Chapter 6 GUI-based EMS Operation Manual

6.1. Overview

6.1.1. Features

This system provides the status view and control function of system configuration and alarm via LAN. EMS manages up to 50 systems and 3 types of Data Circuit-Terminal Equipment (DCE) connected with the system OCU. The system provides the in-band ONT status view and management, the SNMP-based ONU search and the TRC management function.

6.1.2. Characteristics

Operator EMS access: The system is easy to control, and provides access to various devices on a GUI window. You can also view status of various devices on an EMS window.

The EMS integrates up to 50 systems via the TL-1 commands, supporting NMS that manages the network.

An EMS enables the user to implement the NMS network, and to manage up to 50 systems on an EMS. Novera Optics recommends a high-performance PC to support the NMS function.

EMS also reports occurrence and clearance of alarm in real time to the user.

You can save and retrieve history on the database, and also retrieve the stored data.

The system allows only the authorized users to control the device via limitation of user levels and the password function.

6.2. System operation

6.2.1. Network connection between PC and system

The system has no IP in default. Therefore, in order to use the system, you need to register the system IP, and register the system with this IP in EMS.

To register the system IP, refer to "6.2.4 IP Setting."

The PC monitor for EMS is optimized at 16 bit (True color) and 1024X768 (resolution).

The following figure shows how to register IP of the operator PC.

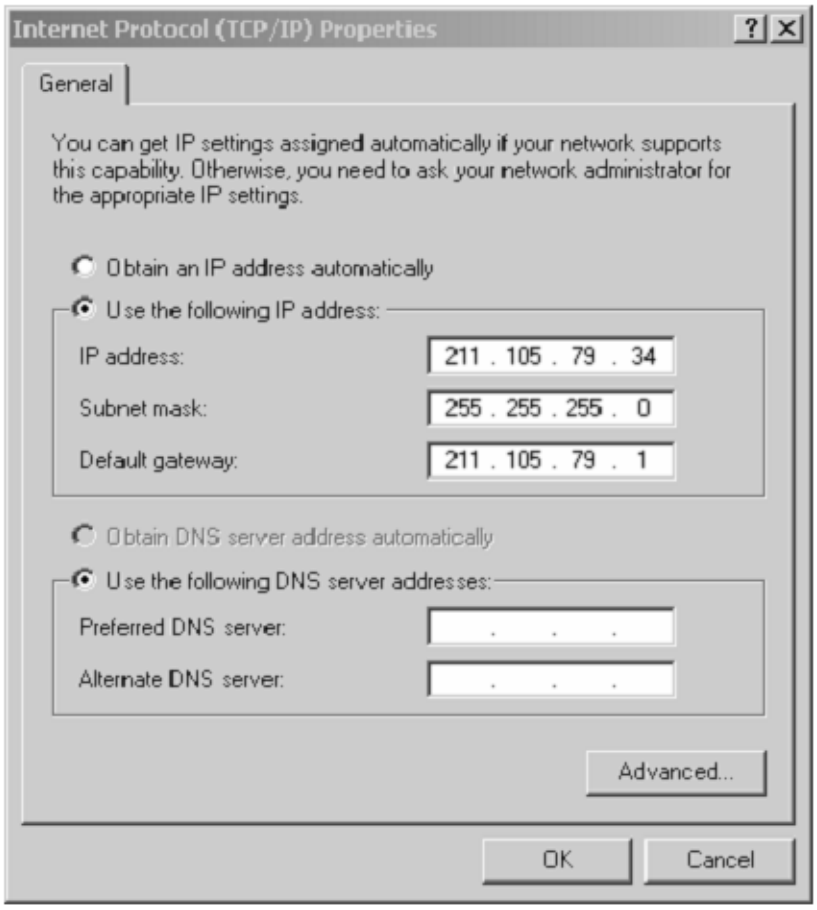

Figure 6-1. PC Network Gateway

6.2.2. Installing EMS program

Insert the CD-ROM to the CD-ROM driver to start the install program.

To install the program by yourself, double-click Setup.exe in the CD-ROM.

You must uninstall the old version or the existing program before installing the program. Or, the program may malfunction.

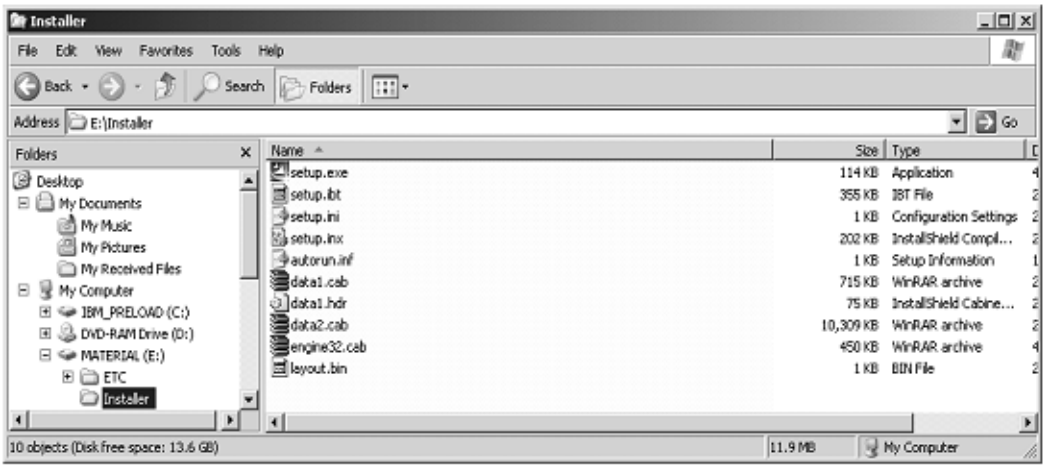

Figure 6-2. Installer Folder of EMS Program

If you double-click Setup.exe, the installer wizard is started, helping you to install the EMS program.

To uninstall the existing EMS program, select Start -> Program -> Novera Optics Korea ->SL16 & TL16 -> Uninstall SL16 & TL16.

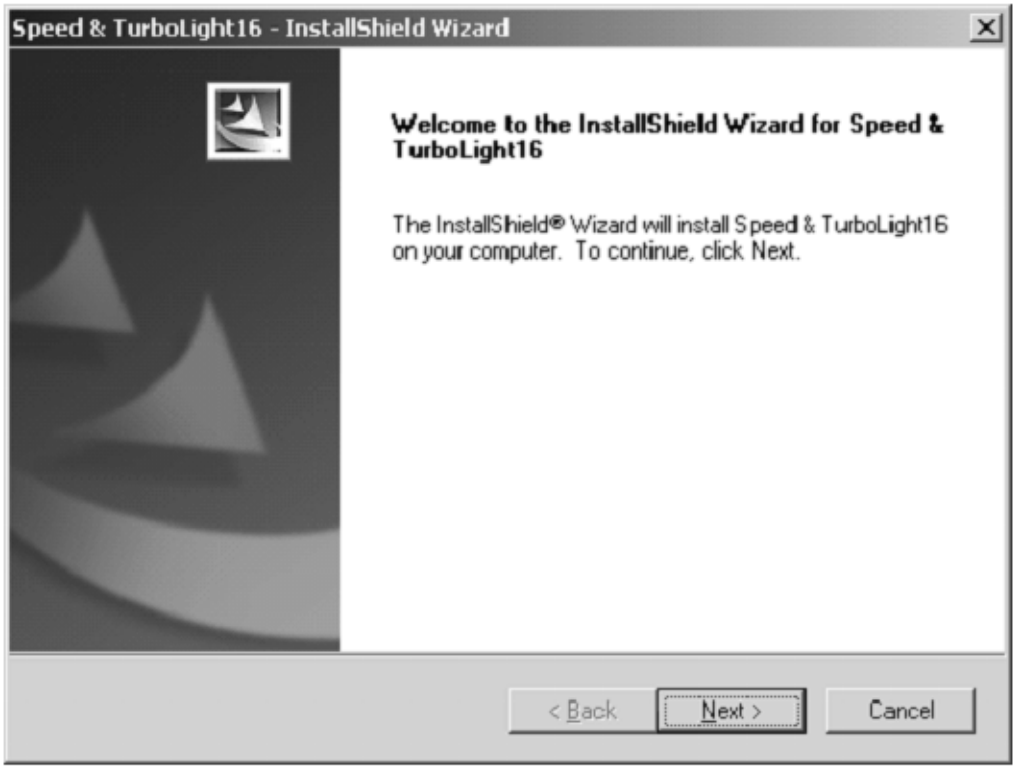

Figure 6-3. Installing EMS Program

6.2.3. Recommended specifications of PC for EMS operation

1) Pentium P4 1.5GHz or higher performance

2) VGA with 256 colors and 1024* 768 or higher resolution

3) Free memory space of 512M Byte or more

4) ***Microsoft Windows 2000 service pack 4 or XP (recommended)***

5) LAN card

6) Mouse

6.2.4. IP setting

Connect the console port of the system with the COM port of PC via the console cable, and start up the hyper terminal.

Set bits per second of the hyper terminal to 9,600 bps as shown in the following figure.

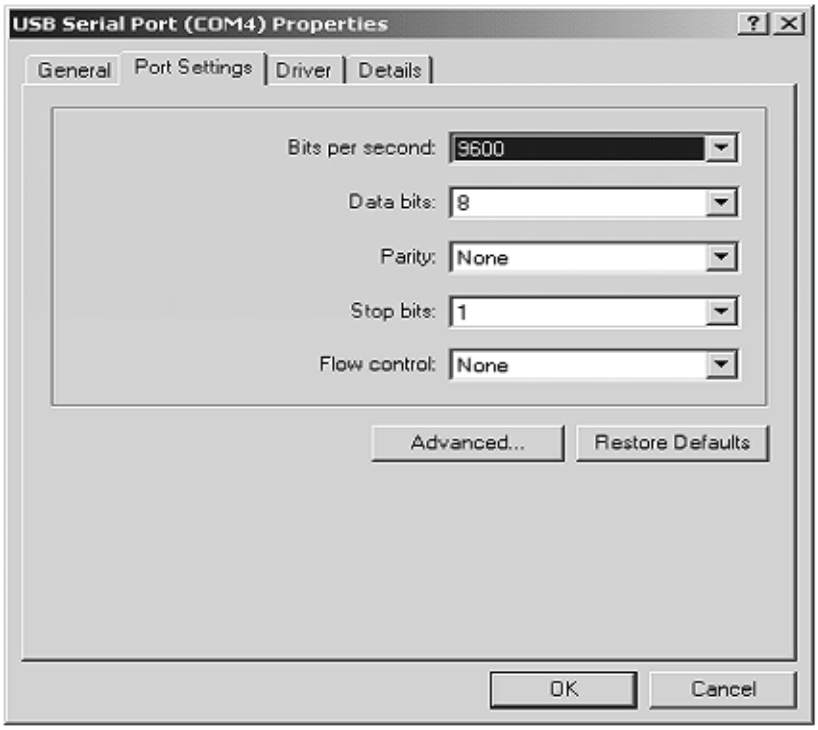

Figure 6-4. Hyper Terminal Setting

Log in to the system with the Admin ID. The initial ID and password are "root."

Welcome to Novera

User Access Verification

Username: root
Password: ****

Check or change the IP setting of the system to enable network communication.

(Refer to CLI commands)

6.2.5. Starting EMS

1) Connect the EMS-installed PC to the network.

2) Switch on the system and start the system.

3) Connect the system, using the hyper terminal, to PC via the console port.

4) Enter the system IP on the MS-DOS screen as in "ping –t system IP (e.g., 192.168.1.30)", and check if the system receives the message through network. If the message "Request Time Out" is displayed on the MS-DOS screen, check the configuration of LAN. If the message continues to display, check the IP of the EMS-installed PC, so that the system can interwork with the network.

5) Double-click the "SL16 & TL16" icon which was created on the desktop through the EMS installation process.

6.2.6. Interworking between EMS and system

1) Enter the user ID on the main EMS window.

2) Enter the password. ID : root Pass : root

3) If the login success window is displayed, click OK. Then the system control mode is on.

4) If the login fail message is displayed, check the password, and repeat the steps 1)-3).

5) If you successfully log in to EMS, the EMS main window is displayed.

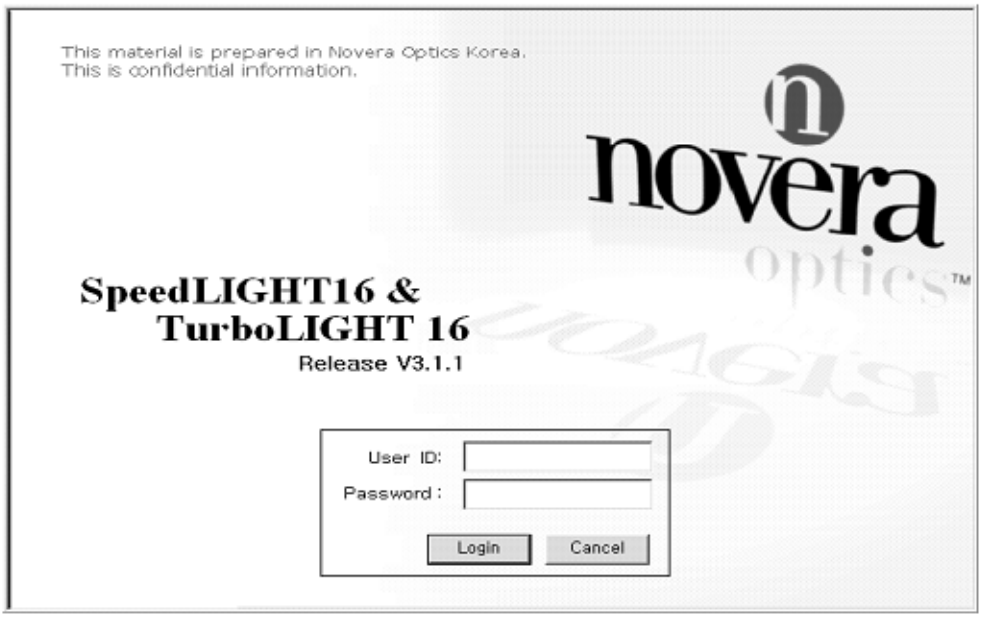

Figure 6-5. EMS Login Window

6.2.7. EMS window

As above mentioned in 6.2.6, if you type the password on the EMS main screen, the EMS

control window is displayed. The figure shows the screenshot of the EMS window.

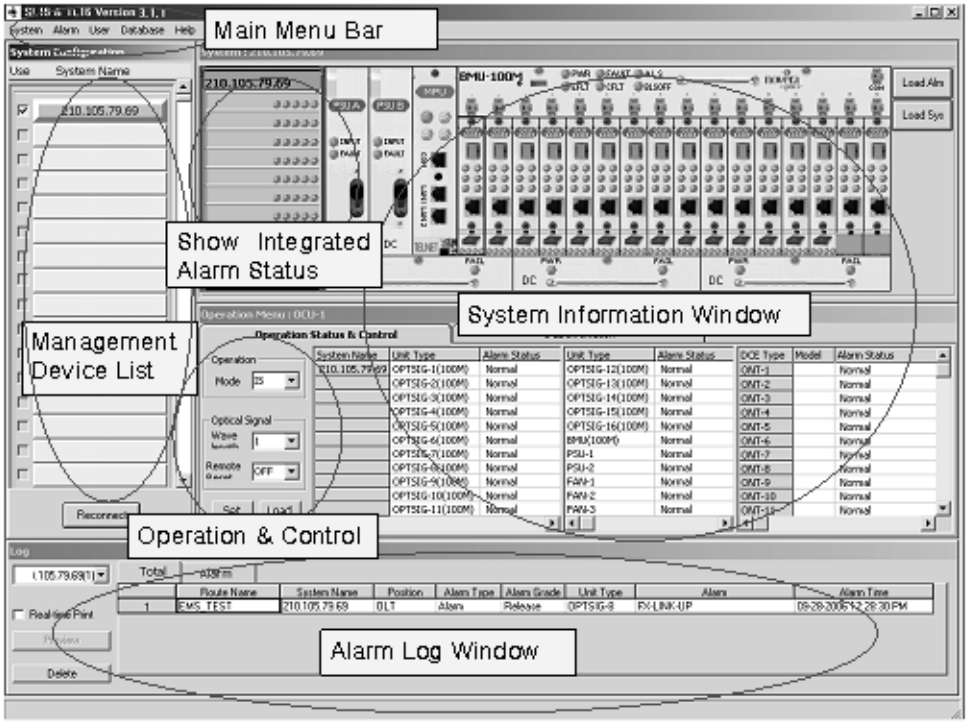

Figure 6-6. EMS Main Window

1) You can select System, Alarm or User on the top menu bar.

2) The System pane in the right shows the status of a system, OCUs mounted in the system, and the states of DCE connected to each OCU.

3) In the Operation menu in the center, you can view and set the fault status of OCU of OLT, operating parameters and the state of DCE.

4) The Alarm Log pane in the bottom of the window shows the list of events occurred in the system.

5) The Management Device List in the left of the window displays the list of systems managed by EMS. You can add, delete of modify information.

The following tree shows the menus you can use in this EMS.

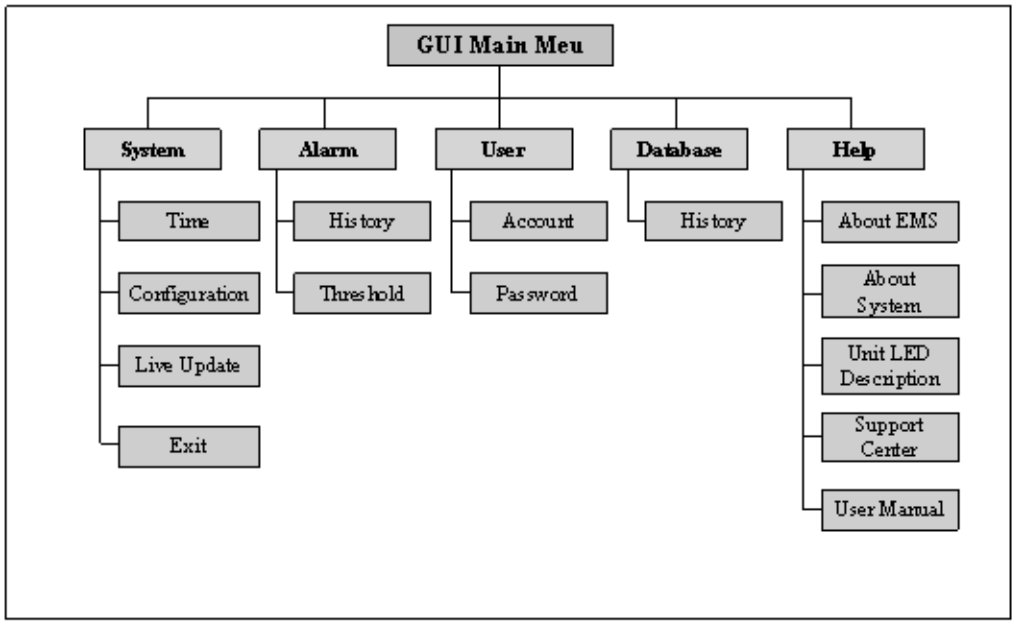

Figure 6-7. EMS Menu Tree

If you log in to EMS, you can integrate a number of systems by viewing and controlling state of up to 50 systems and their terminal devices. When started, EMS imports information on the registered systems and configures the basic data for operation of EMS.

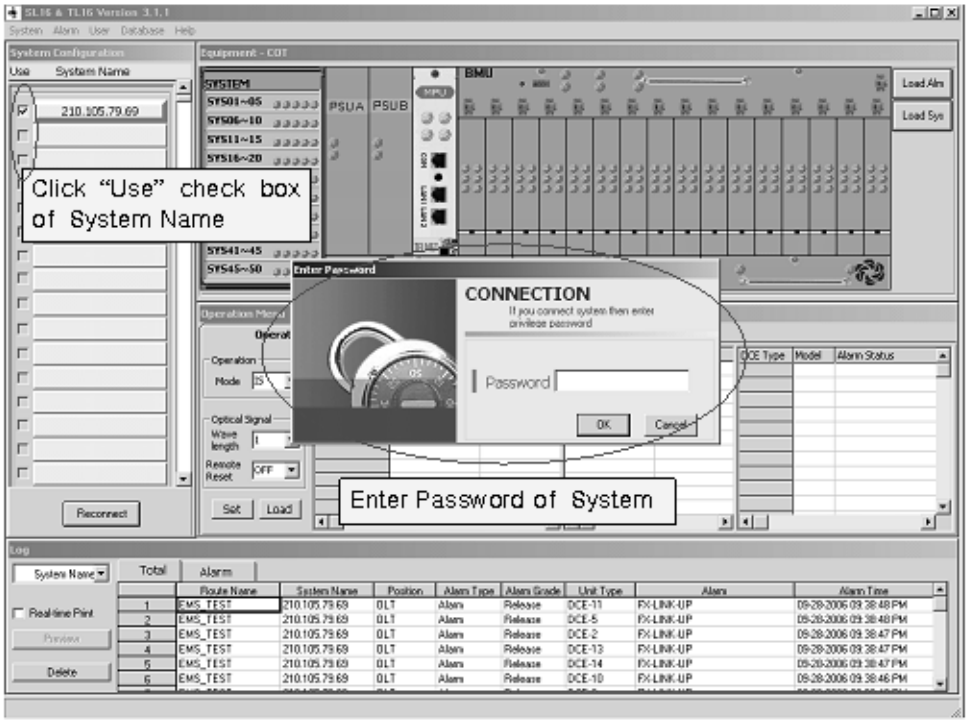

Figure 6-8. Click "Use" Check Boxes

Click the "Use" checkbox in the "System Name" list, and enter your password in the pop-up window. If the password in valid, a connection message is displayed, and the actual view of the selected device is displayed in the window, with real-time status and alarms of each unit. In case the system status does not match between EMS and actual configuration, you can retrieve the status information from the system and update the EMS program, using the two buttons in the top right of the window provide the search function.

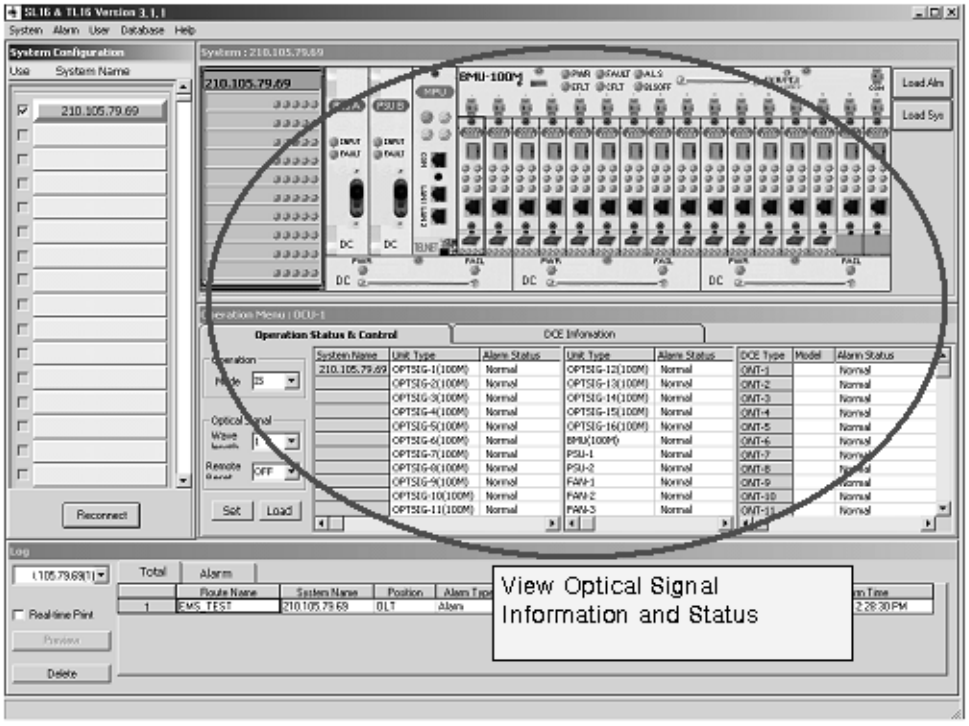

Figure 6-9. EMS Window Connected with a Specific Device

6.3. System management

6.3.1. Time setup

If you select "System" in the main menu, and then select "Time," the system time window pops-up as shown in Figure 6-10. You can retrieve time from the system or set the time in PC.

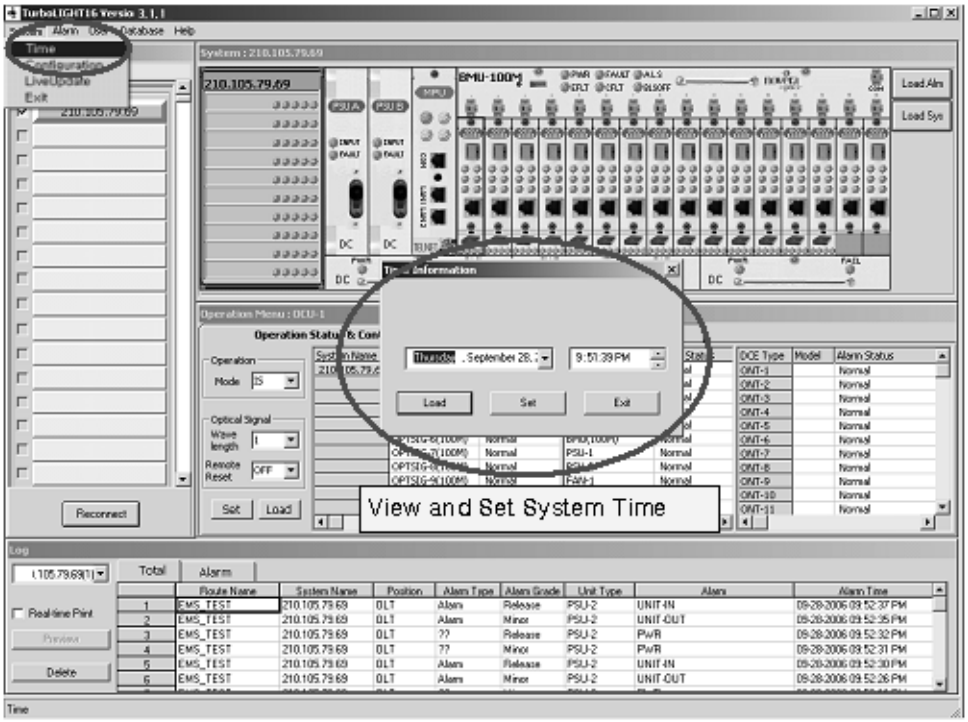

Figure 6-10. System Time View and Setup

6.3.2. Device information

You can modify, update and delete the management object via the device management function. Since this function interworks with the socket communication function, you can continue using EMS without restart it after you have added, modified, or deleted device.

You can configure system connection on EMS.

Select "System" and then "Configuration" from the top menu, and register system name and IP. Then, by selecting "DCE Information," you can view and manage DCEs with the recent information received from the system.

To delete a system, double click the system name or select "Configuration," and in the pop-up

menu, click the “Delete” button.

A. Registration of system

1) System registration 1

This is used to register a new device. To add a new device, double-click a button with no “System Name” in the System Configuration list.

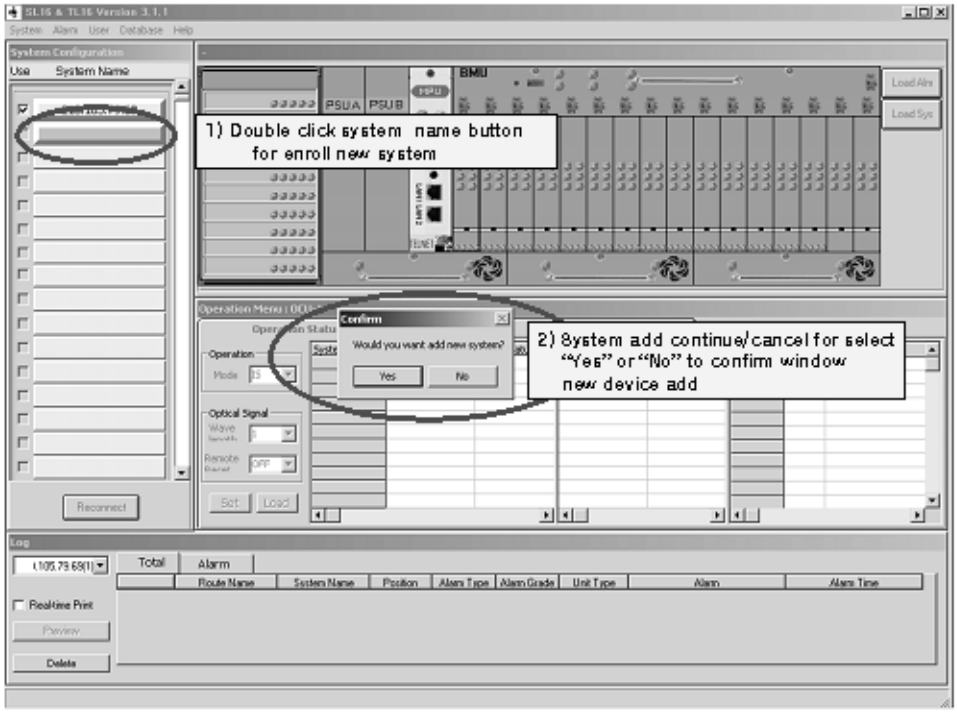

Figure 6-11. System Registration 1

2) System registration 2

If you double-click the button for the new system, the following Configuration Information window pops up. Fill in the appropriate fields and click the “Add” button.

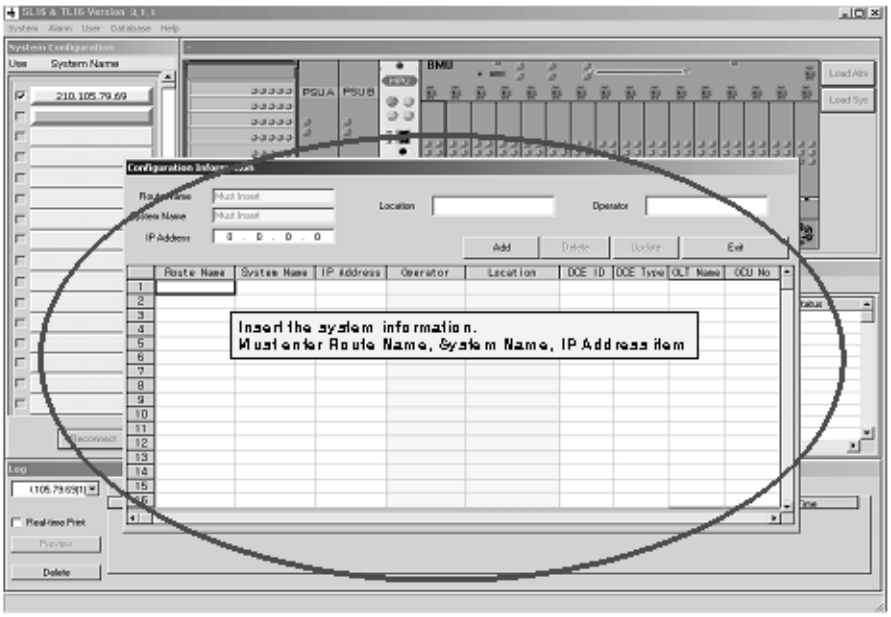

Figure 6-12. System Registration 2

3) System registration 3

If you click the "Add" button, a confirmation message box pop—up. Click the "OK" button. After registration of the system, click "Exit" to apply new configuration in the program. The list field shows the information of DCE retrieved from the system. You can enter the operator and location of DCE.

B. Updating system configuration

If you double-click the system button (the button on which the registered system name is marked), the following Configuration Information window pops up. In this window, modify information and click the "Update" button to save the modified information in the database. After finishing modification, click "Exit" and repeat the Registration Step 3 to update EMS.

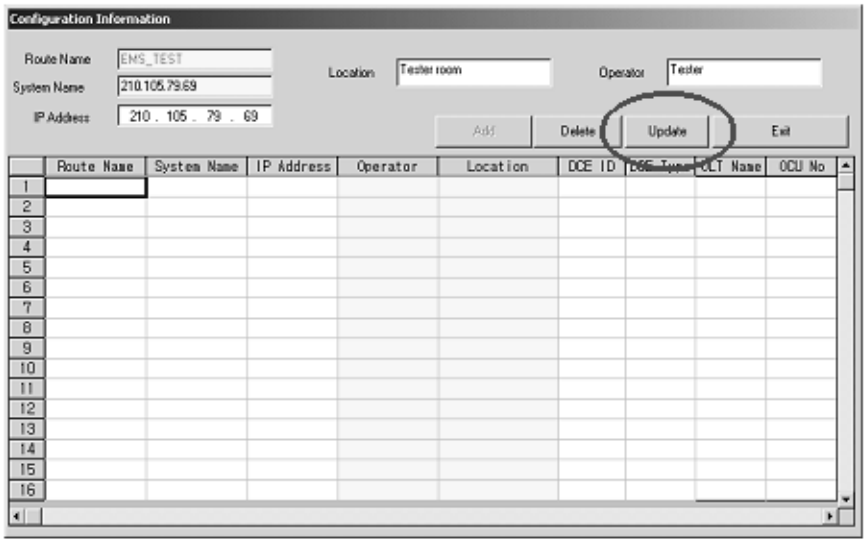

Figure 6-13. Updating System Configuration

C. Deleting system

If you double-click the system button (the button on which the registered system name is marked), the following Configuration Information window pops up. If you click the "Delete" button, the delete confirmation window is displayed. Click "OK" to delete the system. After deleting the system, click "Exit" and repeat the Registration Step 3 to update EMS.

6.3.3. System reset

You can reset the system if it operates abnormally or if you wish to reboot the system. To reset the system, select "System Reset" from the pop-up menu displayed when you right click the MCU image, or double-click the Reset button image in the center of MCU. The following figure shows the image of system reset.

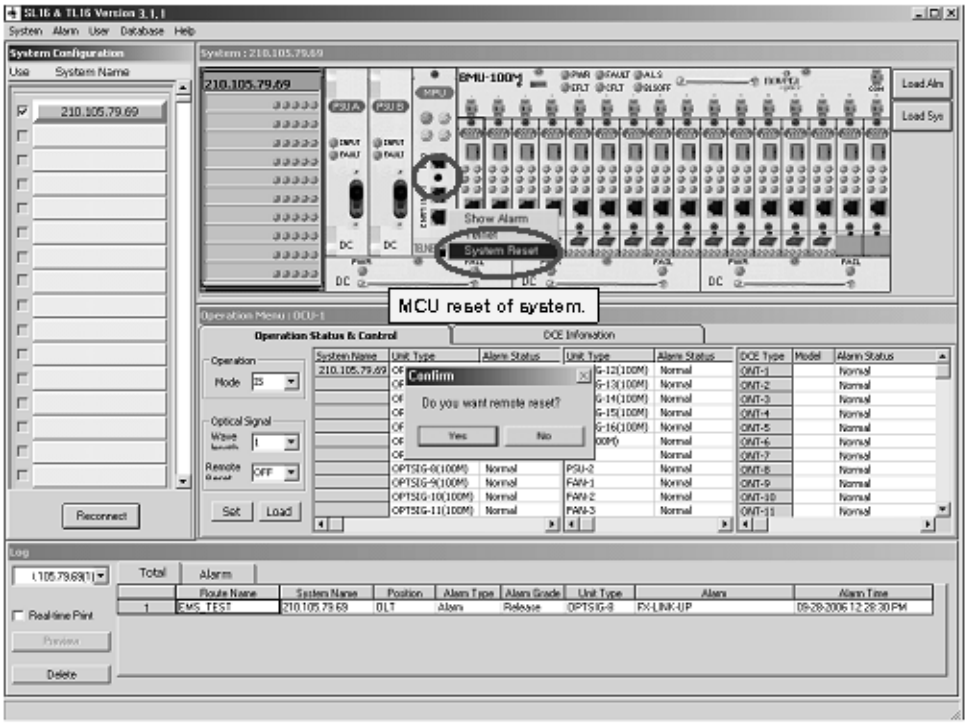

Figure 6-14. System Reset

6.4. Alarm management

This function enables you to view the alarm status and the system log data, and to set the alarm report/log condition. The faulty channel is indicated with red LED on the window and the front panel. Alarm status is displayed in the operation status and control in the center of the window. The following figure shows the screen shot.

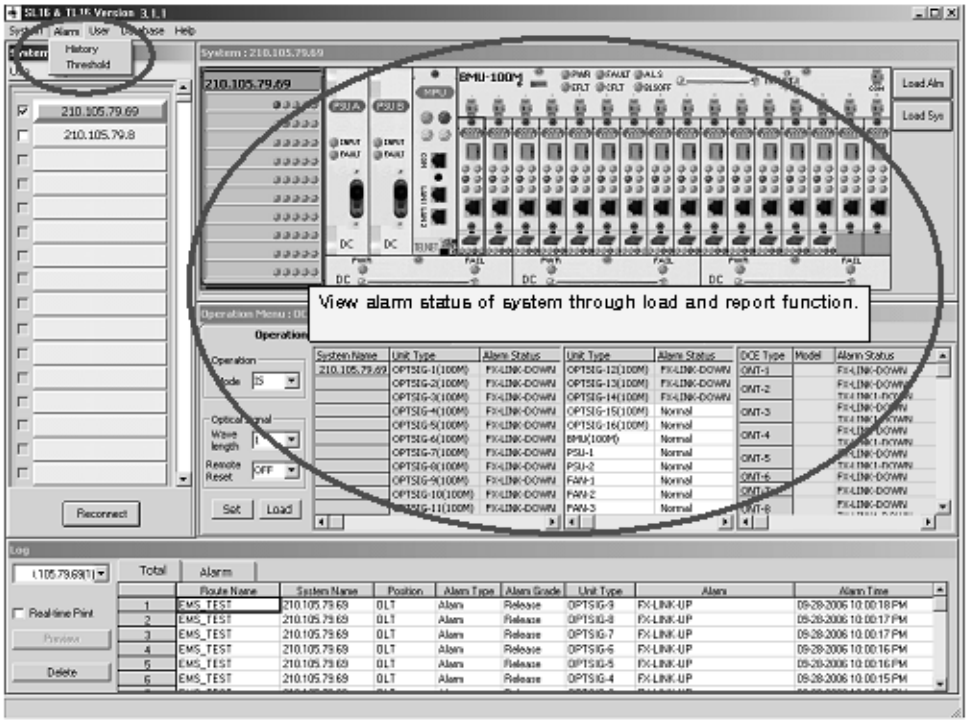

Figure 6-15. EMS Window for Alarm Management

<Table 6-1> shows the grades of alarm. The following alarm grades are default setting, and can be modified by the operator.

<Table 6-1> Types and Grades of Alarm

UNIT	ALARM	GRADE (Variable)
BMU	C-BLS FAULT	Critical
	E-BLS FAULT	Critical
	ALS	Critical
	FAN	Major
	B/D Temperature	Major
	Unit OUT	Major

PSU A, PSU B		Power OFF FAULT Unit OUT	Minor Minor Minor
OCU		FX-LINK TX-LINK IPM Unit OUT	Critical Critical Minor Major
FAN	UNIT	PWR OFF	Major
	FAN1 FAN2 FAN3	FAIL Unit OUT	Minor Major
ONT		FX-LINK TX-LINK1 TX-LINK2 (option) TX-LINK3 (option) TX-LINK4 (option) IPM	Critical Major Major Major Major Minor

This EMS is designed to log alarm occurrence/clearance in the database, and to report it to the operator. However, the operator can select which alarm grade will be reported.

The alarm is displayed with different colors in accordance with the severity, so that the user can easily recognize its severity: Critical alarm is displayed in red, major alarm in orange and minor alarm in yellow. Occurrence and clearance of alarm are indicated in the system in near real time.

The system provides the alarm history view function, and saves the history in non-volatile Compact Flash (CF), so that the data should not be deleted despite the system power off.

6.4.1. System log data

The system provides the fault history view function. You can clear alarm from the window only or delete the log data from the system.

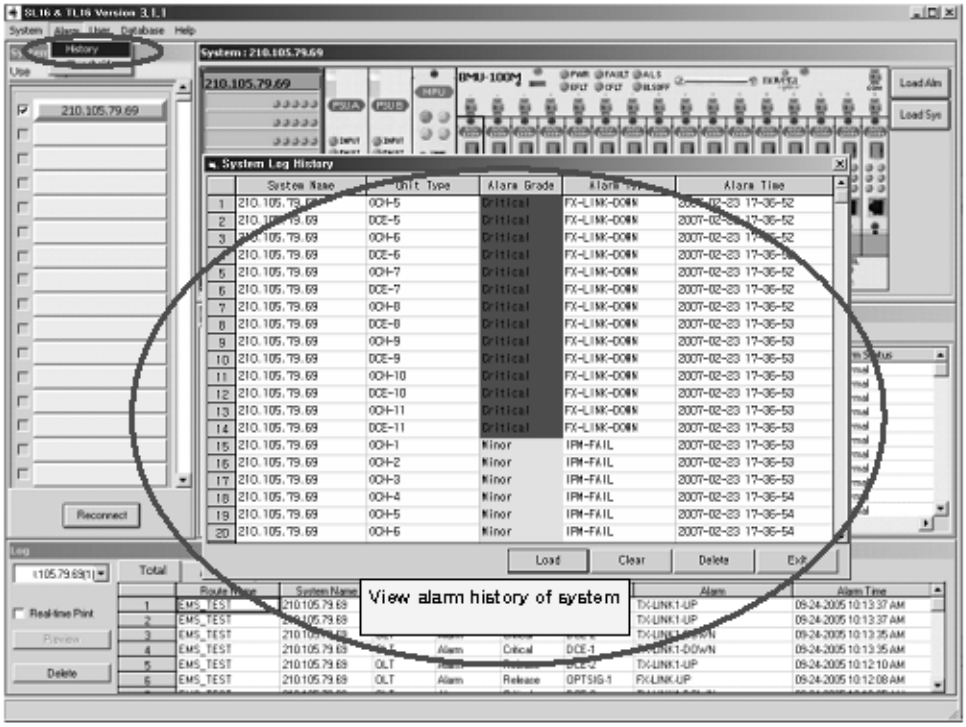

Figure 6-16. System Alarm Log

6.4.2. Alarm report condition setting

You can activate/deactivate report function depending on the alarm grade.

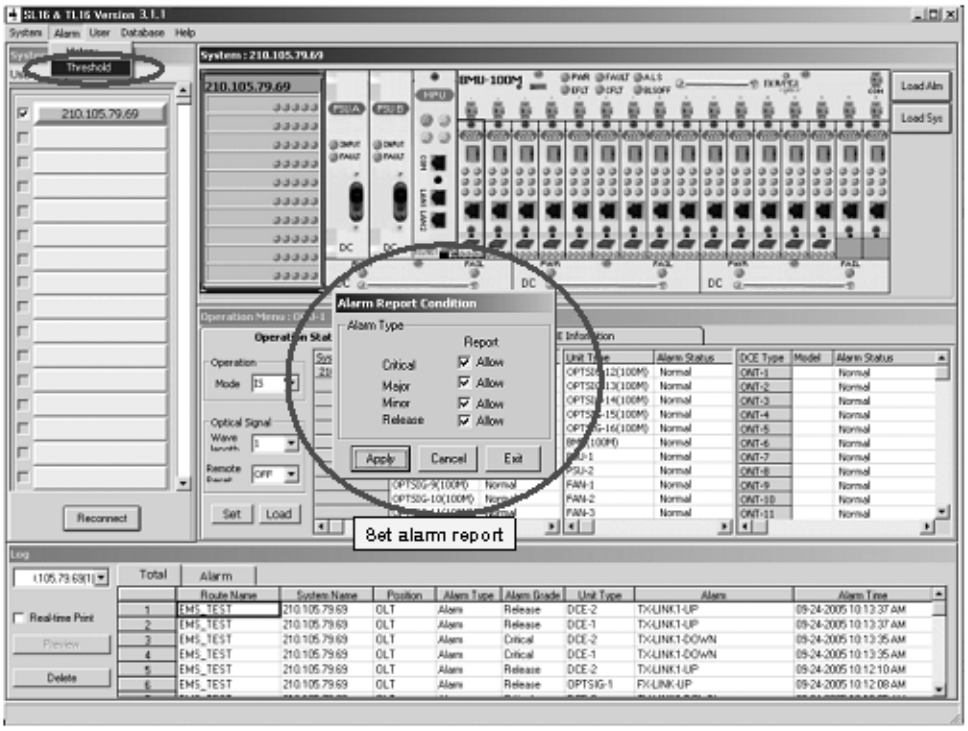

Figure 6-17. Report Condition Setting

6.4.3. Alarm view according to system grade

When an alarm occurs in the system, MCU LED operates according to the alarm grade. The LED indicates the grade of alarm. To see the list of alarms by grade, right-click on EMS MCU, and then, click "Show Alarm" in the pop-up menu. In the MCU Alarm window, there are 4 alarm grade buttons; "ALL," "Critical," "Major" and "Minor." If you click the buttons, the window displays the alarms of the selected grade. If alarms occur in any other system than the current system selected by the operator, 50 alarm LEDs are on in red at the top left of the window. If you double-click an LED, the alarms of the system are displayed by grade. The alarm window is not displayed for any disconnected system. The following window shows the alarm window.

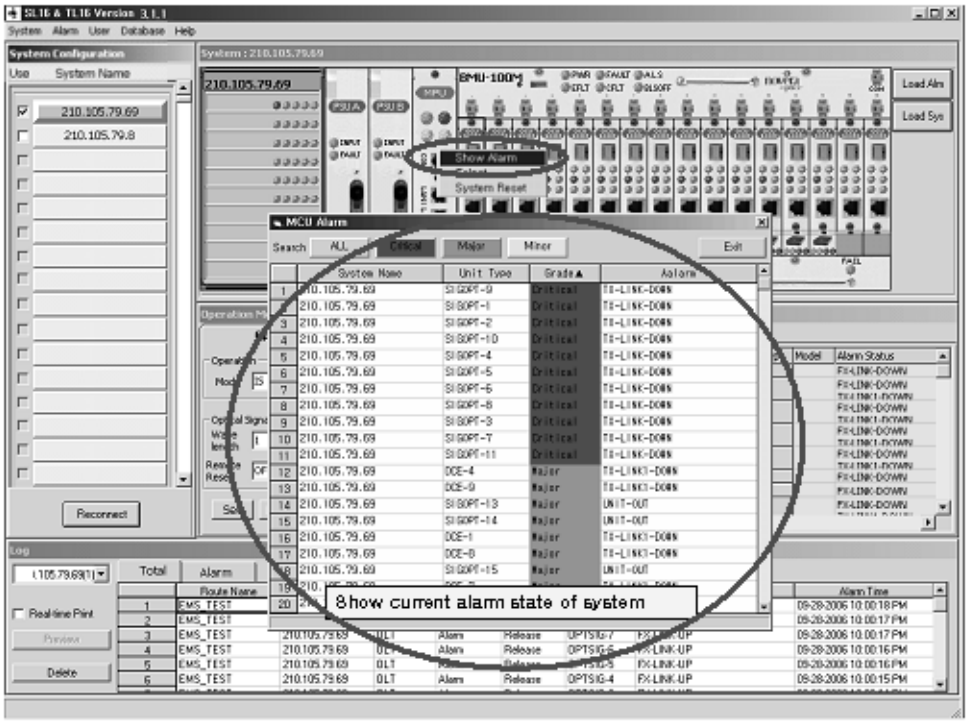

Figure 6-18. Current System Alarms View

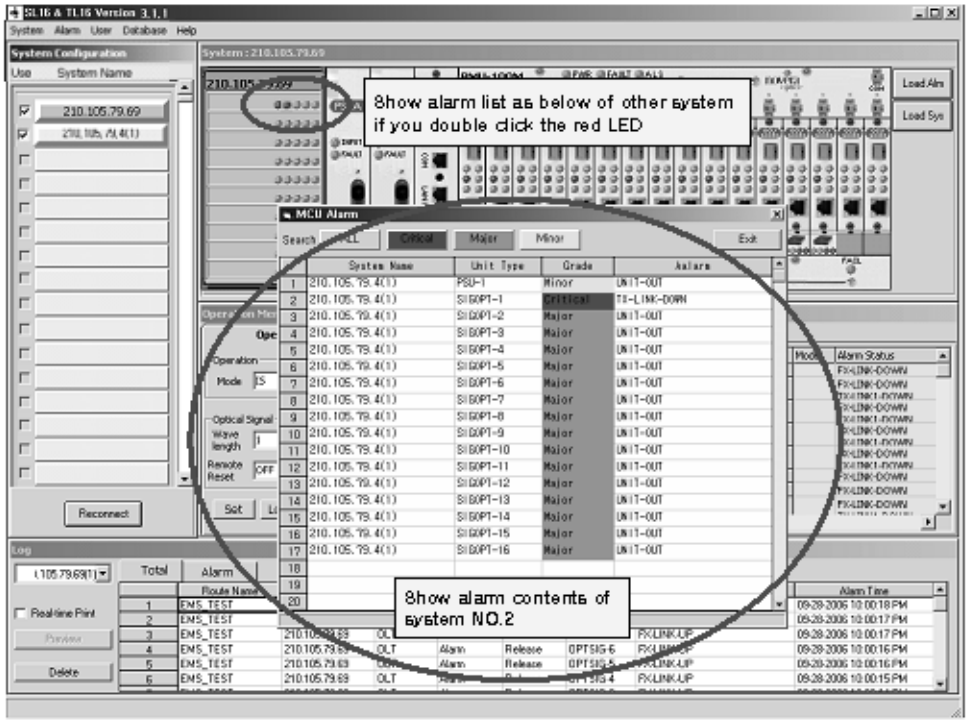

Figure 6-19. Other System Alarms View

6.5. User management

You can add/delete/change operator who can log in EMS and access the system. The user registered with this function has the right to access EMS only.

Accounts are divided into the "Administrator" grade users who can set/view the device status, and the "Normal" users who are authorized only to view the system status.

6.5.1. User account management

You can add/delete/update the user accounts for EMS.

Note If no system is selected, the Add / Delete menus are deactivated.

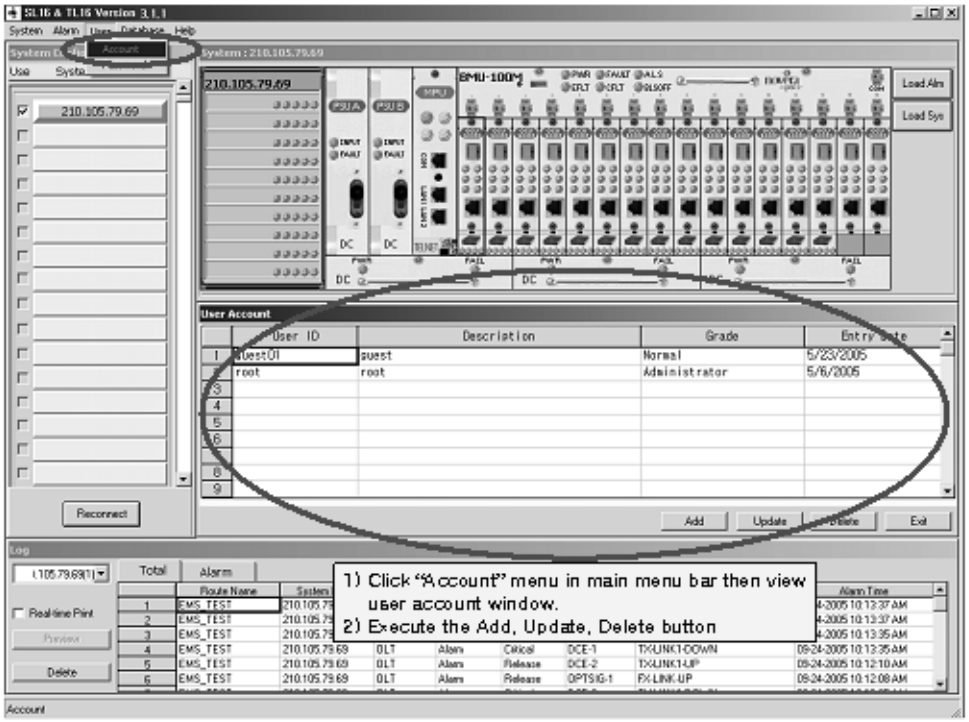

Figure 6-20. User Account Management 1

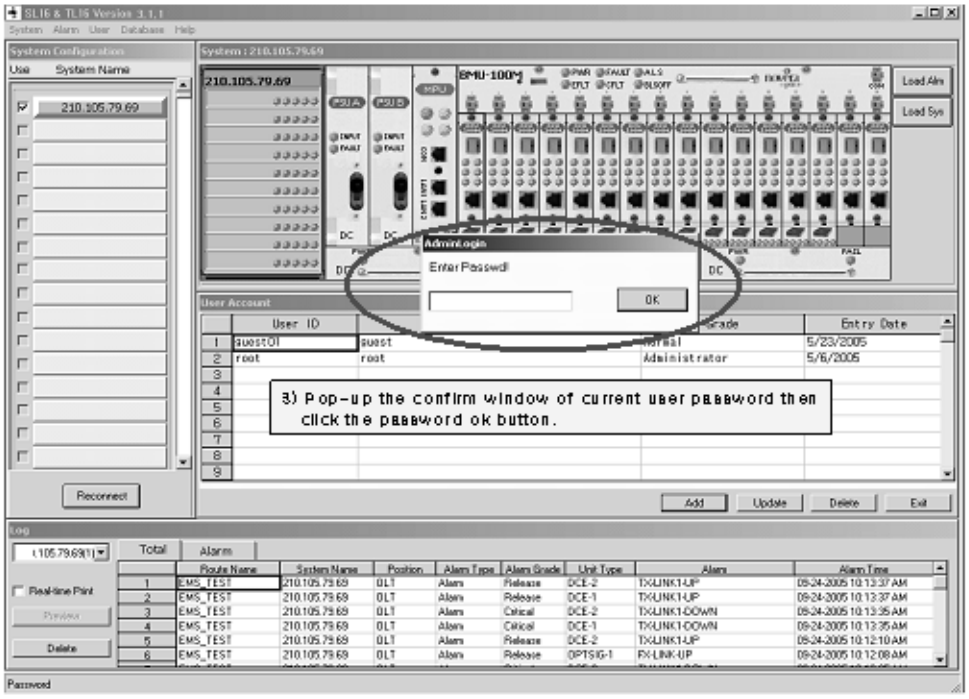

Figure 6-21. User Account Management 2

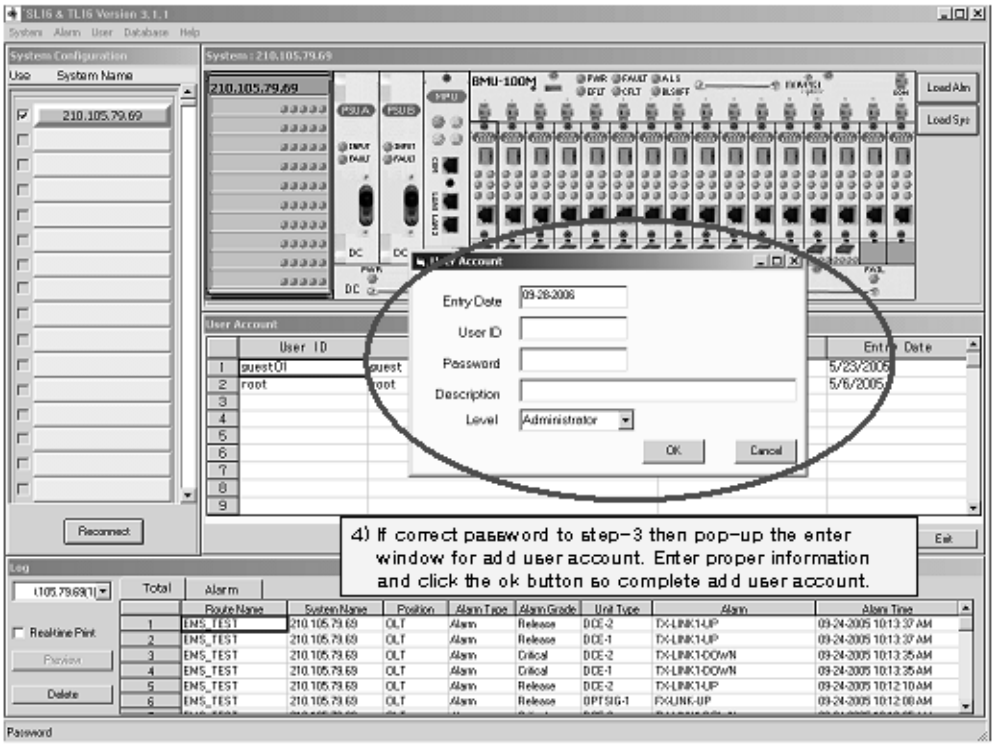

Figure 6-22. User Account Management 3

6.5.2. Changing user password

You can change your password while accessing EMS. To change your password, you need to select "User" in the top menu bar, and select "Password." Then the Change User Password window pops up as shown in Figure 6-20.

Type the current password in the pop-up window, and type a new password in the "New Password" field and the "Confirm Password" window.

After finishing this step, your password is changed, and you must use the new password if you want to log in the EMS from the next time.

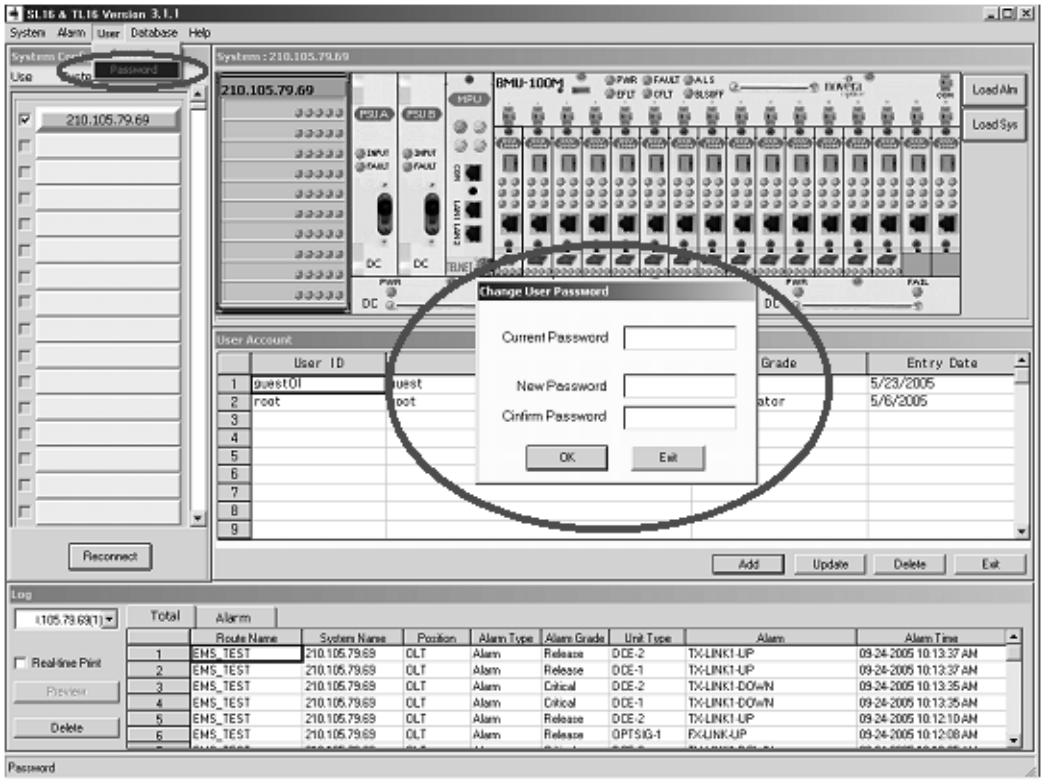

Figure 6-23. Change User Password

6.6. DB Management

When EMS is connected to a system, the alarm message is automatically reported to EMS. EMS stores the alarm messages in HDD, and enables you to view history. This function enables you to view command history and alarm history by time/by unit. One thing you should note is that while EMS is connected with a system, no alarm message is received. Therefore the EMS history cannot exactly match with the system. EMS retains alarm history for a year, and duplicates the database to protect the data.

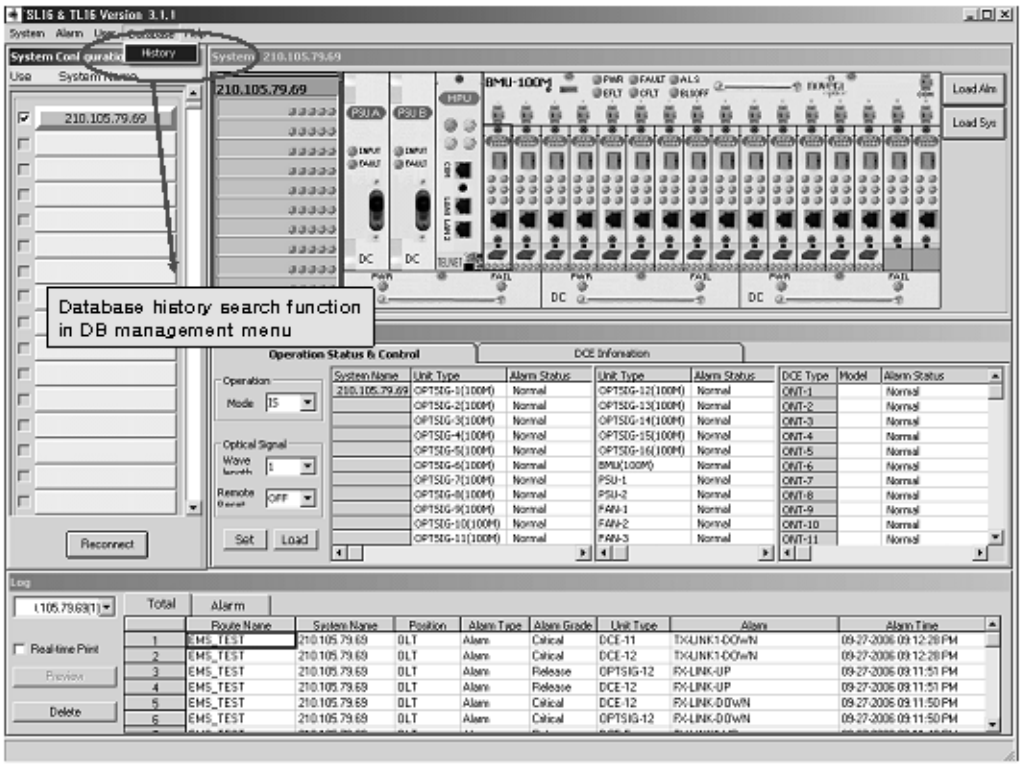

Figure 6-24. Database Management

6.6.1. History view and search

If you select "History" in the top menu bar, the search window pops up as shown in Figure 6-22. This window has two tabs: Command History and Alarm History. You can search history with the search conditions such as the network name, the date, the user ID, occurrence/clearance, the alarm type and the system name.

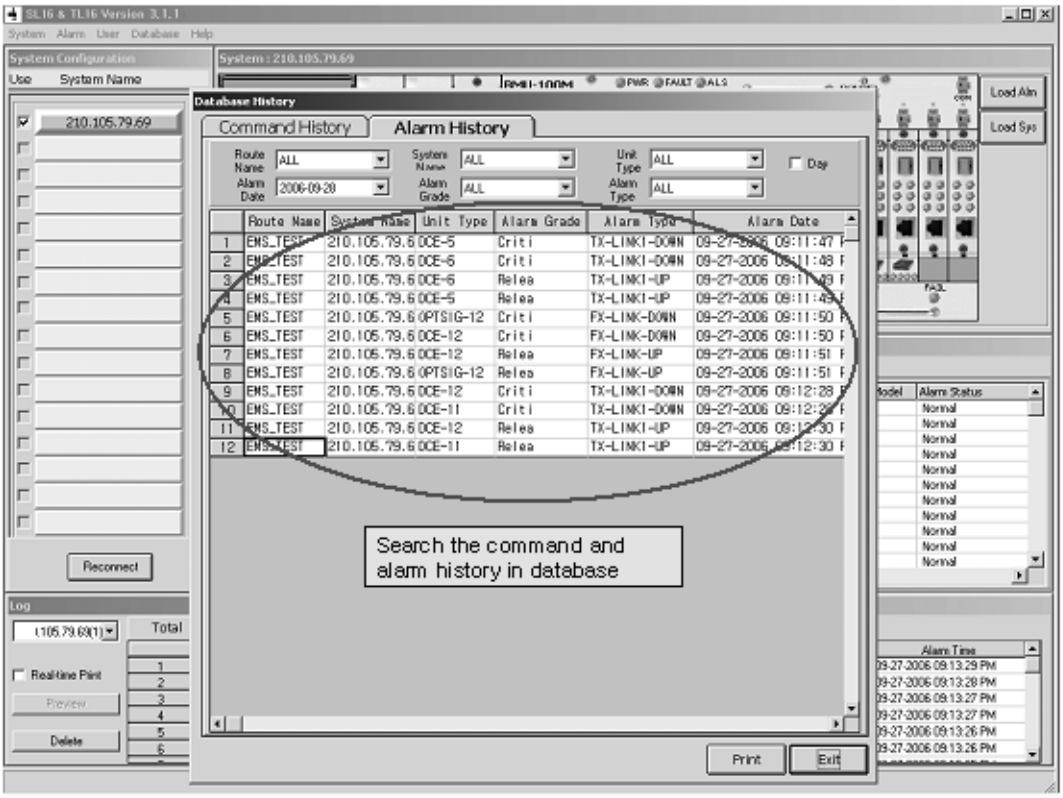

Figure 6-25. DB History View and Search

6.6.2. Alarm data display

EMS retries alarm data from DB at an interval of 3 seconds, and displays the data on the LOG window, with the recent data on the top. You can select the system name in the left of the LOG window.

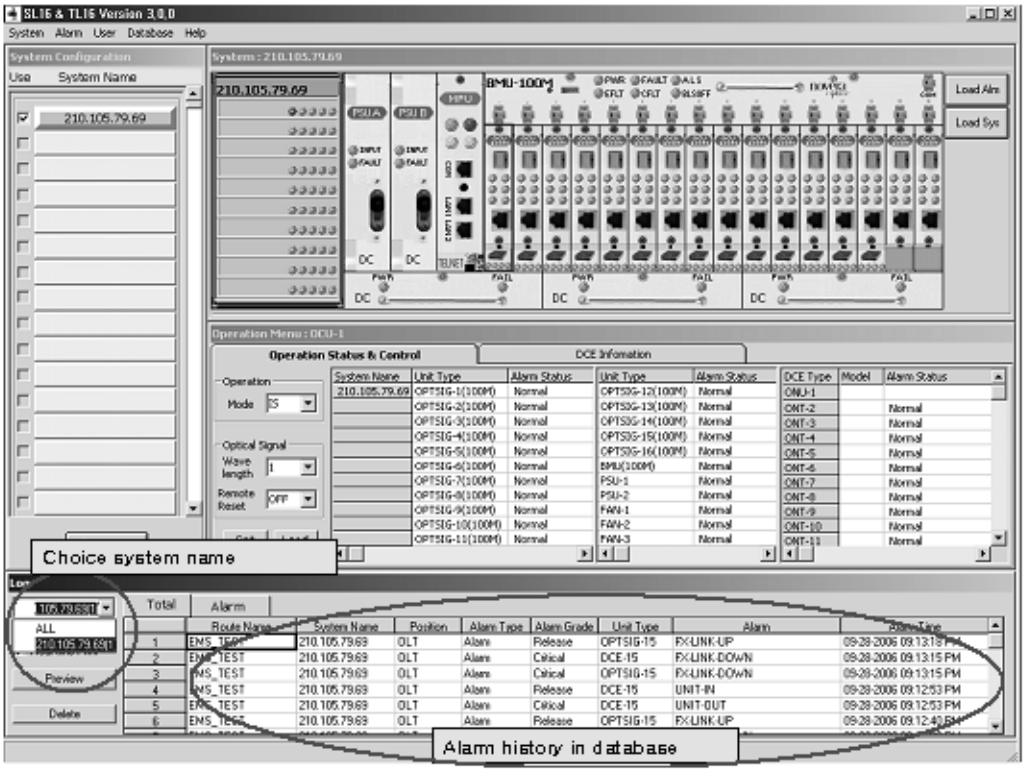

Figure 6-26. Alarm Data Display

6.6.3. Real-time alarm print

This function enables you to download alarm data in real-time from the system. Select the "Real-time Print" check box on the left of the Log window, and click "Preview" to display the real-time alarm data pop-up window. EMS displays the data in real-time upon receiving the alarm report from the system. The pop-up window also provides the "Clear" and "Print" buttons.

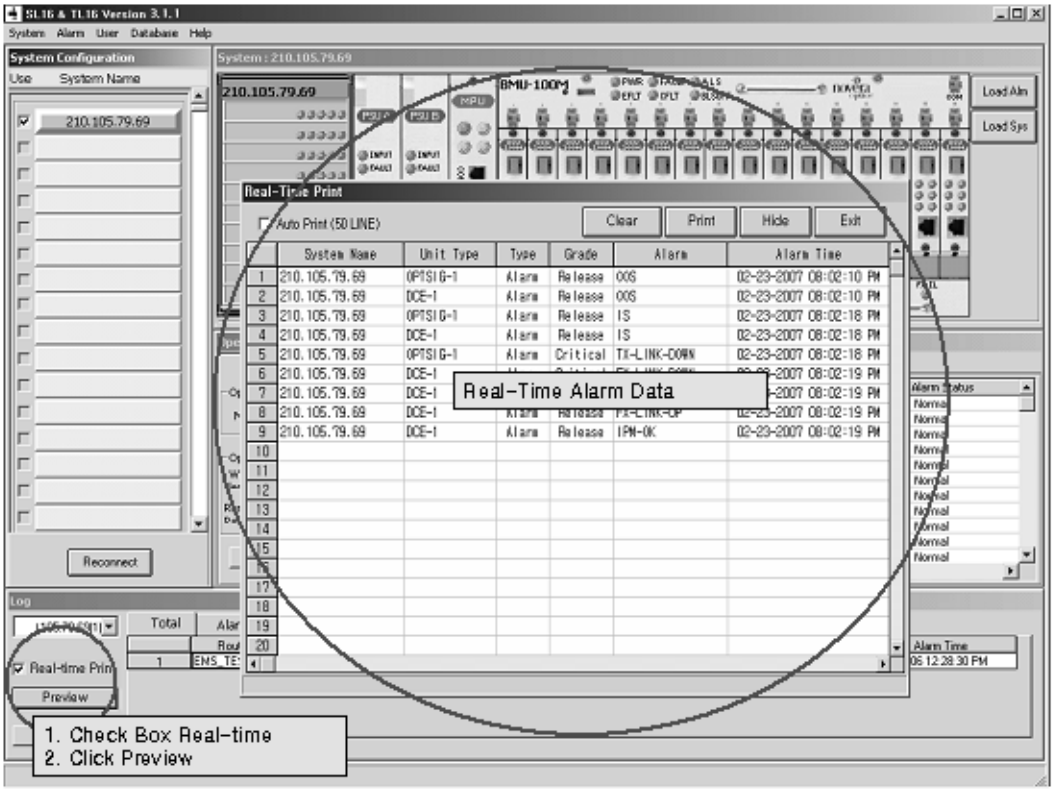

Figure 6-27. Real-time Alarm View

6.7. Configuration management

6.7.1. Optical signal setting

You can set the parameters for optical signal on the Operation Menu window in the center of the GUI window. In the "Operation status & control" window, the parameters required for operation of optical signal of each OCU in OLT are activated. The optical signal operating parameter values are as described below.

- Optical signal (Laser Diode:LD) : ON, OFF
  - -. Optical signal ON/OFF status of OCU is indicated. It remains ON for normal operation. You can switch OFF the function for test.
- Wavelength No. : Indicates the slot number for OCU.
- Remote Reset : ON, OFF
  - -. You can make the hardware-level command for remote reset from the system. It is OFF during the normal operation. This single-shot command is activated only once when the remote reset command is made. The ON status is not continued, and once the status becomes ON, it is always changed to OFF in the next system. If this function is used, the DCE which detects the signal pattern performs self-reset.

The following figures illustrate service status control and remote reset of DCE. You can use the function with the "Operation Status & Control" menu or with the pop-up menu displayed when you right-click the OCU channel card.

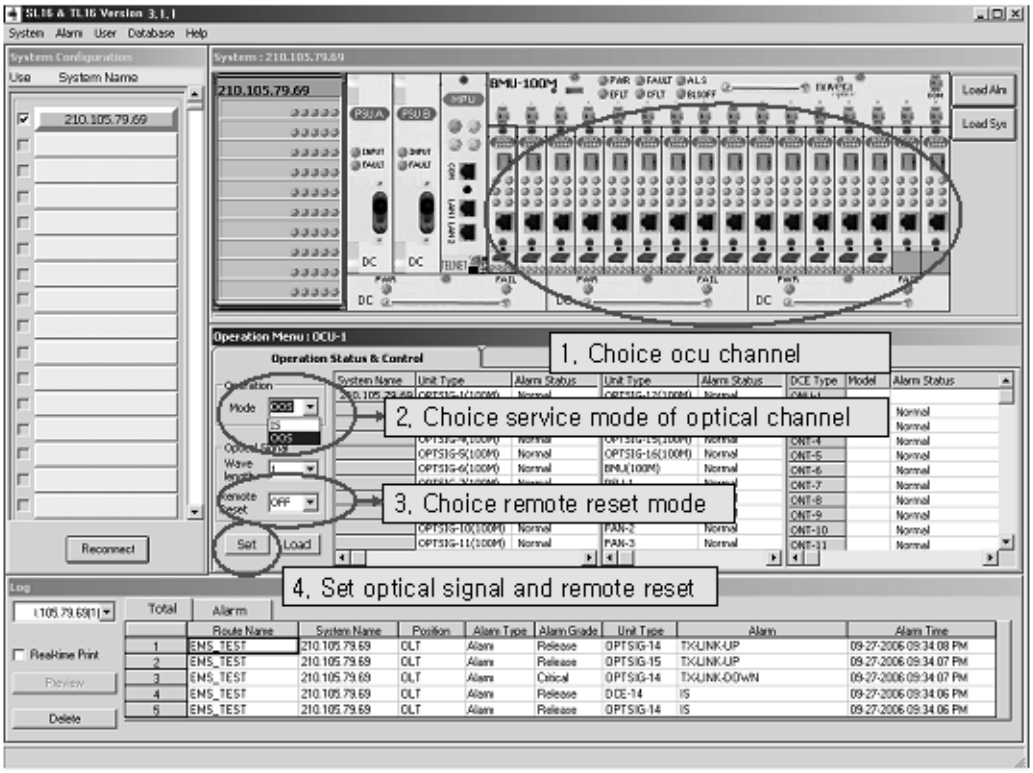

Figure 6-28. Operation Status & Control Menu

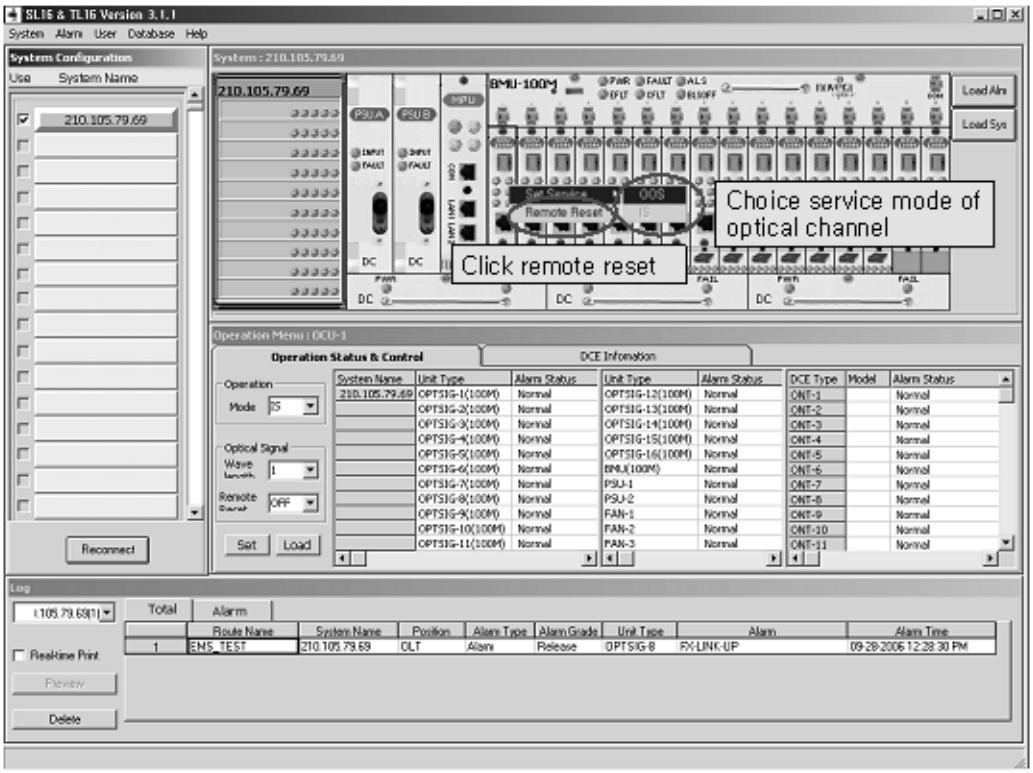

Figure 6-29. Pop-up Menu displayed when Right-Click the OCU Channel Card

6.7.2. DCE information

The system has a DCE per optical channel. EMS retrieves this information from the system, saves it in DB, and enables you to manage the system by entering operator and location of DCE. If you click "Load DCE" on the "DCE Information" page in the center of the EMS window, a confirmation window pops up, and EMS retrieves information on DCE from the system.

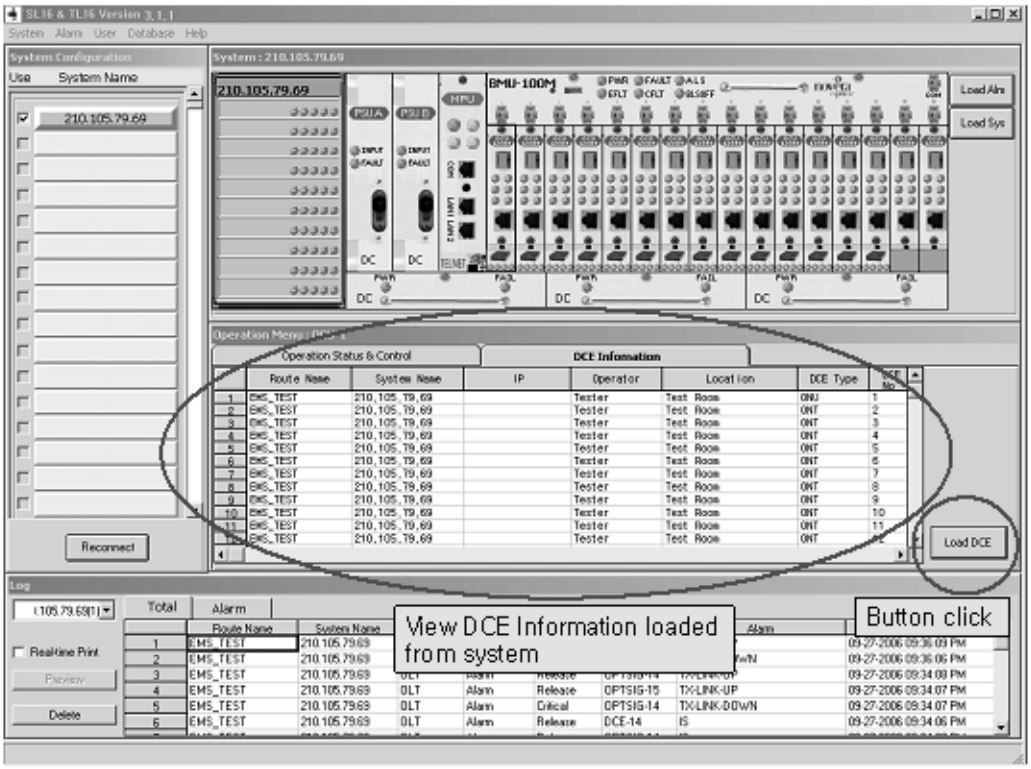

Figure 6-30. DCE Information

6.7.3. Remote connection to system

EMS can access the system through the remote terminal window, not with the console, for inspection and preventive maintenance of the system. If you wish to make connection to the system, double-click the Telnet image in the MCU board image on the EMS window. Then, a remote connection terminal window pops-up, makes connection to the system, and prompts you to enter the login ID and password. If you wish to make connection to an ONU for an OCU channel, you must double-click the ONT image on each channel slot image. However, you cannot make connection to ONT if the OCU channel card is deleted or the optical link is not configured.

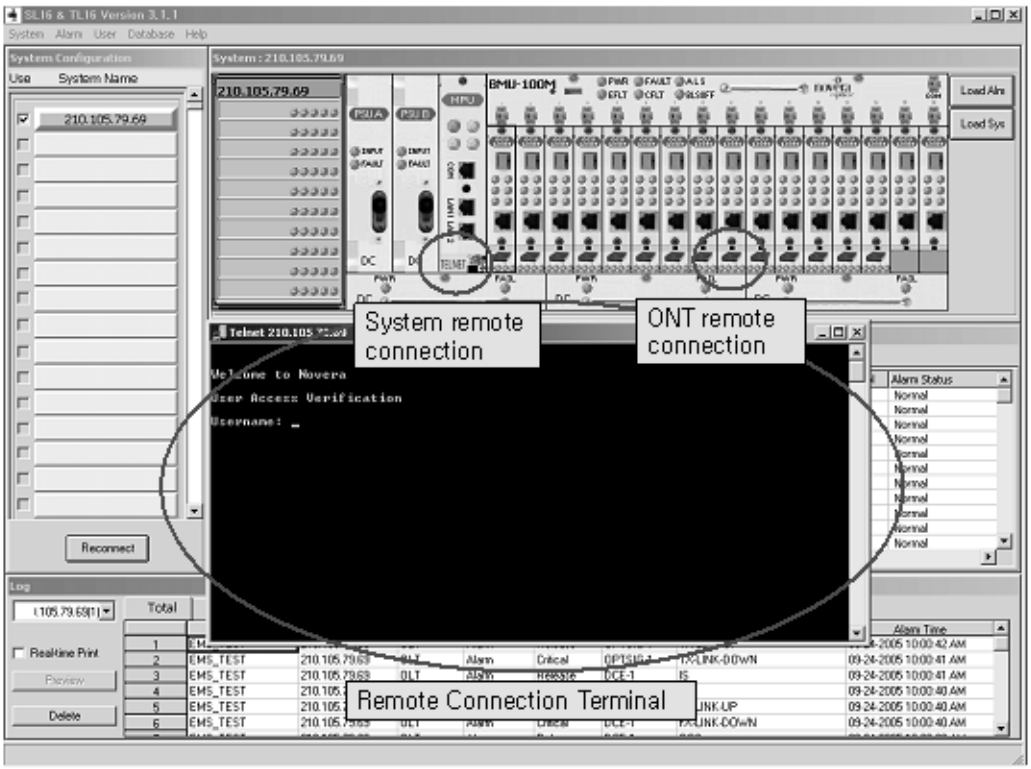

Figure 6-31. Remote Access

6.8. Help

This menu provides help for operating EMS. It consists of the sub-menus, "About EMS," "About System," "Unit LED Description," "Support Center" and "User Manual."

6.8.1. EMS information

If you click "About EMS" in the "Help" menu, the EMS Information window pops up. This window shows the EMS name, the version and the connected system model.

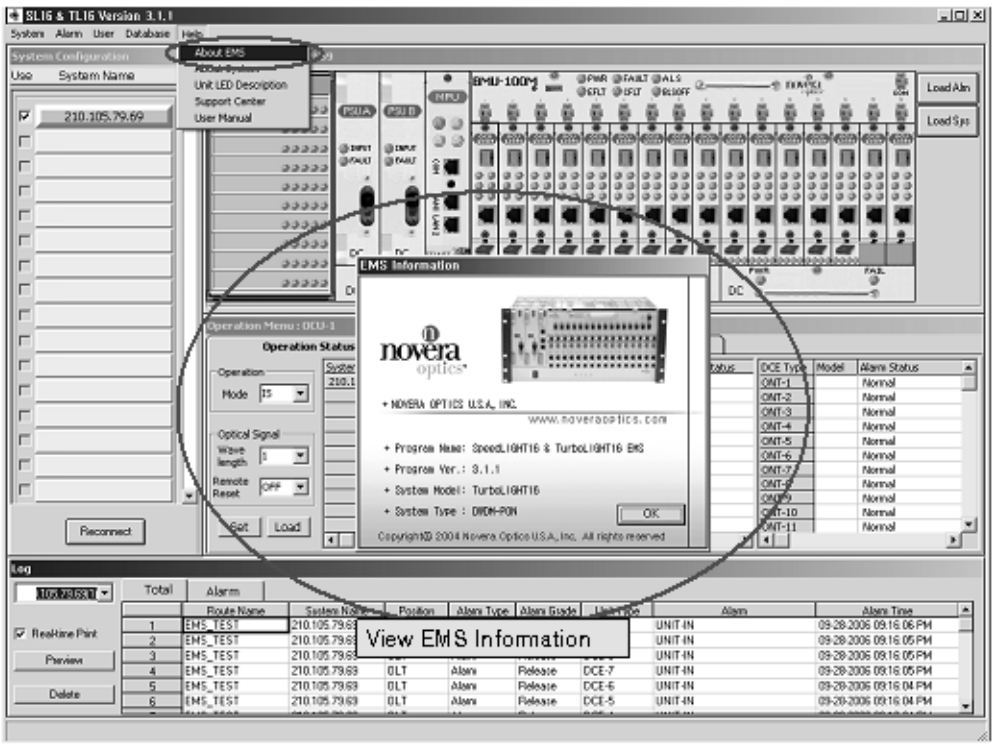

Figure 6-32. EMS Information

6.8.2. System information

If you click "About System," the System Information window pops up, showing the system name, the model and the version.

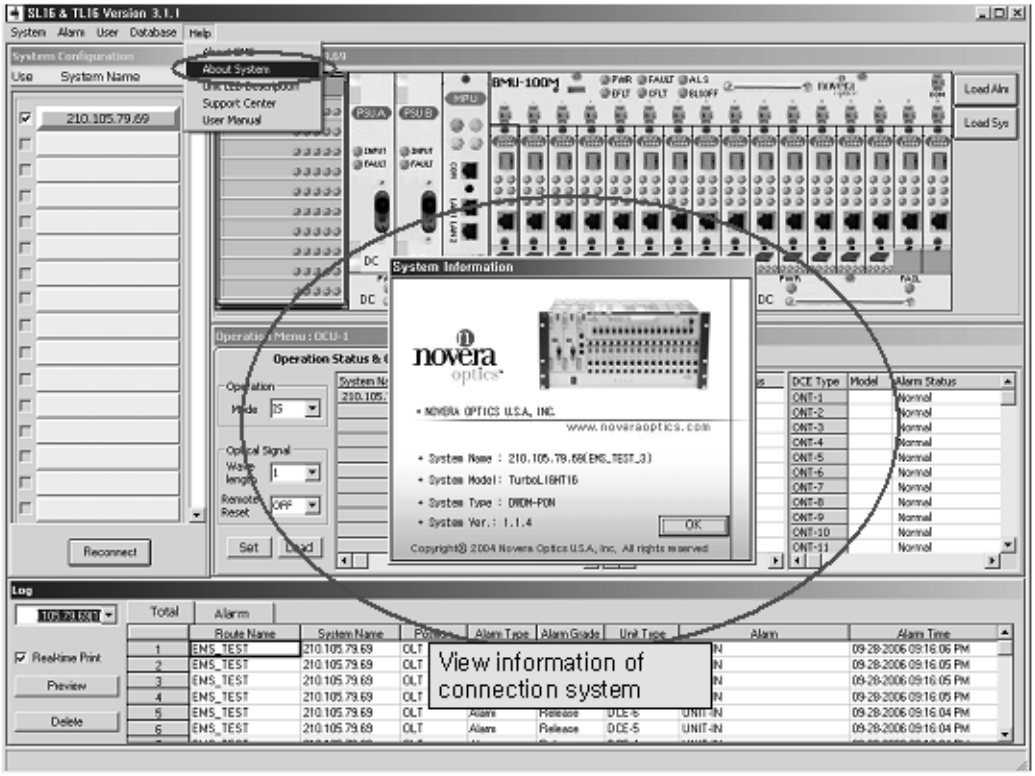

Figure 6-33. Information on Connected System

6.8.3. Unit LED description

If you click "Unit LED Description," the Unit LED Description window pops up, showing LED names and operation states of OCU and ONT.

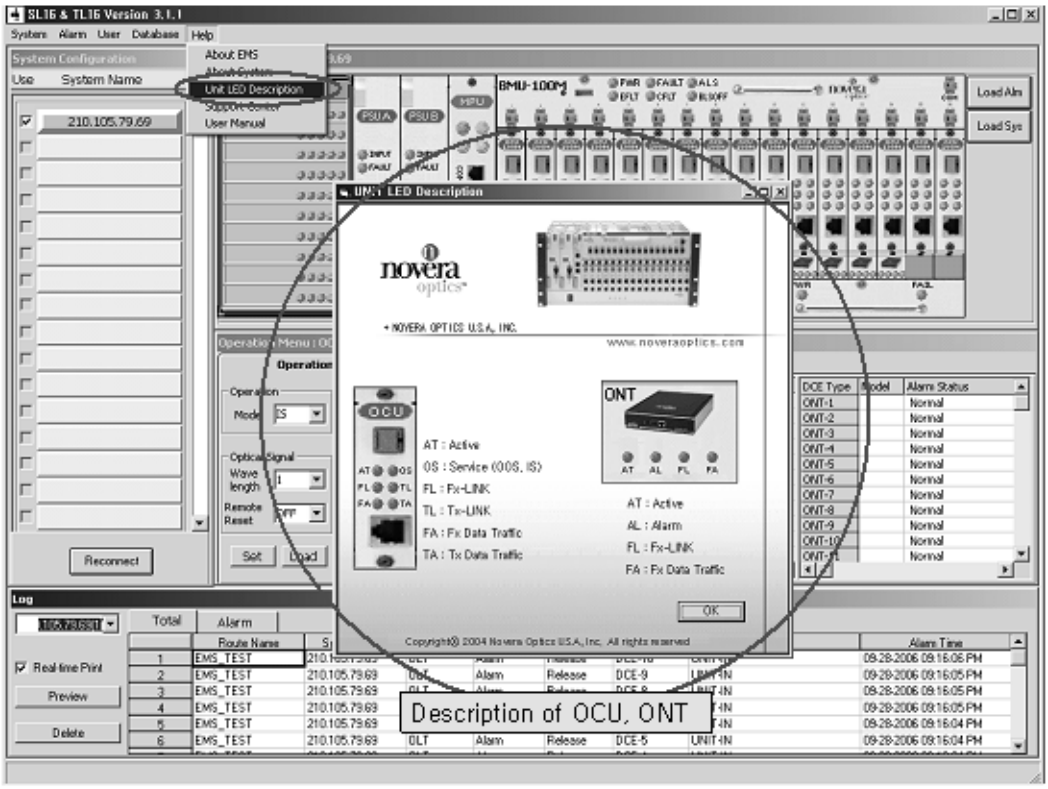

Figure 6-34. Description on OCU and ONT LED

6.8.4. Support center

If you click “Support Center,” the Support Center window pops up, showing the address and the contact information of Novera Optics.

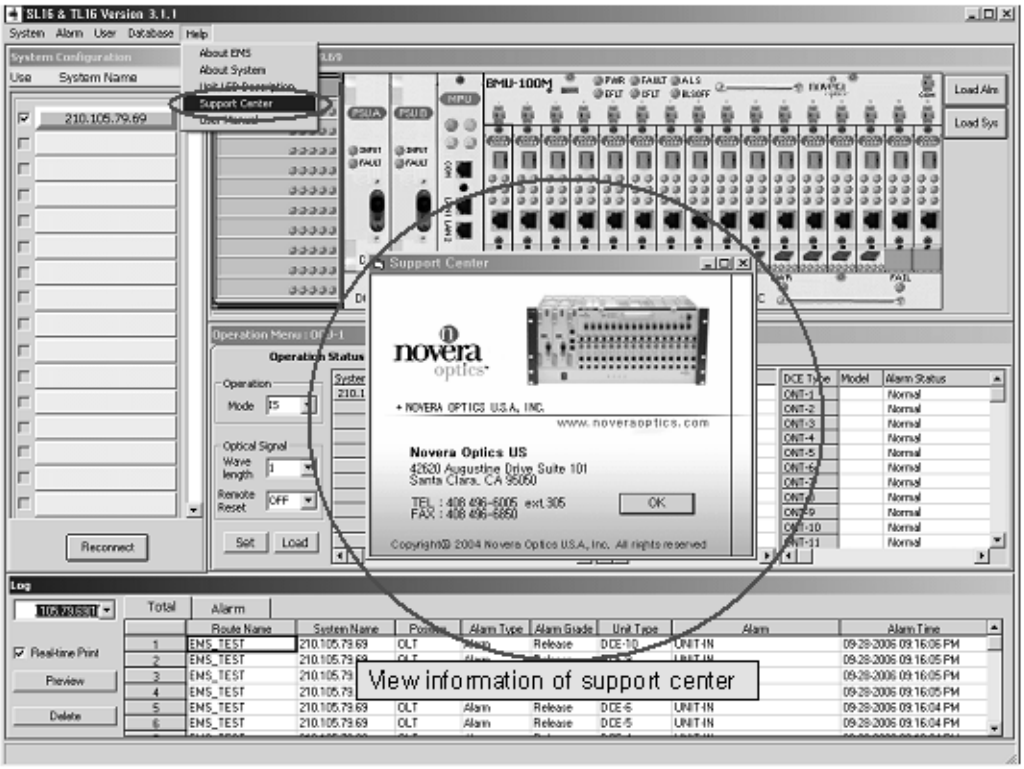

Figure 6-35. Information on Support Center

6.8.5. User manual

If you click “User Manual" from the “Help” menu, you can open the User Manual file that explains all the functions of EMS.

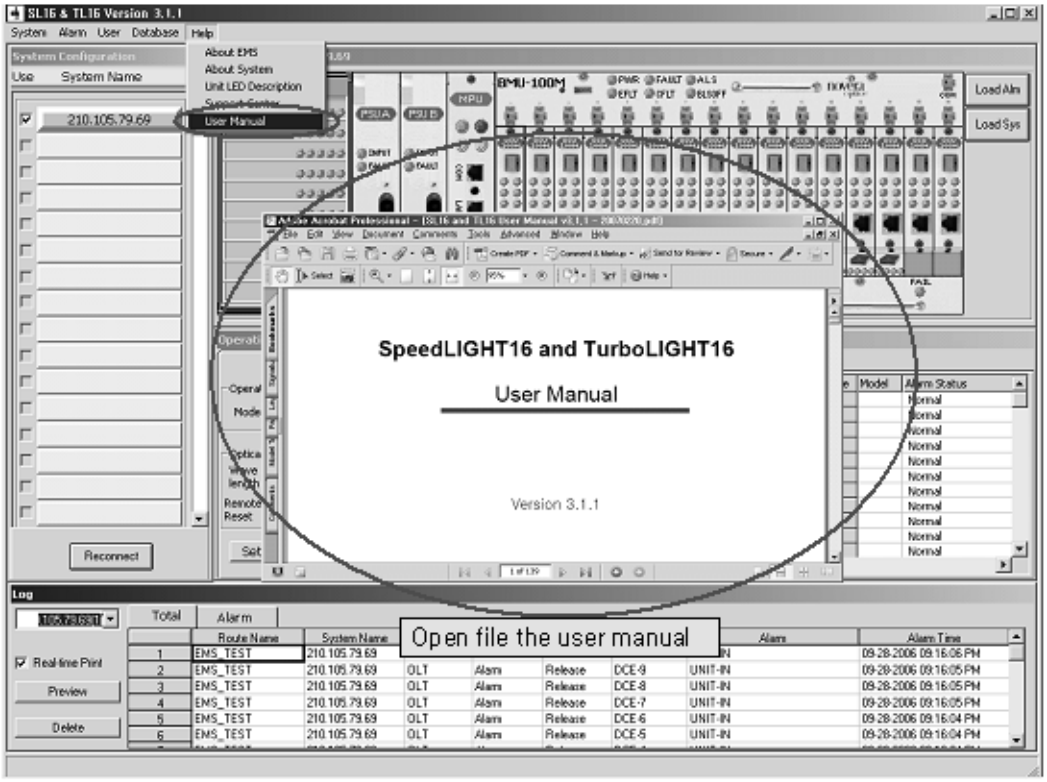

Figure 6-36. User Manual

6.9. LiveUpdate

6.9.1. LiveUpdate menu

LiveUpdate automatically updates the system as you select the targets for update when the system is upgraded or a new version of OS is released upon request of the customers. The LiveUpdate window pops up when you click "LiveUpdate" from the "System" menu.

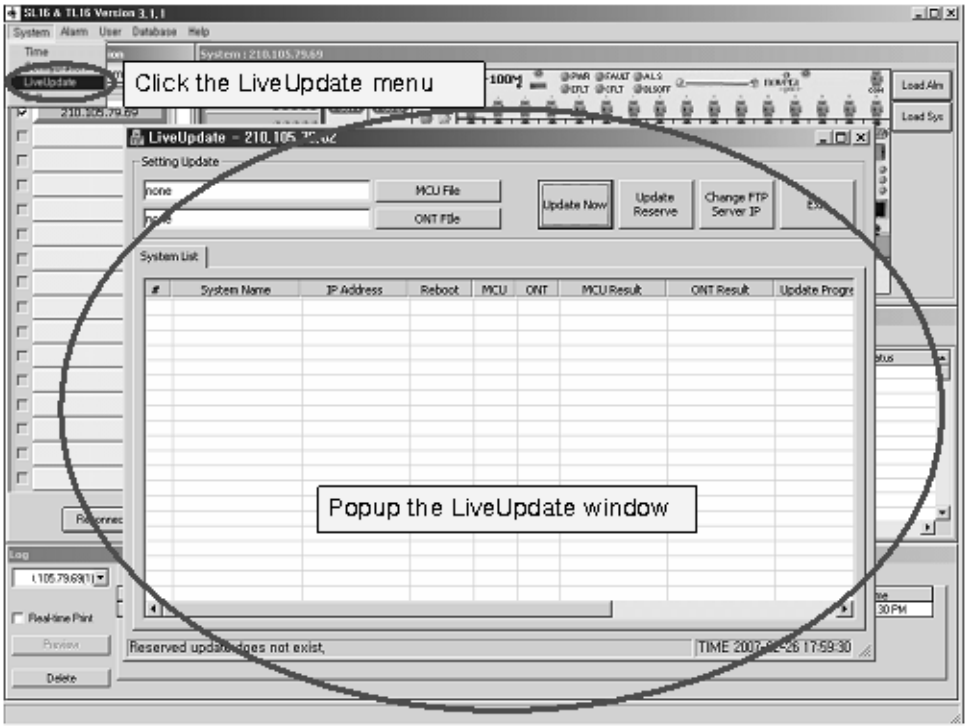

Figure 6-37. LiveUpdate Menu

6.9.2. Update procedure

You can perform LiveUpdate in the following procedure.

1) Create the list for update.
   Select the system name, IP, MCU / ONT, and whether to reboot the system after update. You can give any system name.

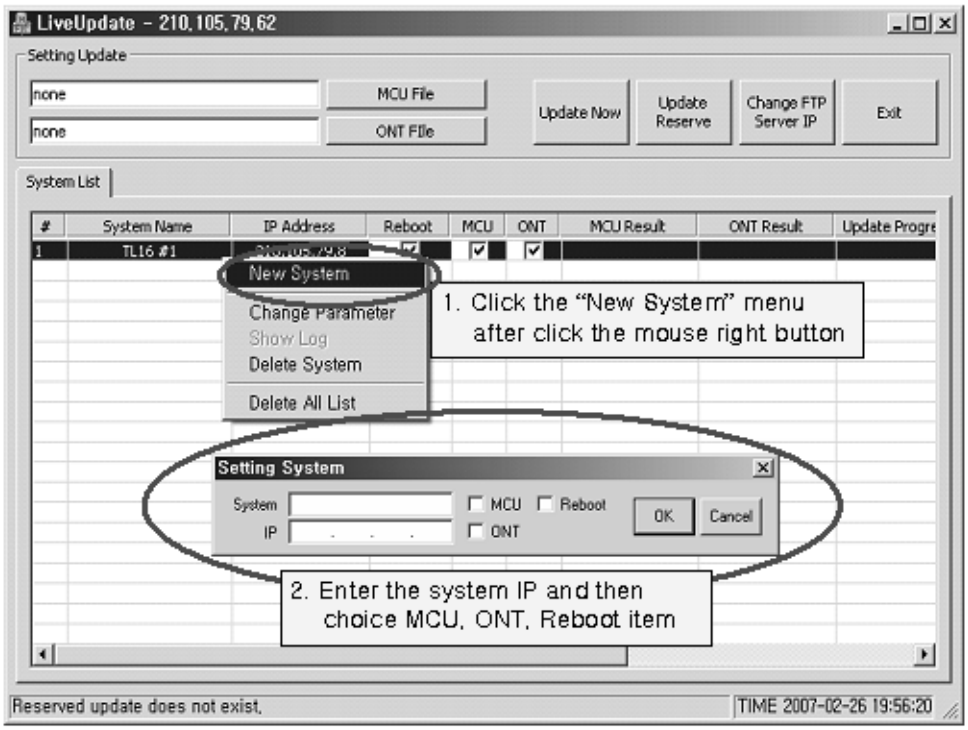

Figure 6-38. LiveUpdate Step 1

2) Click the MCU File or the ONT File button, and select the image file for update.
Click the "Update Now" button, and click "OK" in the pop-up window. If the list has a number of systems, EMS updates the systems in sequence.

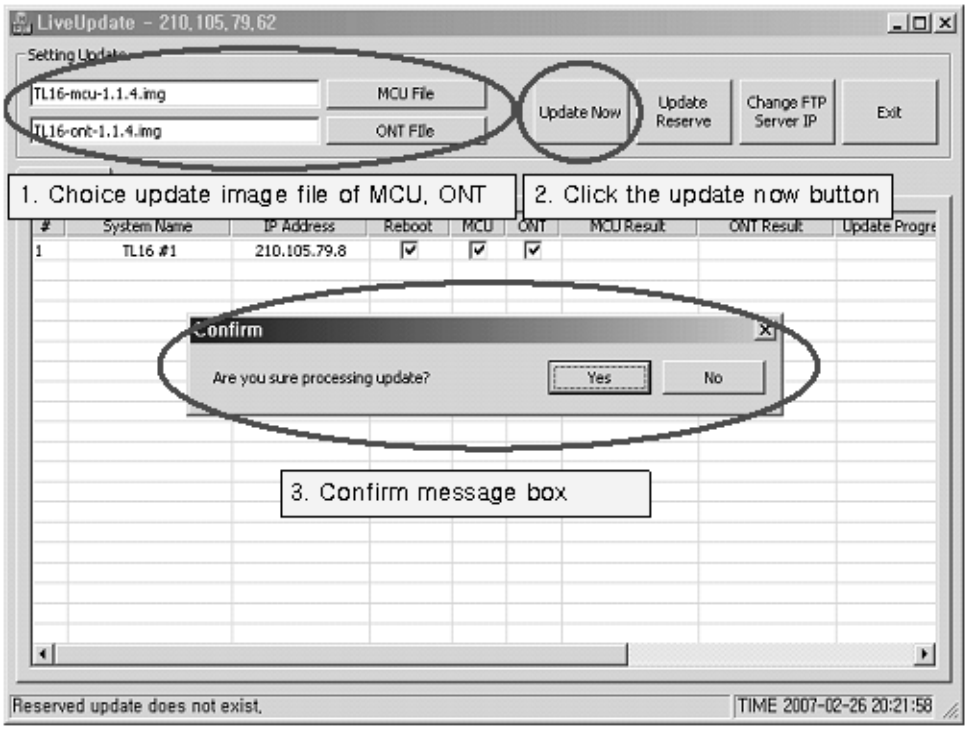

Figure 6-39. LiveUpdate Step 2

3) The update result is displayed on the message box during the update, and on the right side of the list after the update. Click the "Update Now" button, and the "Yes" button on the confirmation message box. If the list has a number of systems, EMS updates the systems in sequence. You can stop update at any time by clicking the "Cancel" button on the message box. If you click "Cancel," the update process is stopped after the current update of the MCU or the ONT is completed.

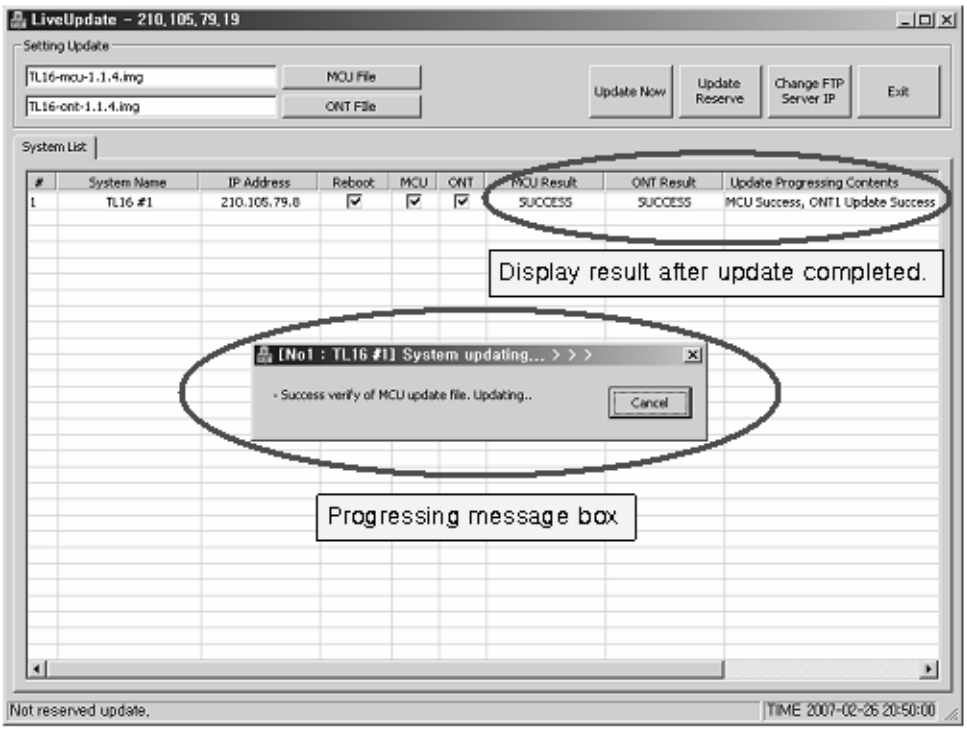

Figure 6-40. LiveUpdate Step 3

6.9.3. Reservation for update

Reserved update is performed in the same procedure described above. The only difference is that you can reserve the time for update. You can reserve the time for update by clicking the "Update Reserve" button as shown in the following figure. If you click the button, the Setting Reserve message box pops up. The message box remains on the window until the reserved update is started. You can cancel the reservation at any time by clicking the Cancel button on the box. The update process is performed as described above.

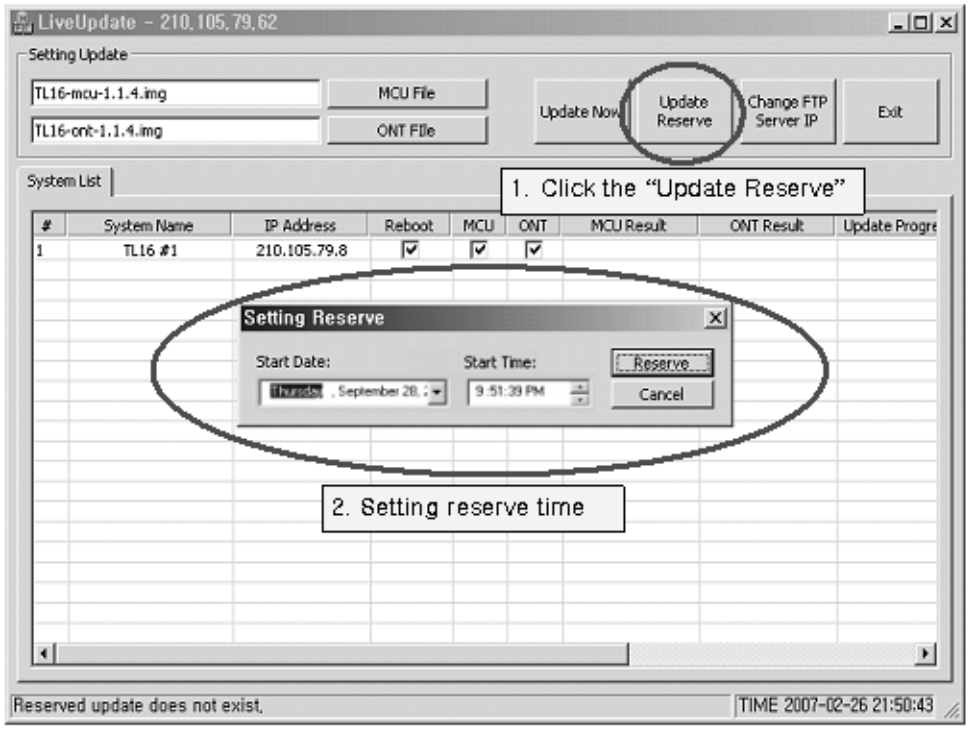

Figure 6-40. Reservation for Update

6.9.4. Changing FTP server IP

LiveUpdate activates the FTP server to download the MCU and ONT update image files to the program. You don't have to designate an IP if there is only one user PC. If there are a number of IP addresses, you need to select an IP as the FTP server. If you do not select an IP, the program uses any IP. If the IP band or gateway is different, the image file might not be downloaded. Therefore, you must select the FTP server IP if you use a private IP or a number of IPs. If you click "Change FTP Server IP," a window pops up. If you click the combo box in the pop-up window, all the IPs are displayed. The current FTP server IP is indicated on the title bar as shown in the following figure.

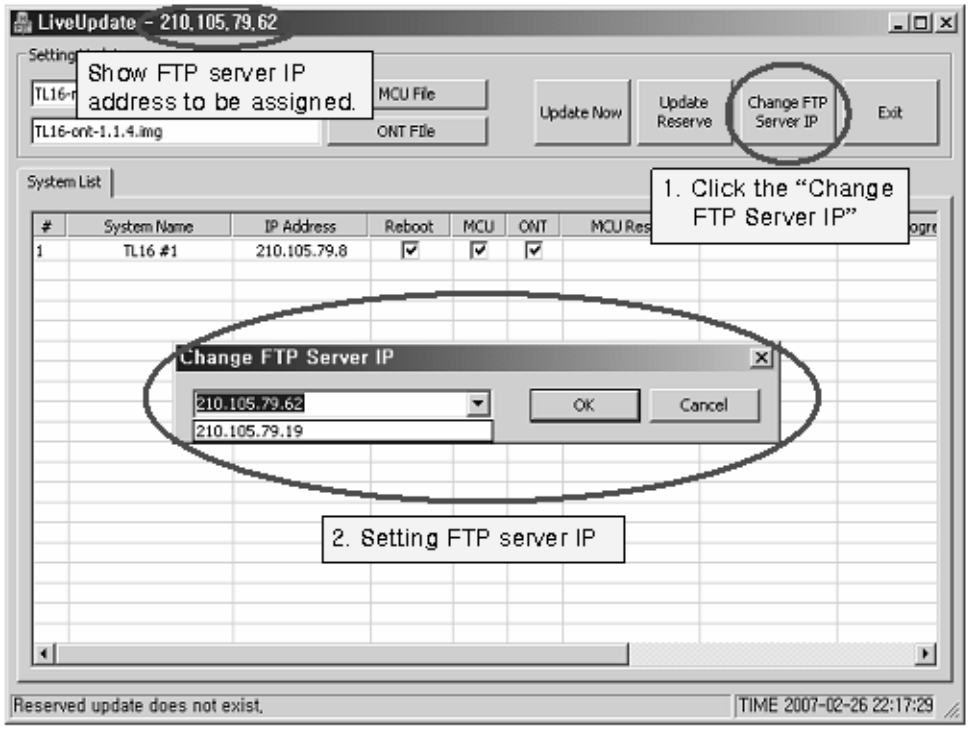

Figure 6-40. Setting FTP Server IP

6.10. EMS menu

6.10.1. Main menus

<Table 6-2> EMS Main Menus

Main menu	Description
System	Manage system by adding device, changing information or updating OS.
Alarm	Set general conditions of alarms
User	Manage users via EMS by adding, deleting user, and changing password.
Database	View history data from database
Help	View information on EMS, system software and customer support

6.10.2. Sub menus

<Table 6-3> EMS Sub Menus

Main menu	Sub menu	Description
System	Time	View and set system time.
	Configuration	Add a system, or view, change or delete the existing system information.
	LiveUpdate	Update OS of OLT and ONT.
	Exit	Exit EMS.
Alarm	History	View log data of the system.
	Threshold	Determine whether to receive report on the system alarms by alarm grade.
User	Password	Change password of the user on EMS.
	Account	Add, change or delete account of EMS user.
Database	History	View and search commands and alarms stored in DB of the operating PC.
Help	About EMS	View information on name and version of EMS.
	About System	View type and version of the connected system.
	UNIT LED Description	Describe LED for OCU and ONT displayed on EMS window.
	Support Center	View address and contact information of the customer center.
	User Manual	Open user manual in MS office.

Chapter 7 Read before requesting service

- Cannot switch the system on.

1. Are +/- of DC –48V properly connected?
   - ✓ Check if +/- of the PDP or power codes are reversed.
   - ✓ Check the power at the PDP port.

- Communication is disabled.

1. Is the subscriber aggregation switch set properly?
   - ✓ Check the LAN cable, and replace the LAN and check the communication status.

2. Check if Tx/Rx ports of OCU in the OLT shelf are properly connected?
   - ✓ Check if Tx/Rx port of OCU are reversed.

3. Is the optical power measured at the OCU card in OLT shelf and the BMU below the specification?
   - ✓ Clean the optical jumper code of the optical output port in each card of each shelf, and then, check the followings. Also check if the optical fiber is bent.
   - ✓ Check if the BLS output power from the BMU channel ports meets specification.
   - ✓ Check if the output power of the OCU card meets the specification.
   - ✓ Check if the output power of BMU common port meets specification.

4. Was the fiber properly terminated during installation of RN?
   - Check if the radius of the end coil of the terminated optical fiber is less than 15cm. Also check if the optical fiber was broken when RF cabinet door was closed.

5. Internet rate is lower than expected.
   - Check the rate of NIC of the subscriber PC. Some of the NIC cards is for 10M. In this case, replace the NIC. Also check if NIC is set to auto nego.

6. IP is received normally, and then, disconnected.
   - The switch blocks the connection at L3 if the subscriber PC is affected by a virus. Check the virus in your PC. (You may have to format the PC.)

7. If you have had used two or more PCs, and now use only one, it is blocked by the max mac filtering function of the switch.

Chapter 8 Appendix A Acronyms

ADSL	Asymmetrical Digital Subscriber Line
ARP	Address Resolution Protocol
BLS	Broadband Light Source
BMU	Broadband Light Source and Mux Unit
CLI	Command Line Interface
CoS	Class of Service
DCE	Data Cirtuit-Terminal Equipment
DWDM	Dense Wavelength Division Multiplexing
DWDM-PON	Dense Wavelength Division Multiplexing Passive Optical Network
DEMUX	Demultiplex
EMC	ElectroMagetic Compatibility
EMI	ElectroMagetic Interference
EMS	Element Management System
FES	Fast Ethernet Switch
FTTB	Fiber To The Business
FTTC	Fiber To The Curb
FTTH	Fiber To The Home
H/W	Hardware
ICMP	Internet Control Message Protocol
IGMP	Internet Group Multicast Protocol
IPM	Input Power Monitoring
L2	Layer 2
L3	Layer 3
L4	Layer 4
LAN	Local Area Network
LED	Light Emitting Diode
MAC	Media Access Control
MCU	Main Control Unit
MIB	Management Information Base
MUX	Multiplex
NMS	Network Management Server
OCU	Optical Channel Unit
OFD	Optical Fiber Distribution

OLT	Optical Line Terminal
ONU	Optical Network Unit
OS	Operating System
PIM	Protocol Independent Multicast
PON	Passive Optical Network
PSU	Power Supply Unit
QoS	Quality of Service
RN	Remote Node
RMON	Remote Monitoring
SMF	Single Mode Fiber
SNMP	Simple Network Mangement Protocol
S/W	Software
ToS	Type of Service
UTP	Unshielded Twist Pair
VDSL	Very high data rate Digital Subscribe Line
VLAN	Virtual Local Area Network
WDM	Wavelength Division Multiplexing
WDM-PON	Wavelength Division Multiplexing Passive Optical Network
WFQ	Weighted Fair Queue
WRED	Weighted Random Early Detection
WRR	Weighted Round Robin
XDSL	ADSL or VDSL