Operation of FAB-SCADA System

SCADA system (Supervisor Control And Data Acquisition System), can be used to acquire real-time field data, to provide the local or remote automatic controls for industrial sites, and implement a complete and real-time monitoring of technological process, as well as to provide the data necessary for production, dispatching and management.

Using FAB controller as a remote control unit, FAB-SCADA system executes the real-time acquisition, display and storage of data, and displays changes in data by the means of data frames, curves, histograms, etc. With a tree diagram FAB-SCADA allows users to set the number of FAB controllers and the definitions of each input and output of controllers based on the actual conditions of process site, and choose and view conveniently the operation conditions of each FAB controller and the real-time data at each control point. In addition, FAB-SCADA system is provided with the functions of querying data and information, printing and defining forms, etc. Following is a detailed description of the operation of FAB-SCADA system.

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Chapter Ⅰ Brief Introduction to system

Initiate FAB-SCADA to enter into the main frame with a tree diagram at its left side. The I/O statues of two control units are displayed on the main frame. In this operating interface the configuration of monitoring system can be implemented rapidly using each instruction in the instruction bar or each express button in the tool bar and the tree diagram on the left side of the frame, and the instant statue or data can be acquired for each control unit in the system from several aspects of lists, curves, barcharts, etc., allowing users to have a comprehensive understanding for the whole system.
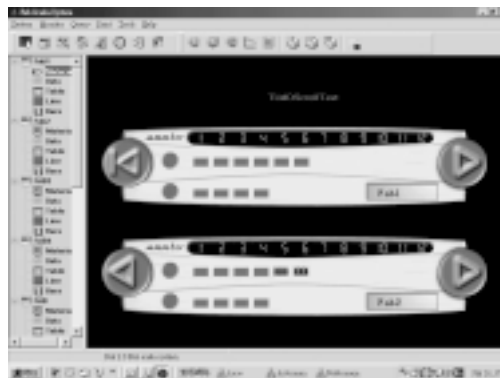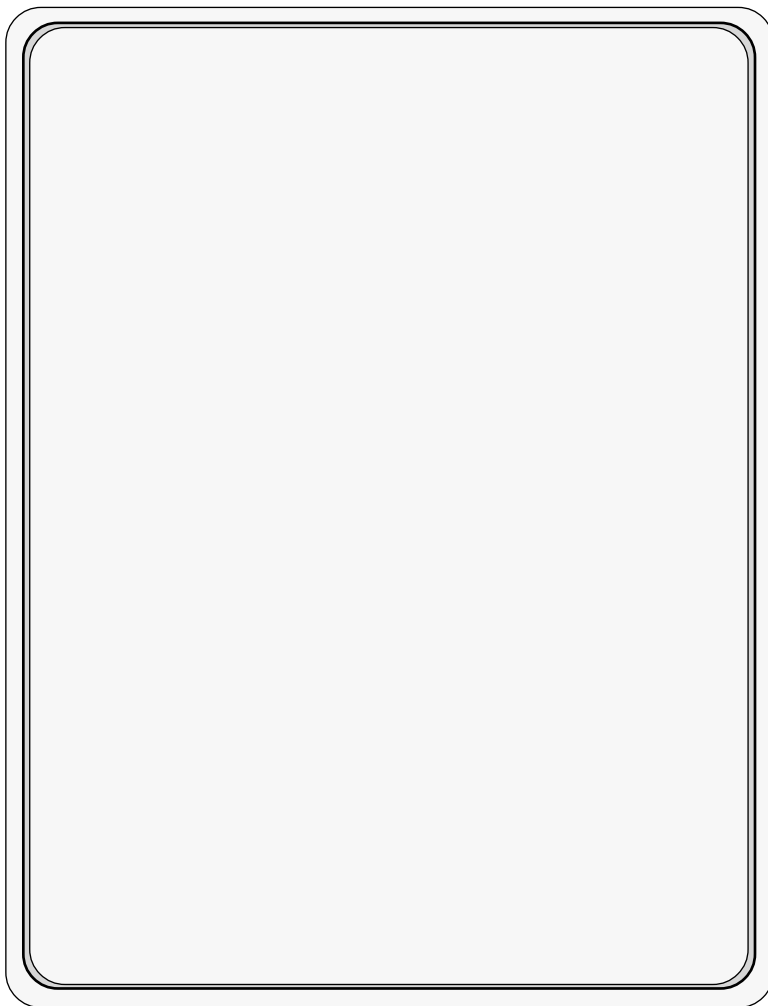

Fig1.1 Main frame to FAB-SCADA

An example is going to be taken as below to describe how to make use of FAB-SCADA to set up an instant monitoring system to implement the data acquisition and supervision & control. If it is necessary to monitor a building control system controlled by 10 FABs, the following procedures shall be followed for the operation.

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Chapter II Configuration of system

     To set up a FAB-Scada system, it is necessary to configure the number (address) of FABs, the I/O ports of FOB controllers, modify password and set up Com. port, etc. All those above-mentioned operations of configuring the system can be implemented by the instruction items under the instruction "System Configuration". "System Configuration" instruction menu is as shown in Fig. 2.1.

Fig2.1 Instruction Menu to System Configuration

2.1   Set the number of on-line FAB controllers

   1.Click the mouse to choose the item "FAB+/-" under the "System Configuration" instruction menu, there will appear a dialogue box as shown in Fig. 2.3. The system requests for entering password (the default of this password is 11111111).
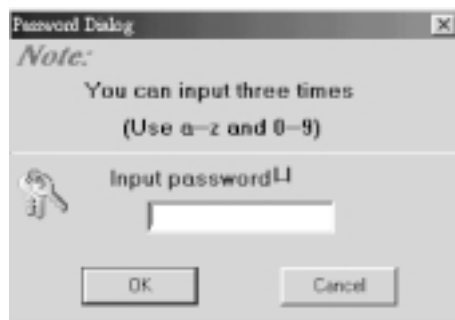

Fig.2.2 Dialogue Box for Entering Password

2. After a correct password is entered, you will enter into the frame for increasing or decreasing on-line FAB number: this frame provides the functions of increasing and canceling FAB controllers. When you choose INCREASE button, you will enter into a dialogue for increasing a FAB controller, and you are required to set a parameter for the number of FABs to be increased.
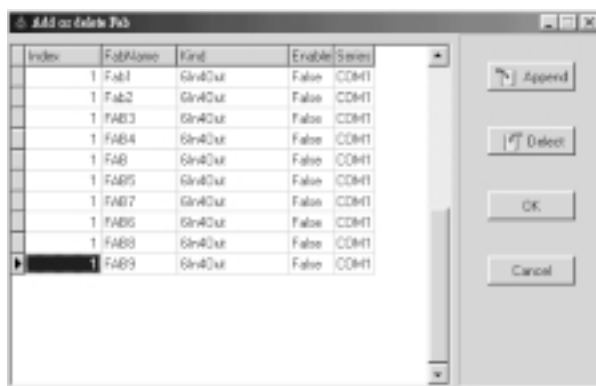

Fig.2.3 add or reduce the number of on-line FABs

Fig.2.4Set Parameter of FAB

3. Set the relative parameters in the dialogue box as shown in Fig. 2.4, including the setting of serial No. (address in the system), name, type, etc. After settings, click the CONFIRM button, thus a FAB is added. Meanwhile, there are contents automatically generated for each newly added items of FAB in the tree diagram at the left side of the displayed frame. Based on the actual conditions of FAB at the site, 10 FABs are added in a same way. At this time you can see the data of 10 FABs as shown in Fig. 2.5.

Attention:

Serial No.: assignment range 1 ~ 255

Designation: set the types according to the requirement for identification in field

Type:6-IN-4-OUT and 12-In-8-OUT available for selection.

Fig.2.5 FAB-SCADA System with 10 FABs

4. If you want to cancel any FAB, merely choose the FAB to be cancelled on the frame as shown in Fig.4 and click the CANCEL button with the mouse left button, and the FAB is cancelled.

2.2 **Setting I/O port for FAB controller**

1. Click the option "Set FAB Port" under the "System Configuration" instruction menu with the mouse, and a dialogue box appears as shown in Fig. 2.6. The system requests entering password.

Fig.2.6 Dialogue Box for Entering Password

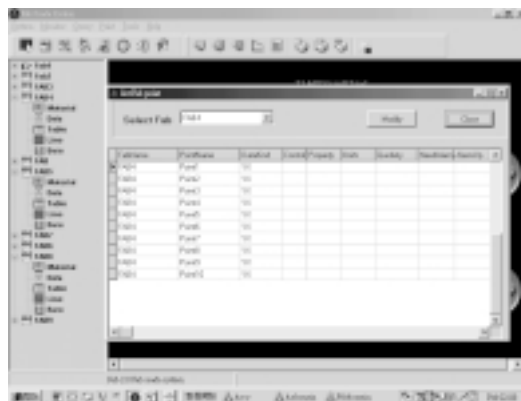2. After the correct password is entered, click OK button to enter the Setting FAB Port frame as shown in Fig.2.7 .

Fig.2.7 Select the COM for setting FAB Port

3. On the frame shown in Fig2.8, choose FAB controllers (FAB1, FAB2, FAB3…) to be set from the "Choose FAB"window, then choose each port for controllers from the list and click the MODIFY button with the mouse left button to enter into the "Modify" frame as shown in Fig.2.8.

Fig.2.8 Setting FAB Port

4. Set the parameters related to FAB ports in the dialogue box as shown in Fig. 2.8, then click the CONFIRM button and the setting is finished.
   Note:
       Data Types: Four types of data for telemetering, telesignaling, telepulsing and telemanipulating are available. Among which
       Telemertering(YC) is referred to the analogue;
       Telesignaling(YX) is referred to the statues;
       Telepulsing(YM) is referred to the pulse accumulation;
       Telemanipulating is referred to the manipulating position;
       Basic setting (attributive, unit, coefficient): to set according to the actual requirement in field.
       Alarm setting (Upper limit, Lower limit, Grade): to set according to the actual requirement.

5. Set I/O ports for all the FABs in a same way, then click CLOSE button and exit from Port Setting Statue.

2.3 Modify password:

When a FAB-Scada system is set up by the user, it is necessary to set a new password for the security of system. The procedures of operation are as follows:

1. Click the "Modify Password" option under the "System Configuration" Instruction menu with the mouse, and a dialogue box appears as shown in Fig.2.9. The system requests entering the password:

Fig2.9 Entering Password

2. After the correct password is entered, enter into the Modify Password interface as shown in Fig.2.10 .
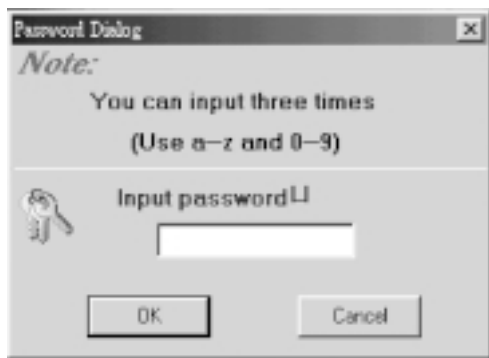
Fig2.10 Frame of Modifying Password

3. Enter new password, and click CONFIRM button to end the modification.

2.4 **Setting Com. Port**

The Com. Port. should be set as soon as you finishe the installation for
Interface485.

1. Click the "Setting Com. Port" option under the "System Configuration" Instruc-
tion menu with the mouse, and a dialogue box appears as shown in Fig.2.11. The
system requests entering the password:

Fig2.11 Entering Password

2. Enter the correct password, and click "OK" button to enter Setting Com. Port
frame as shown in Fig. 2.12.

Fig2.12 Setting Com. Port

3. Set the appropriate parameters on the Setting Com. Port frame shown in Fig.
2.12, and click the" CONFIRM" button to end the setting.
Com. port setting includes the selection of Com. port and the tandem transmis
sion rate:

2.5 Broadcast timing for time coordination

At the beginning of setting up the system or after the system has run for a period, it is necessary to use the upper computer to make time coordination for each FAB in order to ensure the consistency of the time at which each control unit is.

1. Click the "broadcast timing" option under the "System Configuration" instruction menu with the mouse, and a dialogue box appears. The system prompts if the timing operation is initiated as shown in Fig. 2.13.

Fig.2.13 Prompt Facility for Time Coordination

2. Click the YES button to implement the timing function. This function implements the time coordination of all the FAB controllers with the upper PC computer.

So far, a new FAB-Scada system has already been set up, and the main functions of this system is going to be described in detail in the following chapters.

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Chapter III Tree diagram

The tree diagram is created automatically according to the number of current FAB controllers. Each FAB controller is provided with its own data document and graphs. It is only necessary to click a certain FAB on the tree diagram, and the relevant FAB dada documents or graphic documents will be displayed, including various forms of the flow-chart, the instant data documents, lists, curves, instant bar-charts, etc.

3.1 Flow-chart

Click "Material" with the mouse left button in the tree diagram, and the flow-chart will appear as shown in Fig. 3.1.

Fig3.1 Frame for Flow-chart

In this frame, you can control the outputs of FAB remotely, and it is only necessary to move the mouse to the output port which needs the remote control and click once the mouse left button, and the system prompt is as shown in Fig.3.2 . When the YES button is clicked, the system requests entering the password. When the correct password is entered by the user, the system will give out relative remote control instructions to implement the remote control of the far side of this output. As for the telemetering point, click the mouse right button to eject the pull-down function list from which the curves and lists of operations for that day at that point can be selected.
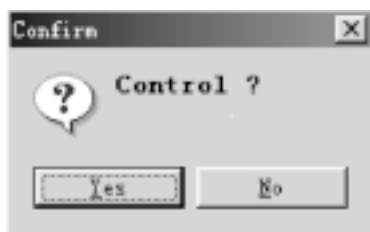
Fig3.2 System prompt: Remote Control , Yes or Not?

3.2 Instant data documents

Click "Data" in the tree diagram, and the instant data document will appear at once as shown in Fig. 3.3. The frame displayed as in Fig.3.3 is the data documents acquired by FAB2 controller.

Fig. 3.3. Display of Instant data documents

3.3   Window frame

Use a format of list to display the data documents of the selected FAB controller. Click "Table" with the mouse left button, and the instant data document of some FAB can be displayed as shown in Fig.3.4.

Fig.3.4. Window for Instant data document

3.4   Curve

Use a format of curve to display the changes in data of selected FAB controller telemetering point for that same day. Click "Line" in the tree diagram with the mouse left button, and the instant curve of some FAB can be displayed as shown in Fig. 3.5. If the user want to amplify some section of the curve for careful observation, click some point which needs to be amplified with the mouse left button and hold it down and drag it to the right and make it become a rectangular and amplification is completed while drag the mouth to the left in a same way the portion of curve can be restored. Besides, this curve can be printed out directly.
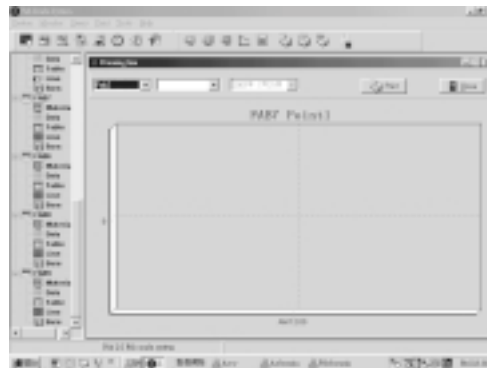
Fig. 3.5.Curve for data acquisition of FAB

3.5　Drive FAB run or stop

　Choose "FAB Run/ Stop" button, when the button is held down, FAB stops running and while the button is ejected, FAB starts running.

3.6　Instant bar-chart

　Use the format of bar-chart to display the changes in the data of the FAB controller telemetering point for that same day. Click in the tree diagram with the mouse left button, and the instant bar-chart of a certain FAB can be displayed as shown in Fig. 3.6. The bar-chart is also provided with the ratio function. In the instant bar-chart frame, if the user wants to enlarge a certain section for a careful observation, click the portion that needs to be enlarged with the mouse left button pressed and held down, dragging the mouse to the right to form a rectangular, there will be the enlargement of that portion of bar-chart. The original condition of the bar-chart can be restored in a same way with the mouse dragged to the left.
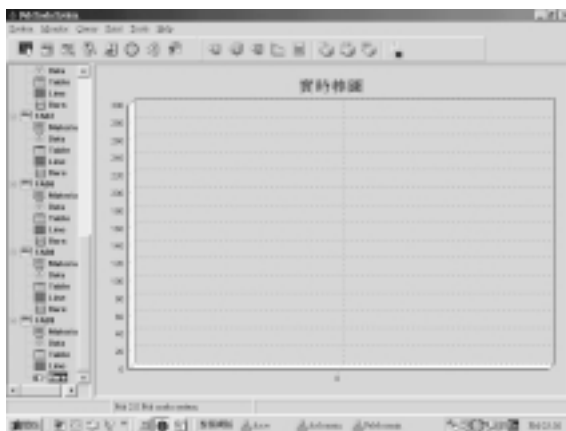
Fig. 3.6. Instant bar-chart

Chapter Ⅳ Other functions

4.1 Instant supervision and control

4.1.1 Comprehensive data display

Click "Data access and remote control" object under the "Instant Supervision and Control" instruction menu with the mouse left button, and the comprehensive data frame will be displayed as shown in Fig. 4.1. This function displays the data of all the FAB controllers in a frame which can be scrolled to left or right and up or down.
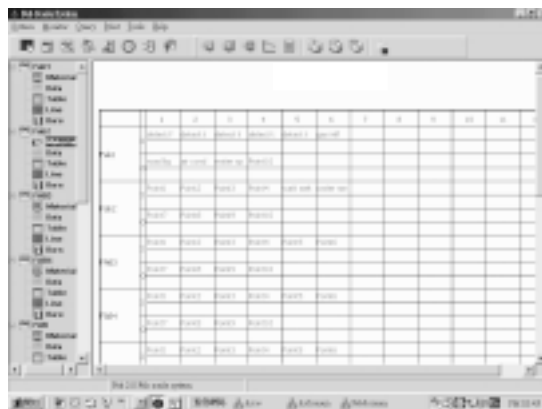
Fig. 4.1.Comprehensive files Frame

Click the telemetering point on this frame with the mouse right button to display lists and curves; and click the telesignaling point with the mouse left button to implement the remote control function.

4.1.2 Release alarm

During the running of system, in case there appears overrun or a change in statues for the data, the system can initiate an alarm automatically meanwhile the screen scrolls to display the contents of alarms, and the alarm is written into SOE automatically. Click the "Release Alarm" option under the "Instant Supervision and Control" instruction menu, and a prompt " whether the alarm is released?" appears on the frame, click "YES" to release the alarm.

Fig4.2 System prompt: Remote Control, Yes of Not ?

4.2 Data query

FAB-SCADA provides four modes for data query, i.e. daily report form, monthly report form, annual report form and operation curve. The instruction operation is as shown in Fig. 4.3.

Fig. 4.3. Display of Instant data

4.2.1 Daily report form

The display frame is shown in Fig. 4.4. This form shows the statue on August 2 for Point #1 of FAB1. The status amount or accumulative amount of a certain measuring point of all FABs on some date can be viewed through choosing FAB controller and the measuring points that need query and then choosing the date that need query, and printing of report forms can be implemented.

Besides, the system can transmit the information in lists to Excel in order to facilitate the other operations. On the frame of report forms as shown in Fig. 4.4, choose EXCEL button, Excel will be activated automatically if Excel is installed in the computer, and the data in the report forms will be transmitted to Excel. When Excel is closed, choose DISCONNECT button before the displaying list function can be exited.

Fig4.4 Daily report form

4.2.2 Operation curve

With the FAB controller and its measuring point to be chosen, the data curve for some date can be created, and the curve can be printed according to the requirement:
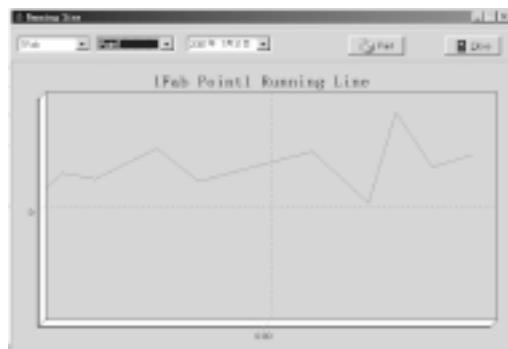
Fig4.5 Operation Curve Frame

4.2.3 Query SOE logging (operation sequence logging)

Choose SOE instruction or SOE EXPRESS button, and all the event logging will be displayed in the logbook, e.g. the diagram users can delete the part of logging which needs not to be maintained according to the requirement.
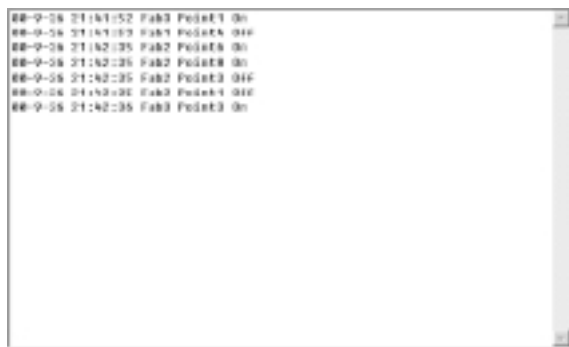
Fig4.6 SOE Logging

4.3 Printing of report forms

FAB-SCADA provides the printing function for report forms. Printings for daily report form, monthly report form and annual report form are selectable as shown in Fig. 4.7.
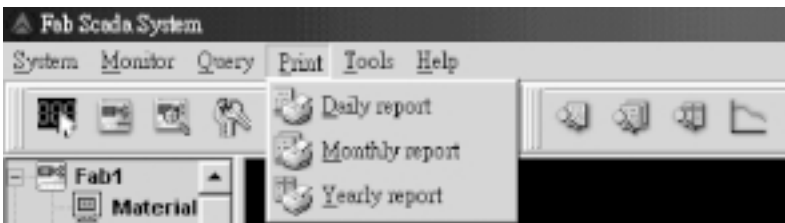
Fig. 4.7. Printing of Report Forms

When printing daily report form object is selected, there will appear a dialogue box as shown in Fig. 4.8. Set the requirement for printing in the dialogue box , then click the PRINTING button to finish printing job.
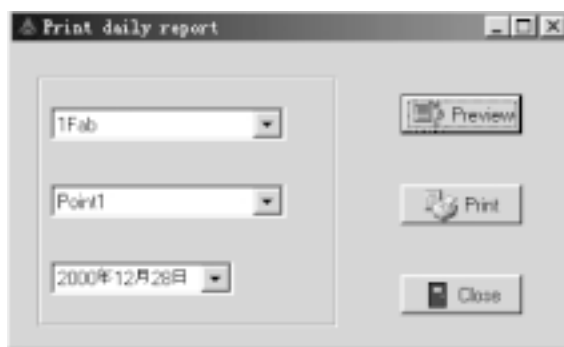
Fig 4.8. Printer Setting

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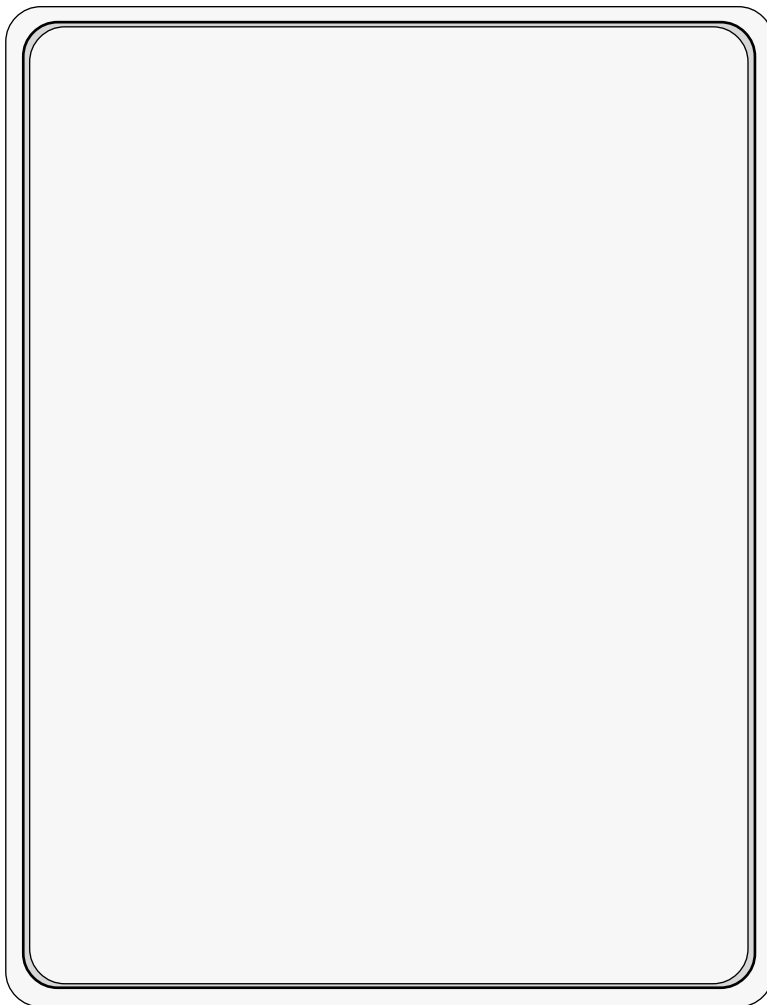
Chapter Ⅴ Tool Bar

For the purpose to facilitate your operation, the common operation instructions in FAB-SCADA system have been turned into express buttons. It is only necessary for you to click the mouse to implement each operation rapidly. The tool bar is as shown in Fig.5.1.

The tool bar falls into two sections. One section is of system configuration tools and the other section is of data handling tools. As shown in Fig. 5.1, the system configuration tool bar is at the left side and the data handling tool is at the right side. The user can open or close the appropriate tool bar through the "Tool" instruction in the Function List Column as shown in Fig. 5.2. When the System Configuration Tool Bar is clicked, this tool bar appears, and when it is clicked again, it will be in a state of concealment. When the Data Handling Tool Bar is clicked, this tool bar appears, and when it is clicked again, it will be in a state of concealment.

Fig.5.1. Tool bar
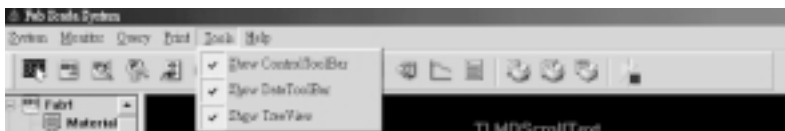
Fig.5.2. Tool bar of Open & Close

	Data acquisition and remote control		Query for daily report form
	Increase or decrease the number of on-line FAB		Query for monthly report form
	Set FAB port		Query for annual report form
	Modify password		Operation curve
	Set Com. Port		Query for SOE logging
	Broadcast timing		Printing daily report form
	Release alarm		Printing monthly report form
	Regarding FAB-Scada		Printing annual report form

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