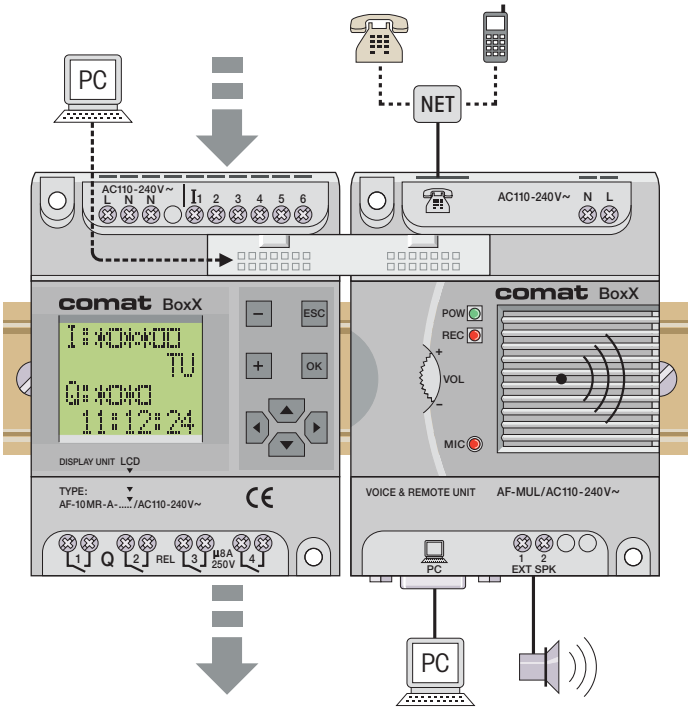
Software
SCADA Version 2.2



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This issue replaces all previous issues.
Availability, errors and specifications subject to change without notice.

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CHAPTER I

Introduction to the Comat BoxX-Scada System

1.1 General Introduction

Comat BoxX-Scada System is a system for Supervisory Control and Data Acquisition. It can collect digital and analog inputs from the field, carry out local or remote real-time control over the fields controlled by the Comat BoxX Controller (Comat BoxX) and provide, with the necessary resource, a management function.

Comat BoxX-Scada System Software is an easily operated and widely used industrial software for the utilisation of the network function of the Comat BoxX. It uses a Comat BoxX as the terminal control unit and it is a network system that collectively carries out the real-time data acquisition and supervisory control over a group of Comat BoxX's that separately carry out the auto-control task. With the Comat BoxX-Scada System Software, you can build a complete supervisory management system from PC's to Comat BoxX's for the control, according to the specific field environments and requirements, of a system.

Comat BoxX has the basic functions of a common PLC, Comat BoxX also has some special additional features: real-time clock function, input and transmission of analog signals, voice function, network and remote supervisory control function and so on. In this manual we will introduce you to how to use a network of Comat BoxX's and ancillary devices together with the Comat BoxX-Scada System.

1.2 Network Structure of Comat BoxX

There are two methods of supervisory control system which uses Comat BoxX as the site-control unit. You may build the following two supervisory control systems according to different control requirements.

Scheme 1: Network of RS 485 Buses (As in Fig. 1.1), this is suitable for a control system of small scale and short distance (within a distance of 1.2 kilometres).

Scheme 2: Network System of Supervisory control by use of a Modem (As in Fig. 1.2). This network is suitable for a control system of a small scale distributed over a long distance.

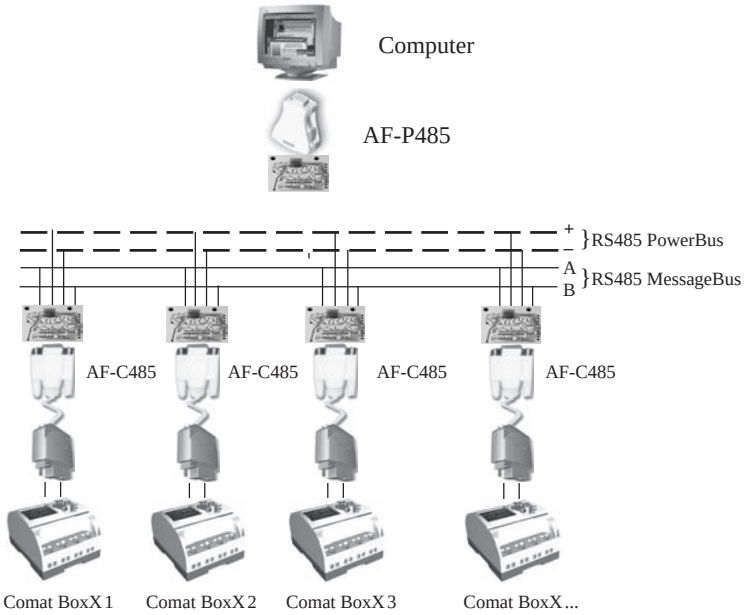

Fig. 1.1
Serial Communication Using RS485

1.2.1 Network of RS485 Buses

The preceding diagram is the schematic diagram of the control system using Comat BoxX as the field-control unit. For Comat BoxX, which has a communication port, it is convenient to use this method via RS485 buses.

The upper device, a computer, communicates with Comat BoxX's using a PC Port via PC485 buses. In this system, a computer port can communicate with up to 255 Comat BoxXs. Expanded, a computer can communicate with an infinite number of Comat BoxXs.

This system is a small structure and can be easily built with other devices, machines, etc., it also greatly simplifies the DCS system. Compared with other field bus networks, it can provide a clear field supervisory diagram from the top to the bottom of the system. It can also provide a very cost effective solution for you. Building this form of control network only needs the installation of communication adaptors type AF-C232, AF-P485 or AF-C485.

Note: *This system is suitable for small scale control with a spread not greater than 1.2 kilometres, for example modern residential quarters, factories and so on.*

1.2.2 Network System for Remote Control via a Modem

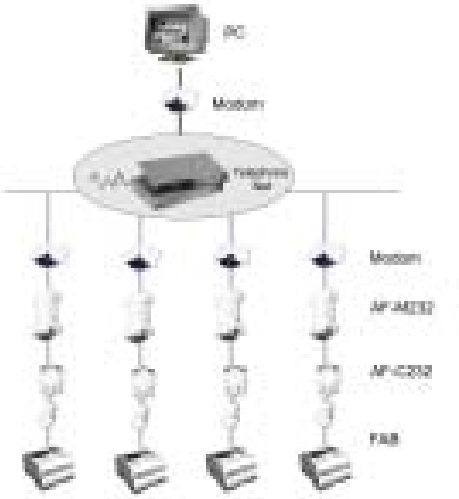

Fig. 1.2
Remote control
Using Modem

You may need to carry out long distance (no limit via a touch tone telephone network) supervisory control, whether using one Comat BoxX or many Comat BoxXs.
This is achieved by using the design method illustrated in the above figure by the use of a telephone network and a Modem.
When building this supervisory control network, you will need to equip it with an AF-M232, AF-C232 and a standard Modem together with telephone network, also to select an AF-MUL voice module. The features of this kind of monitoring network is as follows:

1. PC, the upper device, scans the Comat BoxX control unit at the control end in sequence, to achieve real-time control.
2. When achieving the long distance real-time control using a Comat BoxX, the PC will provide the application function in the down-loading and subsequent changing (as required) of the programs for each of the Comat BoxXs in the network.
3. Being set to monitor the breakdown status of a station, the Comat BoxX, being the lower device, will give alarm signals to the computer, being the upper device, if a breakdown is taking place. When the network is equipped with an AF-MUL voice module, it will broadcast a local audible voice alarm and dial a preset telephone number to confirm the alarm status to the predetermined location.

1.3 More Detailed Introduction to Comat BoxX-Scada System

Comat BoxX-Scada System provides the users with a friendly secondary development interface and makes it possible for you to build a control system as required. It may be the collective control of intelligent residential quarters or of computers dispersed in cities.

The display in Fig. 1.3 is the Comat BoxX-Scada System control displaying the main tableau. In this tableau, you only need to click the mouse and invoke the control flow diagram to monitor the field data and state of different control network spots, observe the resources, print the report and so on.

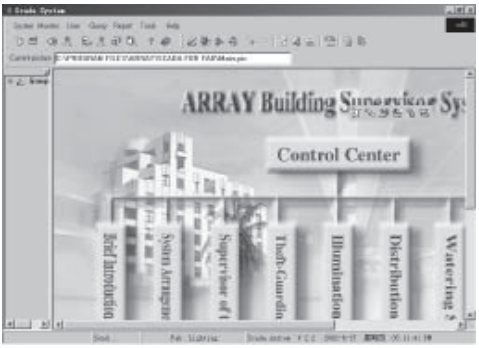

Fig. 13
Main Diagram of
Comat BoxX-Scada

In order to make it possible for you to build your own control system, Comat BoxX-Scada Software provides you with a friendly secondary development interface as shown in Fig. 1.4 (next page). In this interface you may freely build the network system of choice by using the draw tools.

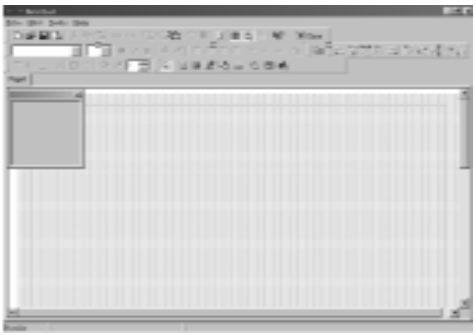

Fig. 1.4
Drawing Interface

Chapter II

Installation of Comat BoxX-Scada System

Comat BoxX-Scada System can be used in the environment of WIN9X/WINNT/ WIN2000 and so on and the hardware requirements are computer based with a processor above 586. A knowledge of the Microsoft Windows operating systems is assumed. Detailed installation steps are as follows:

Step 1:
Insert the **CDROM disc** into the disc drive. The installation system will run automatically and the following installation interface will appear.

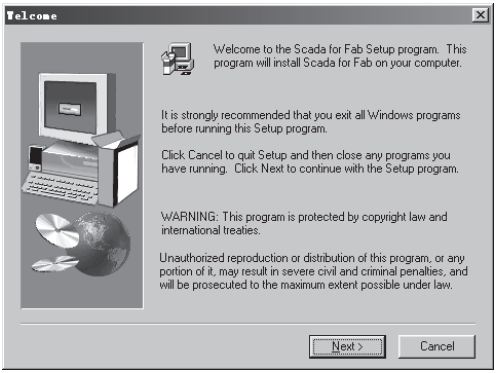

Fig. 2.1
Installation Interface 1

Step 2:

Click “Next” to continue in Fig. 2.2. Key in the users information and then click “Next” again to continue in Fig. 2.3.

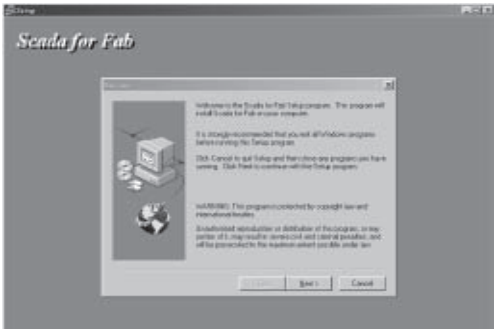

Fig. 2.2
Installation Interface 2

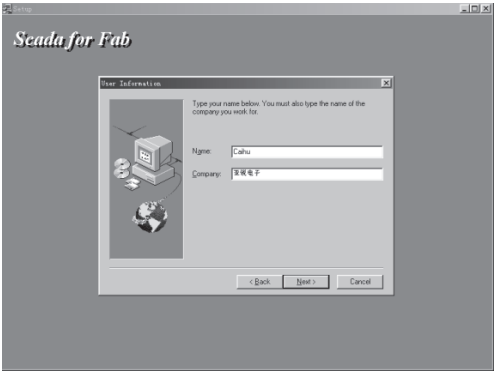

Fig. 2.3
Installation Interface 3

Step 3:

Setup the destination directory. Click “Browse” and then you can set up the destination directory. The system default destination directory is C:\Program Files\array\Scada For Comat BoxX.

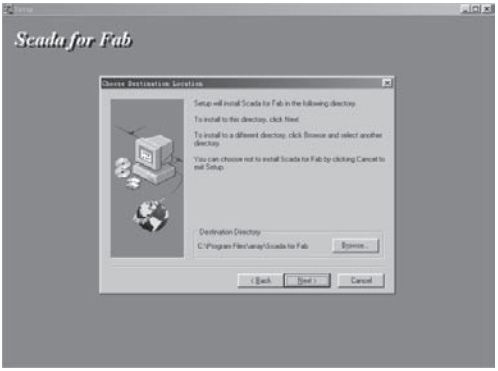

Fig. 2.4
Installation Interface 4

Step 4:

Setup Installation/Deletion Folders. (This item will appear in the function menu of Control Panel Add/Delete). You select, for example, **Scada for Comat BoxX**. Completing the setup, click “Next” to continue in Fig. 2.5.

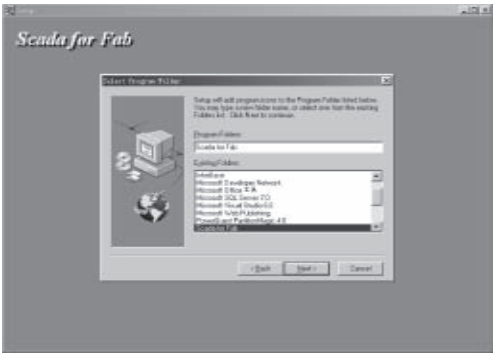

Fig. 2.5
Installation Interface 5

Step 5:

In Fig. 2.6, if you want to run the system immediately, select **"Yes"** to launch the program. If you don't want to run the system immediately then click **"Finish"**.

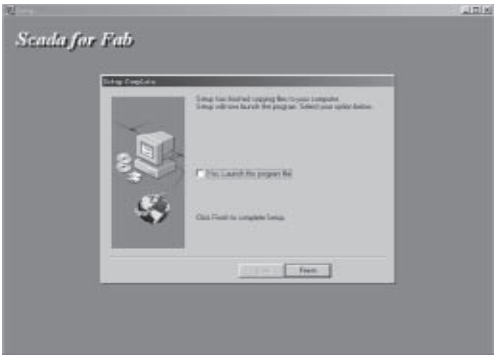

Fig. 2.6
Installation Interface 6

Step 6:

Run Comat BoxX-Scada System. Select **<Program> <Scada for Comat BoxX>** and then click the **quick icon** Scada.

Fig. 2.7
Run Comat BoxX-Scada System

Step 7:

Uninstall the system. This task needs to be carried out when the system is not needed or the system does not work normally. (Certainly, data needs to be backed up before the software is uninstalled. We will explain how to backup the programme in the following chapters). Then use add and remove programs under the system Control Panel, Fig. 2.8, highlight **Scada for Comat BoxX** and then click **"Add/Remove"** and follow the prompts.

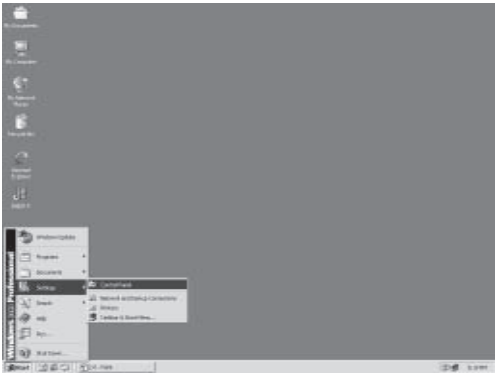

Fig. 2.8
Installation System 1

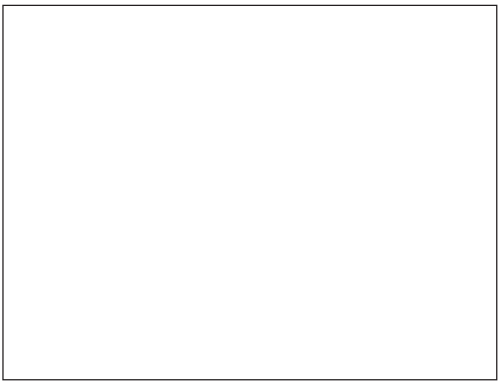

Fig. 2.9
Installation System 2

Chapter III

Operation Instructions and Quick icons

3.1 Instructions and Icons in the Control Interface

In the menu bar of Comat BoxX-Scada run time system, there are some main operating instructions such as System, Monitor, User, Query, Report, Tools and Help. They are used to complete the configuration of the system and to control and monitor the values. We will introduce their functions one by one in the following text and tableau.

3.1.1 **System** (Operation Instructions for System Management)

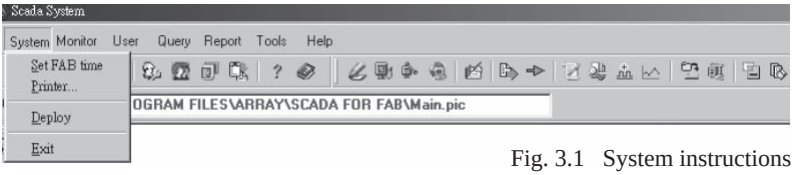

Fig. 3.1 System instructions

Set Comat BoxX time:
Set the current time of the computer to the Comat BoxXs and this is equivalent to the quick icon.

Printer:
Print the report and this is equivalent to the quick icon.

Deploy:
When you edit a control system, you can package all of the diagrams under the Comat BoxX-Scada directory and related files into one engineering file and then deploy it to other computers. When the engineering files are transferred to other computers the installation of all of the diagrams and equipping files under the Comat BoxX-Scada system environment is complete. This feature is equivalent to the quick icon.

Exit:
Close the Comat BoxX-Scada system and this is equivalent to the quick icon.

3.1.2 **Monitor** (Operation Instructions for Monitor Setup)

Operation menu for Monitor Setup include Clear alarm, Draw tools, Station Design, Add/Delete Comat BoxX, Design Comat BoxX, Communication and Batch Control.

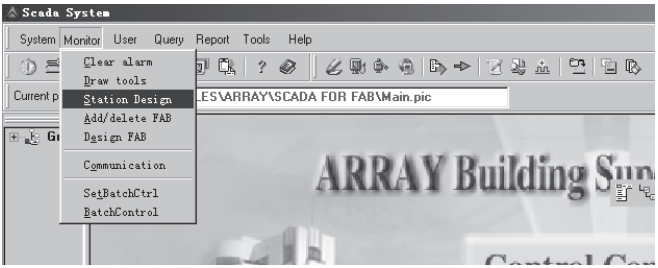

Fig. 3.2 Operation Instructions for Monitor Setup

Clear alarm:
Clear alarm information and reset and is equivalent to the quick icon .

Draw tools:
Open or close the drawing interface and is equivalent to the quick icon .

Station design:
design a station and is equivalent to the quick icon .

Add/delete Comat BoxX:
setup an specified number of Comat BoxX controllers in a station and is equivalent to the quick icon .

Design Comat BoxX:
design each input/output of Comat BoxX and is equivalent to the quick icon .

Communication:
display communication data.

Set Batch Ctrl:
Set Batch Process. Being used for the lifetime-control of the ON/OFF of all the Comat BoxX output. (To complete all of the actions in one step.)

Batch Control:
execute the Batch Process.

3.1.3 **User** (Users-Management Instructions)

Users-Management menu is for the management of the operator setup of the whole system, including User Modify Manager, User Manage, User Login and User Logout.

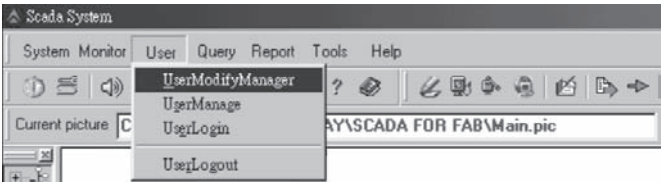

Fig. 3.3
Users instruction

User Modify Manager:

Change the name and password of the system manager.
The default name is Manager and the default password is '0001'.

User Manage:

Add normal users after the system manager login.

User Login:

Users use this menu item to login Comat BoxX Scada system.

User Logout:

Users use this menu item to logout Comat BoxX Scada system.

3.1.4 **Query** (Query Instructions of the System)

In Comat BoxX-Scada System, the menus may be used to query the history records of all measurement values, line diagrams and so on.

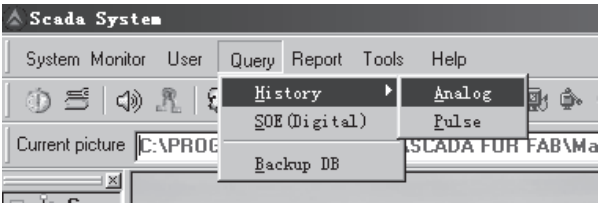

Fig. 3.4
Query instruction

History:

Show the history data of a telemetry signal (analog value).

SOE:

Show all the history data of the switch state (digital value).

3.1.5 Report

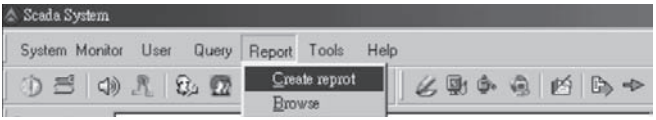

Fig. 3.5

Create Report: Start a new report.
Browse: Browse the report.

3.1.6 Tools

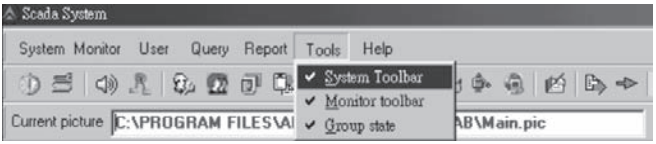

Fig. 3.6
Tools instruction

System Toolbar: Open/Close the System Toolbar.
Monitor Toolbar: open/Close the Monitor Toolbar.
Group state: the state of the group.

3.1.7 Help

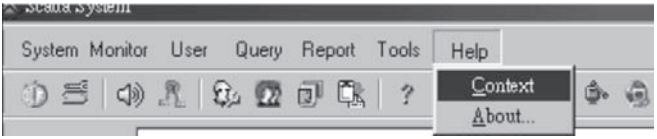

Fig. 3.7
Help instruction

Context: The context help of Comat BoxX-Scada.
About: Brief introduction to Comat BoxX-Scada.

3.2 Operation Instructions and Quick icons in the Drawing Interface

Starting Comat BoxX-Scada system, the monitor interface will be displayed first. Users needs to login to enter the system, and click **<Monitor> <Draw Tools>** or the **quick icon** to enter the drawing interface. The drawing interface is mainly used to edit the site control diagram, connect the site material objects in different control fields and assign physical content to them.

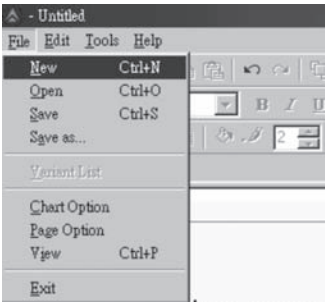

Fig. 3.8
File instruction

3.2.1 **File** (Files management)

New: Open a new drawing page, use the **quick icon** or click **"Ctrl+N"**.
Open: open an existing drawing page, use the **quick icon** or click **"Ctrl+O"**.
Save: save the edited drawing page, use the **quick icon** or click **"Ctrl+S"**.
The default saving directory is .\Comat BoxX-Scada.

Note: Please do not change the saving directory randomly. For the file to be invoked by the system successfully, the file must be saved in this directory.

Save as: change the directory of the existing edited page and save it.
View: view the edited drawing diagrams.
Exit: exit the drawing interface.

3.2.2 Edit

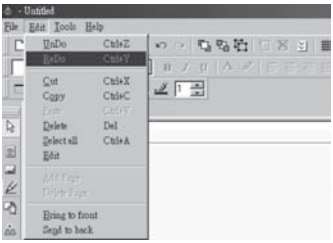

Fig. 3.9
Edit instruction

Undo: undo the editing contents of the previous step.
Redo: clear the undo.
Cut: cut the selected contents.
Copy: copy the selected contents.
Paste: paste the copied or cut contents.
Delete: delete the selected contents.
Select all: select the contents of the whole page.
Bring to front:move to the upper layer.
Send to back: move to the lower layer.

3.2.3 Tools

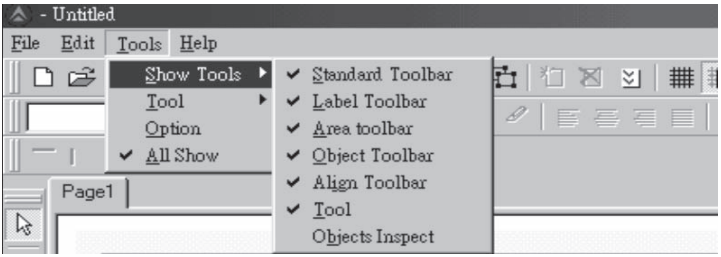

Fig. 3.10
Show tools
instruction

Show Tools: open/close Toolbars.
Tool: select the tools.
Show all: open all Toolbars.

3.2.4 Help

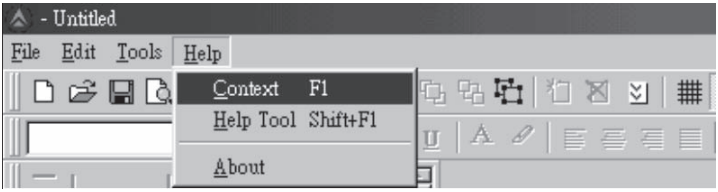

Fig. 3.11 Help instruction

Context: the context help.
Help Tool: the Help Tools.
About: introduction to Comat BoxX-Scada versions.

Chapter IV

Build a Supervisory Control System

In previous chapters we have introduced the Comat BoxX-Scada System Software, this is an industrial software using Comat BoxX intelligent controllers as the field control unit. On the basis of Comat BoxX-Scada System software, you can build a supervisory control system from computer to Comat BoxX according to the specific field environment and control requirements.

To build a complete control system, a Station has to be designed first, then the necessary Comat BoxXs will be setup. After this the control input/output signals relevant to each input/output port and relevant field flow diagram will need to be setup.
The system diagram will be linked to corresponding field control point one by one, thus the system control shall be realised. In order to realise the above procedures, Comat BoxX-Scada System Software provides all necessary operation instructions, these instructions will be introduced in detail in the following text and tableau.

For example, you are about to build a control system for a group of residential quarters. The group of residential quarter comprise 100 households, each of which needs a Comat BoxX. Each household uses a Comat BoxX as the field controller for the theft monitor, the gas leakage monitor, the room illumination monitor, the air-conditioning control, the exhaust fan and the access doors, etc. In the central control room, a computer is set up for real-time control of all Comat BoxXs and thus the state of all of the monitored households. If there is an alarm situation occurring in a household, the relevant Comat BoxX will automatically initiate an alarm and also send the prerecorded emergency call to the preset telephone number.

We can select the networking methods of Scheme 1, communicating via RS485 buses, to complete real time control in this example.

4.1 Station design

Explanations: Generally speaking, a Station is formed by a PC and Comat BoxXs (1~255). The computer is for the human-machine interface, and for carrying out real time control over Comat BoxXs, local or remote, via an RS485 network or telephone line connection via a Modem to realise real time control over various input/output equipment.

The operation for designing a new system is as follows: (You should login first)

1. Click **<Monitor>** **<Station Design>** to open **<Set Station>** dialog box or click the **quick icon** .

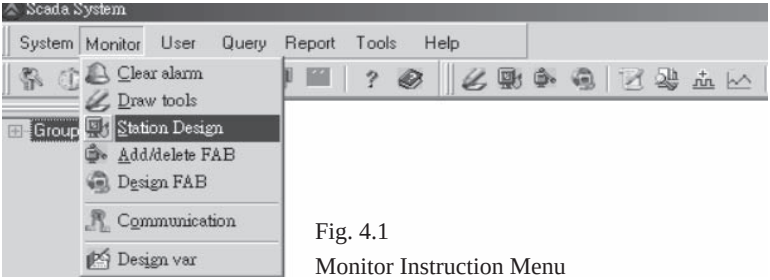

Fig. 4.1
Monitor Instruction Menu

2. A station design dialogue box will automatically appear in the system, as shown in Fig. 4.2.

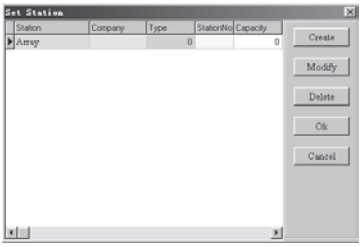

Fig. 4.2
Station Designing dialogue box

3. If you design a Station for the first time, click **"Create"** in the right of Fig. 4.2 to enter station setup dialogue box, as shown in Fig. 4.3. If your system already has a designed station, then click **"Modify"** to modify the existing station and enter station setup dialogue box. Or click **"Delete"** first to delete the existing station and then click **"Create"** to enter the Station Setup dialogue box.

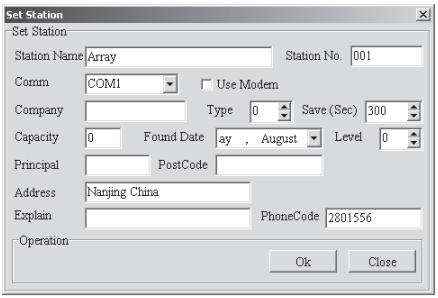

Fig. 4.3
Station Setup dialogue box

The field contents are as follows:

Field Name	**Content**	**Remarks**
Station No	Number of the Station	001 in the example
Station Name	Name of the Station	Sun Garden #1 in the example
Comm	COM Series Connection Port	COM1 in the example
Type	Type	Alternative use
Save (Sec)	Interval of Resources Saving	Preset value is 300 second
Company	Name of the Company	Array in the example
Level	Level	
Capacity	Capacity	
Found Date	The Date of the Founding	2002/1/7 in the example
Principal	Principle	
Post Code	Post Code	21004 in the example
Address	Address	
PhoneCode	Telephone Number	
Explain	Explanation	Residence project in example
Use Modem	Use modem or Not	Not selected in the example

4. In the Station Setup dialogue box, as shown in Fig. 4.3, the Station Name and Comm must be entered and cannot have duplicates, it must be unique. When editing is complete, click **"OK"**, this finishes the setup of the Station Name and the Communication method, then the dialog box, as shown in Fig. 4.4 will appear.

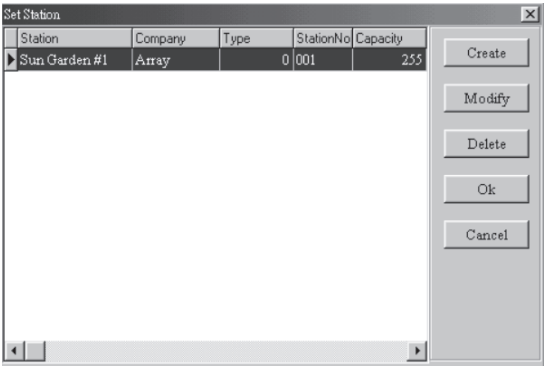

Fig. 4.4
Dialogue box for Definition and Modification of the Station name and Driving Method

5. Select **"OK"** and finish the Station design, and the Station Name being Station and Communication being COM2. These does not apply if **"Create"** is selected.
If **"Modify"** is selected, you can modify the Station Name. And if **"Delete"** is selected, the existing station is deleted.

Note: The Comat BoxXs using the same COM port are considered to be one station. When designing a station, the COMs related to a station should be identical. For upgrade of an existing system, with the expansion or reduction of the system management and the changes of the communication methods, stations can be added or deleted using <**Add/Delete**>.

4.2 Add/Delete Comat BoxX

There are 100 Comat BoxX control units in this example. If you need to add a Comat BoxX in the same Station, you can build them one by one. The operation is as follows:

1. Click <**Monitor**> <**Add/delete Comat BoxX**> per Fig. 4.5, or click the **quick icon** in the Toolbar, the dialogue box, as shown in Fig. 4.6 will appear.

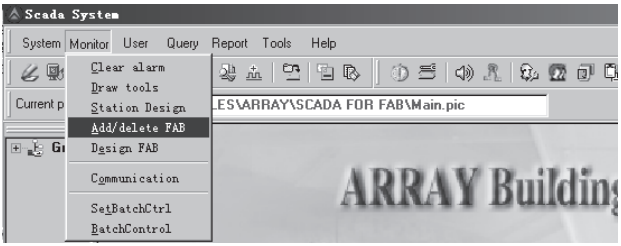

Fig. 4.5
Operation Instructions of Add/Delete Comat BoxX

2. In the dialogue box, as shown in Fig, 4.6, the Station Name is displayed at the upper left hand corner. If you click **"Add"**, you can add a Comat BoxX in the station. If you click **"Delete"**, you can delete a Comat BoxX in the Station. If you click **"Modify"**, you can modify the selected Comat BoxX.

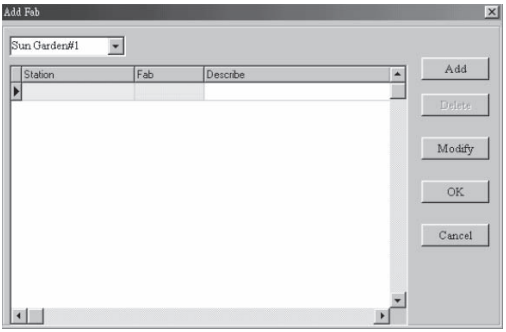

Fig. 4.6
Adding or Modifying Comat BoxX Dialogue box 1

2.1. Click **"Add"** and enter the next Dialogue box as in Fig. 4.7. Enter the Comat BoxX name, Address, Type and Mark.

Note: The Addresses should be unique and be consistent with the Comat BoxX name. For example, for the first Comat BoxX, the name is Comat BoxX1, the Address is 0, the Type is 20-point type and the Mark is 1. Other parameters cannot be modified at the same time.

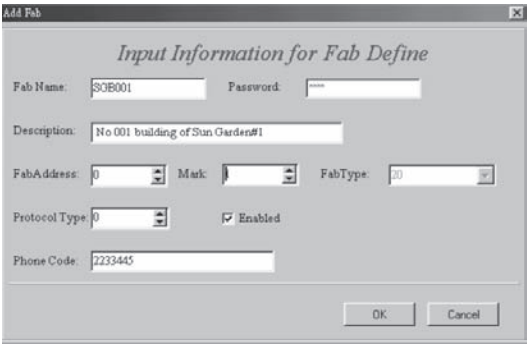

Fig. 4.7
Adding or Modifying Comat BoxXs Dialogue box 2

Field Name	**Content**	**Remarks**
Comat BoxX name	The Name of the Controller	SGB001
Description	Description and Explanation	No 01 building of Sun Garden1
Mark	Using Marks (0-Closing 1-Opening)	
Comat BoxX Address	The Address of the Comat BoxX	The same as the Comat BoxX Address
Comat BoxX Type	The Type of Comat BoxX 10 (point), 20 (point)	
Analog	Tele-metering Data	
Digital	Tele-communicating Data	
Pulse	Tele-pulsating Data	
Protocol Type	The Type of the Protocol	Not used
Enabled	Being Used	
Phone Code	The Telephone Number	

2.2. Click **"OK"** to end the setting up of Comat BoxX1, as in Fig. 4.8.

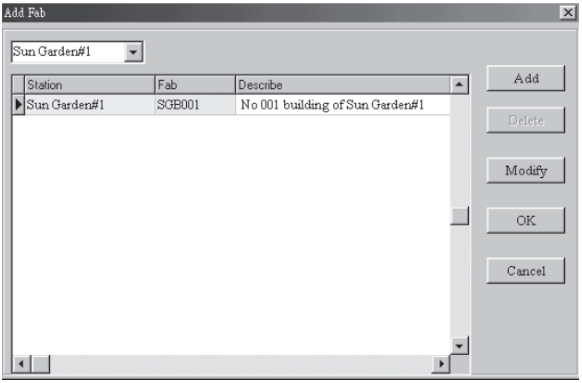

Fig. 4.8
The Controllers
Adding Competition
Dialogue box

2.3. Repeat the above operations and add 100 controllers into the Station Sun Garden #1 one by one as in Fig. 4.9.

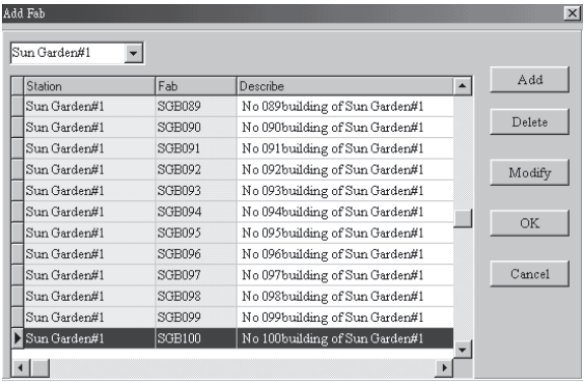

Fig. 4.9
Completing the Add
of 100 Controllers

4.3 Define the Comat BoxX I/O Port

After building the Station and having added corresponding Comat BoxXs, you need to define the I/O ports of the Comat BoxXs to make them consistent with the input signals both in the environment and the field equipment. In the system, the default values of I/O ports are: Digital input point~Digital input point10. If they are inconvenient in actual use. You then need to modify the definition of the Comat BoxX I/O port. The detailed operations are as follows:

Step 1:

Click **<Monitor> <Design Comat BoxX>** or the **quick icon** , the system will display the Comat BoxX definition interface, as in Fig. 4.10.

Fig.4.10
Comat BoxX Defining Dialogue Box

There are three types of I/O Port signals:
1. Tele-metering: the input simulating value of the Comat BoxX.
2. Tele-communicating: the ON/OFF state of the Comat BoxX.
3. Tele-pulsating: the accumulated value of the pulsating value of the Comat BoxX.

The setup of the three I/O types are determined according to the demands of the users. The dialogue frames for the setup of the three types signals: tele-communicating, tele-metering, tele-pulsating are as follows:

A) Digital Points Properties Definition Dialogue Box (Fig. 4.10)

Fig.4.10.1
Tele-communicating Point Properties
Definition dialogue box

The content of each rail is as follows:

Rail Name	**Content**	**Remarks**
Point	Defining the I/O Port	
Alarm Level	The Level of the Alarm	
Property	Property	
Explain	Explanation	
Alarm	Alarm or Not	Not
Control	Controllable or Not	
Sound	Sound Alarm or Not	
Normal Open	Always Being Open	Select one of them
Normal Close	Always Being Closed	
From off to on	From Closed to Open	Select one of them
From on to off	From Open to Closed	
Both	Select the Both States	
Normal Colour	The Normal Colour	
Alarm Colour	The Alarm Colour	

Explanations:

1. Alarm Level: the alarm system can be set into 6 levels. Level 1 is the highest level. The alarm level for each port can be set according to the urgency of the alarm.
2. Controllable or Not Controllable: if the port is set to be controllable, then the computer can control its ON/OFF directly.
3. Sound Alarm Enable and Disable: the alarm message is prerecorded. The addresses of the alarm message are set by Sound On Address and Sound Off Address.

B) Analog ports properties definition dialogue box

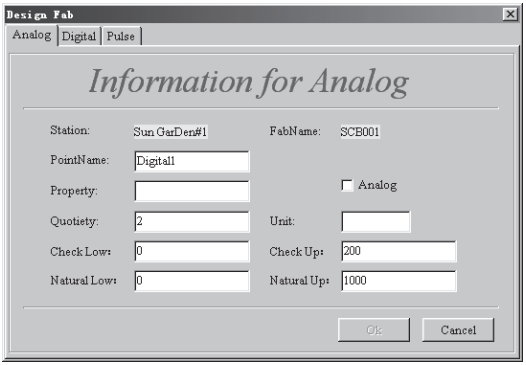

Fig. 4.10.2
Tele-metering Point Properties Definition Box

The meanings of each rail are as follows:

Item	**Content**	**Remarks**
Point	Defining the I/O Port	
Sum	Accumulating the Input	
Simulation	Setting as tele-metering	
Property	Property	
Quotient	Proportion coefficient	
Unit	Unit	
Check low	The Lowest Limit	
Check up	The Upper Limit	
Natural low	The Lower Limit	
Natural up	The Upper Limit	

C) Pulse ports properties defining dialogue box.
The tele-pulsating ports properties defining dialogue box is the same as the tele-metering ports properties defining dialogue frame.

Step 2:

Click the **name of the station** to be controlled and the **name of the port** to be detected, the resources, signals and corresponding message of the Comat BoxXs at the station will be displayed automatically. For example, in Interface 4.10, click Station Name “Sun Garden #1” and Comat BoxX Name “SGB001” the interface as in Fig. 4.11 will be displayed.

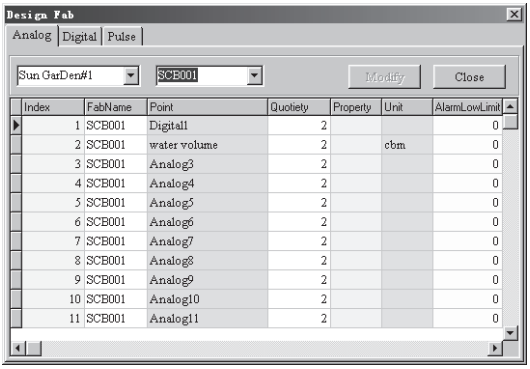

Fig. 4.11
Defining the Comat BoxX I/O Ports

In the table, the corresponding resources of the 20 I/O ports (12I/8O) of SGB001, 1~20 are displayed. Select the **item** to be modified and click “Modify”, the following dialogue frame in Fig. 4.12 will be displayed.

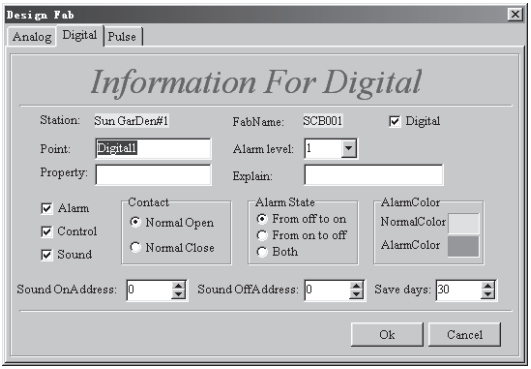

Fig. 4.12
Defining the Port II of Comat BoxX SGB001

In this example, Port II of Comat BoxX SGB001 is a tele-communicating port:
Point Name: Infrared Detector.
Alarm Level: 1 (The alarm levels of the system may be different from each other.
And the highest level is 1.).
The point is an alarm port, and is non-controllable and provides for an audible alarm.
The contactor is normally open.
The alarm state is from OFF to ON.
Normal Colour is green, (It may be set by clicking the rectangle on the left of the Normal Colour.)
Alarm Colour is red.

Step 3:
Define **Port I2 of Comat BoxX SGB001** using the same method, as in Fig. 4.13.

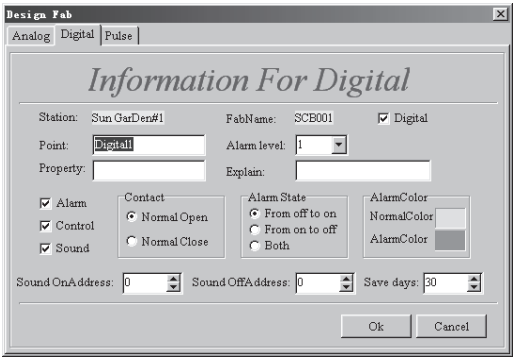

Fig. 4.13
Defining the Port I2 of Comat BoxX SBG001

Port I2 of Comat BoxX SGB001 is a tele-communicating port.
The Point Name is gas detector.
The alarm level is 1. (The alarm levels are set into 6 levels by the system and the highest level is 1.)
The point is an alarm port.
The port is controllable and provides for an audible alarm.
The contactor is normally open.
The alarm state is from OFF to ON.
The normal colour is green.
The alarm colour is red.

Step 4:

Set Port I3 as the Light detector by the same method as above.

Step 5:

Set **Port I4, Port I5 and Port I6** as **Water volume-Gas volume-Electricity value** respectively, as in Fig. 4.14.

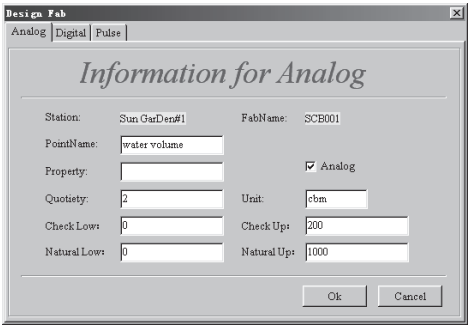

Fig. 4.14
Defining the Tele-metering Port

Step 6:

Define **Port I7~I12 as spare ports**, not being used for the time being.

Step 7:

Define **Port O1~O5 as Fan Lamp Door lock, Cooking pot, Air conditioner,** respectively.

They are all tele-communicating ports as in Fig. 4.15.

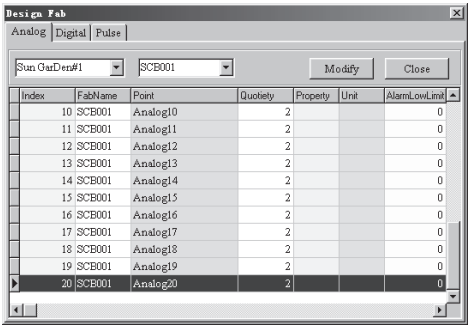

Fig. 4.15
Defining 01, 02, 03, 04, 05

Step 8:

Define Port I8~2O(O6~O8) as spare ports. They are not used for the time being.

In the above, the definition of all of the input and output ports of Comat BoxX SGB001 are complete. Then define all of the input and output ports of Comat BoxX SGB002 by the same methods as above. The only difference is that the ports number of Comat BoxX SGB002 are 21~40. Using the same procedure as above, complete the definition of the input and output ports of all 100 Comat BoxXs.

Note: The sound file name of the sound alarm is sound.wav. In the example, for the tele-communicating port 1, Sound On Address is 0 and Sound Off Address is 12. For tele-communicating port 2, the address of Sound On Address is 1 and the address of Sound Off Address is 13. By recording the different files, the voice prompting function can have different messages.

4.4 Drawing Monitoring Interface

The Comat BoxX-Scada System provides some drawing editing function and allows the you to edit all kinds of monitoring diagrams according to the actual situation.

To illustrate a complete system click the **<Monitor Set-Drawing Tools>** in the main function listing or click the **quick icon** .

The following drawing interface, as in Fig. 4.16, will automatically be displayed in the system.

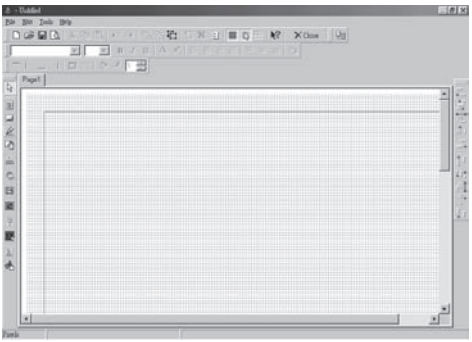

Fig. 4.16
Drawing Interface

4.4.1 Operation Instruments In Drawing Interface

There are four main pull-down menus: File, Edit, Tools and Help.
File is mainly used for files management, such as New, Open, Save and Page Set as in Fig. 4.17.

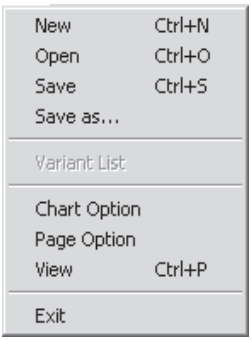

Fig. 4.17
File Menu

Edit is mainly used for the function of cutting, copying or deleting of the drawings as in Fig. 4.18.

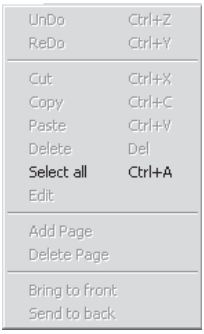

Fig. 4.18
Edit Menu

Tools has four options and the first two options have their own sub-function listing. And their main function is for the open and close of all other tool bars as in Fig. 4.19.

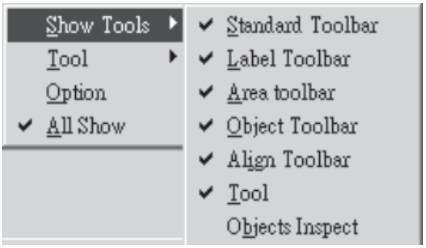

Fig. 4.19
Tools Menu

Help is used to open the help files as in Fig. 4.20.

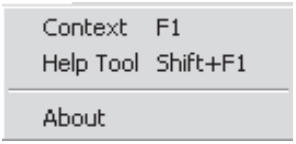

Fig. 4.20
Help Menu

4.4.2 Drawing Tools

1. Basic tools: mainly used for the editing of the text.

BasicTools					
New		Set as the upper layer		Return to the pre-step operation	
Open		Add a Page		Help	
Save		Delete a Page		Set as the Bottom Layer	
Preview		Select All		Close the Drawing Interface	Close
Cut		Page Set		Cancel the Pre-step operation	
Copy		Paste		Show the Grid	

2. Text property Tools: mainly used for the text edit in the procedure drawing.

Text Property Tools		
Font Set	Size Set	Gothic Set
Italic Set	Underline Set	Font Colour Set
Paragraph In the Middle	Right-justify	Align In the Middle
Right-justify	Halve the Interval	Paragraph on the Top of the Page
High Metering Properties Set	Paragraph at the bottom of the Page	Horizontal and Vertical Paragraph Switching

3. Main Drawing Tools: used for the building of the building frame, hot area definition and Comat BoxX definition.

Main Drawing Tools	
Define text and Tele-metering Point	Draw Horizontal and Vertical Line
Insert Basic Frame (Rectangle, ellipse and so on.)	Define Tele-Communicating Point
Insert Spot-Diagram	Define hot area
Define Pulsating Value	Define Comat BoxX
Define Comat BoxX	Define Comat BoxX
Define Comat BoxX	

4. Justifying Tools: Used for arranging the texts and the diagrams in the files in specified order.

Justifying Tool Bar			
Left Justify		Right Justify	
Equal horizontal spacing		Halve intervals vertically	
Align in the middle vertically		Align in the centre	
Bottom Justify		Top Justify	
Equal vertical spacing		Align Group in the Centre	

5. Grids Setting Tools: Used for the frame lines and the colours of the diagrams setting.

Internet Setting Tools			
Top line rim		Bottom line rim	
Right line rim		Left line rim	
Whole line rim		Cancel line rim	
Set drawing pen colour		Set drawing pen width	
Set the colour degree of the form background	1		

4.4.3 Drawing the Monitoring Diagram

4.4.3.1 Page Setting

This function is mainly used for the page size and background colour setting, etc. Select File **<Page Option>** or double click the **<Page Zone>**. The page setting Dialogue box will be displayed, as in Fig. 4.20.

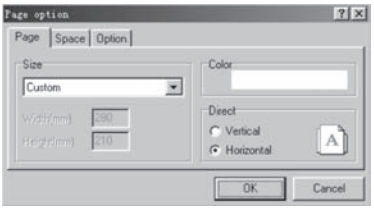

Fig. 4.20
Page-setting Dialogue Box

Select the Page Number: In the tabulate, select or self-define the size of the page. Double click the **rectangle zone in the Colour** to set the background colour of the page as in Fig. 4.21. And the page can be set in long or cross direction.

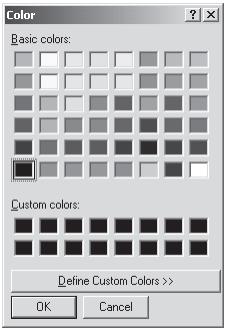

Fig. 4.21
Colour Set

Select the Space Page to set the blank space at the margin. If you select **<Enable>** then the blank space will be effective and at the same time the size of the blank space zone can be modified, as in Fig. 4.22.

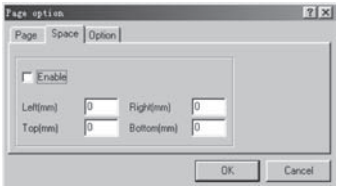

Fig. 4.22
Set the Size of the Blank Space

4.4.3.2 Draw the Monitor Diagram

In this system basic drawing tools are provided, such as inserting basic objects, pictures, inserting BMP picture files, inserting animated pictures, invoking the information and resources of the Comat BoxXs, drawing the basic picture frame and inserting the special objects pictures.

Step 1:

Insert basic objects and BMP pictures:

Previously we mentioned that we provide some component pictures frequently used in the automation control system, such as a valve, water pump, electric motor and so on, for the users to invoke directly. These can be invoked from user-made BMP picture files. The detailed operations are as follows.

1. Click the button and move the mouse to the **drawing interface**, the dialogue block as in Fig. 4.28 will be displayed.

Fig. 4.23
Set the Background Diagram of the Page

2. According to your needs, click the required **component picture** in the following pictures. For example: click **"Valve"**, then valves of all shapes will appear.

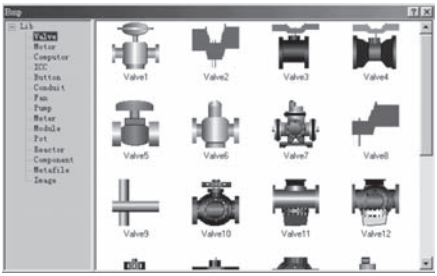

Fig. 4.24
Set the Background Picture of the Page

Similarly, you may select the other diagrams, here we will omit the detailed procedure. When you select the **<Image>** option, as in Fig. 4.30, you may insert the **BMP picture files**.

Fig. 4.25
Inserting BMP Picture Files

Select <Load> in the above figure, the system will prompt the files-opening dialogue frame as in Fig. 4.26. Select and open the home2.bmp and click “OK” thus the home2.bmp will be added to the diagram editing. You can move the inserted pictures and zoom them in and out.

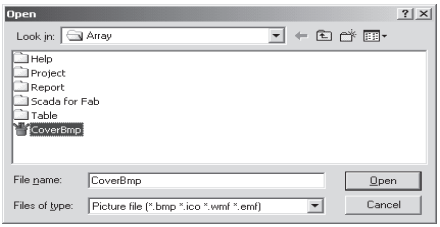

Fig. 4.26
Files Opening Dialogue Frame

After inserting a selected picture, you may obtain the ideal visual effects by zooming in/out and moving the position. Simultaneously, the adjusting tools previously noted, can adjust the picture position as required. The picture can then be set to different colours.

Step 2:

Insert Basic Shape Form

1. Click the **quick icon** then move the mouse to the **drawing interface**. The following dialogue frame, as in Fig. 4.27, will be shown.

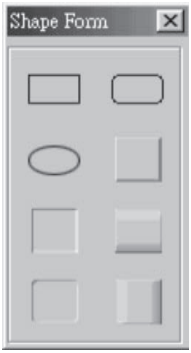

Fig. 4.27
Insert Some Basic Shape Form

2. Click any **basic shape form** you need, then the shape form can be easily inserted into your drawing interface. The system provides for 8 types of basic shape forms, including: the block flow diagram, the circumference diagram, the block flow with round corners and the cylinder diagram, etc.

Step 3:

Insert Animated Pictures

This function is mainly used to dynamically show the state of the input and output of equipment. For example, the exhaust fan is working, and so on. You may need to formulate some animated pictures of the exhaust fan running and save the pictures in the form of an animated picture. For example, to save the animated pictures file as fan.gif.

1. Click the **quick icon** and move the mouse to the **drawing interface**, then the dialogue frame, as in Fig. 4.28, will be shown in the system as below.

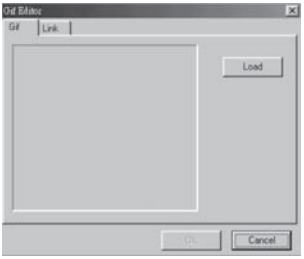

Fig. 4.28
Insert Animated Picture 1

2. Select and click **<Load>**, the system will prompt the path to save the file fan.gif ,Click the **file name** and **<Confirm>**, then the files will be inserted.

3. Select and click **<Link>**, the system will display the dialogue frame as in Fig. 4.29. Select the Comat BoxX I/O Port of the working station that actually corresponds to the exhaust fan and then click **<Confirm>**. The animated picture insertion and interconnecting is then complete. When the exhaust fan is running normally, the required operating conditions being satisfied, its state will be transferred in real-time to the monitoring system. It will be shown in the designed animated pictures. With this function you may observe the running state of any equipment graphically.

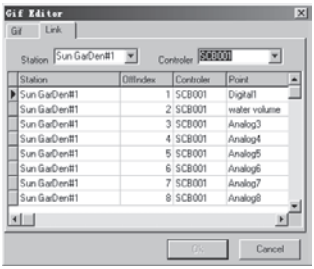

Fig. 4.29
Connect the Input and Output of Animated Picture and Comat BoxX.

Step 4:

Insert Comat BoxXs

The system provides the function which enables the Comat BoxX to be inserted directly, with the resources of the input and output ports, and directly show in the running diagram. If an input/output port is a switch value, the ON/OFF state can be seen in the monitoring interface. If an input/output port is an analog or a pulse value, the value of the analogue or pulse can be shown in real-time in the monitoring interface. Before running the function you need to save the pictures of the Comat BoxX under the path .\SCADA.

1. Select and click **the icon** and move the mouse to the drawing interface, the dialogue frame as in Fig. 4.30 will be shown in the system. Then select the corresponding Comat BoxX.

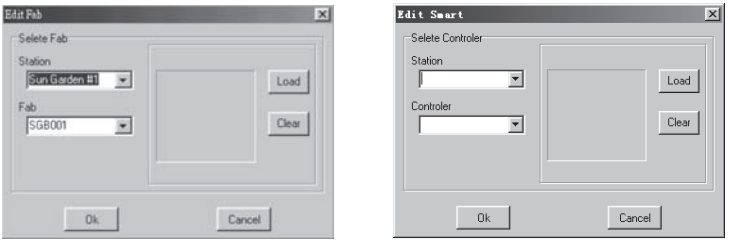

Fig. 4.30 Insert Comat BoxXs

2. Write down the picture of the corresponding Comat BoxX, as in Fig. 4.31, and the click **<Confirm>**. Thus the insertion of the Comat BoxX is complete.

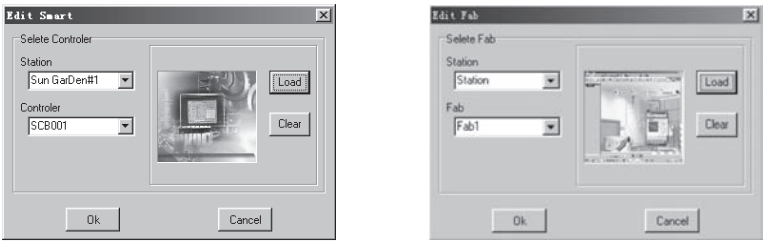

Fig. 4.31 Interface of Inserting Comat BoxXs

Step 5:

Insert OLE Objects

The system provides for a direct access function for all the of the pictures of measuring instruments. This function is mainly used for the access of the tele-metering signals.

1. Select **and click** and then move the mouse to the drawing interface, then the dialogue frame, as in Fig. 4.32, will be shown in the system.

2. Select the corresponding icon button of the required object and connect to the corresponding tele-metering signal port. The port: such as manometer, thermometer, level gauge and so on, will then be monitored in real-time.

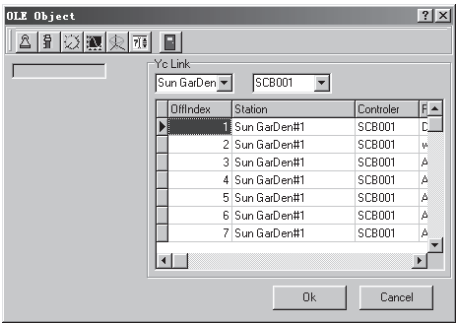

Fig. 4.32
Insert OLE objects

Step 6:

Insert Chart Pictures

This function is mainly used for the direct access of tele-metering signals and provides for the block flow diagram, the circumference diagram, the block flow with round corners, the cylinder diagram and so on. This feature makes the monitoring of the tele-metering signals more straight forward and clear.

1. Select and click the **quick icon** and then move the mouse to the **drawing interface**, and the dialogue frame, as in Fig. 4.33, will be shown in the system.

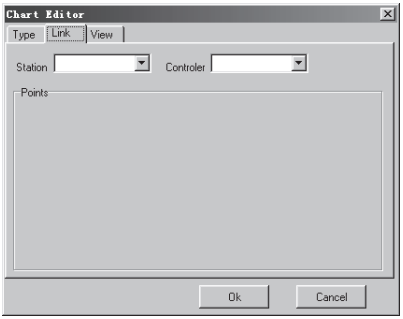

Fig. 4.33
Insert Chart Diagram and Form

2. Select the **Input port of the Comat BoxX** to be defined. Click **"Type"** and select the required shape form, as in Fig. 4.34.

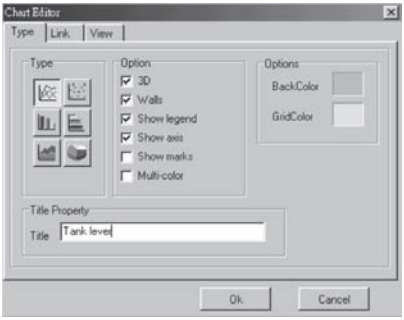

Fig. 4.34
Select the Diagram

3. Click **<Confirm>** to confirm and the setup is completed. During the normal execution of the system, the diagram will be shown as the analog value received from the site.

Step 7:

Define Hot Area

As for any complex monitoring system, you cannot monitor by the use of one diagram. You will need many diagrams for monitoring. You will need to build lines between the pictures to realise the related switching between the graphics.

Fig. 4.35
Define the Hot Area

As in Fig. 4.35, the main monitoring diagram, there are Brief Introduction of Array-System Arrangement Diagram and so on. Click **<Supervisor of the Office>**, and then the corresponding household monitoring diagram, as in Fig. 4.36, will be shown in the system. This link is called the Hot Area.

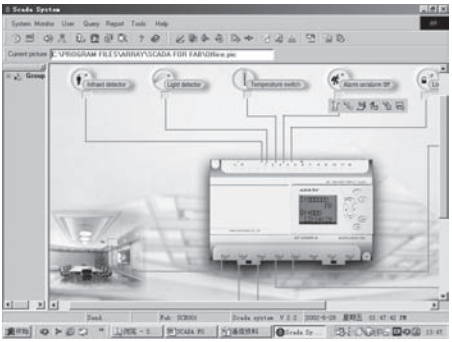

Fig. 4.36
Family Monitoring Diagram

The methods of hot area definition is as follows:

1. Click the **quick icon** of the hot area move the mouse to the **position in which to put the hot area**, then move it together with the rectangle appearing and click the **position where the rectangle appears**, then the dialogue frame, as in Fig. 4.37, will be shown. If you want to modify the defined hot area, just double click **the hot area** in the drawing diagram and the hot area definition dialogue frame, as in Fig. 4.37, will be opened.

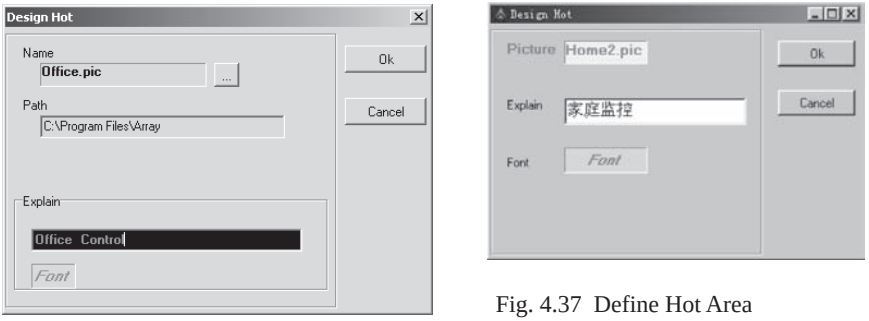

Fig. 4.37 Define Hot Area

Name:

Select the **Name files** and click the **rectangle zone** on the right of Picture, and the file open dialogue block, as in Fig. 4.38, will be seen. Select the **directory path** (the same directory as the Comat BoxX-Scada). If the Office.pic file exists, select the **picture file** and then the diagram corresponding to the Hot Area household Monitor is set as the picture Office.pic.

Explain:

The explanation of the picture files. Input a paragraph of **abstract explana-tion** in the editing diagram on the left of Explain, and the words will be dis-played in the picture diagram. If there is no input, the diagram will display the background contents in the transparent manner, thus to realise the hot area definition of the background. For example, all the hot areas on the main diagram are produced on the same background diagram.

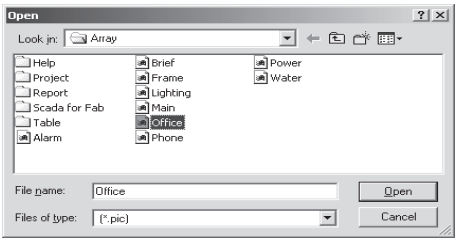

Fig. 4.38
Select the Picture Files

Font:

Set the font of the explanation word. Double click the left zone of **Font**, the font setting dialogue frame, as in Fig. 4.39 will be seen. The shape, size, colour and so on can be set in the dialogue block.

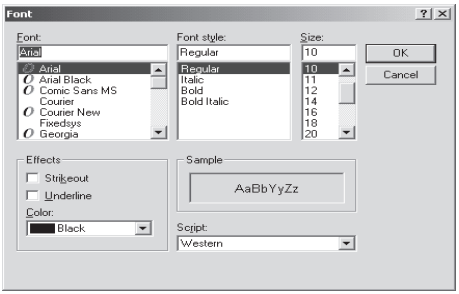

Fig. 4.39
Set Font Properties

2. Set Hot Area background. Click the **quick icon** of the background setup, the dialogue block, as in Fig. 4.40 of colour will be seen. The background colour can then be set in the diagram.

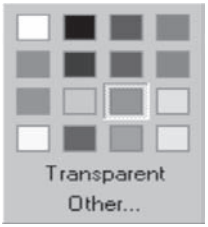

Fig. 4.40
Set the Background
of the Hot Area

Step 8:

Setup the Input and Output ports.

After editing a monitoring diagram, all of the input and output ports of the Comat BoxX in the diagram need to be shown so as to achieve the monitoring of the ports. As for different signal ports, such as tele-communicating, tele-metering and tele-pulsating, you will have different setup methods and the details are as follows:

1. Setup the Tele-communicating Point.

Select and click the **quick icon** , then a small green check (meaning the monitoring point) will appear in the diagram and at the same time the system will prompt the dialogue frame, as in Fig. 4.41. In the Link page click the **station-listing frame** and select the station named **"Sun Garden#1"**, at the same time list all of the Comat BoxXs of the station in the controller-listing frame. Then select the first **"Comat BoxX SGB001"** and select the **Infrared detector** (when the Comat BoxX is defined). All of the I/O ports of the Comat BoxXs will be shown in a list. Thus the definition of a tele-communicating point is done. During the normal operation of the system, the state of the I1 of the SGB001 will be shown by the green check.

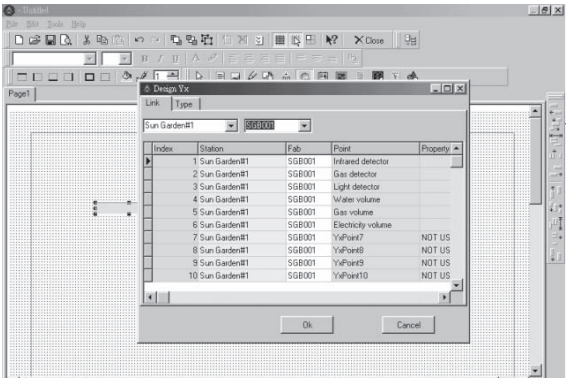

Fig. 4.41
Tele-communicating Port Setup Dialogue Frame

2. Setup the Tele-metering Point and theText Frame.

Select and click the **quick icon** and move the mouse to the **corresponding position**. The following dialogue, in Fig. 4.42, will appear.

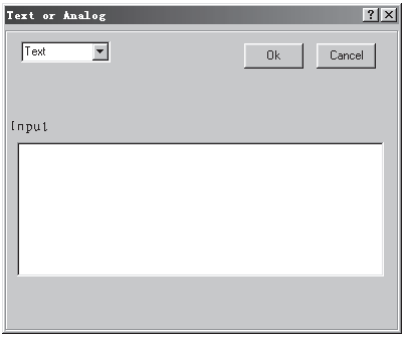

Fig. 4.42
Tele-communicating Point and Text Frame Setting up Dialogue Frame 1

There are two options: Text and Remote measurement (digital input) in the pull-down menu at the upper-left corner in the diagram. Select **<Text>**, and the text can then be placed. Enter the text in the Input zone and then click **"OK"**. The text is then placed. The text is used for the title and for explanatory notes and can be used for tele-communicating and tele-metering points.

Select **<Remote measurement>,** and the tele-metering point can be placed. Select and click the **Link page** and then the dialogue frame for placing tele-metering point, as in Fig. 4.43, will be displayed. The two pull-down menus are used for selecting the station name and the Comat BoxX name.

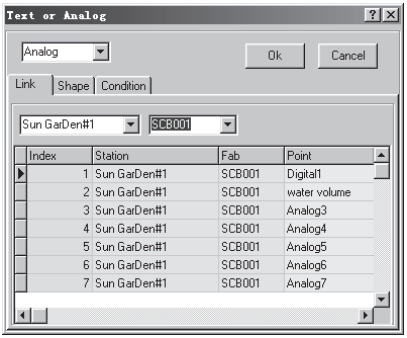

Fig. 4.43
Tele-metering Point Setup Dialogue Frame

Select **<Sun Garden #1>** in the station-listing table and select **SGB001** in the list of Comat BoxX's. Thus the listing menu will show all of the information of the tele-metering SGB001. Select **<Remote measurement point 3>** in the listing table and click the **"OK"** button. Thus the placement of the tele-meter-ing point Remote measurement point 3 and the connection of the relative resources are completed. The details are as in Fig. 4.44.

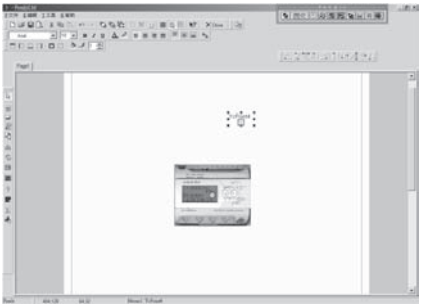

Fig. 4.44
Complete the Setup of
Tele-metering Placement

Select and click **Shape** in Fig. 4.43, and you can select the shape form of the tele-metering point unit as in Fig. 4.45.

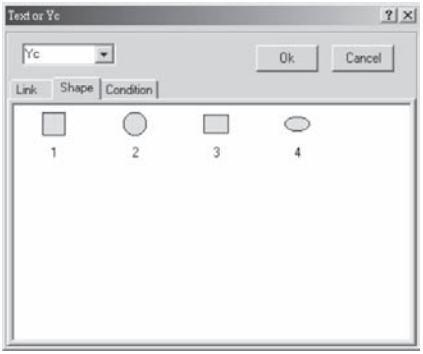

Fig. 4.45
Select the Shape Form of the
Tele-metering Point

3. Setup the Tele-pulsating Point.
Select and click the **quick icon** and move the mouse to the **corresponding place**. Then the dialogue block of setup the tele-pulsating point, as in Fig. 4.46, will be displayed by clicking the mouse.

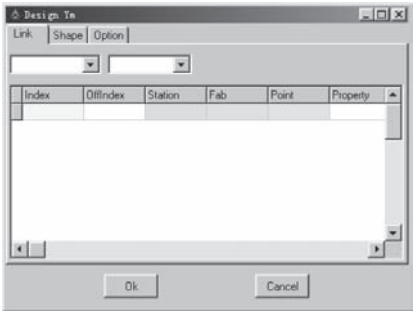

Fig. 4.46
Dialogue Block for Placing the Tele-pulsating Point

In the dialogue block, the connection of the resources and selection of the shape of the units can be carried out. The operating methods are the same as setup the tele-metering point, we will skip the details here.

By the drawing methods mentioned above, drawing lines, drawing diagram shape, inserting diagram shapes, inserting BMP picture files, inserting animated picture, inserting Comat BoxX, setup the hot area, setup the input and output controlling ports and so on, the contents of the monitoring diagram will be a true reflection of the site being controlled. Click **"Save"**, the system will automatically save the picture in the form of *.frf under the path of .\SCADA FOR Comat BoxX. Using the same methods, complete the drawing of all the pictures that the system needs, including the main diagrams and the sub-diagrams, and save them. Then build the connections between all of the picture files, by the defining hot area using the method mentioned before. Thus the system will be built and completed. In order to tidy up and beautify the diagram, you can set the system by the adjusting tools and the background colour setup methods and carry out the editing operations such as modification and deletion by the editing tools.

Note: Please name the picture file of your main monitoring interface as main.frf. During the system startup, this main diagram will be shown in the system. Please refer to the household-monitoring system attached to the CD-ROM.

4.4.3.3 Analyse the Communicating State

Click the menu **<Monitor> <Communication>** as in Fig. 4.47.

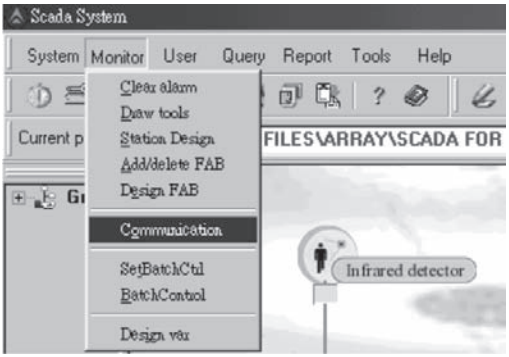

Fig. 4.47
Menu <Monitor> <Communication>

The Comat BoxX-Scada System provides the function of showing the binary codes of the Comat BoxX as in Fig. 4.48.

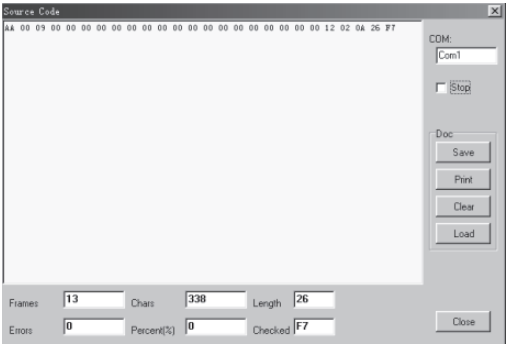

Fig. 4.48
Analysing Diagram of the Communicating State

Function:

1. The dialogue block records the communicating time, the number of the accepting character, the length of the frame, the time of the errors and calculates the rate of error codes.
2. If you need to observe carefully the current information, just click **"Stop"** to pause.
3. The current resources in the files which may need to be analysed and/or used can be saved.
4. The original resources of the current frame can be printed.

Chapter V

User Management

When considering the security of the system, it is necessary for you to manage all of the customers in the whole system. Only the users with the appropriate authorities can enter the system to observe or modify it. User Management mainly includes Modify Manager Name, Append, Delete and User Login function items as in Fig. 5.1.

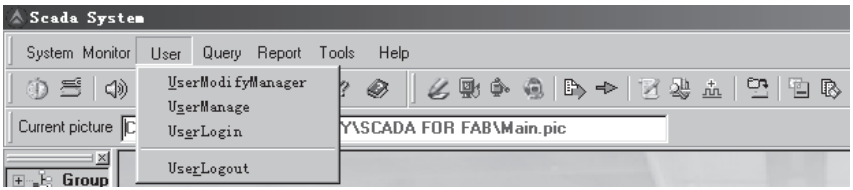

Fig. 5.1 User Management

5.1 Modify Manager Name

Select **<User> <User Modify Manager>** function item, as in Fig. 5.2 or click the **quick icon.**

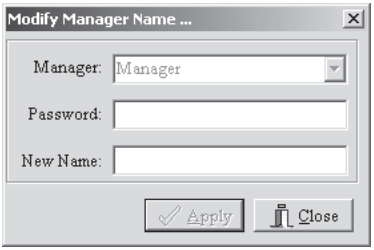

Fig. 5.2
Modify Manager Name

In Fig. 5.2, select **<Manager>** and enter the **password** "0001" then enter the **new manager name** and click **"OK"**. The function of modifying the manager name is done. (The default manager name is Manager and the default password is 0001).

5.2 User Management

This function item is only for the use of the manager. It mainly includes Append, Delete and Modify Password (including the manager's password). The details are as follows in Fig. 5.3.

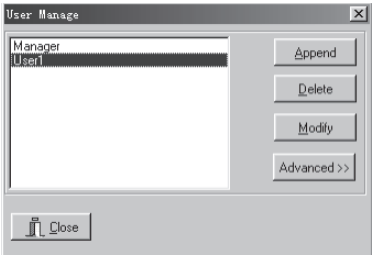

Fig. 5.3
User Management

5.2.1 Append

Select and click **"Append"** as in Fig. 5.4. In the interface enter **the user name, password,** and then confirm the password. If the user's name exists, the system will prompt for it to be re-entered. The password and its confirmation must be the same. Finally click the **"OK"** button.

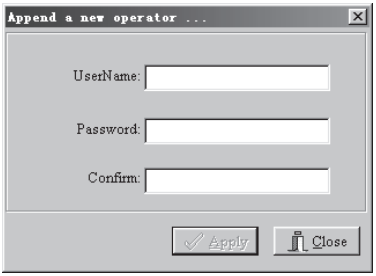

Fig. 5.4 Append

Fig. 5.5 Delete

5.2.2 Delete

In Fig. 5.5, select the **user's name** to be deleted in the listing table and click **"Delete"**, then the prompting dialogue block as in Fig. 5.6 will be displayed to prompt you whether you really want to delete the user.

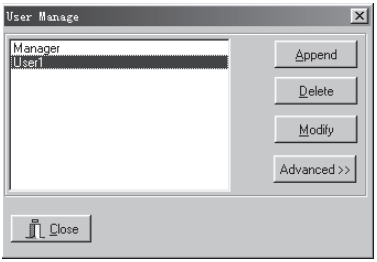

Fig. 5.5 Delet

Fig. 5.6
Confirming Dialogue Frame

5.2.3 Modify the Password

Click the **user's name** (including the manager) to be modified and then click **"Modify"** as in Fig. 5.7. Enter the **old password** and the **new password**, and then confirm the **new password**. The new password is to be **entered twice**. Finally click the **"OK"** button and the password is changed.

Fig. 5.7
Dialogue Frame for Modifying Password

5.2.4 Query the User Information

Select and click **"Advence"**, the dialogue block as in Fig. 5.8 will be displayed and the information of all the users will be shown in the listing table. Clicking **"Advence"** again will cancel the listing table shown.

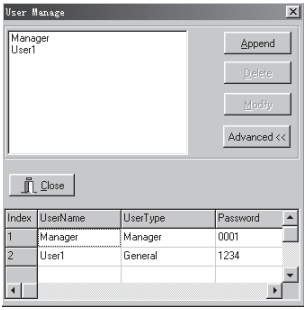

Fig. 5.8
Querying the Users' Information Dialogue Frame

5.3 User Login

When entering the system, the user is authorised, within the scope of the authority, to carry out general operations. The user must login ,as in Fig. 5.9, for more advanced operations. Login can only be tried for three consecutive times. If the user fails to login after third time, the system will exit automatically. If the user does not carry out any operation after login the system will automatically cancel the authorities of the current user and authorise the user as general operator again. If the user must log in if there is a need to carry other operations.

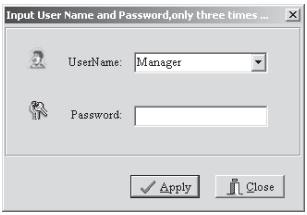

Fig. 5.9
User Login Dialogue Frame

Note:
After entering the password the Enter key or the "OK" button must be clicked!

5.4 User Logout

The user will need to logout when the user is out of the office. Other users will need to login as required. This feature provides the security for the system.

5.5 Explanations for User Authorities

Manager (one only): Having access to all of the functions.

General User (may be several): Not having access to the following functions
<Deploy><Clear Alarm> <Draw Tools> <Station Design>
<Add/Delete Comat BoxX> <Design Comat BoxX> <BatchControl>
<UserModifyManager> <UserManage> <Backup DB> <Create Report>

User with Lowest Authority (Non User): Not having access to the following functions.
<Deploy> <Clear Alarm> <Draw Tools> <Station Design>
<Add/Delete Comat BoxX> <Design Comat BoxX> <BatchControl>
<UserModifyManager> <UserManage> <Backup DB> <Create Report>
<Set Comat BoxX Time>

Explanation: When all of the users logout of the system , the system will automatically be set to the state of lowest authority.

Chapter VI

System Configuration

The System Configuration Part includes the following function such as Set Comat BoxX Time, Print, Deploy and Exit. Click the main menu **<System>** and select the operation item from the pull-down menu, or click the **quick icons**, as illustrated, to carry out the desired operations.

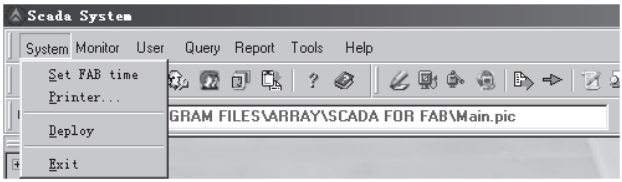

Fig. 6.1
System Configuration Instruments Selecting Menu

6.1 Set Comat BoxX Time

At the time when the system has been completed, or after a period time when the system has been running, it is necessary to set the time for each Comat BoxX using the upper computer as the reference time. This step is necessary to guarantee the agreement of the times between each Comat BoxX and the upper computer. The detailed procedure to accomplish this is are as follows:

1. Select and click the option **<System>** **<Set all Comat BoxX Time>** then a dialogue frame to carry out the operation of setting the time will be displayed in the interface, as in Fig. 6.2.

Fig. 6.2
Dialogue Frame for Setting Comat BoxX Time

2. Select **"Yes"** to realise the function of time setup.
This function is used for synchronizing the time of all Comat BoxXs to the time of upper computer so that the upper computer can effectively manage all of the Comat BoxXs simultaneously.

6.2 Print

1. Select and click the options **System Print**, then a dialogue block required to carry out the print setup operation will be displayed in the interface as in Fig. 6.3.

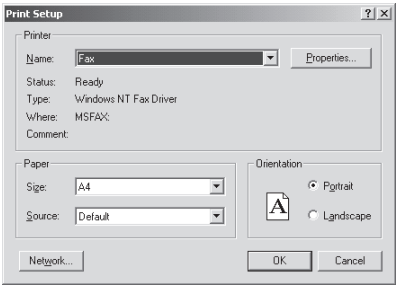

Fig. 6.3
Print Setting Dialogue Block

6.3 Deploy

After editing a monitoring system, you will be able to package all of the diagrams and relative configuration files into a project files. For example, the household-monitoring system can be packaged into a text file named Home2.mmm and it can then be deployed to other computers. Other computers may unpack the text file and rerun all of the diagrams and configuration files. The detailed operations are as follows:

Select and click **<Deploy>** or the **quick icon** , then the following dialogue block, as in Fig. 6.4, will be displayed in the interface.

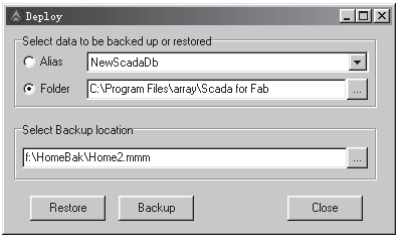

Fig. 6.4
Dialogue Block for
Back-upping and rerunning

1. Backup

- Select the database: In Select data to be backed up or restored to select **Alias** is to package the data base and to select the **quick icon** ... on the left of Folder is to select the current path of Comat BoxX Scada. For example, c:\Program Files\array\SCADA for Comat BoxX is to say that Comat BoxX Scada is under the directory of c:\Program Files\array\SCADA for Comat BoxX.
- Set the **saving directory** and **file name** for the packaging files. For example: Set the path as f:\HomeBak and set the file name as Home2.mmm.
- Select and click **"Backup"**, the system will package and zip files.
  With the above procedures, Comat BoxX-Scada will package all of the files under the directory of c:\Program Files\array\SCADA for Comat BoxX into the file f:\HomeBak\Home2.mmm.

2. Rerun

- Select the **path** to be rerun or click the **quick icon** ... of **Folder** and set the path as: D:\Scada
- Select the **file** to be packaged or click **quick icon** ...
  Select **Backup location** and find the file F:\HomeBak\Home2.mmm.
- Select and click **"Restore"**, and the system will enter the state of disconnecting the package.

3. After the completion of disconnecting the package, the system will prompt to restart the Comat BoxX-Scada system.

By the use of above procedures, Comat BoxX Scada reruns the packaged files Home2.mmm under the directory F:\HomeBak to the directory D:\Scada.

Chapter VII

Data Query

Many different type of data are produced in the process of the system operation.
The Comat BoxX-Scada software provides the function of data querying and backup..

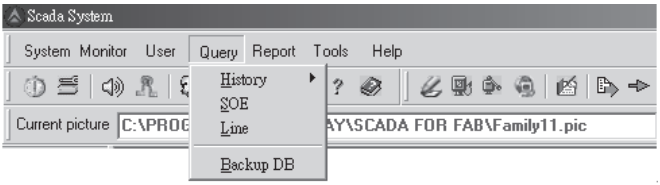

Fig. 7.1
Data Query

7.1 Data Query

1. The Tele-metering History Data Query:
Select and click **<Query> <History> <Remote measurement>**, the dialogue block as in Fig. 7.2 will be displayed. Select **<Sun Garden #1>** in the station-listing table and select **Comat BoxX2** in the Comat BoxX listing table, then select the date. The system will list all of the related data and show the history changes of the tele-metering point in the form of a line diagram.

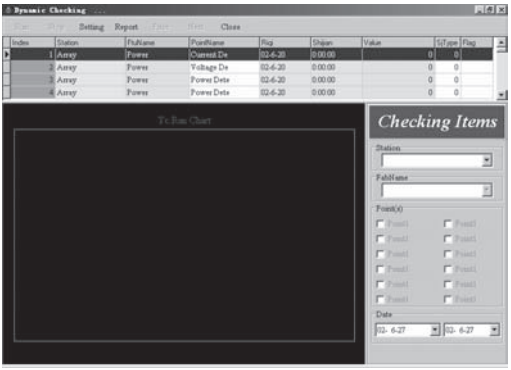

Fig. 7.2
History Data of
Tele-metering Point

2. The Tele-pulsating History Data Query: This is similar to querying the tele-metering history data, as in Fig. 7.3.

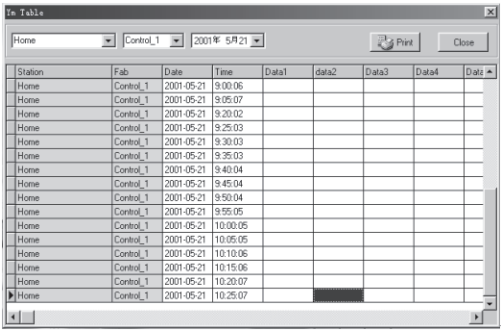

Fig. 7.3
Tele-pulsating History Data Query

3. The Tele-communicating Data Query

A) Data Query: As in Fig. 7.4, select the conditions to be queried in the figure and then click the **quick icon**

.

The relationship between the conditions is AND.Thus the relative data will be shown in the interface.

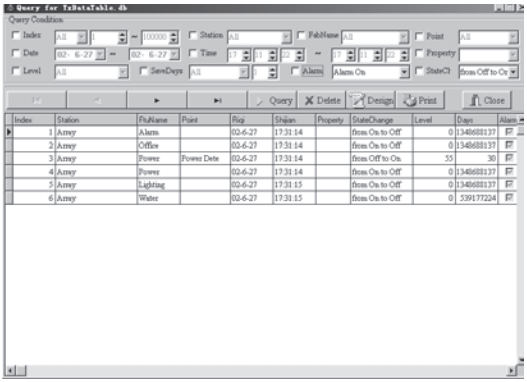

Fig. 7.4
Tele-communicating Data Query

B) Alarm Off: Double click the **top of the record** to cancel the alarm. Then click **"Yes"** in the dialogue block shown at the same time, as in Fig. 7.5.

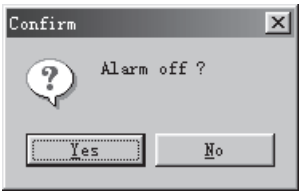

Fig. 7.5 Alarm Off

C) Delete the Records of Alarm Off or Over the Save Days: Click **"Delete"**, and the dialogue block, as in Fig. 7.6, will be displayed on the interface.

Fig. 7.6
Records Deleting Dialogue Block

Select the **record type** to be deleted in the dialogue block Alarm Off /Over the Save Days, then select the **user** as manager and enter the **password**.
Click the button **"OK"** will change Comat BoxX-Scada into the operation state. Click **"OK"** and the system will display the confirmation dialogue block.
Select **"Yes"** to delete the record.
It will take a while if a large amount of data is to be deleted.

D) Design the Report: Select and click **"Design"** and you will then enter the diagram of the designing report, as in Fig. 7.7.
You can then design various reports according to your requirements.

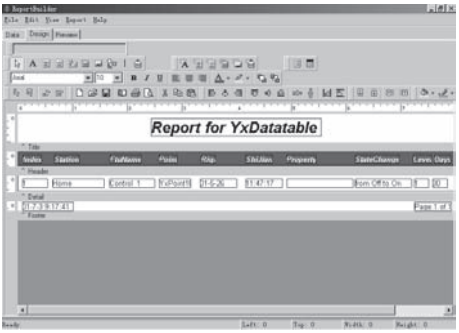

Fig. 7.7
Design the Report

E) Print the Report: Select and click **Print**.

7.2 Backup the Data Base

After a period of running the Comat BoxX-Scada System it needs to be backed up to maintain the database and in order for the Comat BoxX-Scada System to run effectively. Click **<Query> <Backup>** or the **quick icon** , then the dialogue block, as in Fig. 7.8, will be displayed.

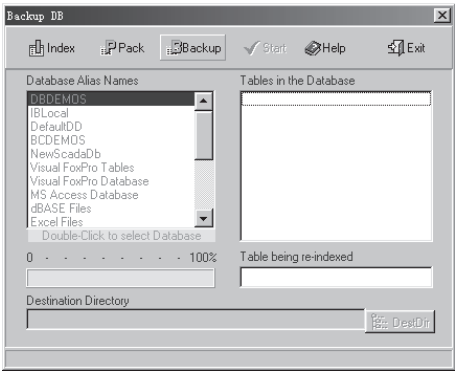

Fig. 7.8
Backup Dialogue Block

1. Index the Database: Click **“Index”** and the listing table frame under the Database Alias Names will changes from gray to black. The database name of the Comat BoxX-Scada System is NewScadaDB. Double click the option **“NewScadaDB”**, and the listing table of Table in the Database will show all of the table menus of NewScadaDB.

2. Pack the Database: After selecting the database, it is necessary to package the database. Click **“Pack”.** The system will then enter the packing state.

3. Backup the Database: After packing the database, click the **“Backup”**, the system will then enter the backup state.

4. Select the Saving Directory of the Database. Select and click the **“DestDir”** to do the selection.
After the completion of the above procedures, click **“Start”**, and the system will carry out the backup of the database. After the backup, click **“Exit”** to exit the database backup dialogue frame.

Chapter VIII

Report

The Report function options include Create Report and Browse Report as in Fig. 8.1.

Fig. 8.1 Report

8.1 Create a Report

Select the function option **<Report> <Create Report>** or click the **quick icon** , the designing interface, as in Fig. 8.2 will then be displayed.

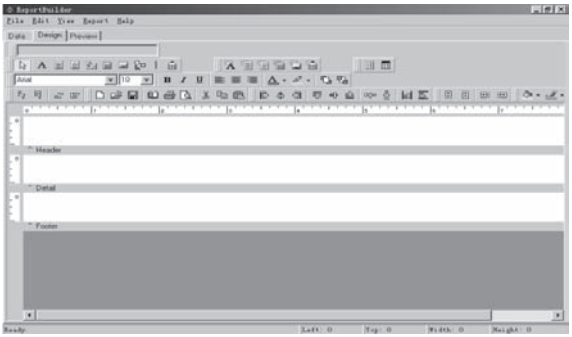

Fig. 8.2
Report Creating Interface

The main procedures are as follows:

1. Select Database Original: Click the page key **Data** and then select **<File>** **<Data Settings>**. Then carry out the selection as in Fig. 8.3.

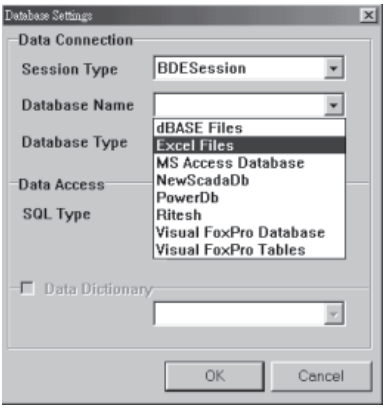

Fig. 8.3
Select the Database Original

2. Select the Table Menus

2.1 Select <File-New> and then click **"Query Wizard"**.

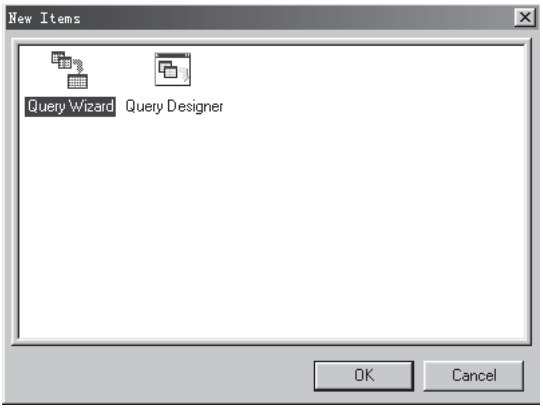

Fig. 8.4
Select the Listing Table 1

2.2 Double click the table name in Fig. 8.5.
For example, select **<Remote signal datatable>**, and it will appear in the listing table frame on the right. Then click the button **"Next"**.

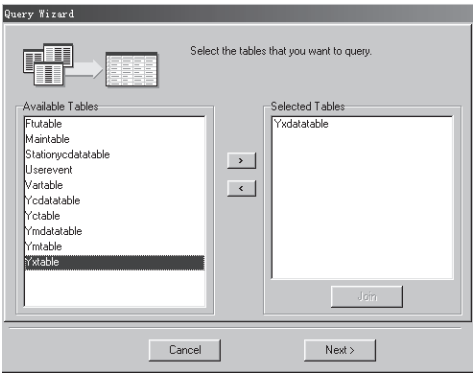

Fig. 8.5
Select the Listing Table 2

2.3 Choose the fields, as in Fig. 8-6. All Fields means choosing all of the fields and Choose Fields means choosing the required fields. Then click **"Next"**.

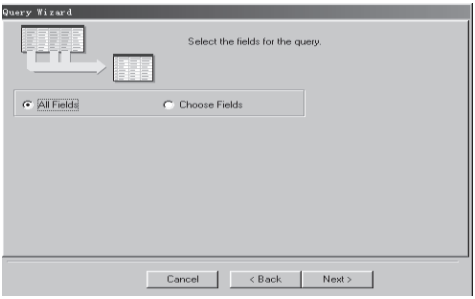

Fig. 8.6
Select the Fields

2.4 Select the Calculating Fields, as in Fig. 8.6: No Calculations means no calculating fields and Add Calculations means adding the calculating fields. Then click **“Next”**.

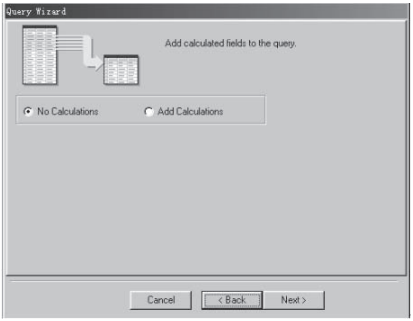

Fig. 8.7
Select the Calculating Fields

2.5 Select the Grouping Fields as in Fig. 8.8. No Grouping means no grouping fields and Select Grouping Field means adding grouping fields. And then click **“Next”**.

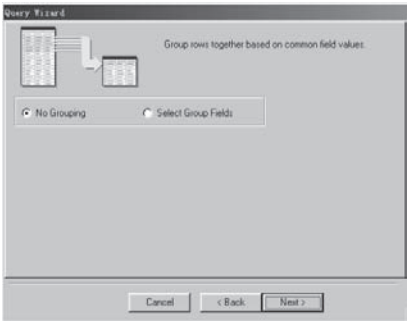

Fig. 8.8
Select the Grouping Fields

2.6 Select the <query condition> as in Fig. 8.9. All Row means selecting all of the records and Define Search Criteria means selecting the records to be queried. Then click **“Next”**.

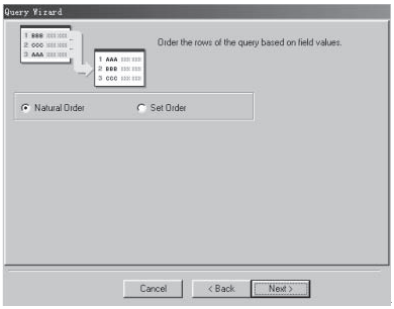

Fig. 8.9
Select the Query Conditions

2.7 Select the ordering conditions as in Fig. 8.10. Natural Order means not ordering and Set Order means selecting the ordering fields. Then click **“Next”**.

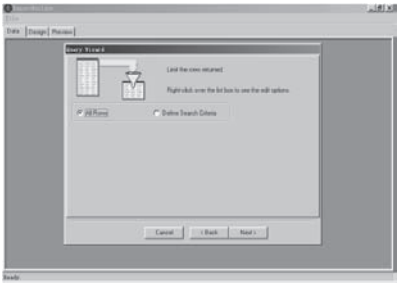

Fig. 8.10
Set Ordering Fields

2.8 Click **“Finish”**, as in Fig. 8.11. Then the listing table of the database that has been set will be displayed, as in Fig. 8.12.

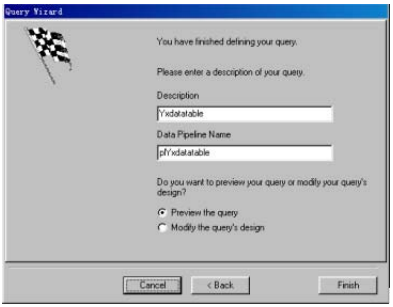

Fig. 8.11
Last Step of Selecting the Listing Tables

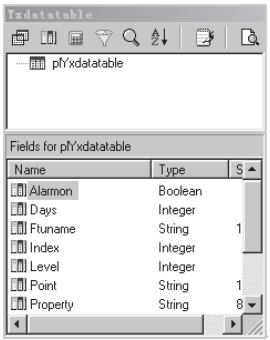

Fig. 8.12
The Completion of Selecting Listing Tables

3. Select the page key **"Design"** and enter the report design window:

3.1) Title: For example, as in Fig. 8.13, set the title of the report as Report for Remote signal DataTable.

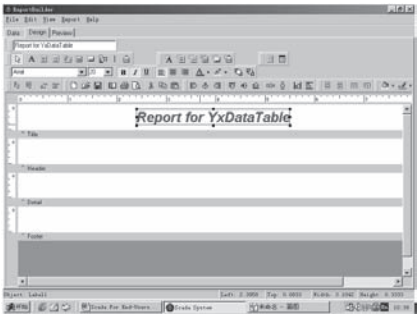

Fig. 8.13
Design the Title of the Report

3.2 Design the Head of the Report. For example, as in Fig. 8.14, set the **labels** such as Index, Station, Comat BoxX Name and so on.

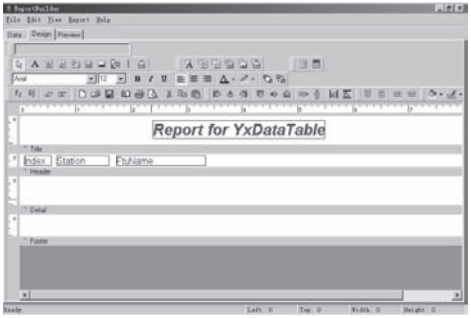

Fig. 8.14
Design the Head of the Report

3.3 Design the Body of the Report. For example, as in Fig. 8.15, set the **fields** such as Index, Station, Comat BoxX Name and so on.

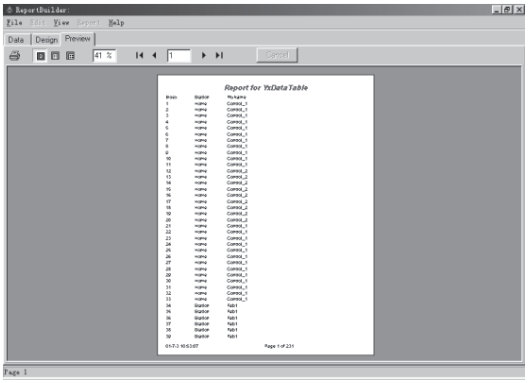

Fig. 8.15
Design the Body of the Report

3.4 Design the Report description: For example, as in Fig. 8.16, set the **system variable** as DateTime, PageSetDesc.

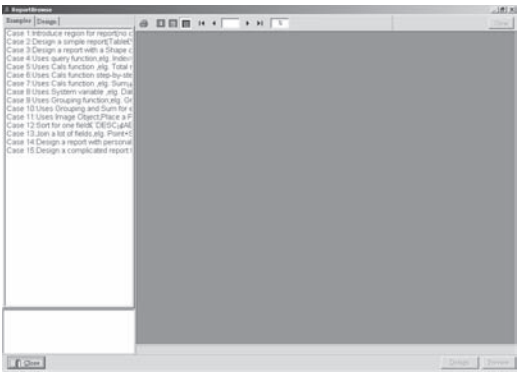

Fig. 8.16
Design the Date and the Page Code

4. Preview the Report: Select and click the page key **Preview** as in Fig. 8.16. And the diagram as in Fig. 8.17 will be displayed.

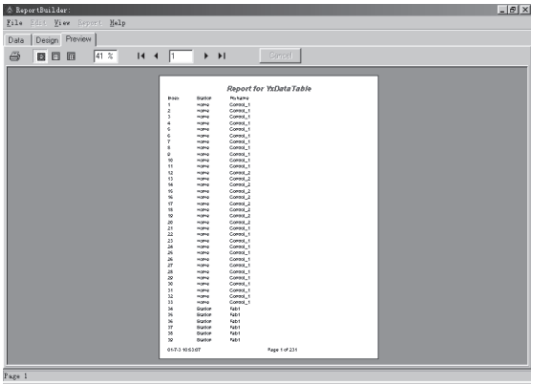

Fig. 8.17
Preview the Report

Explanation: Refer to Report Builder Users Manual for detailed help information.

8.2 Browse

Select **<Report> <Browse>** or click the **quick icon** , then the diagram, as in Fig. 8.18, will be displayed.

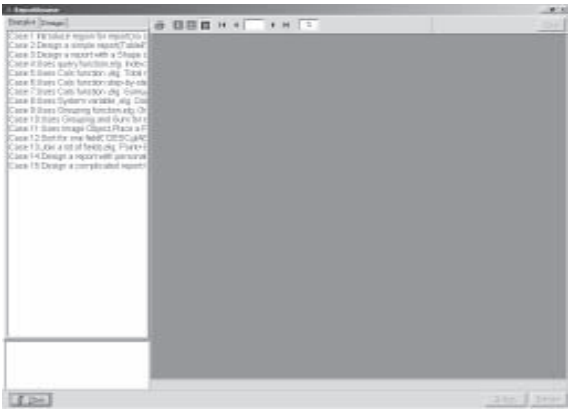

Fig. 8.18
Reports-Browsing Interface

1. The example of browsing the report. Select the page key **Examples**.
Click the **listing option** in the listing table, the browsing results will be shown in the sub-interface as in Fig. 8.19. Double click the **listing option**, the designing interface will be shown, as in Fig. 8.20. The example cannot be changed.

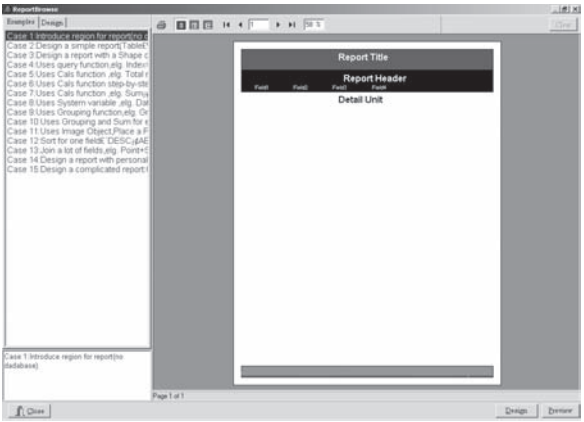

Fig. 8.19
Click the Listing Option Once

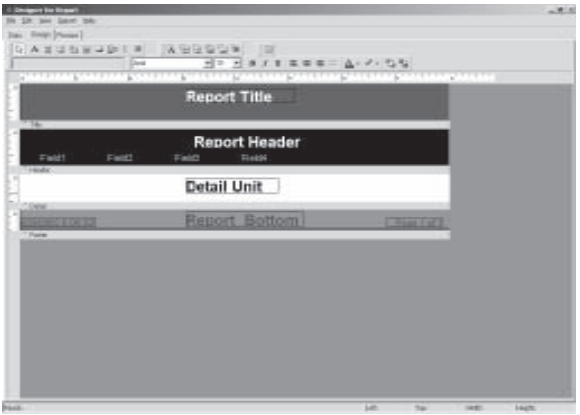

Fig. 8.20
Click the Listing Option Twice

2. Design the Report: Select the page key **Design** and the listing table is empty, if opened for the first time, as in Fig. 8.21.

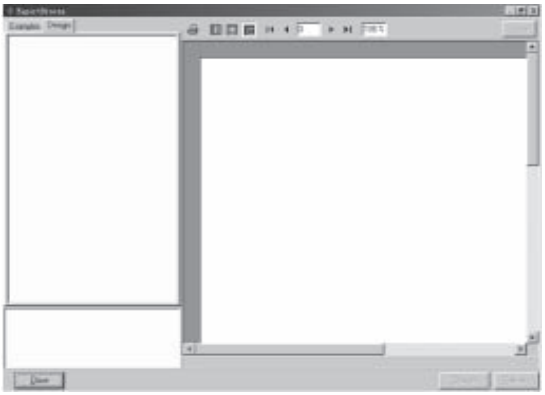

Fig. 8.21
Select the Page Key “Design”

2.1 Add the Designed Report to the Table List. Click the right key of the mouse in the listing table, and the dialogue block as in Fig. 8.22 will be shown. Select the function option **Append** and the dialogue block, as in Fig. 8.23 will be show..

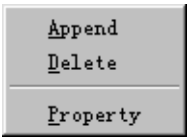

Fig. 8.22
Click the Right Key of the Mouse

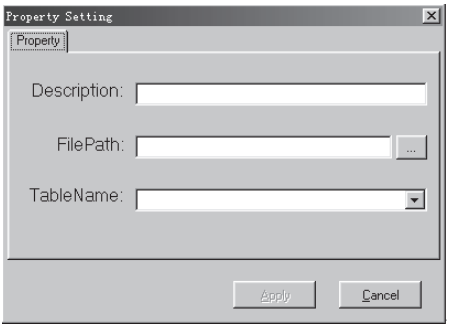

Fig. 8.23
Select the ‘Append’ Function Option

Referring to Fig. 8.21, enter the **name** describing the use of the report in the position of Description and the path and name of the report in the position of FilePath or click the **quick icon** ... to open the dialogue block for selecting the files to be opened.
Then click **"Apply"**, as in Fig. 8.24.
A new record is added to the listing table frame as in Fig. 8.25.

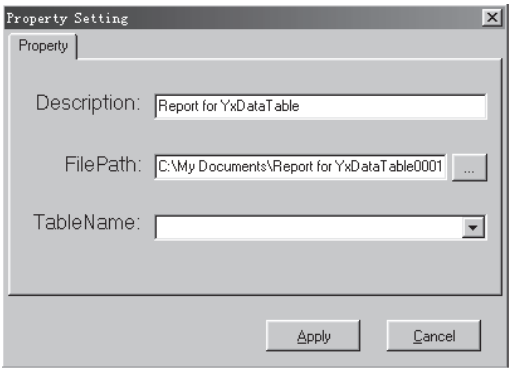

Fig. 8.24
Entering the Options

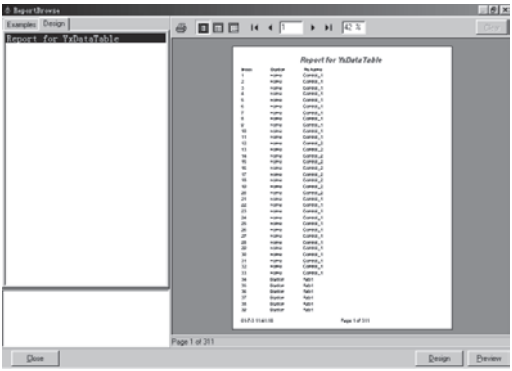

Fig. 8.25
The Page After Clicking 'Apply'

At this time, you can preview the report by clicking the mouse **once** and design the report by clicking the mouse **twice**.

2.2 Delete the listing option from the listing table. First select the **listing option** to be deleted and then click the **right mouse button**. Then the dialogue block, as in Fig. 8.22 , will be shown. Select the **Delete** function option.

2.3 Modify the properties of the listing option. First select the **listing option** to be modified and then click the **right mouse button**. Then the dialogue block, as in Fig. 8.23, will be shown. Select the **Property function** option, then the **dialogue block**, as in Fig. 8.26, will be shown. In the dialogue block, modify the Description and FilePath, and then click **"Apply"**. Thus the modification is completed.

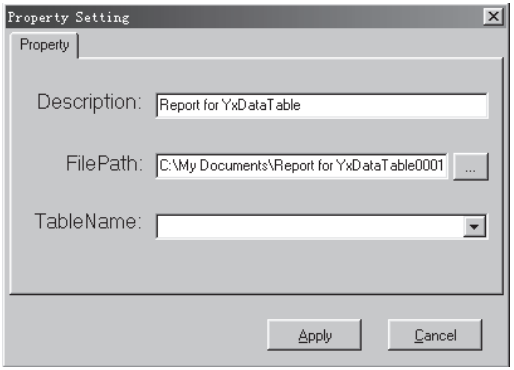

Fig. 8.26
Properties Modifying Dialogue Bolck