Abnormal operation	● Without user privilege	● Contact the Administrator to assign the operation privilege.

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15 APPENDIX RMA (RUTRUN MATERIAL AUTHORIZATION)

Comba

Comba Telecom Ltd.
Rm 1503-10, Delta House, 3 On Yiu St., Shatin, Hong Kong
Tel: +852 2636 6861 Fax: +852 2637 0966

RMA Request Form

Date: _____

From: _____
Address: _____
Tel: _____ Fax: _____
E-Mail: _____
ATTN: _____

Product Information:

Item	Model	Serial Number	Return Category	Qty	Problem Description
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

INFORMATION ONLY

Notes:
1. For 'Return Category' column, please select from A: Return of Dectve Product, B: Return of Trial Sample, or C: Return of New and Unused Product.
2. If A or C category of return product is chosen, please give short description of the problem or reason for returning.

Transportation Information:

Location of Product: _____
Transportation Method: _____
Shipping Forwarder: _____

Note: **Location of Product'** must be stated, while '**Transportation Method**' or '**Shipping Forwarder**' can be left blank if not determined.

Signature:

_____

For Comba Use (Only)
Return Merchandise Authorization Number (RMA#):
Recommended Action:
Shipment and Handling Cost to be paid by:

Approved by:

_____ **Date:** _____

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