



# **RC003COMM (RC004-16) EMS**

## **User Manual**

**RC-A043-V27-050909-EN**

**Beijing Raisecom Science & Technology Co., Ltd.**

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## Preface

### About This Manual

This manual introduces primary functions of the configuration management software for RC series products.

### Who Should Read This Manual

Sales and marketing engineers, after service staff and telecommunication network design engineers could use this manual as a valuable reference. If you want to get an overview on features, applications, architectures and specifications of Raisecom RC series integrated access devices, you could find useful information in this manual as well.

### Compliance

The RC series products developed by Raisecom are strictly complied with the following standards as well as ITU-T, IEEE, IETF and related standards from other international telecommunication standard organizations:

YD/T900-1997 SDH Equipment Technical Requirements - Clock

YD/T973-1998 SDH 155Mb/s and 622Mb/s Technical conditions of optical transmitter module and receiver module

YD/T1017-1999 Network node interface for the Synchronous Digital Hierarchy (SDH)

YD/T1022-1999 Requirement of synchronous digital hierarchy (SDH) equipment function

YD/T1078-2000 SDH Transmission Network Technique Requirements-Interworking of Network Protection Architectures

YD/T1111.1-2001 Technical Requirements of SDH Optical Transmitter/Optical Receiver Modules—2.488320 Gb/s Optical Receiver Modules

YD/T1111.2- 2001 Technical Requirements of SHD Optical Transmitter/Optical Receiver Modules—2.488320 Gb/s Optical Transmitter Modules

YD/T1179- 2002 Technical Specification of Ethernet over SDH

G.703 Physical/electrical characteristics of hierarchical digital interfaces

G.704 Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels

G.707 Network node interface for the synchronous digital hierarchy (SDH)

G.774 Synchronous digital hierarchy (SDH) - Management information model for the network element view

G.781 Synchronization layer functions

G.783 Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks

- G.784 Synchronous digital hierarchy (SDH) management
- G.803 Architecture of transport networks based on the synchronous digital hierarchy (SDH)
- G.813 Timing characteristics of SDH equipment slave clocks (SEC)
- G.823 The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy
- G.825 The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH)
- G.826 End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections
- G.828 Error performance parameters and objectives for international, constant bit-rate synchronous digital paths
- G.829 Error performance events for SDH multiplex and regenerator sections
- G.831 Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)
- G.841 Types and characteristics of SDH network protection architectures
- G.842 Interworking of SDH network protection architectures
- G.957 Optical interfaces for equipments and systems relating to the synchronous digital hierarchy
- G.691 Optical interfaces for single channel STM-64 and other SDH systems with optical amplifiers
- G.664 Optical safety procedures and requirements for optical transport systems
- I.731 ATM Types and general characteristics of ATM equipment
- I.732 ATM Functional characteristics of ATM equipment
- IEEE 802.1Q Virtual Local Area Networks (LANs)
- IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering
- IEEE 802.3 CSMA/CD Access Method and Physical Layer Instruction

## Chapter 1 Overview

This chapter describes the architectures and functions of RC003COMM(RC004-16) EMS, and consists of the following sections:

- ✧ Function overview
- ✧ Product models

### 1.1 Function Overview

**RC003COMM(RC004-16) EMS** (Element Management System) provides GUI for device management. A device view generated by the EMS is identical with appearance of the real device. In addition, that view could truly reflect current status of the device, so you can monitor and maintain the device in a centralized and quick way.

**RC003COMM(RC004-16) EMS** enables you to manage RC003 standalone PDH, RC004-16 Modular PDH and RC3000 PCM comprehensive Multiplexer.

**RC003COMM(RC004-16) EMS** supports two management modes. The first mode enables you to manage devices connected to COM ports on a PC through the Agent software running on the PC. At present, you can manage up to 16 COM ports in this mode, and each port can connect 1 to 40 devices depending on the type of those connected devices. The manageable devices in this mode cover 1U standalone PDH. The second mode enables you to manage PDH modules through the Agent software running on the RC004-16 NMS master control card which is plugged in Slot 0 of Chassis 1. Slot 1 to 15 could be used to insert PDH modules. One Agent software could manage up to 4 10U big chassis.

### 1.2 Product Models

Table 1-1 Standalone PDH Product Model Table

Serial Number	Product Model Identification
1	RC801-240B(REV.B) Dual-strand PDH
2	RC803-240B(REV.B) Single-strand PDH, 1310 nm TX
3	RC805-240B(REV.B) Single-strand PDH, 1550 nm TX
4	MS2104-240(REV.B) Dual-strand PCM
5	MS2304-240(REV.B) Single-strand PCM, 1310 nm TX
6	MS2504-240(REV.B) Single-strand PCM, 1550 nm TX
7	RC801-480B(REV.A) Dual-strand PDH
8	RC803-480B(REV.A) Single-strand PDH, 1310 nm TX
9	RC805-480B(REV.A) Single-strand PDH, 1550 nm TX
10	RC801-120C(REV.A) Dual-strand PDH
11	RC803-120C(REV.A) Single-strand PDH, 1310 nm TX
12	RC805-120C(REV.A) Single-strand PDH, 1550 nm TX



13	RCMS2104-120(REV.A) Dual-strand PCM
14	RCMS2304-120(REV.A) Single-strand PCM, 1310 nm TX
15	RCMS2504-120(REV.A) Single-strand PCM, 1550 nm TX
16	RC801-240B(REV.M) Dual-strand PDH
17	RC803-240B(REV.M) Single-strand PDH, 1310 nm TX
18	RC805-240B(REV.M) Single-strand PDH, 1550 nm TX
19	RC801-120B(REV.M) Dual-strand PDH
20	RC803-120B(REV.M) Single-strand PDH
21	RC805-120B(REV.M) Single-strand PDH
22	RC801-480B(REV.M) Dual-strand PDH
23	RC803-480B(REV.M) Single-strand PDH
24	RC805-480B(REV.M) Single-strand PDH

Table 1-2 RC004-16 Product Model Table

Serial Number	Product Model Identification
1	RC802-240B(REV.B) Dual-strand PDH module
2	RC804-240B(REV.B) Single-strand PDH module
3	RC802-120BX2(REV.B) Dual-strand PDH module
4	RC804-120BX2(REV.B) Single-strand PDH module
5	RC802-240B(REV.C)+RC802-240BS(REV.A) Dual-strand PDH module
6	RC804-240B(REV.C)+RC802-240BS(REV.A) Single-strand PDH module
7	RCMS2204-240(REV.A) Dual-strand PCM module
8	RCMS2404-240(REV.A) Single-strand PCM module
9	RC802-240B(REV.C) Dual-strand PDH module
10	RC804-240B(REV.C) Single-strand PDH module
11	RC802-240B(REV.M) Dual-strand PDH module
12	RC804-240B(REV.M) Single-strand PDH module
13	RC802-120B*2(REV.M) Dual-strand PDH module
14	RC804-120B*2(REV.M) Single-strand PDH module
15	RC802-240B(REV.M)+RC802-240BS(REV.M) Dual-strand PDH module
16	RC804-240B(REV.M)+RC802-240BS(REV.M) Single-strand PDH module
17	RC802-120B(REV.M) Dual-strand PDH module
18	RC804-120B(REV.M) Single-strand PDH module

Table 1-3 The Line Cards supported by Current PCM Comprehensive Multiplexer Table

Serial Number	Product Model Identification
1	8M Optical Line Card
2	2E1 Line Card (with ADM)
3	2E1 Line Card (without ADM)
4	4E1 Line Card

Table 1-4 The User Cards Supported by Current PCM Comprehensive Multiplexer

Serial Number	Product Model Identification
1	8-Channel FXS <i>User Card</i>
2	8-Channel FXO <i>User Card</i>
3	8-Channel FXS&FXO Mixed <i>User Card</i>
4	8-Channel EM2 <i>User Card</i>
5	4-Channel EM4 <i>User Card</i>
6	Single-Channel V35 <i>User Card</i>
7	Single-Channel V24 <i>User Card</i>
8	10MBase-T Ethernet <i>User Card</i>
9	RS232 Asynchronized Communication <i>User Card</i>
10	RS422 Asynchronized Communication <i>User Card</i>
11	Magnet Telephone Card

## Chapter 2 Device Management

This chapter describes the functions and service management of device, and consists of the following sections:

- ✧ 1U standalone PDH management
- ✧ RC004-16 modular PDH management
- ✧ PCM comprehensive Multiplexer management

### 2.1 1U Standalone PDH Management

#### 2.1.1 Device View

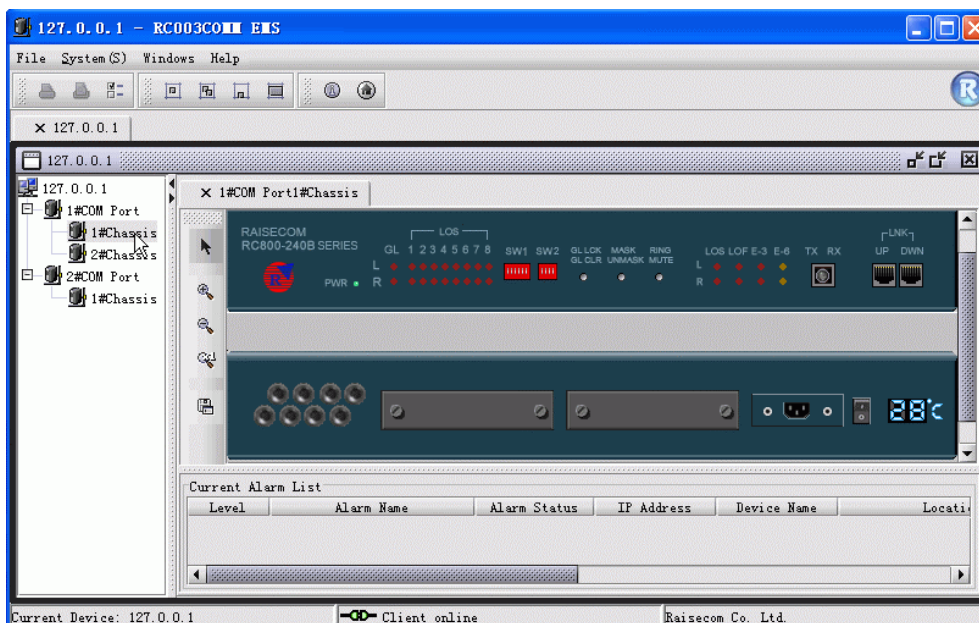


Figure 2-1 The Device View of Standalone PDH

As the figure shows above, the chassis tree and device view are located on the left side and right side of the window respectively. Double click a chassis node beneath the chassis tree, the view for front panel and rear panel of this device will be displayed in the right tab page.

The view area could accommodate multiple views. When there're more than one window opened simultaneously, user can access each view simply by double clicking the relevant tab, and the one will be bulged for displaying the intended view.

#### 2.1.2 Device Management

Right click the front panel or rear panel, you'll see a menu listing several items popup. Here's an example of this menu:

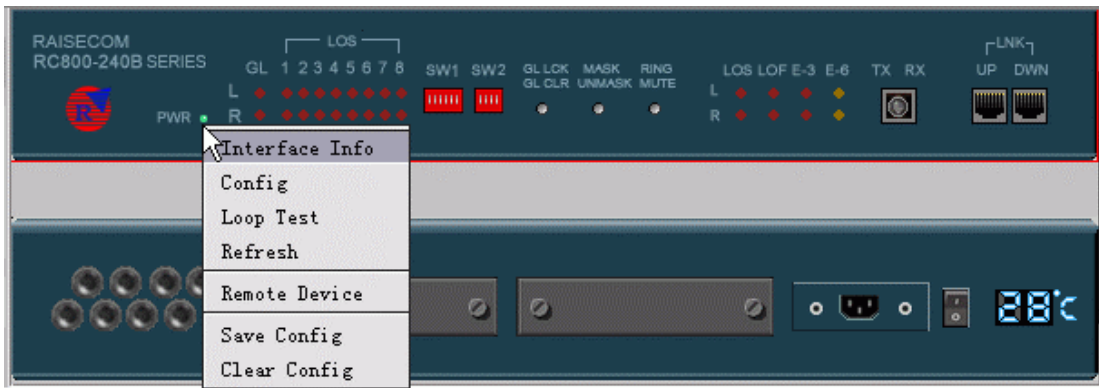


Figure 2-2 The right click menu

Select [Interface Info] from the right click menu to launch the **Interface Information** dialog box, which provides access to the information like LOS Status, LOF Status, Loop Status and so on. The following figure is an example of this window:

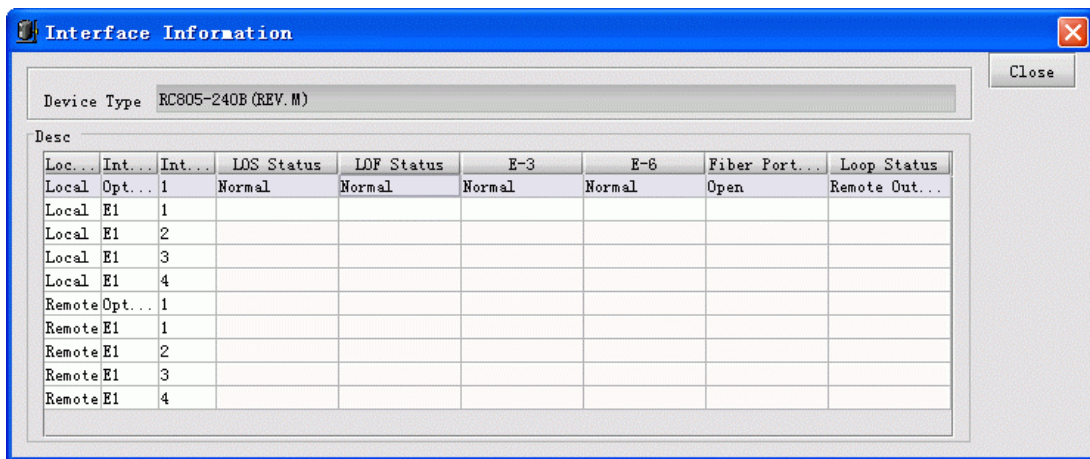


Figure 2-3 The Interface Information dialog box

**Note:** The **Interface Information** dialog box launched from the front panel only displays information of E1 lines within basic subsystems, the information of expansion cards would be displayed in the dialog box launched from subcards.

➤ **Configuration**

Select <Config> from the right click menu, a **Config Management** dialog box similar to the following will appear. From it, you can make configuration for the alarm and fiber port.

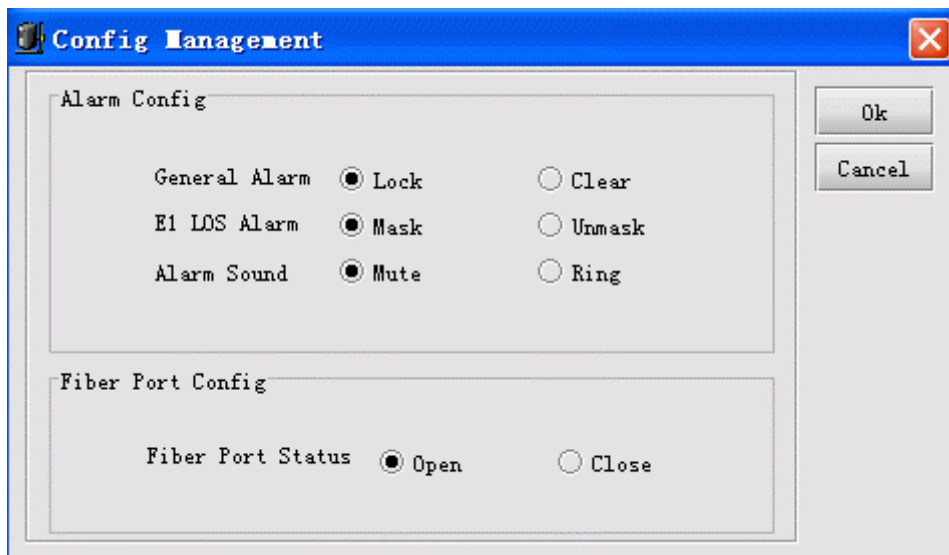


Figure 2-4 The Config Management interface

➤ **Loop Test**

Select [**Loop Test**] from the right click menu, you will see a **Config Management** dialog box popup. It enables you to make relevant configuration for loop test.

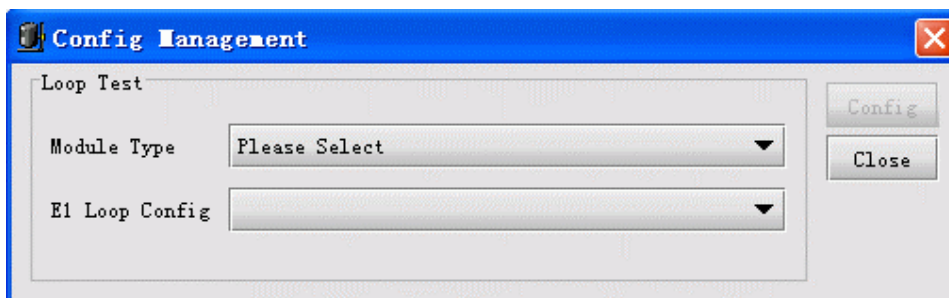


Figure 2-5 The Loop Test interface

To do so, you need:

Firstly, select the module type to be configured.

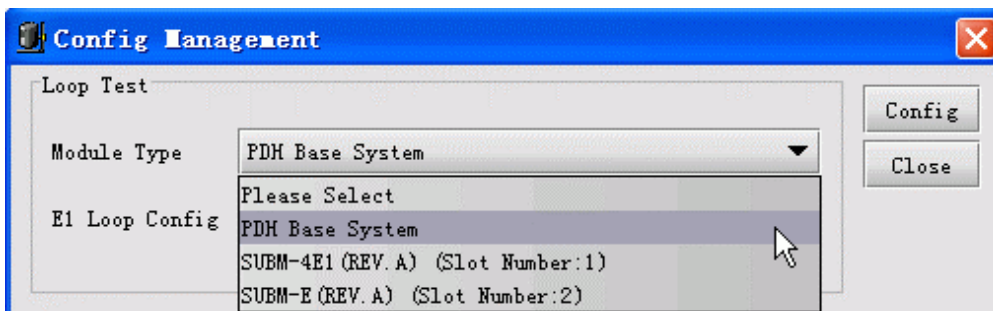


Figure 2-6 The Loop Test configuration procedure

**Note:** The <Config> button will be disabled if this item is not specified.

After you have selected the module type, its relevant E1 Line will appear in the **E1 Loop Config** drop down menu. In this way, the <Config> button is enable.

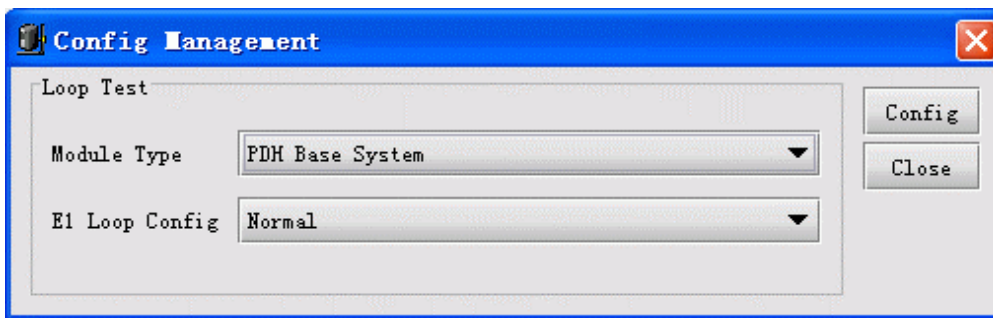


Figure 2-7 The Loop Test configuration procedure

Next, select a loop item for E1 line.

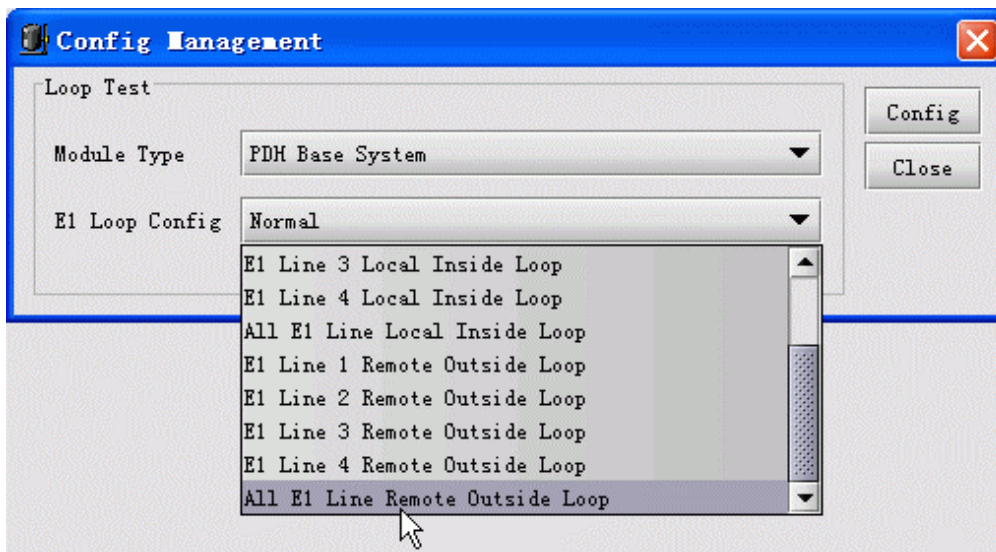


Figure 2-8 The Loop Test configuration procedure

Click <Config> to apply the configuration.

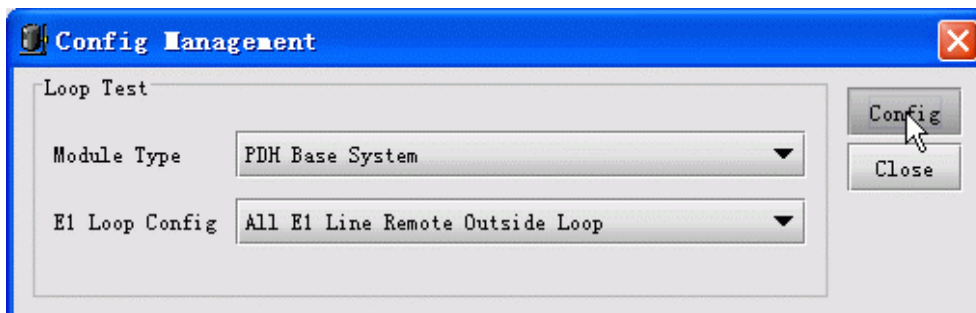


Figure 2-9 The Loop Test configuration procedure

At last, when you complete configuration, click <Close> to exit this dialog box.

**Note:** The **Loop Test** dialog box for RCMS Ethernet Multiplexer is differing from the preceding one, it can be used for configuring more than one line loop simultaneously. Here’s an example of this window:

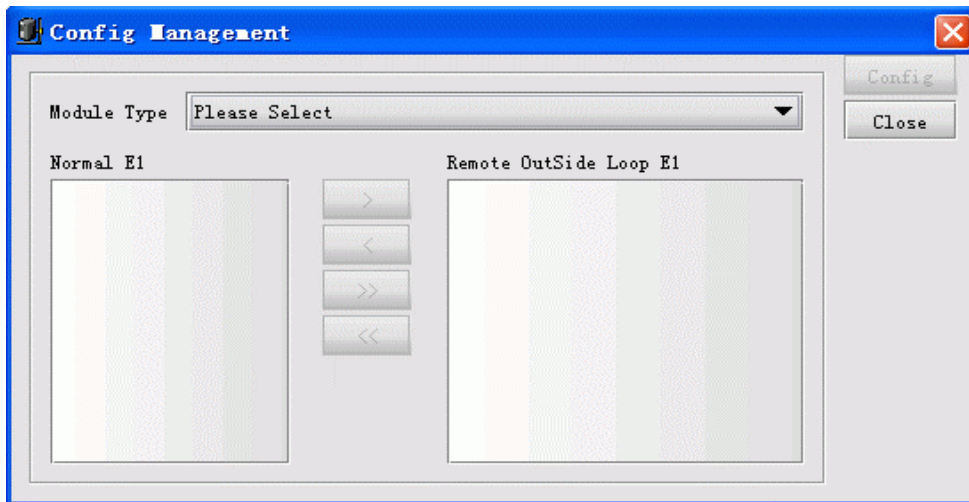


Figure 2-10 The Loop Test interface of RCMS-2000 Device

To perform loop test for RCMS-2000 device, do the following:

Firstly, select the module type to be configured.

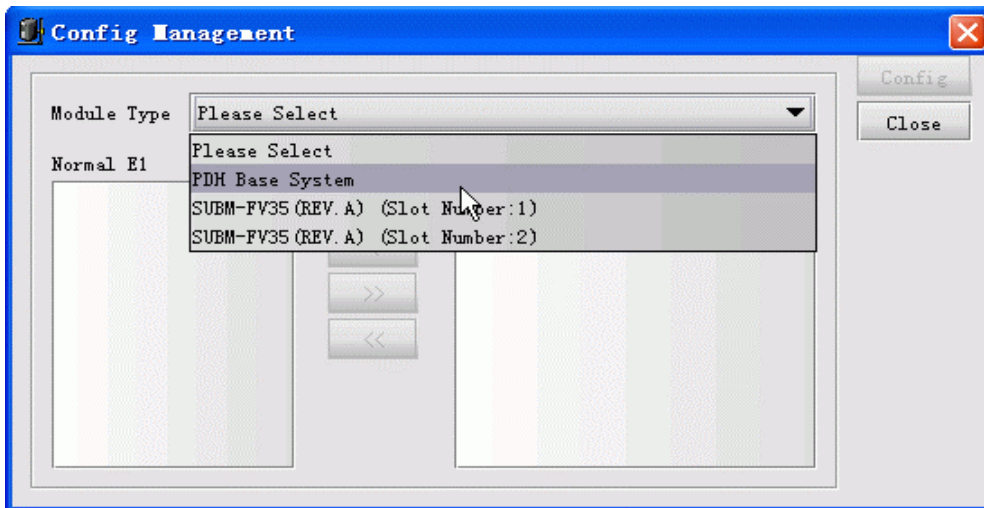


Figure 2-11 The Loop Test configuration procedure of RCMS-2000 Device

Secondly, select the lines to be configured in “Normal” and “Loop” status.

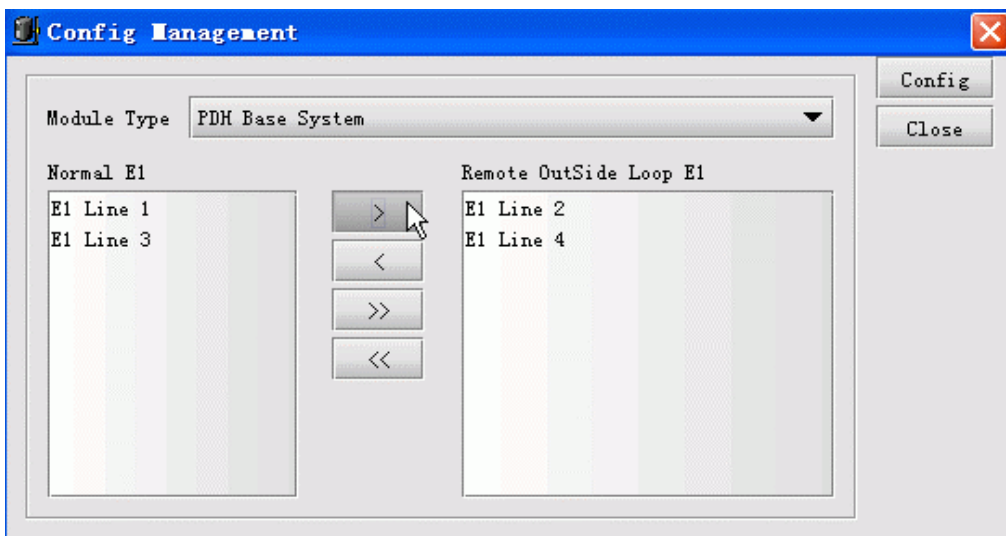


Figure 2-12 The Loop Test configuration procedure of RCMS-2000 Device

Table 2-1 The descriptions for each button available on the window

Item	Description
>	Move selected item(s) from left list to right list.
<	Move selected item(s) from right list to left list.
>>	Move all item(s) from left list to right list.
<<	Move all item(s) from right list to left list.

Thirdly, configure loop or normal settings for the E1 line.

At last, when you finish configuration, click the <Close> button to exit this dialog box.

#### ➤ Refresh

Select [**Refresh**] from the right click menu to perform refresh operation, the current device view will turn to latest status correspondingly. When Trap messages from the device cannot be received appropriately, this operation is useful for user to monitor that device real-timely.

#### ➤ Open Remote Device View

Select [**Remote Device**] from the right click menu to open the views for remote device. You will see a prompt message appear when this selected one is not connected.

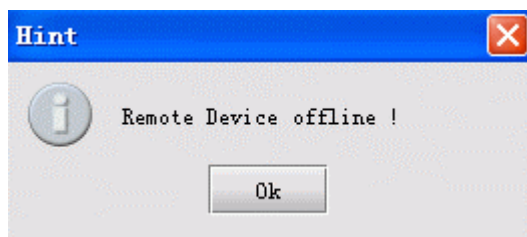


Figure 2-13 The Hint message

**i** Note: This function is only available in standalone PDH of REV.M version.

#### ➤ Save Configuration

Select [**Save Config**] from the right click menu to apply configuration for this device. When restart after power off, the device will resume to its previously saved configuration automatically. For example, when enable the “Alarm Sound Output” feature and perform “Save Config” operation, after you turn off and restart the device, the “Alarm Sound Output” item will be still in enable state.

#### ➤ Clear Configuration

This function is only available in standalone PDH of REV.M version.

Select [**Clear Config**] from the right click menu to perform clearance operation. Thus the device will not perform reconfiguration after restart, and will resume to settings preconfigured at factory automatically.



➤ **Refresh Chassis Temperature**

Double click the temperature icon presented on rear panel view, the temperature value of current device will update simultaneously, as the figure shows below:



Figure 2-14 Refreshing chassis temperature

**2.1.3 Subcard Management**

➤ **Subcard Model**

The device with expansion slot(s) currently supports 4 kinds of expansion cards, they are:

Table 2-2 Expansion Card Model Table

Serial Number	Model Number	Expansion Card Model	Description	Extended E1 Count
1	1	SUBM-4E1(REV.A) 4E1 Line Sub-module	Unintelligent Card	4
2	16	SUBM-E(REV.A) Ethernet Sub-module	Intelligent Card	1
3	20	SUBM-E(REV.B) Ethernet Sub-module	Intelligent Card	1
4	19	SUBM-FV35(REV.A) Frame, V35 Sub-module	Intelligent Card	1

The extended E1 Line number may be varying when plugging different expansion cards into expansion slots. The corresponding relationships between them are as follows:

Table 2-3 The Subcard Model Corresponding to Line Number of Expansion Card

Expansion Card Model	E1 Line Sequence (Slot 1)	E1 Line Sequence (Slot 2)
SUBM-4E1(REV.A) 4E1 Line Sub-module	5, 6, 7, 8	8, 7, 6, 5
SUBM-E(REV.A) Ethernet Sub-module	5	8
SUBM-E(REV.B) Ethernet Sub-module	5	8
SUBM-FV35(REV.A) Frame, V35 Sub-module	5	8

Table 2-4 The Views of Expansion Cards in Support





Expansion Card Model	View
SUBM-4E1(REV.A) 4E1 Line Sub-module	
SUBM-E(REV.A) Ethernet Sub-module	
SUBM-E(REV.B) Ethernet Sub-module	
SUBM-FV35(REV.A) Frame, V35 Sub-module	

Table 2-5 SUBM-E Indicator Table

Indicator	Description
LAL	Indicates alarm status at local side. It represents “or” relationship among LOF, CRC and AIS. When one of these has alarm generated, the LAL indicator turns to “Red”; when there’re no alarms generated among the three, it presents “Dark Red”.
RLP	Indicates loop status of remote module. When the module is looping toward remote side, this indicator turns to “Yellow”, otherwise it presents “Dark Yellow”.
RAL	Indicates alarm status of remote module. When the module working on remote device has any type of alarm generated, this indicator will turns to “Red”, when there’re no alarms generated, it presents “Dark Red”.
LNK	Indicates LINK state of Ethernet interface on local module. When LINK UP, this indicator presents “Green”; otherwise (LINK DOWN), it presents “Dark Green”.
FDX:	Indicates duplex state. When the duplex state of Ethernet interface on this module is configured as Full Duplex, this indicator presents “Green”, otherwise (Half Duplex), it presents “Dark Green”.

Table 2-6 SUBM-FV35 Indicator Table

Identification	Description
LAL	Its meaning and status are identical with those of LAL indicator on SUBM-E module.
RAL	Its meaning and status are identical with those of RAL indicator on SUBM-E module.

➤ **Subcard Operation**

Select a card and right click, you will get a menu displaying several items. From this menu, you can:

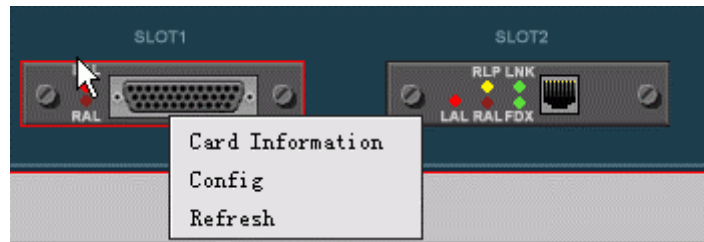


Figure 2-15 The right click menu available on the expansion card

1. View card information

Select [Card Information] item, the Card Information dialog box will popup for displaying related information:

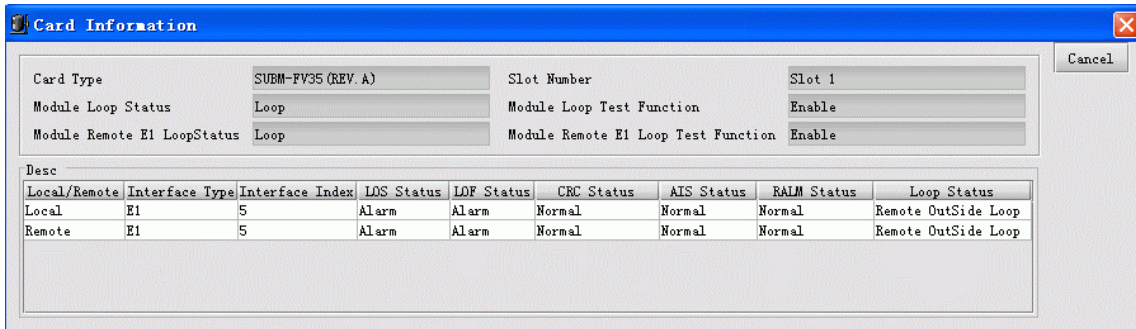


Figure 2-16 The Card Information dialog box

2. Configuration

Select [Config] item, the Config Management dialog box will be displayed as follow:

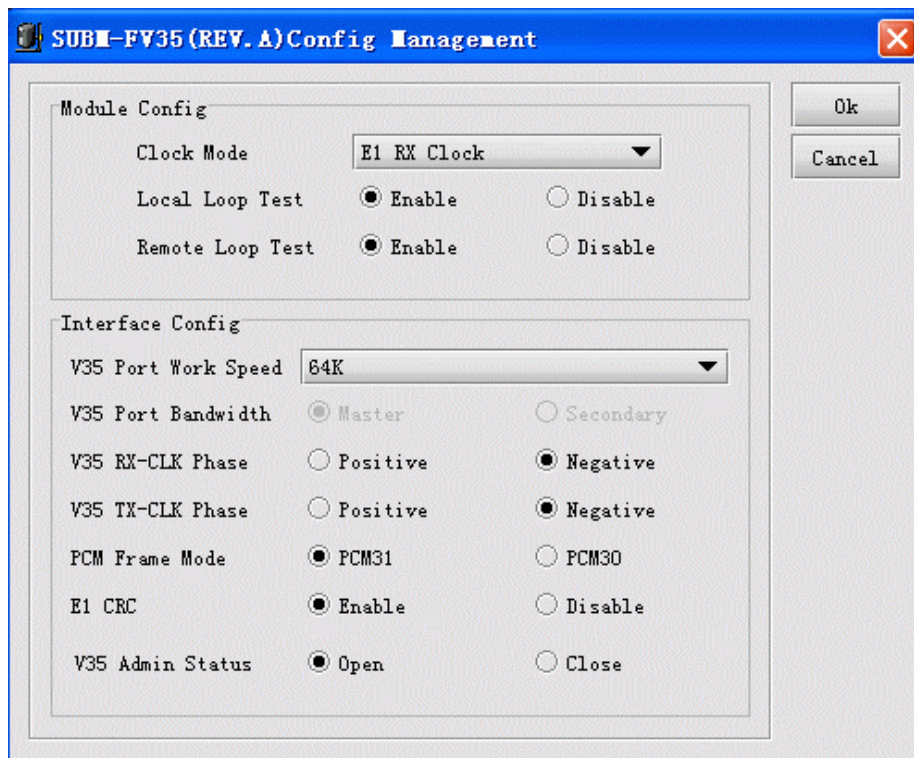


Figure 2-17 The Config Management dialog box for expansion subcard

3. Refresh

Select [Refresh] item, the card type and indicators on it will update simultaneously.

## 2.2 RC004-16 Modular PDH Management

### 2.2.1 Device View

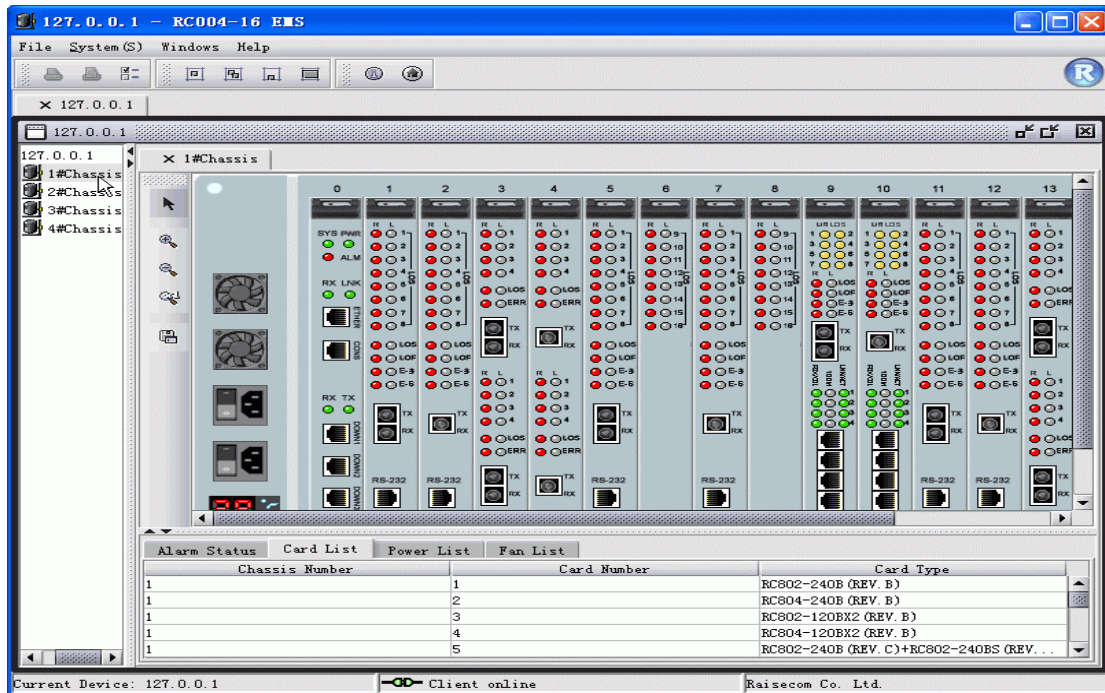


Figure 2-18 The Device View of RC004-16 device

Double click a node beneath the chassis tree on left to open the corresponding chassis view.

If some a chassis view has already been opened, when double clicking this node, the relevant tab will bulge for displaying the view.

### 2.2.2 Device Management

#### ➤ Operations On Master Network Card

The Master Network Card resides in the slot 0 of first chassis. Select it and right click, you'll see a menu popup:

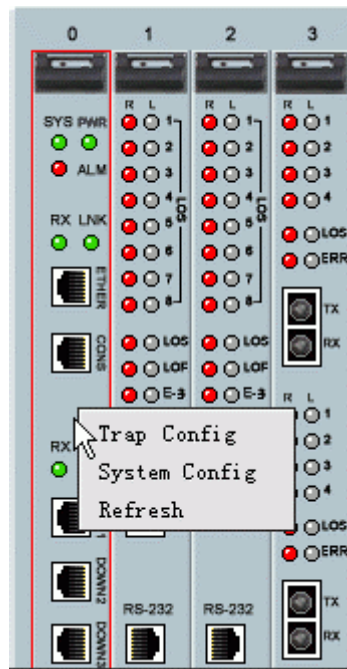


Figure 2-19 The right click menu available on the master control card

The [Trap Config] and [System Config] item are also available from the menu bar on top of the EMS window. See relevant description in this manual for details.

Select [Refresh] item to refresh the state of ALM indicator on master network card. The ALM indicator is used to identify if there're alarms generated on current chassis. If there are, the indicator will turn to "red", otherwise it will be in "gray". The alarm indicator will take effective only in case you configure the "Chassis Alarm" item to be enabled in "System Config".

➤ **Operations On PDH Module**

The following section describes operations on modular PDH by taking RC804-120B\*2(REV.M) as example. The panel of RC804-120B\*2(REV.M) comprises two parts, the Up PDH and Down PDH.

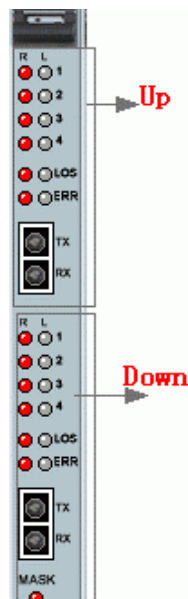


Figure 2-20 The demonstration of PDH module

Select a card from the slots labeled from 1 to 15 on RC004-16 chassis, you'll see a menu shown in

below appear:

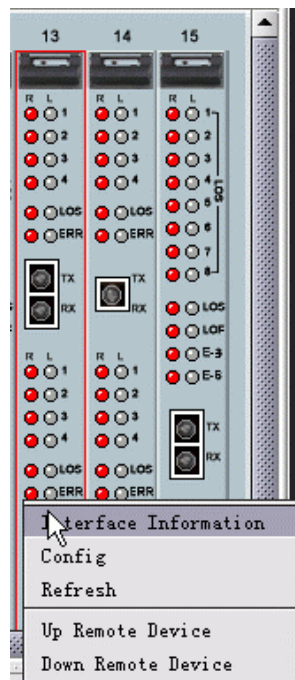


Figure 2-21 The right click menu available on the PDH module

**1. Interface Information**

Select [**Interface Information**] from the right click menu to launch the **Show Interface Information** dialog box.

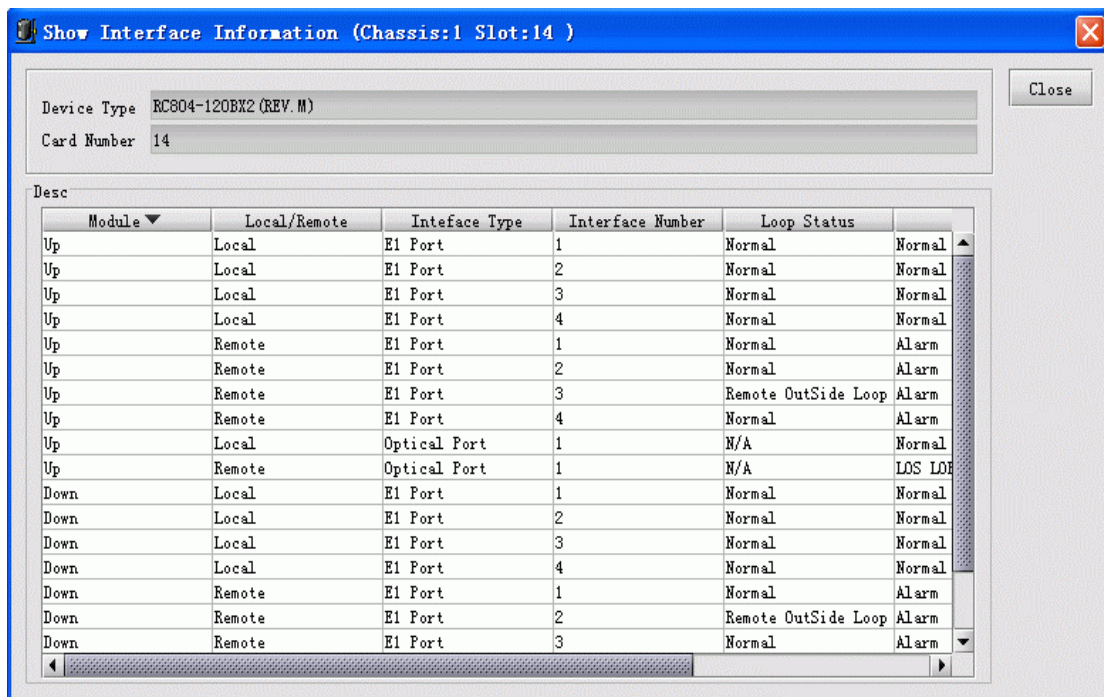


Figure 2-22 The Show Interface Information dialog box

Where the **Desc** table at lower section of this window displays a list of information for selected card, including Module (Up or Down), Local/Remote, Interface Type (E1 port or Optical Port), Loop Status, Alarm Status and so forth.

## 2. Configuration

Select [**Config**] from the right click menu to launch the dialog box show in below.

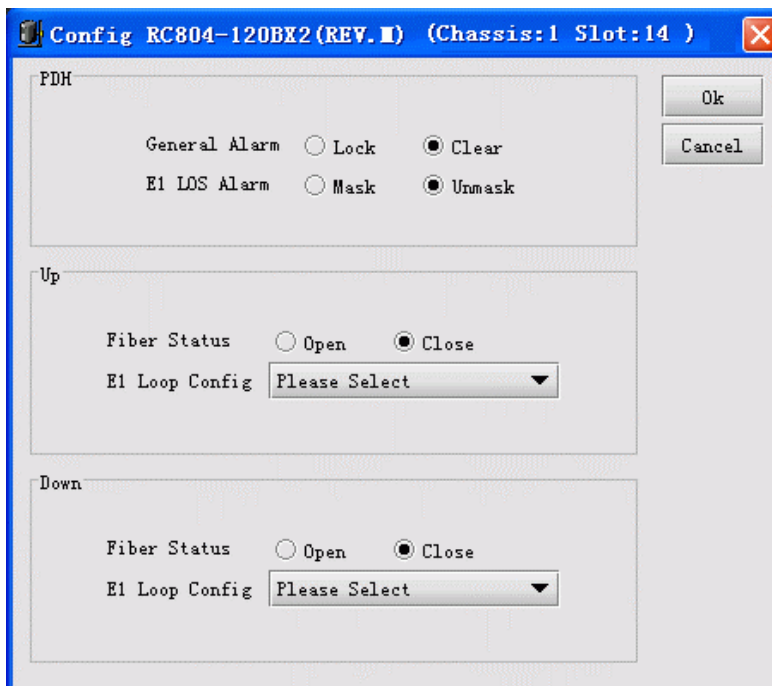


Figure 2-23 The Config interface

## 3. Refresh

Select [**Refresh**] from the right click menu to perform refresh operation, the current view will turn to latest status correspondingly. When Trap messages from that card could not be received appropriately, this operation is useful for user to observe alarm indicator real-timely.

## 4. Up Remote PDH Device

Select [**Up Remote Device**] from the right click menu to open the view for remote 1U device(s) linked to optical port of up remote PDH module.

## 5. Down Remote PDH Device

Select [**Down Remote Device**] from the right click menu to open the view for remote 1U device(s) linked to optical port of down remote PDH module.

## 2.3 PCM Comprehensive Multiplexer Management

### 2.3.1 Device View

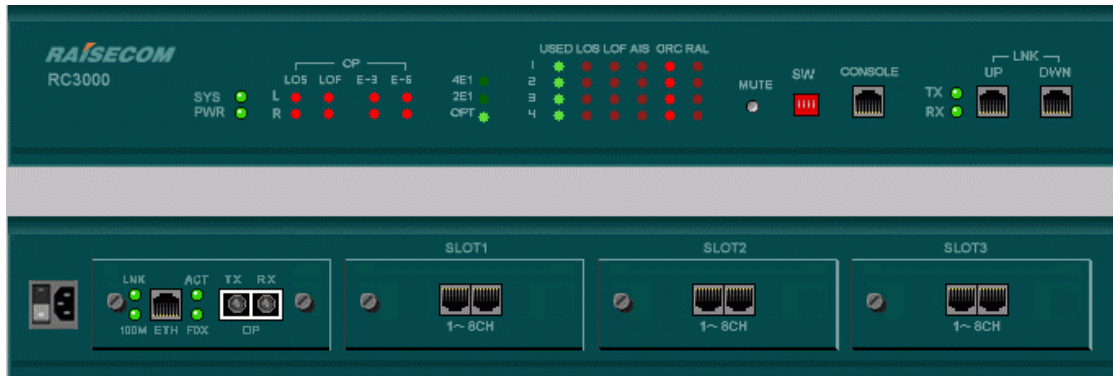


Figure 2-24 The view of PCM Comprehensive Multiplexer

### 2.3.2 Device Management

Right click on front panel or rear panel of the device, you will see a menu shown in figure 2-25 appear. Select one of the items to perform relevant operation.

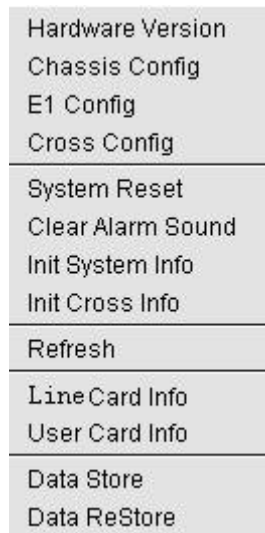


Figure 2-25 The right click menu launched from the front or rear panel

#### ➤ Hardware Version

The operation interface launched by the [Hardware Version] item is similar to the following figure:



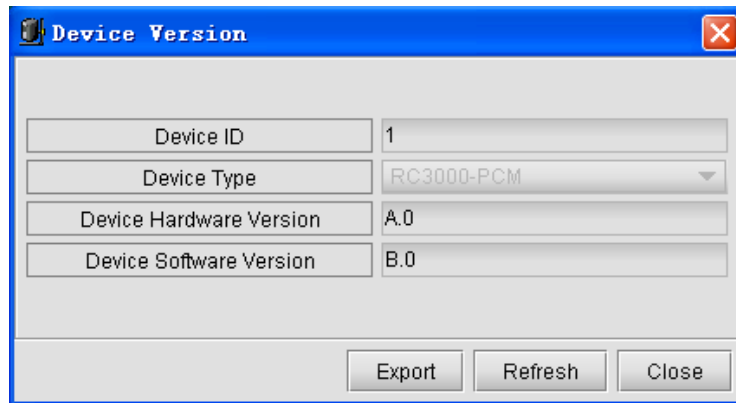


Figure 2-26 The Device Version dialog box

Table 2-7 Description of information available on this interface

Object	Description
Device ID	The device’s serial number, with a value between 1-40
Device Type	The type identification of managed device
Hardware Version	The hardware version of this device
Software Version	The application version of the Single Chip Micyoco

➤ **Chassis Configuration**

The operation interface launched by the [**Chassis Config**] item is similar to the following figure:

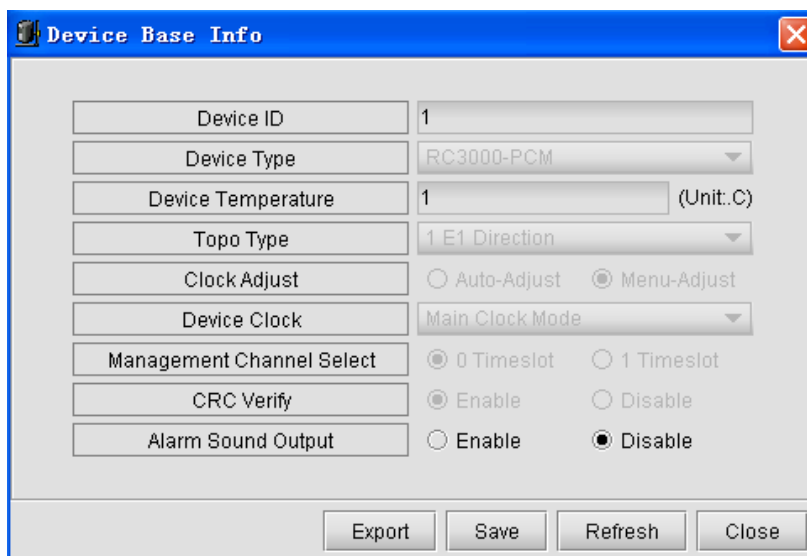


Figure 2-27 The chassis configuration interface

➤ **E1 Line Configuration**

The E1 line configuration feature is used to view and configure information of E1 line, including E1 port useable, frame mode, and controls on various alarm outputs. It enables you to configure one or more lines at one time.

To perform configuration, do the following:

Firstly, select [**E1 Config**] from the right click menu available on device panel, you will see a window similar to the following popup.

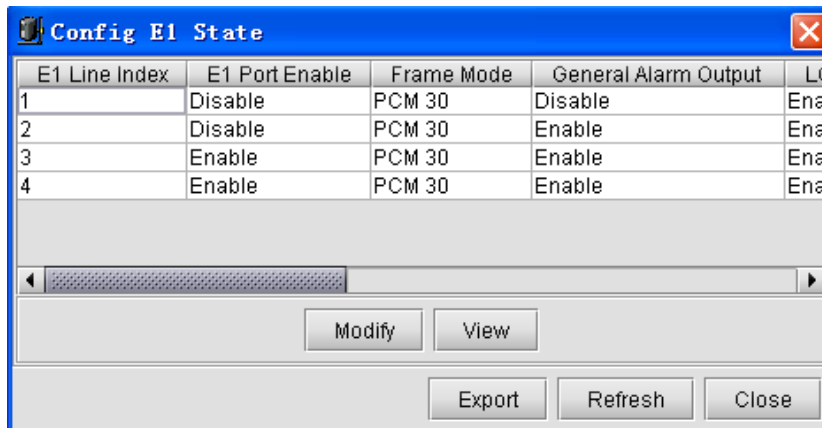


Figure 2-28 The E1 Line configuration interface

Next, select a row of information to be modified, and click the <Modify> button to enter the Modify dialog box.

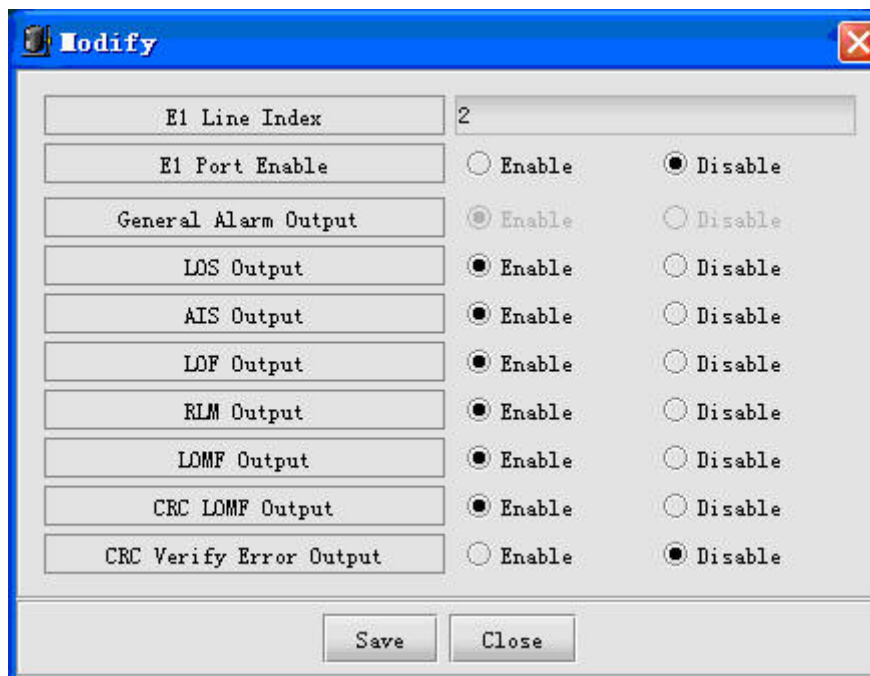


Figure 2-29 The E1 information configuration interface

When select more than one line for modification, the window will be like this:

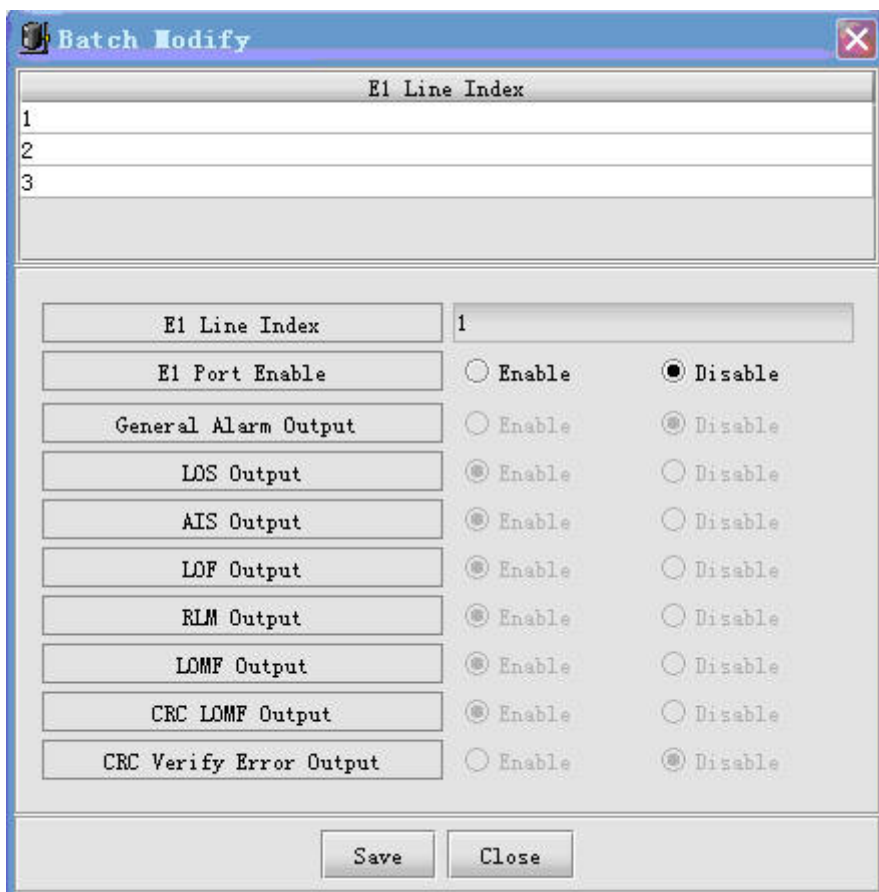


Figure 2-30 The Batch Modify dialog box

- Note:**
1. The number of E1 line is determined by the type of Line Interface Card.
  2. The cross information and alarm outputs of the E1 line can be configurable only when the line is enabled.
  3. Alarm Output Control is the master switch of E1 alarm outputs. Only when this function is enabled that the remainder of outputs could take effective.

Finally, after you finish configuration, click the <Save> button to apply the modification, or click <Close> button to quit without any change.

#### ➤ Cross Configuration

Click <Cross Config> from the right click menu, you will see a dialog box similar to the following appear:

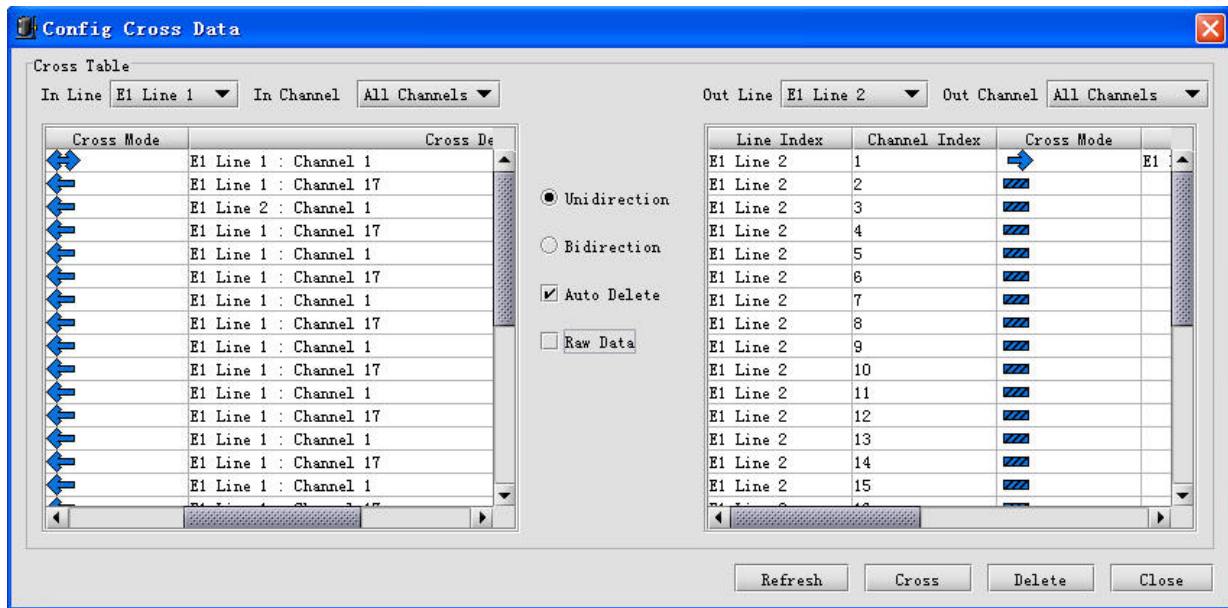


Figure 2-31 The Cross Configuration dialog box

➤ **Description of Cross Configuration interface**

As the figure shows above, the **Cross Configuration** dialog box consists of two tables, the **In Line Cross** table and **Out Line Cross** table. They are respectively located on left side and right side of this window. Where the **In Line Cross** table is intended to indicate if there is incoming cross data, and which channel of line they're sourcing from, while the **Out Line Cross** table presents the same information for outgoing cross data.

The previous window contains a column named “**Cross Mode**”, whose detailed implication are listed in the following table:

Table 2-8 The Implication of Cross Mode Icon

Icon	Implication
	The channel has incoming cross data delivered.
	The channel has outgoing cross data delivered.
	The channel has bi-directional cross data delivered, i.e. it has both incoming cross data and outgoing cross data.
	The channel has no cross data delivered on it.

Not all types of line are crossable at present. The following table gives out crossable lines in support by current version:

Table 2-9 The Cross Line Type

Serial Number	Incoming Line	Outgoing Line	Crossable
1	E1 Line	E1 Line	Yes
2	E1 Line	User Line	Yes
3	User Line	E1 Line	Yes

4	User Line	User Line	No
---	-----------	-----------	----

Plus, the Cross table contains a column of “**Cross State**”, which is used to identify the context of cross data. In **In Line Cross** table, it represents the source of existing cross data within specific channel, i.e. which channel belonging to which line it comes from; while in **Out Line Cross** table, it presents where the existing cross data transfer to, i.e. transfer these data to which channel within which line.

For description on each control of **Cross Configuration** interface, refer to the following table:

Table 2-10 The Controls available on Cross Configuration dialog box

Object	Description
Unidirection	When this item is selected, the system will do incoming cross configuration for selected incoming line.
Bidirection	When this item is selected, the system will do incoming cross configuration for both incoming channels and outgoing channels. It servers as bi-directional configuration.
Auto Delete	When this item is selected, for instance, to configure bi-directional cross for Channel A and Channel B, if the Channal A already has cross data outgoing to Channel C, the system will automatically delete these outgoing cross data (A->C), and establish bi-directional cross between Cannel A and B (A<->B); Otherwise, besides establishing bi-directional cross (A<->B), the previous outgoing cross (A->C) will not be deleted.
Raw Data	When this item is selected, the data in cross table will be displayed as original data, and the type of line and chanel will not be displayed.
Refresh	Obtain latest data from device and update the Incoming and Outgoing Cross tables.
Cross	This button is used to initiate cross configuration for channels of selected lines.
Delete	Remove the existing cross data.
Close	Clicking this button will exit the configuration interface.

**Note:** Your system only allows one incoming cross data staying in each channel of line. When configure incoming cross or bi-directional cross for a channel with existence of incoming cross, the system will delete previous incoming cross data, and replace it with new one.

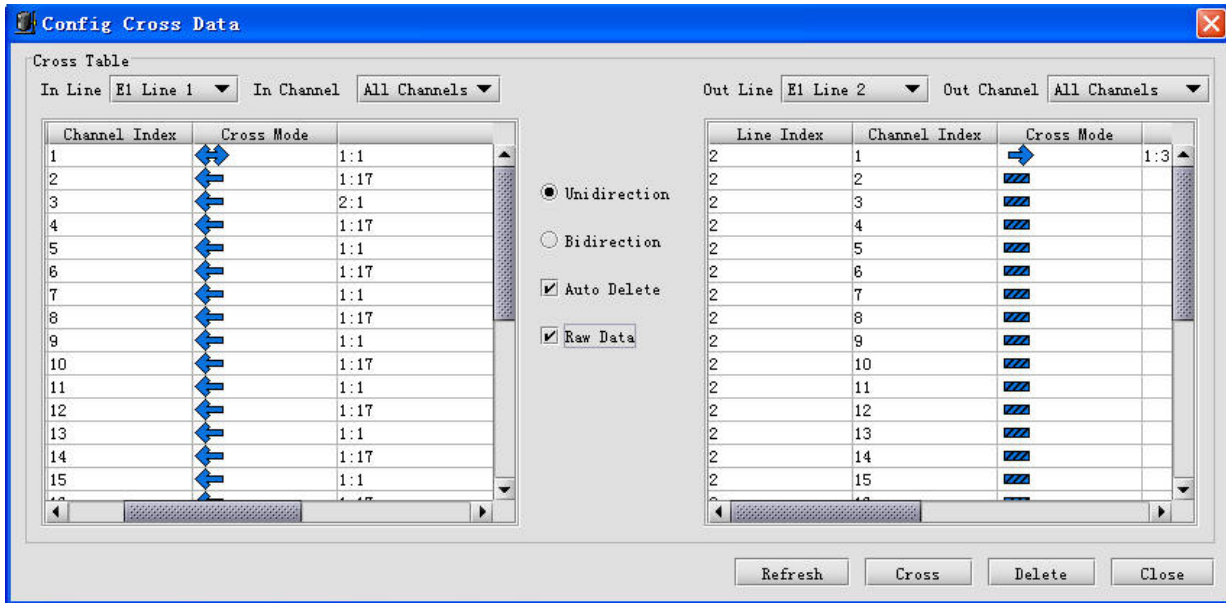


Figure 2-32 The appearance of Cross Configuration interface when Raw Data option is selected

**Note:** In the “Cross State” column of preceding figure, the line number from 1-4 presents E1 line, and the scope of 5-8 presents user line.

### ➤ Cross Operation

Select successive rows with equivalent amount in both In Line and Out Line Cross tables. Then select <Unidirection> or <Bidirection> option, as well as the <Auto Delete> option as applicable. After you complete selection, click the <Cross> button.

**Note:** 1. If the rows you selected from both Incoming and Outgoing Line Cross tables are not successive, the cross configuration could not be performed.

2. If the amount of selected rows in both tables are not consistent, the cross configuration could not be performed as well.

3. In case of no rows selected in the Incoming and Outgoing Line Cross tables, or rows in the two are all selected, the system will perform cross configuration for current lines in both tables by crossing the corresponding channels from top to bottom.

### ➤ Delete Operation

Select the row(s) to be deleted from the In Line Cross table and click the <Delete> button. At this time, the system will give a **Confirm** dialog box for your confirmation. Click <Yes> to perform deletion operation.

**Note:** Select row(s) in the Incoming Line Cross table, thus you can delete the intended rows.

Selecting in the Outgoing Line Cross table will take no effectiveness.

➤ **System Reset**

Select <System Reset> to restart the device after then.

➤ **Clear Alarm Sound**

When the device encountered alarms and its “Alarm Sound Output” feature is enabled, performing <Clear Alarm Sound> operation will stop the playing alarm sound.

➤ **System Information Initialization**

Select <Init System Info>, all the settings of your system will resume to the settings preconfigured at factory.

➤ **Cross Connect Information Initialization**

Select <Init Cross Info>, all the cross data will resume to the settings preconfigured at factory.

➤ **Line Card Property**

The line card is fixed in the first slot of rear panel. Executing the [Line Card Property] command will trigger the property interface of line card.

The operation of accessing and configuring properties of line card can not only be initiated from right click menu available on front and rear panels, but also available from the right click menu on line card.

➤ **User Card Property**

The user card, hotswappable, is populated from Slot 2-4 on rear panel of the device. Executing [User Card Property] command will launch the property interface of user card, which is shown as follows:

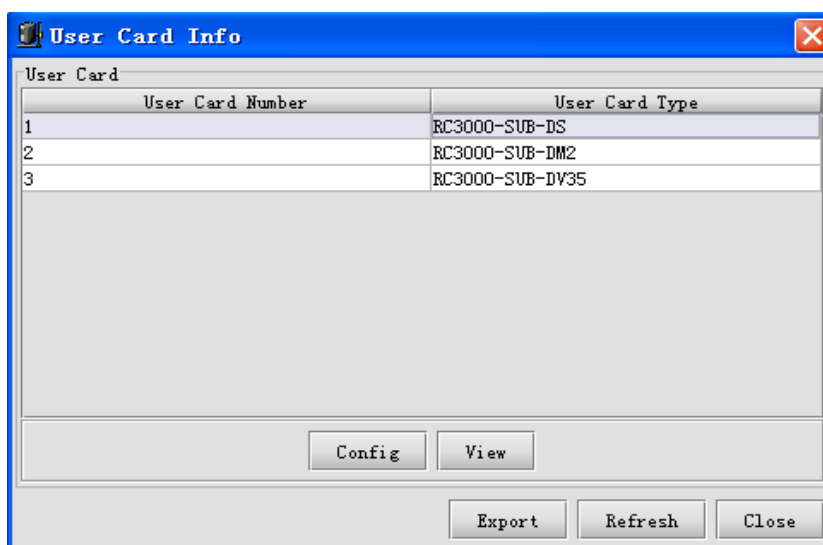


Figure 2-33 The User Card Property interface




**Note:** Your system allows you to perform configuration through one of the following ways:

- Select a row in the previous window, and click the <Config> button;
- Select a row in the previous window and right click;
- Double click a row to launch the configuration dialog box.

### 2.3.3 Subcard Management



The PCM Comprehensive Multiplexer embraces two types of subcard, the line card and user card. In general, a device is equipped with only one line card, which is fixed, along with three slots for accommodating user cards, which are hotswappable. The following table gives out the types of line card and user card that are in support by current version.

Table 2-11 The Line Card Type


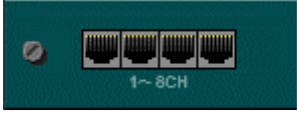

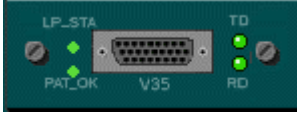
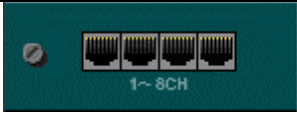

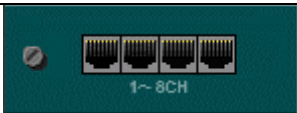
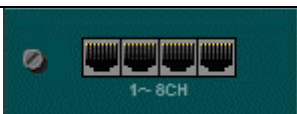

Serial Number	Line Card Type	Illustration	Type Identification	Description
1	4E1 Line Card		RC3000-SB-U4E1	Support for 4 E1 line
2	2E1 Line Card		RC3000-SB-U2E1	Support for 2 E1 line
3	8M Optical Line Card		RC3000-SB-UOPT	Support for 4 E1 line

**Note:** The 2E1 Line Card is categorized into two types, with one supporting for Add-Drop Mode (ADM), while the other not.

Table 2-22 The User Card Type

Serial Number	User Card Type	Illustration	Identification
1	8-Channel FXS User Card		RC3000-SUB-DS
2	8-Channel FXO User Card		RC3000-SUB-DO



3	8-Channel FXS&FXO Mixed User Card		RC3000-SUB-DSO
4	8-Channel E&M User Card		RC3000-SUB-DM2
5	4-Channel E&M User Card		RC3000-SUB-DM4
6	Single-Channel V35 User Card		RC3000-SUB-DV35
7	Single-Channel V24 User Card		RC3000-SUB-DV24
8	10MBase-T Ethernet User Card		RC3000-SUB-DETH
9	RS232 Asynchronized Communication User Card		RC3000-SUB-D232
10	RS422 Asynchronized Communication User Card		RC3000-SUB-D422
11	Magnet Telephone Card		RC3000-SUB-DMT

Select a sub-card and right click to perform operation through the popup menu. See relevant section for details.

## Chapter 3 Operating And Maintenance

This chapter introduces the related knowledge of device's operating and maintenance, and consists of the following sections:

- ◇ RC004-16 element management
- ◇ PC COM port management
- ◇ Device browser tree management

### 3.1 RC004-16 Element Management

The main view of RC004-16 EMS looks like the following figure.

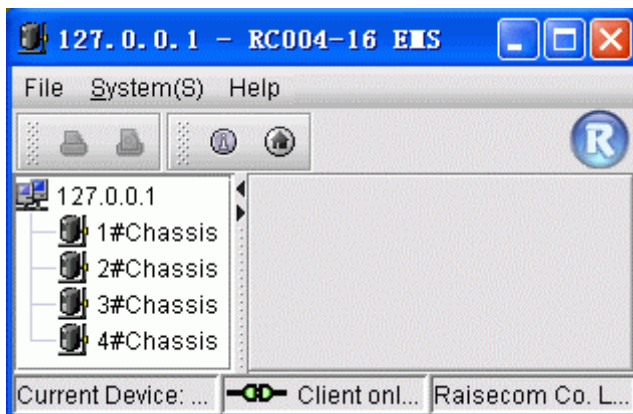


Figure 3-1 The main view of EMS

The RC004-16 EMS “System” menu contains the following sub menus:

- ✧ Trap Config
- ✧ Sytem Config
- ✧ E1 Line Detail
- ✧ Name Remote Device
- ✧ System Command

### 3.1.1 Trap Receipt Configuration

Select [System] in menu bar on top of the EMS window, and select the [Trap Config] item, a configuration dialog box similar to following will popup.

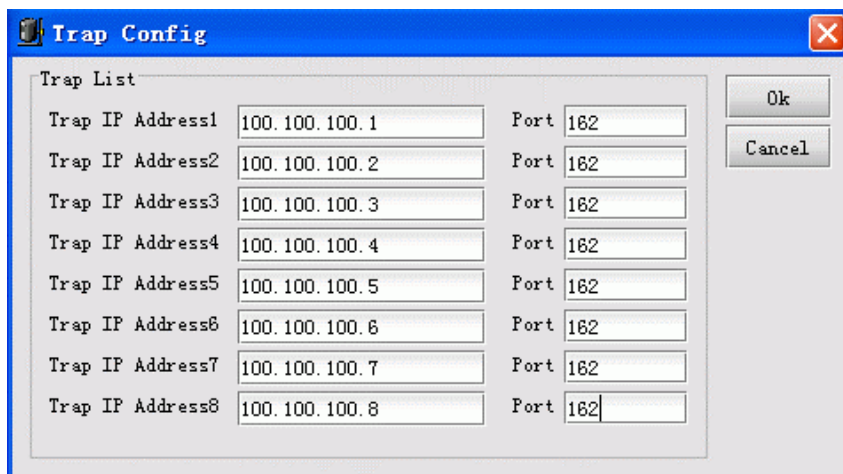


Figure 3-2 The Trap Config dialog box

From this interface, you can view and modify target address and port number configured for device proxy software when sending alarm notification. Generally, the port number is set to 162. You have to set the IP address of the host where network management software runs as Trap IP Address at least, otherwise the network management software could not receive alarms from devices managed by the proxy software appropriately. The system now allows configuring up to 8 alarm receipt targets.

The information available on this interface are as follows:

Object	Description
--------	-------------

Trap IP Address	The target address to which alarms within current proxy send.
Port	The port number of alarm target within current proxy.

After you finish modification, click the <OK> button to accept these changes, or click <Cancel> to exit without any modification.

### 3.1.2 System Information Configuration

Select [System] in menu bar on top of the EMS window, and select [System Config] item, a configuration dialog box will popup.

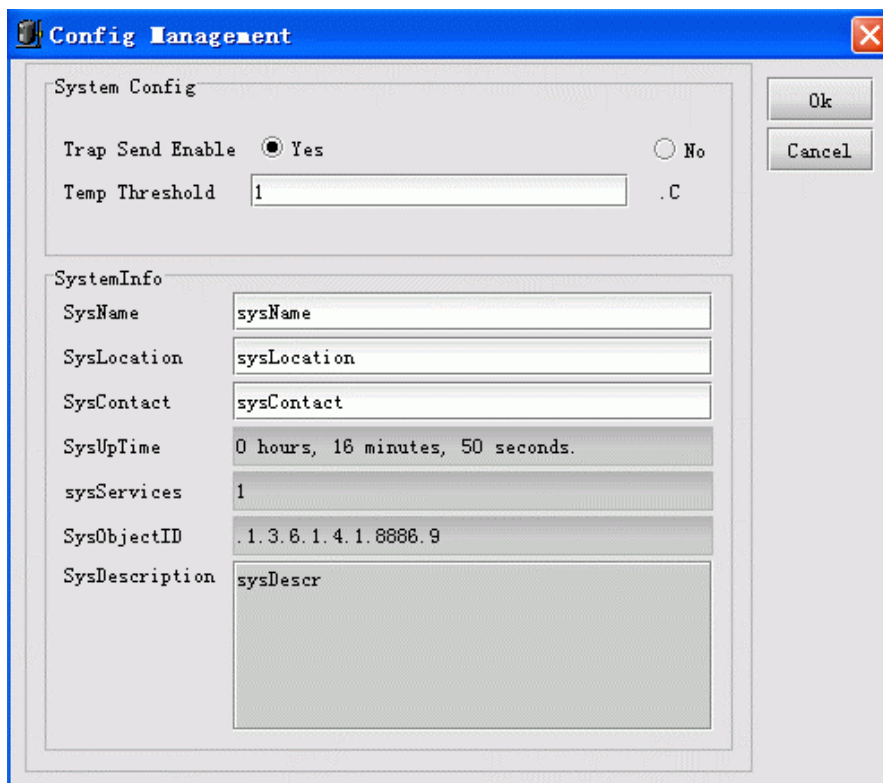


Figure 3-3 The Config Management dialog box

The operation buttons available on this interface are as follows:

Object	Description
OK	Click this button to accept modification and close this window.
Cancel	Click this button to cancel operations and close this window.

### 3.1.3 E1 Line Information

This function deals with information of E1 Line at local or remote side that user has configured, including user information, line state and so forth in concerns.

To configure the line information, do the following:

Select [System] menu in menu bar on top of the EMS window, and select [E1 Line Detail] item, a configuration dialog box similar to the following will popup.

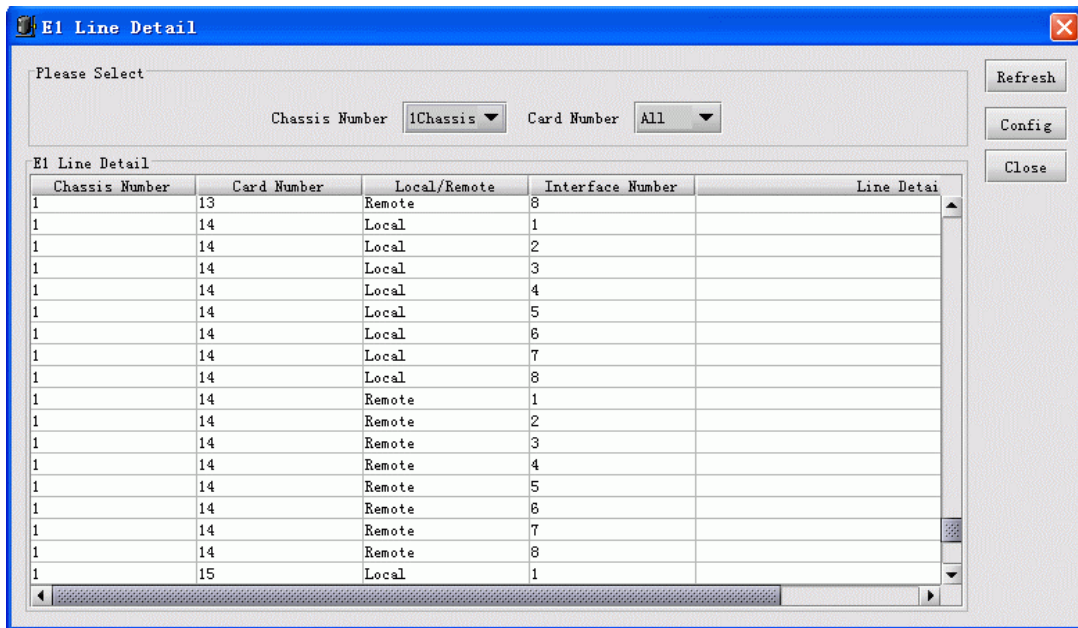


Figure 3-4 The E1 Line Detail dialog box

In this interface, select chassis number and card number.

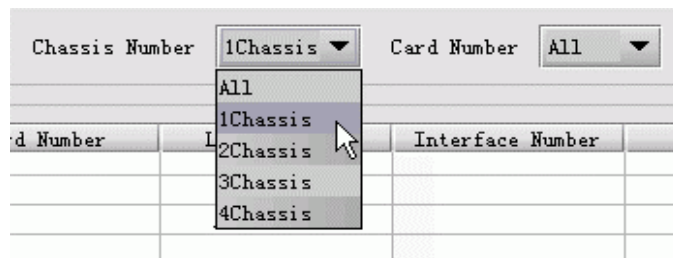


Figure 3-5 The operations on E1 Line Detail interface

Then, select the local/remote E1 line to be configured, which can be accessible by clicking the <Config> button on right.

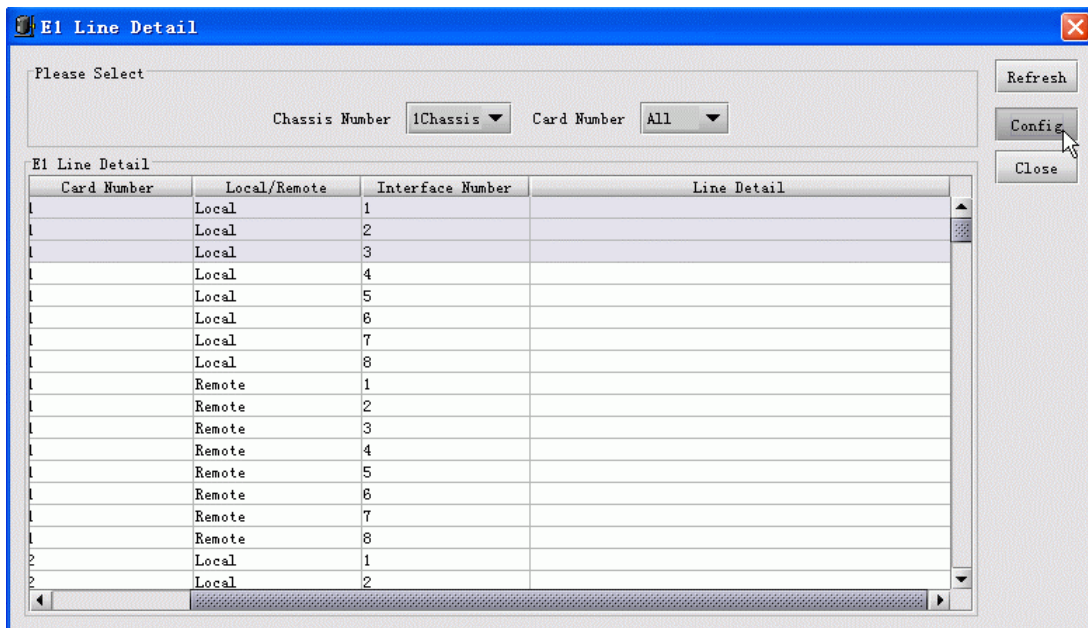


Figure 3-6 The E1 Line Detail dialog box

Afterwards, move your cursor into the text box for inputting information on popup box, the system will give a prompt message providing you with information of E1 Lines needed to be configured.

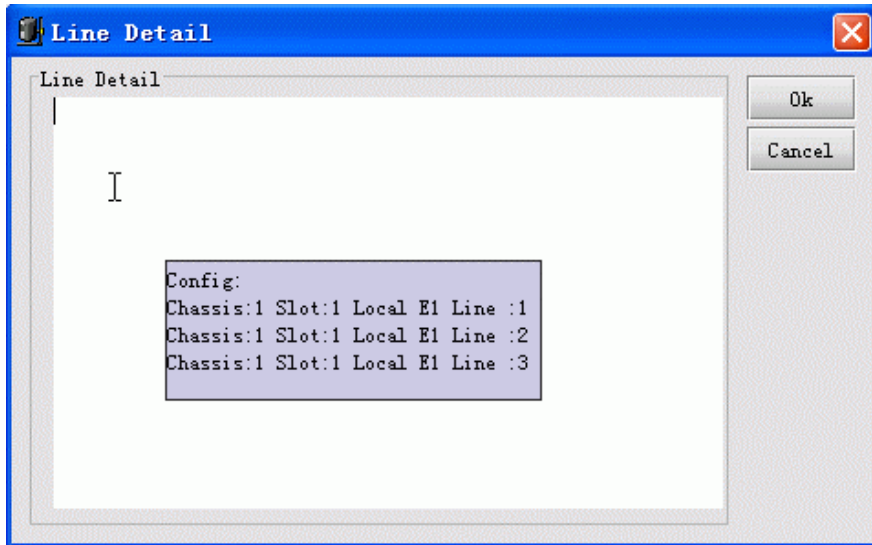


Figure 3-7 The Line Detail dialog box

Input appropriate information in this box. For example, the words of “E1 Line” we entered.

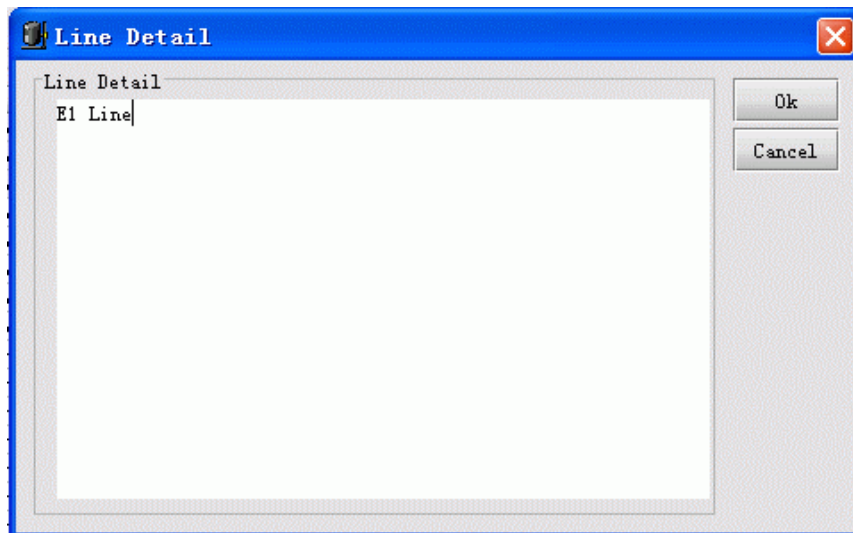


Figure 3-8 The Line Detail dialog box

After then, click the <OK> button to save the information into database.

When complete successfully, a Hint message will appear informing you with this success.

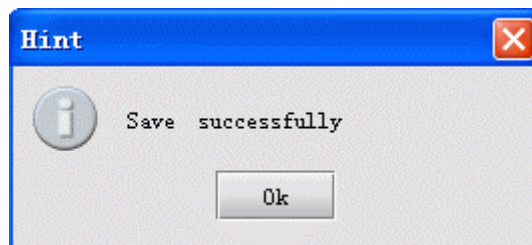


Figure 3-9 The Prompt Message

At last, click the <OK> button on this prompt, the information table will be refreshed.

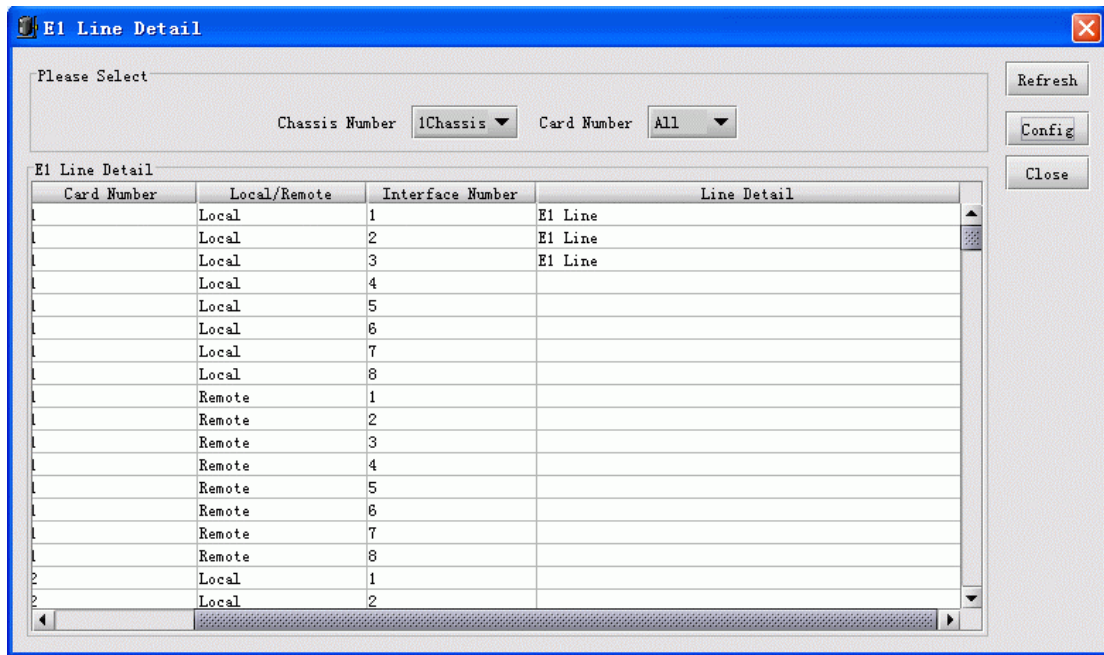


Figure 3-10 The E1 Line Detail dialog box

### 3.1.4 Name Remote Device

➤ **Function description**

It provides the capability to name managed remote device. While the device has alarm generated, its name will be shown in the “Host Name” field of alarm message, thus you can differentiate the alarm of remote device from that of local device.

➤ **Interface description**

Select [**System**\Name Remote Device], you will see a dialog box popup for configuring.

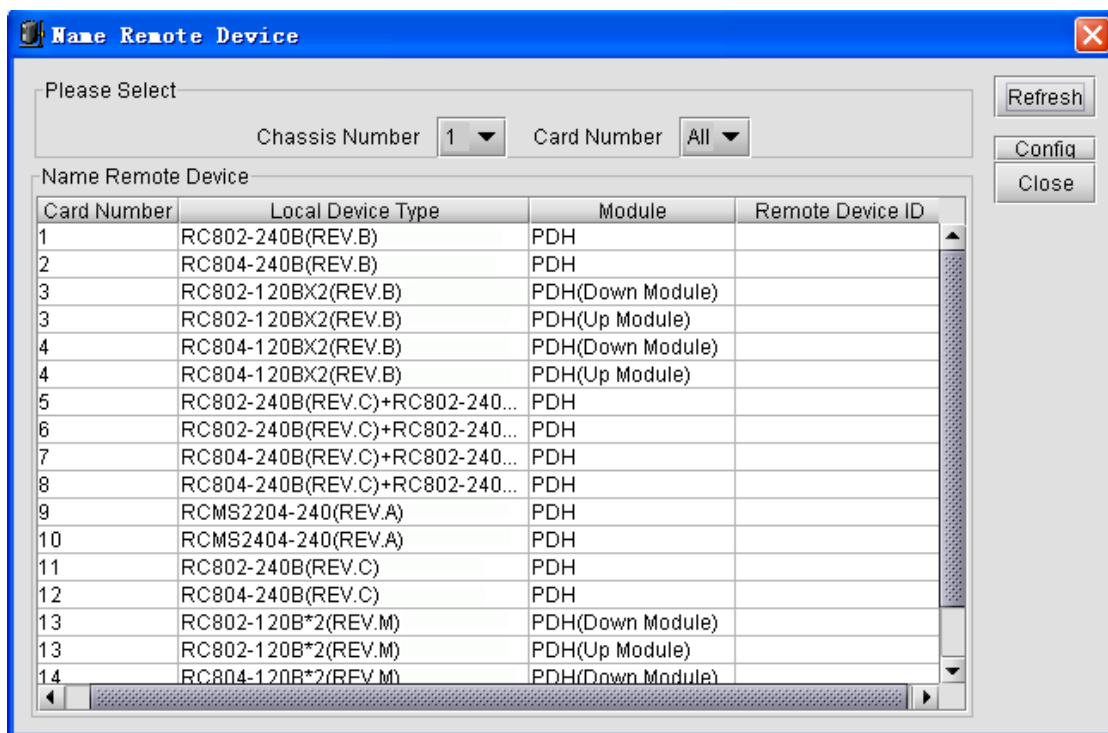


Figure 3-11 Name Remote Device

Click <Refresh> button to synchronize the device information. After then, the device information would be synchronized to database, meanwhile, the data presented in table on interface would be updated also.

Select one or more rows, and click <Config> button to launch the dialog box for modifying identification of remote device.

Click <Close> button, you will exit the configuration interface.

The operation on this interface is similar to that of line information, see section 3.1.3 for reference.

### 3.1.5 System Command

The “System Command” menu contains the following sub menus: Save Config, Delete Config, and Restart.

#### ➤ Function description

**Save Configuration Files:** Supports for storing the system configuration, device configuration and other information into Flash chip. Once restart the Agent, these information would be automatically loaded by Agent.

**Erase Configuration Files** Execute this command will remove the profiles stored in Flash, and when you restart the Agent after deletion, all the information would be resumed to configuration at factory.

**Reboot:** Execute this command will restart the Agent.

### ➤ Operation description

Select any item from the [System Command] menu, the system will give a prompt for confirming this operation. Click <Yes> button to execute the command, then a progress bar indicating this command is being executed on the Agent side will popup after your successful initiation.

**Note:** Do not pull or plug the card, cold start the device during this period, or this may lead to the failure of execution.

### 3.1.6 Data List

The data list is located beneath the device view. Four lists are provided for managing RC004-16 element currently, these are: alarm list, card list, power list, and fan list.

#### ➤ Alarm List

The alarm list presents you the newly generated yet haven't been acknowledged or cleared alarms. Here's an example of this list:

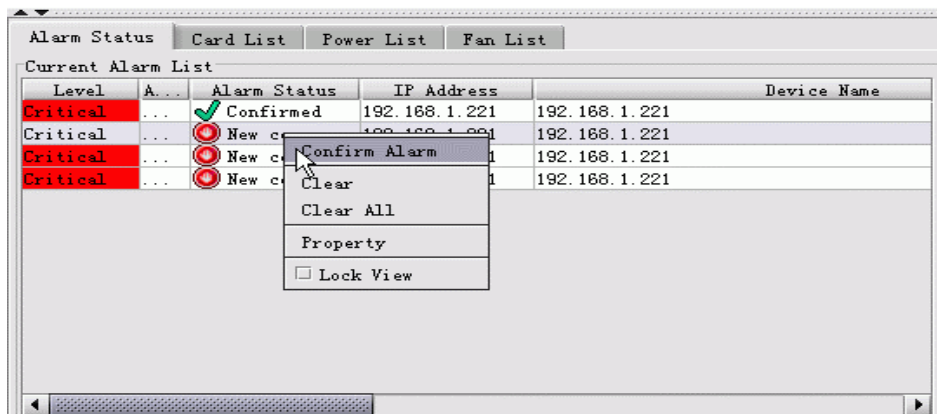


Figure 3-12 The Alarm List

#### ➤ Card List

The card list displays all the modules plugged in current device. Provision of information include the chassis and slot number where the module resides and so on. When click a module on device view, the corresponding row in card list would be highlighted.



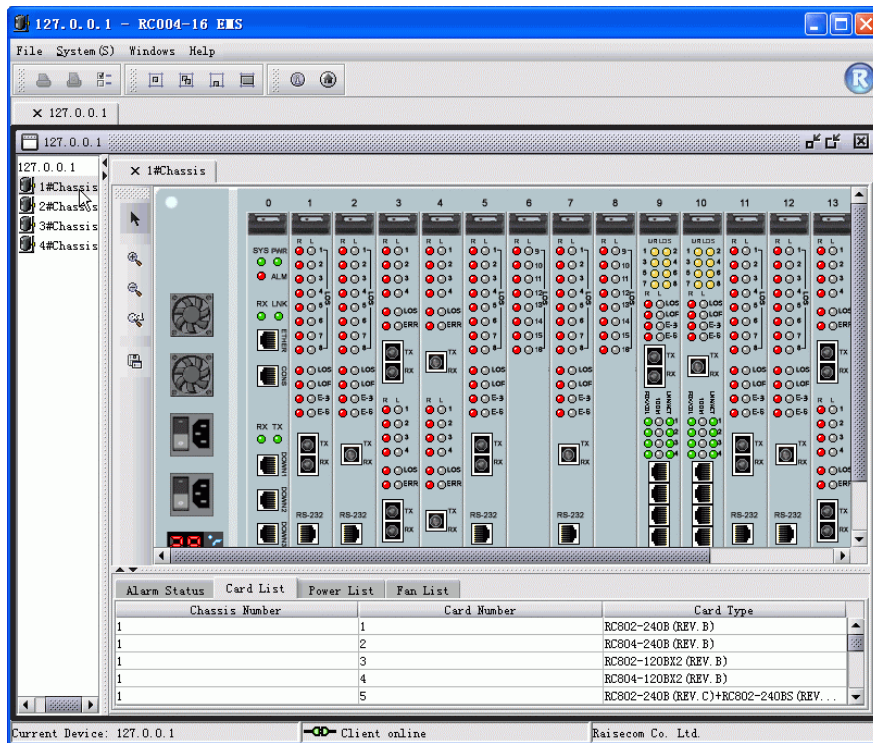


Figure 3-13 The Card List

➤ Power List

The power list displays the powers populated on current device. Provision of information include the chassis number where the power resides, power status (alarm, normal) and so on. When click a power on device view, the corresponding row in power list would be highlighted.

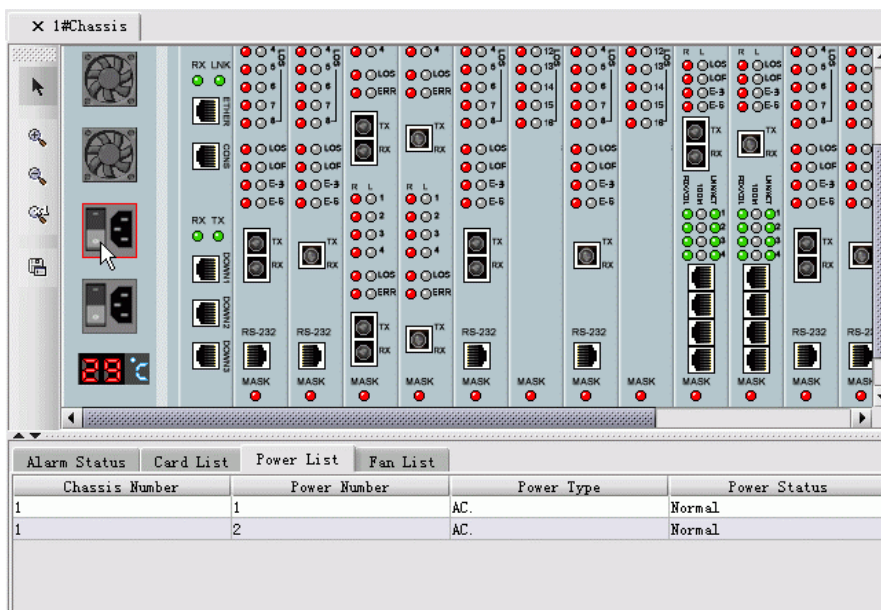


Figure 3-14 The Power List

➤ Fan List

The fan list offers the information of fans accommodated in the device, including the chassis number where the fan resides, fan status (alarm, normal) and so on. When click a fan on device view, the

corresponding row in fan list would be highlighted.

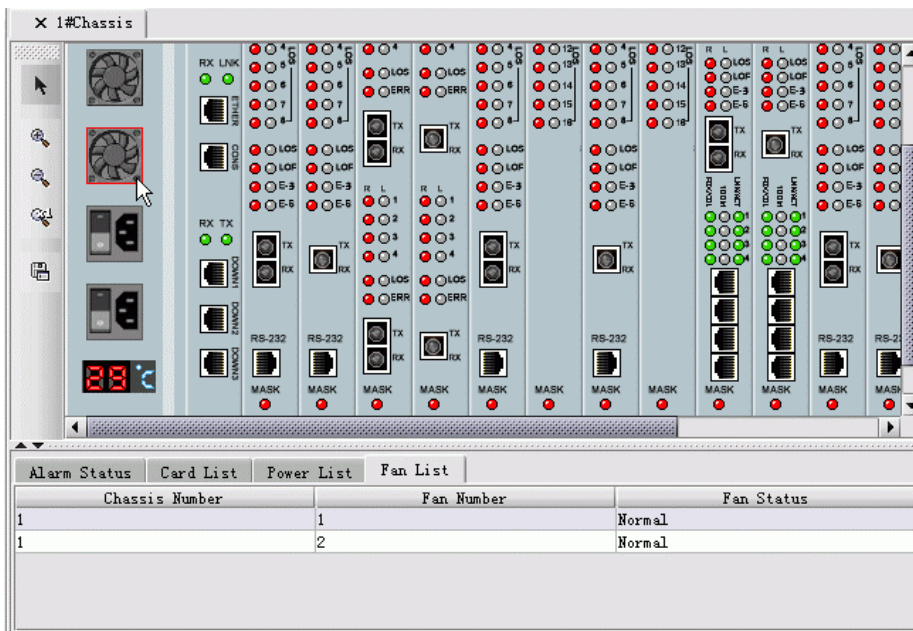


Figure 3-15 The Fan List

The Power and Fan Status are listed as follows:

Object	Icon	Implication
Power		The power is functioning well.
		The power is functioning abnormally.
Fan		The fan is working well.
		The fan is working abnormally.
Thermometer		The temperature is within normal range.

### 3.2 PC COM Port Management

The main view of EMS under PC COM port management mode will be displayed as follows:

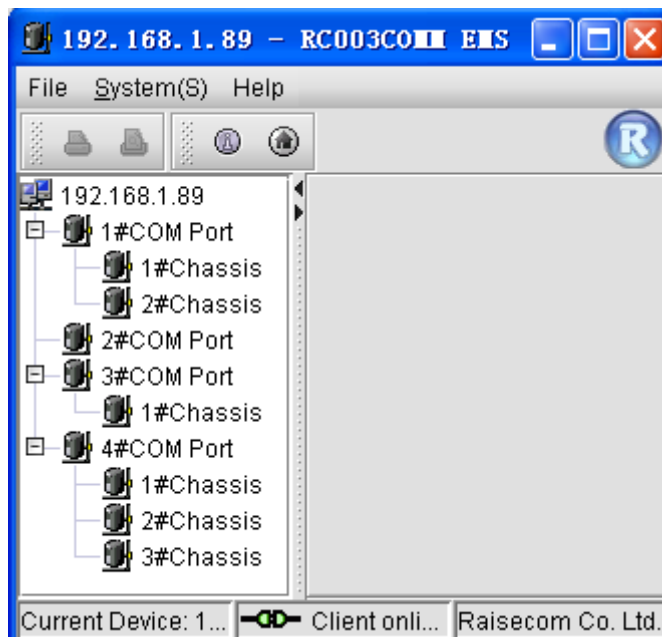


Figure 3-16 The COM Port menu

The RC003COMM EMS “System” menu contains the following sub menus

- ✧ Trap Config
- ✧ System Config
- ✧ E1 Line Detail
- ✧ Name Remote Device
- ✧ Config Com Port

### 3.2.1 Trap Configuration

See description in section 3.1.1. Its specific function and operation are as the same as described in that section.

### 3.2.2 System Information Configuration

See description in section 3.1.2. Its specific function and operation are as the same as described in that section.

### 3.2.3 E1 Line Details

See description in section 3.1.3. Its specific function and operation are as the same as described in that section.

### 3.2.4 Name Remote Device

See description in section 3.1.4. Its function and operation are consistent with those in that section.

### 3.2.5 COM Port Configuration

#### ➤ Device Type Configuration

When connect a device to specific port, you need to make configuration for this device for management.

To do so, you need to configure device type for the COM port firstly.

Here’s procedure for performing this operation:

Firstly, select [**System**] menu on the EMS window, and select [**Config COM Port**] -> [**Config COM Port Status and Device Type**] item, a configuration interface similar to the following will popup.

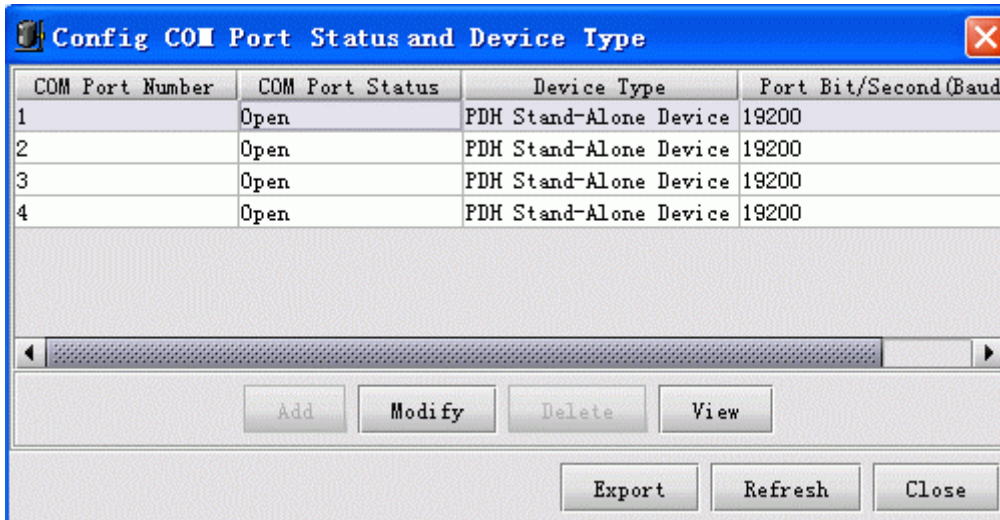


Figure 3-17 The Device Type Configuration dialog box

Then, select the row of information pertaining to the COM Port to be modified, and click the <**Modify**> button, a configuration window similar to the following will popup.

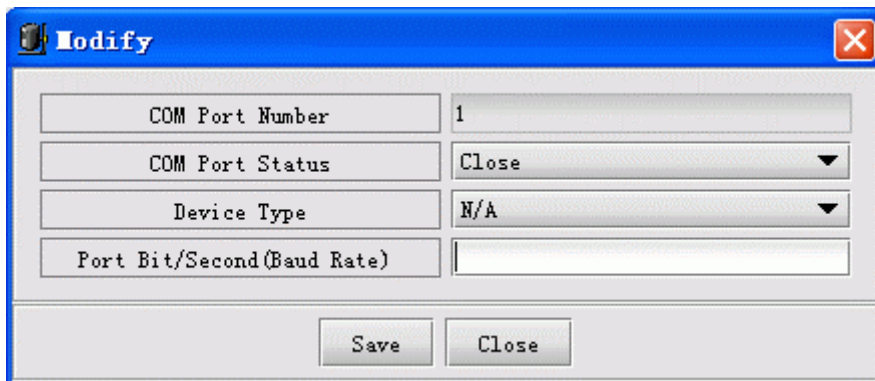


Figure 3-18 The Modify dialog box

The description of information available on this interface are listed as follows:

Object	Description
COM Port Number	The value of COM Port Number provided at present is from 1 to 16.
COM Port Status	Supports two status, open and close.
Device Type	The device type managed under current COM Port.
Port Bit/Second (Baud Rate)	The default value is 19200. It may be varying depending on the configuration of devices, see “Hardware User Manual” for details. The port bit can be configured properly only when this COMM Port is in close state, so it is required to keep the COMM Port in close when configuring this item.

The buttons available on this interface are listed as follows:

Object	Description
Save	Click this button to accept modification and close this window.
Close	Click this button to cancel operations and close this window.

Afterwards, configure device type and baud rate for the device managed by this COM Port.

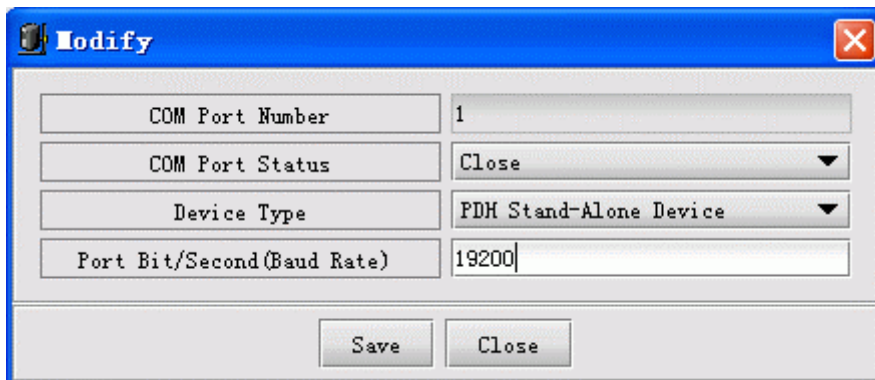


Figure 3-19 The Modify dialog box

**Note:** The Port Bit can be configured successfully only when this COM port is in close state. So it is recommended you keep the COM port in close as possible.

After you made modification to device type and port bit, click the <Save> button.

Finally, after your successful save, change the COM port status to be “Open”, and click the <Save> button.

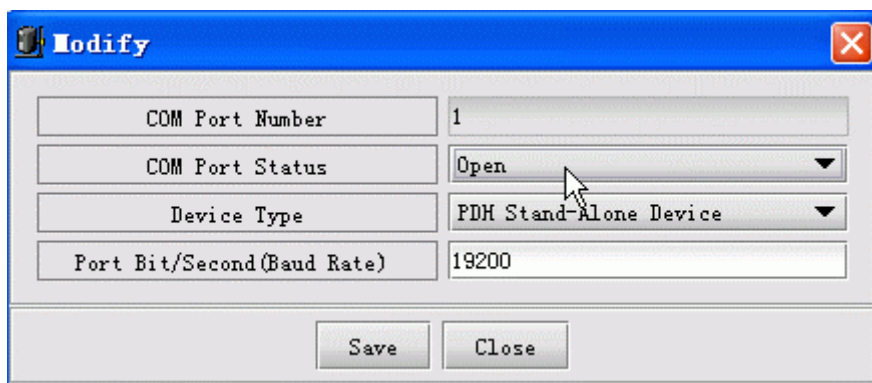


Figure 3-20 The Modify dialog box

➤ **Chassis Online Configuration**

The managed device could be discovered and managed by Network Management Software only if you have configured online state properly for it. This operation would take effective only after the preceding operation on “Device Type Configuration” is successful.

The procedure for this is:

**Step 1.** Select [System] menu on the EMS window, and select [Config COM Port] -> [Config Device State] item, a configuration interface similar to the following will popup.

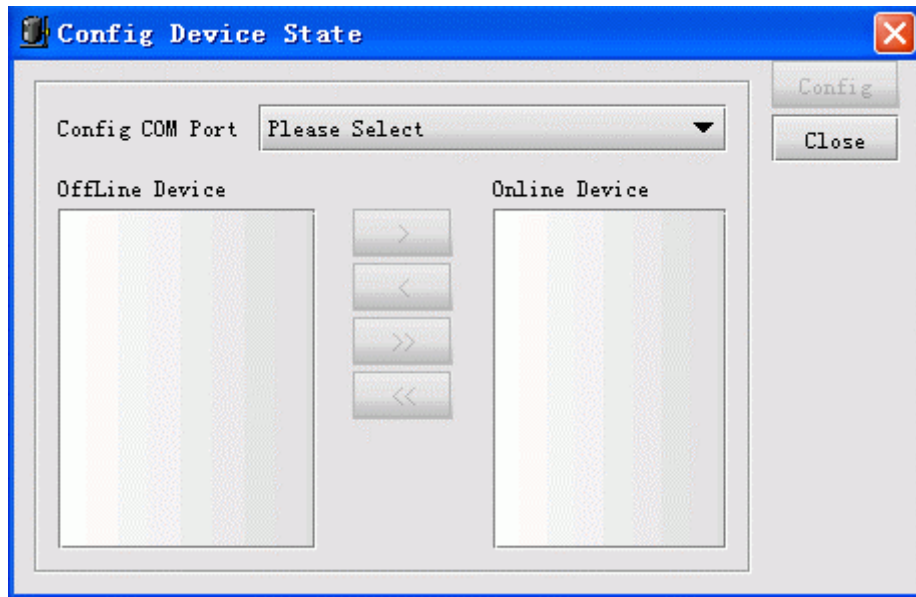


Figure 3-21 The Config Device State dialog box

**Step 2.** Select the [Config COM Port] item. If the COM port you selected has not been configured with relevant device type, a prompt message will appear as follows.

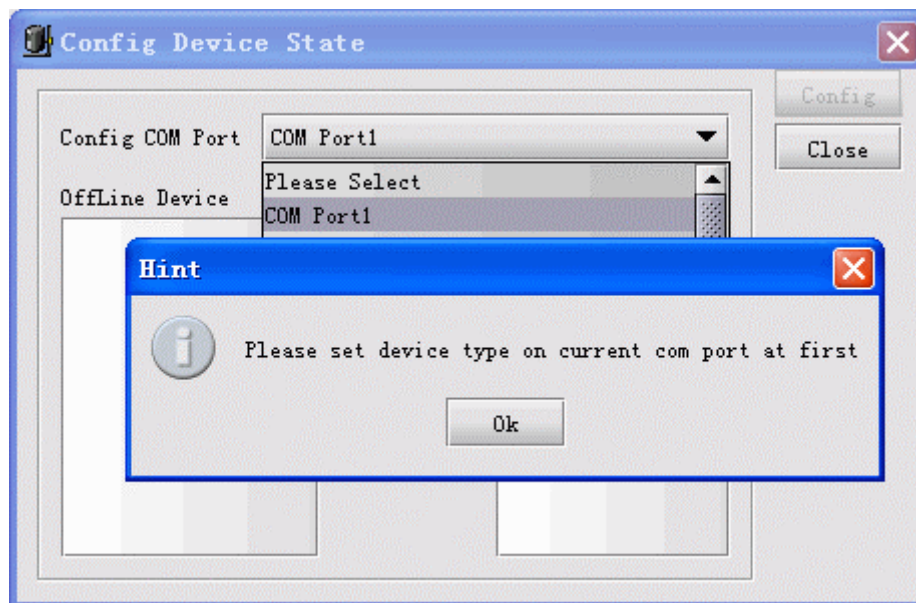


Figure 3-22 The Config Device State dialog box

If the COM port you selectd has already been configured with relevant device type, the information of device type will be automatically attached after this COM port.

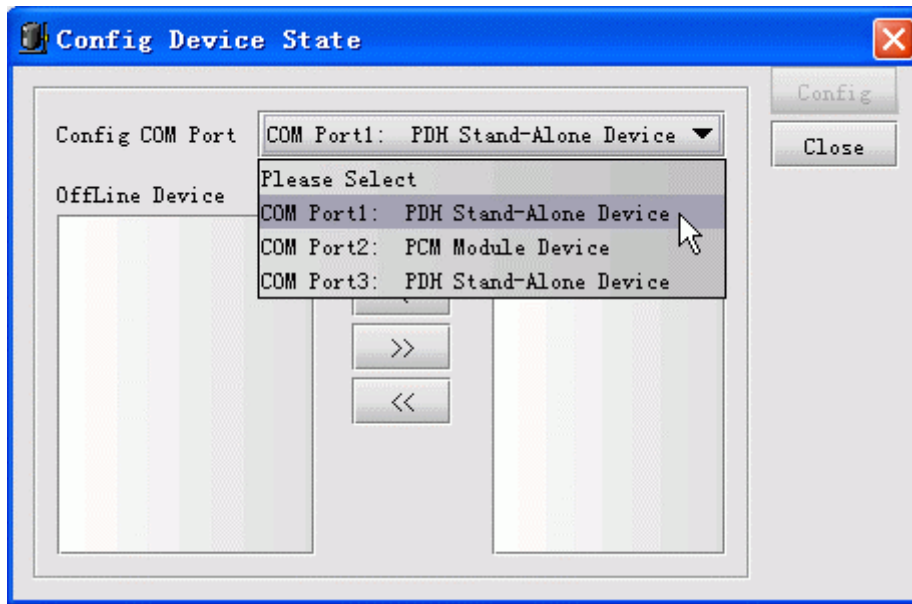


Figure 3-23 The Config Device State dialog box

After you have selected the relevant COM port, the chassis list on right will display the online chassis that have been configured. And the left list displays all the ones that haven't been configured.

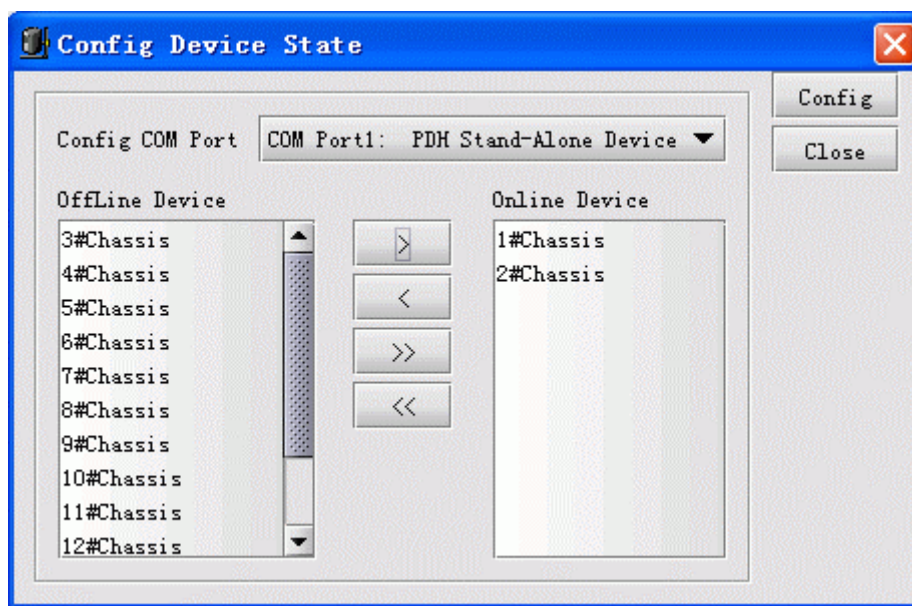


Figure 3-24 The Config Device State dialog box

At this time, you can perform operations by using [>], [<], [>>] and [<<] button between the two lists. Description for these buttons are as follows:

Item	Description
>	Move selected item(s) from Offline Device list to Online Device list
<	Move selected item(s) from Online Device list to Offline Device list
>>	Move all items from Offline Device list to Online Device list
<<	Move all items from Online Device list to Offline Device list

**Note:** Don't set all chassis presented in the list in online state as possible, since this may reduce the polling efficiency of Agent proxy software. You'd better just set the chassis already connected with current COM port in online state.




At last, when you have finished the configuration, click the <Config> button.

### 3.3 Device Browser Tree Management

#### 3.3.1 Function Overview

Device browser tree is located on the left side of element management window. From it, you can easily browse through the devices beneath it and do relevant operations.

The Device Browser Tree uses different icons for indicating each chassis's current state. The icons used here include:

Object	Description
	Indicates current chassis is working normally, and has no alarm generated.
	Indicates current chassis has alarm(s) generated.
	It appears when some a chassis lost. In this case, double clicking this chassis will popup a message prompting <i>Chassis Loss</i> , and the device view could be opened no longer.

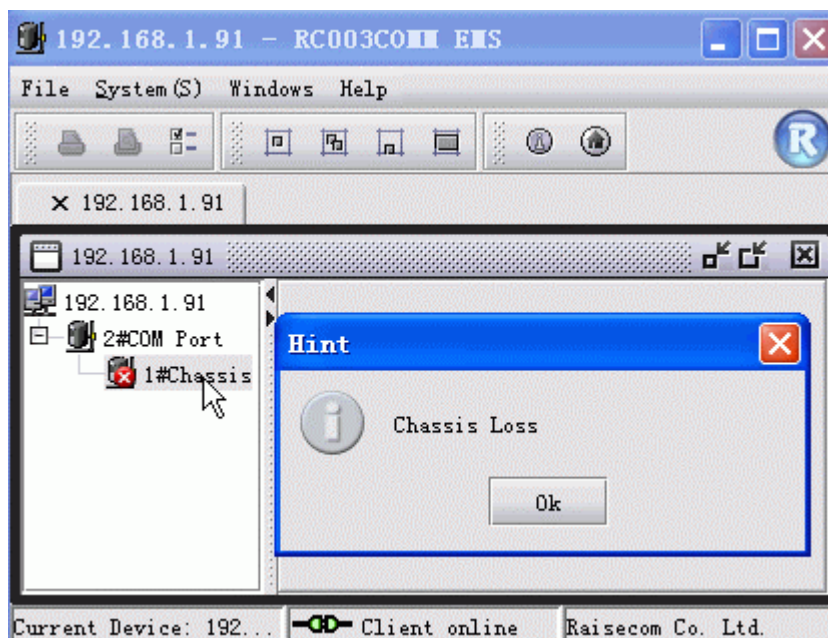


Figure 3-25 The prompt message which appears for Chassis Loss



### 3.3.2 Specific Operation

1. Right click menu available on the blank area around Chassis tree

Right click in the blank area around the Chassis tree, a menu similar to the following will popup.

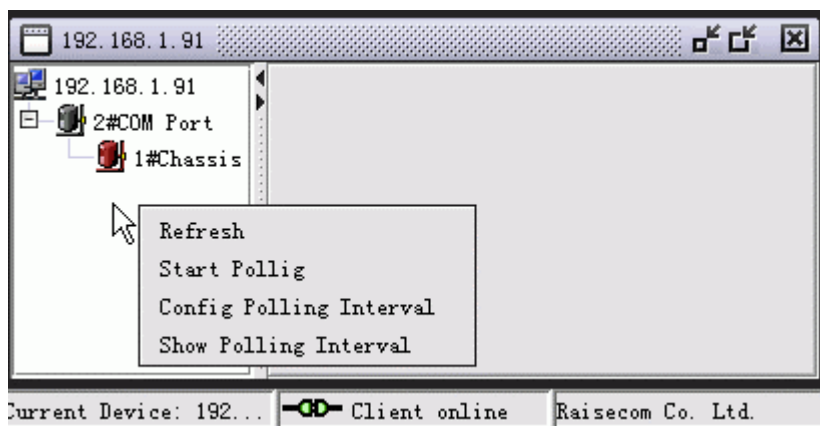


Figure 3-26 The right click menu available on the blank section of Chassis List

2. Right click menu available on root node of Chassis tree

Right click the root node of Chassis tree, a menu similar to the following will popup.

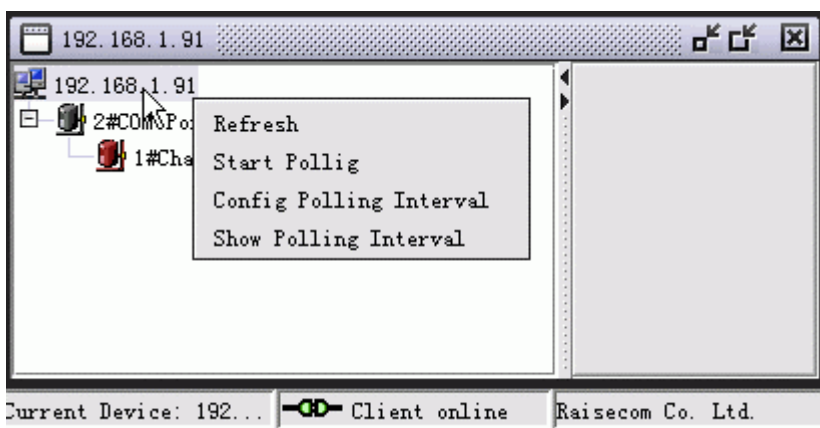


Figure 3-27 The right click menu available on the root node of Chassis List

3. Right click menu available on the node in loss state of Chassis tree

Right click the node that is in loss state on the Chassis tree, a menu similar to the following will popup.

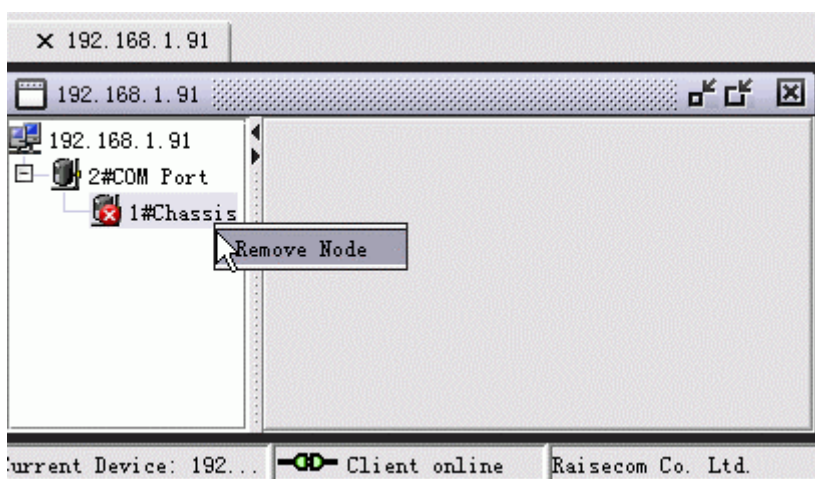


Figure 3-28 The right click menu available on the node in loss state of Chassis tree

As described above, the Device Browser Tree provides five kinds of operations in total. These are:

Object	Description
Refresh	Refresh Chassis List
Start/Stop Polling	Start or stop polling on Chassis List tree
Config Polling Interval	Configure polling interval for current Chassis tree
Show Polling Interval	View polling interval of current Chassis tree
Delete Node	Delete selected node from the Chassis Browse Tree. Only the nodes in Chassis Loss (🚫) state on the Chassis tree have this menu item

**Note:** The polling operation triggered by right click menu available on Device Browser Tree is performed for the Chassis Browser Tree itself. When the Chassis tree has experienced changes such as node adding, deleting and alarm generated, polling it will display the latest chassis state in view.

### 3.4 Control Tool Bar On The View




Figure 3-29 The Tool Bar on the View

The Chassis Management window is also configured with a tool bar which provides several functions including Mouse Interaction, Zoom In, Zoom Out, Restore and Save function. You can click these buttons on left side of the window directly to launch relevant operations. The description for these buttons are as follows:

GUI	Object	Description
	Mouse Interaction	Trigger mouse event when selected, such as launch right click menu while holding the cursor upon an object. With no operation when unselected.
	Zoom In	Zoom in the device view by proportion.
	Zoom Out	Zoom out the device view by proportion.
	Restore	Restore the device view into initial size.

---

	Save	Save the device view as a picture.
---	------	------------------------------------

## Chapter 4 Alarm And Event Management

The chapter provides related description on alarm and event management, and consists of following sections:

- ✧ View current alarm
- ✧ View historical alarm

### 4.1 Viewing Current Alarm

#### ➤ Open the Current Alarms Management window

Double click NView platform function tree, and select [**Current Alarm Management**]

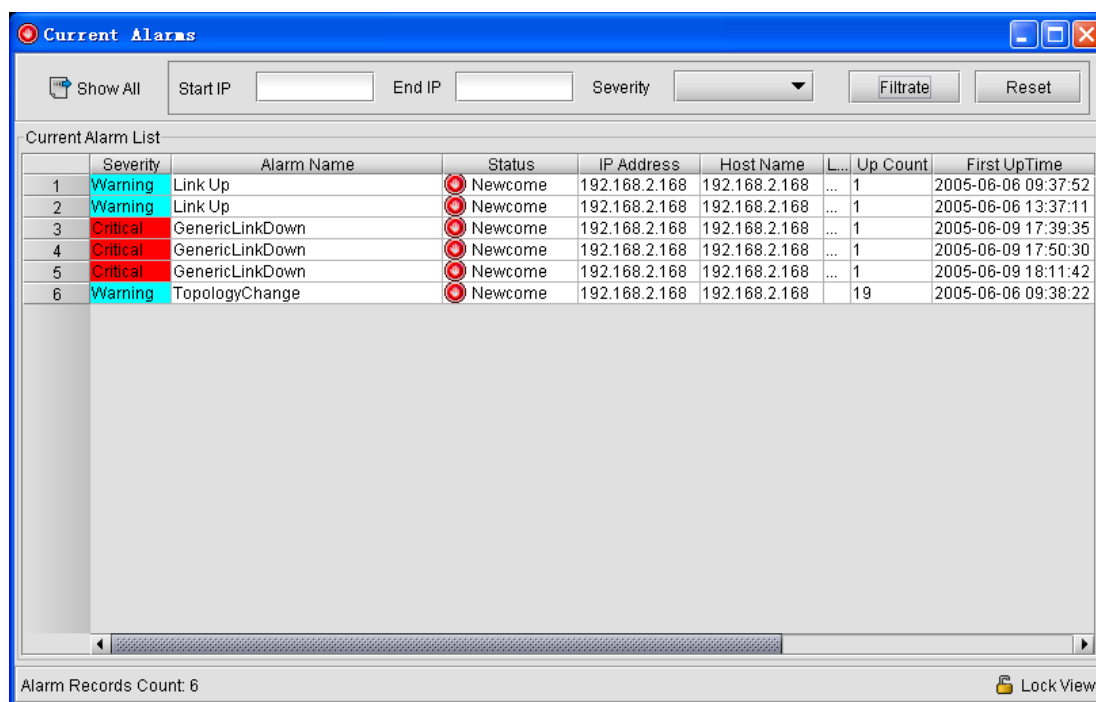


Figure 4-1 The Current Alarms window

#### ➤ Acknowledge Alarm(s)

Select a row of records with “Newcome” state presented in the “Status” column from the Alarm List, and select [**Acknowledge**] from the right click menu.

#### ➤ Clear Current Alarm(s)

Select one or more alarms from the Alarm List, and select [**Clear**] from the right click menu.

#### ➤ Export Current Alarm(s)

Select [**Export**] from the right click menu to export a list of alarms into Text file or Excel file.

#### ➤ Filtering Current Alarm(s)

Enter the filtration conditions including “IP Address Range” and Alarm Level, then click <**Filter**>.

**Note:** The IP Address Range supports asterisk wildcard “\*”. For example, “192.168.1.\*”, the address range of asterisk wildcard here can be set as “Start IP Address”.

➤ View Alarm Details

Click a record in the Alarm List, and select **[Properties]** from the right click menu.

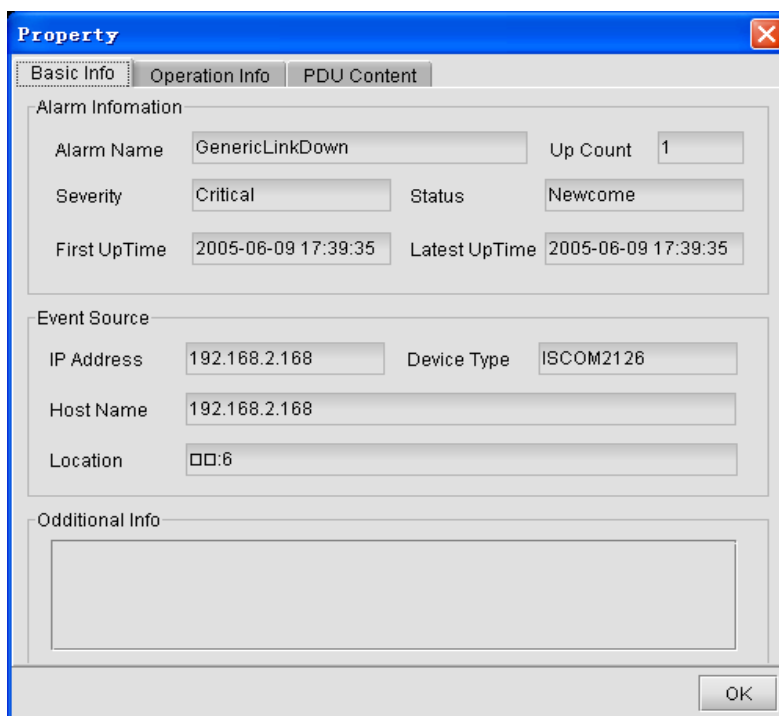


Figure 4-2 The Property dialog box

## 4.2 Viewing History Alarm

➤ Open the History Alarm Management window

Double click on the “NView Platform Function Tree”, and select **[History Alarm Management]**

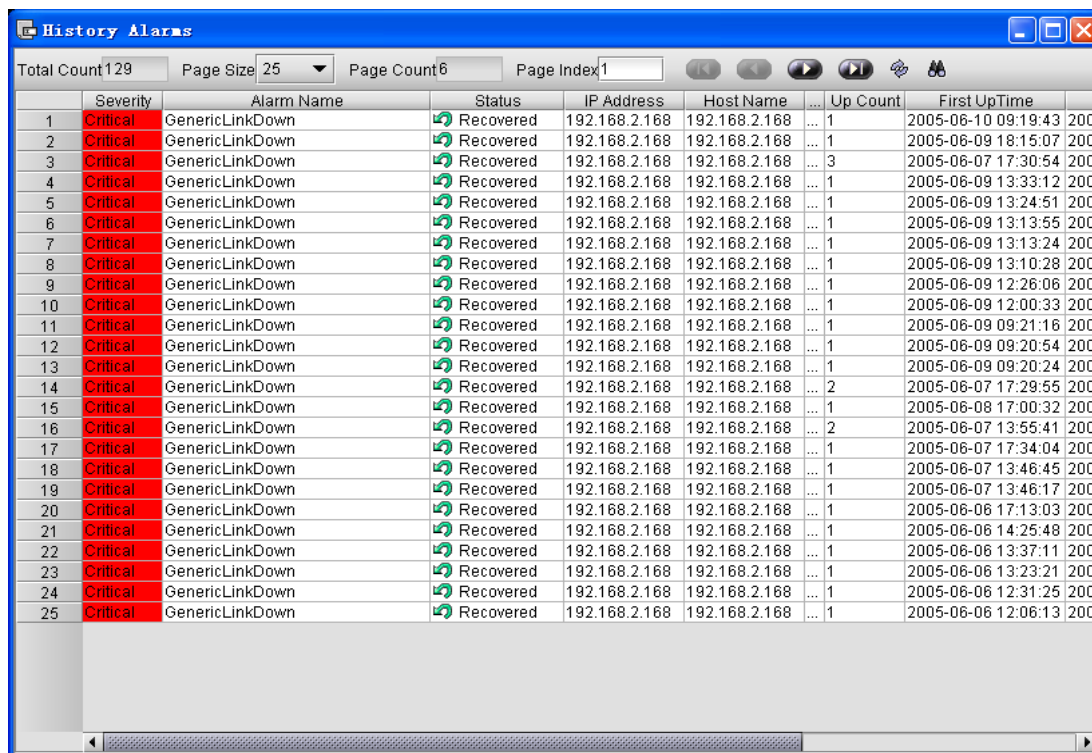


Figure 4-3 The History Alarms window

➤ **Delete history alarm(s)**

Select one or more records in the Alarm List, and select [**Delete**] from the right click menu.

➤ **Export history alarm(s)**

Select [**Export**] from the right click menu to export the record(s) into a Text or Excel file.

➤ **View alarm details**

The screenshot shows a 'Property' dialog box with three tabs: 'Basic Info', 'Operation Info', and 'PDU Content'. The 'Basic Info' tab is selected. It contains the following fields:

- Alarm Information:
  - Alarm Name: GenericLinkDown
  - Up Count: 1
  - Severity: Critical
  - Status: Recovered
  - First UpTime: 2005-06-09 13:13:55
  - Latest UpTime: 2005-06-09 13:13:55
- Event Source:
  - IP Address: 192.168.2.168
  - Device Type: ISCOM2126
  - Host Name: 192.168.2.168
  - Location: □□.7
- Additional Info: (Empty text area)

An 'OK' button is located at the bottom right of the dialog.

Figure 4-4 The Property dialog box

➤ **Query history alarm(s)**

Select [**Query**] from the right click menu, the Query Condition panel will appear. It enables query on history alarms by condition(s) of device node, time range, alarm type and alarm level.

History Alarms

Total Count: 295 | Page Size: 25 | Page Count: 12 | Page Index: 1

	Severity	Alarm Name	Status	IP Address	Host Name	Log
1	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□4
2	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□10
3	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□8
4	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□7
5	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□12
6	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□7
7	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□7
8	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□4
9	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□4
10	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□4
11	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□17
12	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□17
13	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□17
14	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□6
15	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□7
16	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□4
17	Critical	GenericLinkDown	Recovered	192.168.2.168	192.168.2.168	□□7

Figure 4-5 The History Alarms Query window

## Appendix A Alarm Type

### 1. The Alarm Types Supported By Standalone PDH

Serial Number	Full Name	Source
1	Cold Start	1U
2	Optical Port Local LOS Alarm	1U
3	Optical Port Local LOS Alarm Recover	1U
4	Optical Port Remote LOS Alarm	1U
5	Optical Port Remote LOS Alarm Recover	1U
6	Optical Port Local LOF Alarm	1U
7	Optical Port Local LOF Alarm Recover	1U
8	Optical Port Remote LOF Alarm	1U
9	Optical Port Remote LOF Alarm Recover	1U
10	Optical Port Local Error Code Ratio More Than 10E-3 Alarm	1U
11	Optical Port Local Error Code Ratio More Than 10E-3 Alarm Recover	1U
12	Optical Port Local Error Code Ratio More Than 10E-6 Alarm	1U
13	Optical Port Local Error Code Ratio More Than 10E-6 Alarm Recover	1U
14	Optical Port Remote Error Code Ratio More Than 10E-3 Alarm	1U
15	Optical Port Remote Error Code Ratio More Than 10E-3 Alarm Recover	1U
16	Optical Port Remote Error Code Ratio More Than 10E-6 Alarm	1U
17	Optical Port Remote Error Code Ratio More Than 10E-6 Alarm Recover	1U
18	Local E1 Line LOS Alarm	1U
19	Local E1 Line LOS Alarm Recover	1U
20	Remote E1 Line LOS Alarm	1U
21	Remote E1 Line LOS Alarm Recover	1U
22	Chassis Loss Alarm	1U
23	A New Chassis Online	1U
24	Chassis Temperature Alarm	1U
25	Chassis Temperature Alarm Recover	1U
26	Chassis Power Alarm	1U
27	Chassis Power Alarm Recover	1U
28	Card Loss Alarm	1U
29	A New Device Online	1U
30	The First Extend Module Loss Alarm	1U
31	The First Extend Module Online	1U



Serial Number	Full Name	Source
32	The Second Extend Module Loss Alarm	1U
33	The Second Extend Module Online	1U
34	E1 AIS,Alarm	1U
35	E1 AID Alarm Recover	1U
36	E1 LOF Alarm	1U
37	E1 LOF Alarm Recover	1U
38	E1 CRC Alarm	1U
39	E1 CRC Alarm Recover	1U
40	Remote Module General Alarm	1U
41	Remote Module General Alarm Recover	1U
42	Local Ethernet Port Link Down	1U
43	Local Ethernet Port Link Up	1U
44	Local Ethernet Port Speed Change to 10M	1U
45	Local Ethernet Port Speed Change to 100M	1U
46	Local Ethernet Port Status Change to HDX	1U
47	Local Ethernet Port Status Change to FDX	1U
48	Voltage out of Upper Limit Alarm	None
49	Voltage out of Upper Limit Alarm Recover	None
50	Voltage out of Lower Limit Alarm	None
51	Voltage out of Lower Limit Alarm Recover	None
52	Fiber Channel Link Down	None
53	Fiber Channel Link Up	None
54	Multi Fiber Channel Receive Link Down	None
55	Multi Fiber Channel Receive Link Up	None
56	Multi Fiber Channel Send Link Down	None
57	Multi Fiber Channel Send Link Up	None
58	Remote Ethernet Port Link Down	1U
59	Remote Ethernet Port Link Up	1U
60	Remote Ethernet Port Speed Change to 10M	1U
61	Remote Ethernet Port Speed Change to 100M	1U
62	Remote Ethernet Port Status Change to HDX	1U
63	Remote Ethernet Port Status Change to FDX	1U
64	Remote Fiber Channel Link Down	None
65	Remote Fiber Channel Link Up	None
66	Fan Fault	None
67	Fan Fault Recover	None
68	Power Fault	None
69	Power Fault Recover	None
70	Local Total Alarm	1U
71	Local Total Alarm Recover	1U
72	Remote Total Alarm	1U
73	Remote Total Alarm Recover	1U
74	COM Port Closed	1U
75	COM Port Opened	1U

## 2. The Alarm Typies Supported By RC004-16 Modular PDH

Serial Number	Alarm Name	Source
1	Cold Start	10U
2	Optical Port Local LOS Alarm	10U, 1U
3	Optical Port Local LOS Alarm Recover	10U, 1U
4	Optical Port Remote LOS Alarm	10U, 1U
5	Optical Port Remote LOS Alarm Recover	10U, 1U
6	Optical Port Local LOF Alarm	10U, 1U
7	Optical Port Local LOF Alarm Recover	10U, 1U
8	Optical Port Remote LOF Alarm	10U, 1U
9	Optical Port Remote LOF Alarm Recover	10U, 1U
10	Optical Port Local Error Code Ratio More Than 10E-3 Alarm	10U, 1U
11	Optical Port Local Error Code Ratio More Than 10E-3 Alarm Recover	10U, 1U
12	Optical Port Local Error Code Ratio More Than 10E-6 Alarm	10U, 1U
13	Optical Port Local Error Code Ratio More Than 10E-6 Alarm Recover	10U, 1U
14	Optical Port Remote Error Code Ratio More Than 10E-3 Alarm	10U, 1U
15	Optical Port Remote Error Code Ratio More Than 10E-3 Alarm Recover	10U, 1U
16	Optical Port Remote Error Code Ratio More Than 10E-6 Alarm	10U, 1U
17	Optical Port Remote Error Code Ratio More Than 10E-6 Alarm Recover	10U, 1U
18	Local E1 Line LOS Alarm	10U, 1U
19	Local E1 Line LOS Alarm Recover	10U, 1U
20	Remote E1 Line LOS Alarm	10U, 1U
21	Remote E1 Line LOS Alarm Recover	10U, 1U
22	Chassis Loss Alarm	10U, 1U
23	A New Chassis Online	10U, 1U
24	Chassis Temperature Alarm	10U
25	Chassis Temperature Alarm Recover	10U
26	Chassis Power Alarm	10U

Serial Number	Alarm Name	Source
27	Chassis Power Alarm Recover	10U
28	Card Loss Alarm	10U, 1U
29	A New Card Online	10U, 1U
30	Fan Alarm	10U, 1U
31	Fan Alarm Recover	10U
32	Card Type Changed	10U
33	E1 AIS Alarm	10U, 1U
34	E1 AIS Alarm Recover	10U, 1U
35	E1 LOF Alarm	10U, 1U
36	E1 LOF Alarm Recover	10U, 1U
37	E1 CRC Alarm	10U, 1U
38	E1 CRC Alarm Recover	10U, 1U
39	Remote Module General Alarm	10U, 1U
40	Remote Module General Alarm Recover	10U, 1U
41	Interface Link Down	10U, 1U
42	Interface Link Up	10U, 1U
43	Interface Speed Change to 10M	10U, 1U
44	Interface Speed Change to 100M	10U, 1U
45	Interface Status Change to HDX	10U, 1U
46	Interface Status Change to FDX	1U
47	The First Extend Module Loss Alarm	1U
48	The First Extend Module Online	1U
49	The Second Extend Module Loss Alarm	1U
50	The Second Extend Module Online	1U
51	Remote Chassis Temperature Alarm	1U
52	Remote Chassis Temperature Alarm Recover	1U
53	Local Total Alarm	1U
54	Local Total Alarm Recover	1U
55	Remote Total Alarm	1U
56	Remote Total Alarm Recover	1U

### 3. The Alarm Typies Supported By PCM

Serial Number	Alarm Name	Source
1	Chassis Temperature Alarm	PCM
2	Chassis Temperature Alarm Recover	PCM
3	Line Card Fault,Alarm	PCM
4	Line Card Fault,Alarm Recover	PCM
5	E1 LOS,Alarm	PCM
6	E1 LOS,Alarm Recover	PCM
7	E1 AIS,Alarm	PCM
8	E1 AIS,Alarm Recover	PCM
9	E1 LOF,Alarm	PCM
10	E1 LOF,Alarm Recover	PCM
11	E1 RALM Alarm	PCM
12	E1 Remote RALM Recover	PCM
13	E1 MLOF,Alarm	PCM
14	E1 MLOF,Alarm Recover	PCM
15	E1 CRC MLOF,Alarm	PCM
16	E1 CRC MLOF,Alarm Recover	PCM
17	E1 CRC verify Alarm	PCM
18	E1 CRC verify Alarm Recover	PCM
19	Line Card Communication Failed,Alarm	PCM
20	Line Card Communication Ok	PCM
21	Fiber Port LOS,Alarm	PCM
22	Fiber Port LOS,Alarm Recover	PCM
23	Remote Fiber Port LOS,Alarm	PCM
24	Remote Fiber Port LOS,Alarm Recover	PCM
25	Fiber Port LOF,Alarm	PCM
26	Fiber Port LOF,Alarm Recover	PCM
27	Remote Fiber Port LOF,Alarm	PCM
28	Remote Fiber Port LOF,Alarm Recover	PCM

Serial Number	Alarm Name	Source
29	Fiber Port E-3,Alarm	PCM
30	Fiber Port E-3,Alarm Recover	PCM
31	Remote Fiber Port E-3,Alarm	PCM
32	Remote Fiber Port E-3,Alarm Recover	PCM
33	Fiber Port E-6,Alarm	PCM
34	Fiber Port E-6,Alarm Recover	PCM
35	Remote Fiber Port E-6,Alarm	PCM
36	Remote Fiber Port E-6,Alarm Recover	PCM
37	Extend E1 LOS,Alarm	PCM
38	Extend E1 LOS,Alarm Recover	PCM
39	Remote Extend E1 LOS,Alarm	PCM
40	Remote Extend E1 LOS,Alarm Recover	PCM
41	User Card Fault,Alarm	PCM
42	User Card Fault,Alarm Recover	PCM
43	User Card Loss,Alarm	PCM
44	A New User Card Online	PCM
45	Chassis Loss,Alarm	PCM
46	A New Chassis Online	PCM
47	Line Card Type Changed	PCM
48	User Card Type Changed	PCM
49	Fan Fault Alarm	PCM
50	Fan Fault Alarm Recover	PCM
51	Eth Port Link Down	PCM
52	Eth Port Link Up	PCM
53	Distribute Channel Number of User Card Wrongly	PCM
54	Distribute Channel Number of User Card Normally	PCM

## Appendix B Abbreviation List

Abbreviation	Full Name
ADM	Add-Drop Multiplexer
AIS	Alarm Indication Signal
APS	Automatic Protection Switching
ASON	Automatic Switched Optical Network
ASTN	Automatic Switched Transport Network
ATM	Asynchronous Transfer Mode
AU	Administrative Unit
AU-n	Administration Unit, level n
AUG	Administration Unit Group
AU-PTR	Administration Unit Pointer
BA	Booster Amplifier
BBE	Background Block Error
BBER	Background Block Error Ratio
BER	Bit Error Ratio
BITS	Building Integrated Timing Supply
BML	Business Management Layer
CMI	Coded Mark Inversion
C-n	Container-n
CORBA	Common Object Request Broker Architecture
CV	Code Violation
DB	Data Base
DBMS	Data Base Management System
DCC	Data Communications Channel
DCE	Data Circuit-terminating Equipment
DCF	Data Communications Function
DCN	Data Communications Network
DDN	Digital Data Network
DLL	Dynamic Link Libraries
DNA	Distributed Network Architecture

DNI	Dual Node Interconnection
DQDB	Distributed Queue Double Bus
DTE	Data Terminal Equipment
DWDM	Dense Wavelength-division Multiplexing
DXC	Digital Cross Connect
ECC	Embedded Control Channel
EDFA	Erbium Doped Fiber Amplifier
EM	Element Management
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EML	Element Management Layer
EMS	Element Management System
EOS	Ethernet Over SDH
ES	Error Second
ESD	Electronic Static Discharge
ESR	Error Second Ratio
ETSI	European Telecommunication Standards Institute
FDM	Frequency Division Multiplexing
FDDI	Fiber Distributed Data Interface
FEBBE	Far End Background Block Error
FEES	Far End Error Second
FESES	Far End Severely Error Second
GUI	Graphical User Interface
HDLC	High Digital Link Control
HPC	Higher order Path Connection
HW	High-Way
IP	Internet Protocol
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
L2	Layer 2
LAN	Local Area Network
LAPD	Link Access Procedure On D-channel

LCT	Local Craft Terminal
LOF	Loss Of Frame
LOP	Loss Of Pointer
LOS	Loss Of Signal
LPC	Lower order Path Connection
MAC	Medium Access Control
MAN	Metropolitan Area Network
MCU	Micro Control Unit
MD	Mediation Device
MF	Mediation Function
MII	Medium Independent Interface
MM	Multi Mode
MS	Multiplex Section
MS-AIS	Multiplex Sections -Alarm Indication Signal
MS-PSC	Multiplex Sections - Protection Switching Count
MS-PSD	Multiplex Sections - Protection Switching Duration
MS-SPRing	Multiplexer Section Shared Protection Ring
MSAP	Multiple Service Access Platform
MSOH	Multiplex Section OverHead
MSP	Multiplex Section Protection
MSTP	Multiple Service Transport Platform
MSSP	Multiple Service Switching Platform
MTIE	Maximum Time Interval Error
NE	Network Element
NEF	Network Element Function
NEL	Network element Layer
NML	Network Manager Layer
NMS	Network Management System
OAM	Operation, Administration and Maintenance
OFS	Out of Frame Second
OOF	Out of Frame



OS	Operation System
OSF	Operation System Function
OSI	Open System Interconnect
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PDH	Plesiochronous Digital Hierarchy
PGND	Protection GND
TDEV	Time Deviation
TDM	Time Division Multiplex
TIM	Trace Identifier Mismatch
TM	Terminal Multiplexer
TMN	Telecommunications Management Network
TU	Tributary Unit
UAS	Unavailable Second
VC	Virtual Container
VC-n	Virtual Container, level n
VDN	Virtual Data Network
VLAN	Virtual Local Area Network
WAN	Wide Area Network
WDM	Wavelength Division Multiplexing
WS	Work Station
WSF	Work Station Function