Preface

This guide provides an introduction to industry software with SCADA----the primary functions, features and applications in KingView 6.52, which will help industry control system users understand KingView software.

The guide is made up of three parts. First, it introduces the primary features of KingView; second, it describes in detail the primary functions of KingView 6.52; third, it provides details of the system demands of KingView.

After reading this manual, if you wish to study KingView software further you can refer to the up-to-date KingView training tutorial. Should you need further assistance you can refer to KingView’s user guide or the on-line help. You are also welcome to contact your local branch of WellinControl or the franchiser.

For ease of understanding and reference, the appendix introduces some of the industry control devices supported by KingView drivers.

KingView’s advantages such as its strength and high performance are obvious. Using software, designed by WellinControl, industrial companies can completely automate their projects and successfully achieve automated monitoring faster than ever. For up to date product information please visit the WellinControl website.

This guide is provided for your information and no part of it can be replicated or distributed by any means for any purpose by any organization or individual without prior consent from WellinControl. Although the utmost has been done to ensure the accuracy of this guide, some errors may have occurred when printing. Should any of these mistakes come to your attention please notify us.
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Introduction

Kingview6.52 is function rich HMI/SCADA software; it can be used for automated monitoring of the control and management processes in industry. KingView 6.52 provides an integrated, flexible and easy to use development system, with a wide range of functions making it very easy for system engineers to use. The system can create, test, and dispose of automation applications and can quickly connect, transmit and record real time information, allowing users to monitor the process in real time and control the industry production process.
KingView provides a rich, simple configuration interface and a wide variety of wizards. It also provides an easy to use interface for the creation and reuse of projects.

KingView series 6 has been used in over 30 thousands successful projects in various fields. The new edition is compatible with old one so existing users don’t need to replace any of their existing systems. WellinControl has an excellent team of highly trained software engineers devoted to the collection and analysis of clients’ demand, so we can easily satisfy any specific client demands quickly and to a high quality.

KingView 6.52 has a universal development system and flexible structure; it can be installed in a single node system, and also fits a distributed client/server structure.

KingView 6.52 supports multiple standards, provides strong connections between various automation devices and provides thousands of driver connections for automation devices including most well known device manufacturers such as AB, Siemens, Schneider, Omron, Salon etc. KingView 6.52 supports multiple communication criterions (not sure this is the right word but I am not sure what you are trying to say) such as DDE, OPC, and provides ways to connect with relational databases.
Chapter 1  Basic HMI Function

1.1 Fast and Easy Application Design

One of the best aspects of using SCADA software to construct monitor and control data collection systems is that it reduces development time whilst at the same time assuring system quality, fast and convenient graphics maintenance and data collection is a key point of this type of system, KingView provides a function rich and (you need to add another word here) applied design tool.

1.1.1 Convenient and Practical project Management

KingView6.52 provides a convenient and practical project management tool-Project Manager. Project Manager manages all local KingView projects; it can compress, backup and resume projects as well as import or export data from the data dictionary thereby enabling the switch from KingView’s developing or running system and so on.
1.1.2 Integrated Development Circumstance

KingView 6.52 project browser is designed to provide users with up to the minute information regarding integration development. Project designers can look over all parts of the project such as pictures, databases, the configuration of the communication drive program, the report designs thus allowing them to complete the system configuration.
Fig 1.2 Integration development circumstance helps you construct system fast

The Project browser adopts a tree like menu structure allowing easy access. User can switch between the development and running systems through the project browser.

1.1.3 Drawing Tools

Simple indicative graphics are not enough to denote the complicated production processes of the industrial scene; most users demand more rich, colorful and realistic pictures to satisfy their needs. KingView provides well-equipped and easy to use drawing tool.
The tool box includes many different shapes commonly used in drawing software such as straight lines, polygons, arcs, rectangles, rectangles with round corners, spherical shapes and so on, Users do not need any special training in order to use this function.

1.1.4 Flexible and Convenient Menu

Users can right click the mouse randomly to open the relative shortcut menu in KingView, which are more convenient than the other common menus and will help to expedite the development period.
Fig 1.4 Multifarious shortcut mode can improve development efficiency

1.1.5 Supporting Unlimited Colors and Transition Colors

KingView 6.52 color palette supports unlimited colors and twenty four transition color effects. Any drawing tool in KingView can use all the available colors and most of the graphic transition color effects. Skillful application of these effects allows the development of accurate and beautiful pictures.
Fig 1.5 Color palette

Fig 1.6 Transition color effect
1.1.6 Rich Animation Effects for Graphic Objects

Any object or compound object in the picture can be transformed and the process parameters’ changed to create an animated effect. The process of setting up a link between a graphic object and its process parameters is called an “animation link”.

Graphic objects can change color, size, position, percentage of filling and many other properties according to what the animation link specifies. One graphic object can have multiple connections at any one time; you can therefore combine animation links to create vivid and accurate animation effects.

Animation link include:

**Property change:** line property, fill property, and text color

**Change in position or size:** moving horizontally and vertically, zoom, rotation, and fill

**Output value:** output analog value, output discrete value, output character string

**Input by users:** input analog value, input discrete value, input character string

**Slider input:** horizontal slider input, vertical slider input

**Special:** blink, imply, and flow. Setting the pipe flow condition in the animation link for a pipe “flow” creates the animation of moving liquid in a solid pipe.
Script connection: powerful script programs can be executed by opening the Holden popup menu

Menu: the “menu” tool provided by the toolbox can be used to edit menu items and menu sub-items as well as enable co-operation between menu functions and script.

Print and Preview: KingView6.52 can print pictures and preview pictures using this function.

Prompt text: a prompt message can be defined for each basic graphic

Fig 1.7 Animation link effect

Defining an animation link is very simple, take the rotation
connection for example; a designer needs only to set the bias angle of rotation and process parameters. As shown below in the simple dialogue box.

**Fig 1.8 set the rotation property for a graphic**

1.1.7 Animation Link Guide

Finish the rotation animation definition for the visual graphic.
1.1.8 Graphical Interface

Monitor and data collection systems need easy to use graphical interfaces. Application system more and more complicated, operators need systems to provide intelligible, flexible and reliable operation modes and designers want fast and powerful system development tools. Our outstanding track record has proved that KingView is just the kind of system development tool to satisfy all designers’ need.
1.9.9 Large Pictures and Navigation

Sometimes a complicated technical flow is difficult to show in a screen-size picture and if it is divided up into multiple pictures the technicalities of the flow cannot be represented, and the browse operation is not convenient to use. KingView 6.52 therefore supports large picture navigation, the user can use three 1024*768 screen-size picture to display their industrial scene as a whole, and can then select any part which they want to browse using the scroll bar or using the mouse to navigate in the picture.
1.1.10 Practical Picture Management Function

Facing a large number of complicated pictures and an extensive tag list can make it very difficult to find what you need when you need it. KingView 6.52 provides not only provides the means by which you can sort the device and tag lists but also provides a lookup function for tag, a sort function to sort by picture name, description, file name and a picture lookup.
function. KingView possesses management functions for grouping pictures, user can create nine layers, and there can be up to 256 group lists in each layer. Operations such as copy, move and paste can be done between picture groups.

1.2 Increased Graphics Library

Operators can construct any graphics needed using the graphical library provide by the system.

1.2.1 Numerous Standard Industrial Components

KingView provides a new graphical library, which includes large numbers of combined graphic objects such as control buttons, instruction sheets, valves, electric machinery, pumps, pipelines and other standard industrial components. Elements in the graphics library are called “fairy”, using them will simplify the application system structure.
1.2.2 Object-Oriented Design

Elements in the graphics library are called “fairy” because not only are they a set of graphics, but they also include rich animation links. A fairy is actually a small application that can define all the conditions of an object including (Fairies are similar to Wizards):

- Graphical objects are made up of fairies
- Process parameters for triggering animation effects (tag)
- Animation links

The designer can take out graphical fairies from the graphics library, and place them in their own applications and zoom into
it our out of it accordingly without distortion.
Graphical fairies are can be modified (including the animation link), as shown in the dialogue box.

1.2.3 Extending the Graphics Library

Users can design fairy of graphical library, save repeated work

To satisfy the various needs of different users the graphics library design has been extended. Users can now create or delete fairy in the graphics library, and can even create new graphics libraries.

Creating a new fairy is very simple:

Draw a fairy face in the picture, select the objects, define all the
animation links and then create the fairy through the command menu and place it into the graphics library.

KingView 6.52 provides extensive additional functions: Once a user has drawn a graphic and defines the animation link the system can make a description program about graphic. Through programming, graphic face can be controlled. Create a new graphics library is also simple; using the command menu and enter name of the new graphics library. A self-defined fairy can be used in the same as those already in the system.

1.3 Multimedia Support

KingView 6.52 has perfected the multimedia support function and users are able to design acceptable and usable HMI.

1.3.1 Embedding Picture

KingView can embed various picture formats, such as BMP, GIF, JPG, JPEG, and PNG. The color of the graphics is only restricted by the display system (it is not limited to 256). Graphic size can be adjusted randomly according as required.
Fig 1.14 Embed various pictures

Bitmap supports transparency operations. Users can appoint any color to bitmap transparency, once completed any zone taking this color bitmap can display the background image. GIF type pictures support the original animation effects; users can easily construct any animation effect they want. Embedded pictures are more vivid.
Fig 1.15 KingView multimedia function makes your system vividly
1.3.2 Using Sound

The KingView function “PlaySound” can be used to play a sound file (.WAV) directly, you can call it at any time, for example to sound a warning. DisplayMCI function provides a common interface for multimedia devices, it has strong control abilities and can be used to play films (VCD). For example, to display a real time video image from a camera in the industry control system, and control the movement of the camera lens using KingView.

The following example demonstrates the script for playing the third song on a CD:

DisplayMCI( "PLAYCD", 3 );
Stop playing CD
DisplayMCI( "STOPCD", "" );
Play background music MIDI format
DisplayMCI( "PLAYMIDI", "c:\midi.mid" );

Note: playing sound needs the support of a hardware device, such as a sound card or speaker.

1.3.3 Playing Animation

KingView has control for playing animation, through which users can play AVI animation.
1.4 Simple Tag Definitions and Management

The database is the core of the application system. Operators can define the process parameters and other tags in database. The tag types are:

- Memory discrete tag
- Memory integer tag
- Memory real tag
- Memory character string tag
- I/O discrete tag
- I/O integer tag
- I/O real tag
- I/O character string tag
- Structure tag

I/O tag is used to connect external collection components, and to exchange data with other application programs. Memory tag is used to store middle result.
Fig 1.16 Define tag

KingView maintains a real time database when the system is running, and the database stores all new data from all the tags; by detecting changes in the tag values, KingView can change the state of a graphic and trace warnings.

1.4.1 Tag Based on Structure

Tag management such as structure and grouping can reduce your work on definitions.

In many application systems, users need to define a lot of tags, which have common properties, users can defines these tag quickly and in batches. KingView6.52 has the added function of tag structure. Once the template structure is set, the members belonging to the template do not need to be defined again and
can be quoted directly enabling users to finish organizing their pictures faster.

**Fig 1.17 Defining structure tag and grouping tag management**

KingView6.52 can import or export tags and their information from the data dictionary through excel files or access databases, which makes modification of a single or multiple tags information convenient.
1.4.2 Tag Replacement

The “Replace tag name” option in KingView 6.52’s tool menu provides many means by which tags can be replaced in terms of their name and use., this function can also replace the station name or identifiers for remote station tags or non-current project tag. Users can use different replacement methods to replace tags within different zones of the project.

Fig 1.18 Tag replacement

1.4.3 Tag Grouping Management

To allow users to easily manage and maintain the tag system, KingView 6.52 supports tag-grouping management. Grouping tags helps to avoid difficulty when searching and modifying tags in a system with many tags. Through tag grouping, users can place tags in different groups according to different needs. The search and modification operations are only available in tag
1.4.4 Modifying Tag Properties by Selecting Multi-tags

Once defined, modifying individual tags can be very time consuming especially for the modification of multiple tags possessing the same properties. KingView 6.52 provides a function by which you can modify tags with the same properties at once by selecting multi-tags. To use this function select multi-tags inform the data dictionary, then select the modification property from the shortcut menu, then use the popup dialogue box to modify the properties of the selected tags.

1.4.5 Tag Statistic

Project designers often think about many things, such as; how many tags are used in a project? Where the tags are used? Which tags haven’t been used? Etc KingView 6.52 provides the answers through functions such as the tags usage report function and the tags update count function, which provides all kinds of tag information.
1.5 Strong Control Script

Through KingView users can construct a perfect “monitor and data acquisition system”. KingView script is a fully integrated, strong program language which enables the adjustment and extension functions required to personalize each project and achieve perfect system control.

1.5.1 Simple and Easy to Learn Syntax

KingView script is simple, its syntax is a subset of C language, so any developer whether they understand C language or not will be able to grasp it quickly.

KingView script language operations include mathematics and logic operators. The script can support sequence execution, condition branches and loop structure, which can all be used to develop a whole program.

All of the script is written in dialogue box in the KingView system. To facilitate development all of the tags and function can be found over in the dialogue box.
1.5.2 Strong Functions

KingView’s script program functions can be divided into:

✧ Character string functions: Analyze, search, replace, intercept character string and conversion between character strings and numerical values
✧ Mathematical functions: Triangle function, logarithm function, exponential function and so on
✧ System functions: File operation, access information and function of controlling other application programs
Control functions: Face and action (I am not sure what you mean by face and action) can be changed using these functions

SQL function: Exchanges information with the ODBC database

Other functions: Operating history curves, alarm window, picture functions, print function and so on

Using these functions, users cannot only manage recipe (a recipe is something that tells you how to cook something), statistic analysis, print curves and realize other function, but also provides flexible controls over history curves, warning windows and other objects.

1.5.3 Convenient Self-defined Functions, Self-defined Structure Tags and Temp Tags

To decrease the difficulty of programming script, users can program functions used repeatedly as user-defined functions. Users can define various functions, which can be used to satisfy specific needs in a project.

Self-defined functions are written using programming language such as C, and then a different script is used to call it and perform the function for example; calculation, communal
script function block (I am not sure what this means).

Users can define user-defined structure tags according to pre-defined structures using script; these have the same structure as originals. Structure tags with the same structure can evaluate each other. Self-defined structure tags belong to local tags and their fields are within the current script.

Users can define temporary local tags using script, whenever they define or use, number of tag isn’t within points. (This doesn’t make sense but I don’t know what you are trying to say)

1.5.4 Script Trigger Mechanism

Users may obtain a more flexible control system using conditional execution of script. Based on different execution conditions, script is separated into:

- Application script—to be executed when application system is starting up, quitting or to be executed periodically whilst the system is running
- Event script—to be executed when events happen, exist, or disappear (an event is defined as a specified condition)
- Data change script—to be executed when tag values change
- Hot key script—to be executed when operators press a hot key
- Self-defined function script—to be executed when
self-defined functions are called in another script

- Picture script—to be executed when pictures are loading, in existence or closing
- Animation link script—to be executed when linked symbols are clicked on, held and then released
- Alarm pre-set self-defined function—to be called automatically when an alarm is produced, confirmed, resumed or when alarm information in the alarm window is double-clicked
- Control event function—to be called when a control event is triggered

Fig 1.20 Executing condition of script

![Condition Scripts](image)

Beijing WellinControl Technology Development Company Limited
1.6 Collection and Display of Historical Data

1.6.1 Data Collection in a Group Guarantees Priority Collection of Important Tags

The data from some key tags will need to be collected first. KingView has therefore developed a group collection strategy. To a level for every 55 milliseconds, tags of higher priority guarantee collection times, (I don’t understand this sentence) for example, comparing a tag whose collection frequency is set to 110 milliseconds with another tag whose collection frequency is set to 220 milliseconds, if the latter collects just once, the former needs to collect twice. If tags need be collected at the same time, same structure tags connected to the same device and will be collected together with the minimum collection frequency w.

KingView 6.52’s high-speed historical database has enhanced techniques enabling steadier performance. The main function of the database is to store or search for data quickly, it occupies a small space, adopts a more advanced storage mechanism and prevents the loss of data due to system abnormalities. The use of data streaming to transmit historical data in the network and guarantees the security of saving data.
1.6.2 Distributed Historical Database

KingView is network-based distributed processing system, which supports a distributed database. In the network, all data collected from the industry scene will be transmitted to the historical data server, which can be directly accessed by any computer in the network.

Accessing the distributed database is simple for all users; users can obtain historical data from other computers in the network but do not need to know the complex network protocols, just like accessing the local data.

Fig 1.21 system architecture for distributed historical data
1.6.3 Record Mode for Historical Data

- Compressed Data Records
  
  KingView writes process parameters, which are periodically collected by the historical database. To avoid repeatedly recording the same data, KingView adopts the compressed data recording mode, which reduces data redundancy, and prevents the loss of data.

  Adopting the compressed data-recording mode reduces system expenses (this is just repeating the same thing; you should explain how it reduces system expenses)

- Recording Mode

  There are two ways to record data in KingView: the first is recording the change in data, it only records data if the range of data change exceeds the defined threshold value. The second is to record historical data according to a specified time interval in accordance with the data change in the industry scene.

1.6.4 Trend Curves

  Trend curves can show the process state and trends over a period of time using graphs. Users can define infinite trend curve windows in the application system, and a trend curve window can display many process parameters graphs at one time. KingView trend curves can be used to portray the precise change...
in process values thanks to a data exchange technique based on the event driver and a compact and efficient structure.

Real time trend curves and real time curve control

The real time trend curve is the same as observing the change of process parameters online, the curve window can also display up to date data through using the auto-roll mode.

Real time curve control is stronger than real time trend curves in the side of function (I don’t know what you mean by this and it doesn’t make sense), it can obtain real time data through the TCP/IP. The data server can be any computer running KingView, and does not need to be network configured. Up to 16 curves can be displayed at any one time.

History trend curves and history curve control

History trend curve look over data from all the process parameters. Curve window cannot use auto-roll, but the same effect can be realized through script if needed.
History trend curve control not only connects to KingView’s inner historical database, but also portrays through curves data recorded in the ODBC database. You can add/delete curves, zoom into curves without limit, and dynamically compare curves, print curves and so on whilst the system is running.

Fig 1.23 Real time curve control graph

XY curve control

Super XY curve control is a type of XY curve provided by KingView in the form of Active X control. This can display up to 16 curves and the corresponding Y-axis for each curve at one time.
1.6.5 Opening the Database Programming Interface

To develop the historical data resource to its fullest, KingView provides a programming interface for the historical database, this interface is given in the form of DLL, any programming language (VC++, VB and so on) based in Windows can be used to call it. Thus, developers can write their own data processing to enhance system functions.
1.7 New and Flexible Embedded Report with Simple Operations

Data reports record and reflect the state of tags during the production process; information regarding the state of the tags is exported. Information regarding the manufacture can be displayed in any format specified by the users, for example; production report, monthly production report of the class level (what do you mean by this?) products in some workshop, are all data processing reports.

KingView provides two data report modes:
- Create various forms of reports using KingView’s integrated report system.
- Create Excel reports using KingView’s historical data programming interface and DDE data exchange.

KingView’s Integrated Report System

KingView provides a new and integrated report system, with enriched report functions, for example; date and time functions, logic function and statistic function, all of which users can use to create various reports. Users are able to change the appearance of according to the project specifications. The report tool bar makes the operation simple users can finish setting row or column numbers, combine or split rows or columns, set margins and table design and export text or tag values.
Fig 1.25 Set cell format of report

Users can configure the reports, such as; the date report, month report, year report, real time report. The operation is simple, for example; configuration of date report only needs only tag selection and a collection interval set for every tag. In addition, report templates make it easier for users to call other tables.
Creating reports using EXCEL

Excel is the most popular Windows based spreadsheet electronic form procedure based on Windows; its function is very strong (I don’t think you need to say this because everyone knows Excel already). Using the historical database programming interface and the DDE data exchange provided by KingView, data from the application system can be used to form a product report in Excel.

Operators can utilize Excel’s functions and analyze the historical data in different ways, then draw charts and print the output. The
result can be sent back through DDE after analysis.

Fig 1.27 Obtain data from history database using DLL

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<th>Reactor_Temperature</th>
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</table>

1.8 Recipe Management

In the manufacturing field, recipe is used to describe the proportional relation between different items; it is a set of preset value parameters corresponding to different tags in the course of production. For example, there is a basic recipe when in a bread factory, this recipe lists all the items to bake the bread (water, flour, sugar, egg, etc, in addition, it also lists all the optional items (fruit, chocolate). KingView provides all-round recipe management for any project that needs a recipe. Users can define recipes in the development system.
Fig 1.28 Define recipes in development system

Users also can write their own recipe templates, for example:

Fig 1.29 Recipe template file
In the running system, operators can call different recipes according to their need; the way in which something is called is realized through script.

KingView’s recipe management function is the extension of standard script; it can be used in any form of script. Using these functions users can operate existing recipe template files, such as; select, change, call, insert, delete.

Fig 1.30 Modify recipe in running system

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<th>RECIPE</th>
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<tr>
<td>Water:</td>
<td>100 grams</td>
</tr>
<tr>
<td>Flour:</td>
<td>200 grams</td>
</tr>
<tr>
<td>Salt:</td>
<td>66 grams</td>
</tr>
<tr>
<td>Sugar:</td>
<td>40 grams</td>
</tr>
<tr>
<td>Egg:</td>
<td>40 eggs</td>
</tr>
<tr>
<td>Butter:</td>
<td>40 grams</td>
</tr>
<tr>
<td>Fruit:</td>
<td>40 grams</td>
</tr>
<tr>
<td>Core:</td>
<td>40 grams</td>
</tr>
<tr>
<td>Chocolate:</td>
<td>40 grams</td>
</tr>
<tr>
<td>Note:</td>
<td>fruit type bread</td>
</tr>
</tbody>
</table>
Chapter 2  Strong and Advanced Security Management System

Security protection is of paramount importance in application systems. When different types of operators all use a large-scale complex application there may be some problems regarding authorization and security the system can allow or prohibit some system operations according to a user’s authority level.

2.1 Priority and Security Zones

KingView provides a strong, advanced and user-based security management system. KingView adopts a classification and zonal double protection strategy. Every operable element in the application system can be appointed a specific protection level (999 is the maximum) and security zone (there are at most 64), including tags and hot key script. Designers can also specify operational priority (999 is the maximum) or operators and working security zones (there are at most 64). When the system is running, if the priority of the operator is less than the access priority of operable element, or the working security zone is not within the security zone of operable element, the operable element cannot be accessed or operated.
Fig 2.1 Set the protection level and the security zone for the

The security zone function is used widely in projects. Generally there are multiple control processes in a control system, at the same time there are also multiple users operating this control system. It is possible to set the security zone for the control process objects that need authorization and at the same time set the security zone for users who operates these objects. For example, a project demands that worker A can only operate objects and data in workshop A, and worker B can only operate objects and data in workshop B. Set the security zone of all objects and data from workshop A to be included in the operational security zone of worker A; set the security zone of all objects and data from workshop B to be included in the
operational security zone of worker B, therefore the security zone of worker A is different to that of worker B.

2.2 Managing User Groups

The system adopts identifiers and passwords to differentiate and protect operators. Every operator gets a unique identifier and password, therefore preventing illegal operators from entering the system. KingView adopts a group management method to deal with the large number of operators trying to access the same operating system. Designers can divide users into several groups according to the specifications of the project and can configure communal security zones for a user group, which facilitates operation.

2.3 Application of a Security Management System

Application of security system includes the following:
Configuration of security system and login.

- Configuration of the security system allows designers to:
  - Define the user group, username, password and so on
  - Define the security zone name
  - Define the priority and security zone for the user
Define the security zone for tag writing
Define the operational priority security zone for operable objects
Define the priority and operational security zone for executing hot key script

Login
Operators login to the system by entering their username and password, after login, if the priority of the operator is higher than the access priority of the operable objects, and the security zone of the operator is within the security zone of the operable objects, can the operator access and operate the operable objects. If either of these conditions are not met the operator will not be allowed access. As long as the security zone of the operators is within the operable security zone of the tag, the operators can change the tag value.

The operators whose operational priority is more than 900 can be system administrators. System administrators are in charge of managing the operators, which includes: add/delete operators and modifying their group name, identifier, password, operational priority, security zone and so on.
Fig 2.2 System administrator manages users

2.4 Operation Record

Users often need collect and record various bits of system information, to enable monitoring and analysis of the historical running system. KingView can record all kinds of events, such as; alarms, finished operations, system login, changing the tag value. KingView will also auto-record when, the operation is done. Data recorded can be written in the record file (*.al2), ODBC database or be sent to the printer. The following is an
example; The operational record is recoded in two hours.

Fig 2.3 Operation record

```plaintext
[machine name:local] [event type:station] [station time:01:24:21]
[machine name:local] [event type:station] [station time:01:23:14]
[machine name:local] [event type:station] [station time:01:26:39]
[machine name:local] [event type:station] [station time:01:42:53]
[machine name:local] [event type:station] [station time:01:48:22]
[machine name:local] [event type:station] [station time:02:05:31]
[machine name:local] [event type:station] [station time:02:08:50]
[machine name:local] [event type:station] [station time:02:09:09]
[machine name:local] [event type:station] [station time:02:14:11]
[machine name:local] [event type:station] [station time:02:14:29]
[machine name:local] [event type:station] [station time:02:16:32]
[machine name:local] [event type:station] [station time:02:17:12]
[machine name:local] [event type:station] [station time:02:20:59]
[machine name:local] [event type:station] [station time:02:21:16]
[machine name:local] [event type:station] [station time:02:23:36]
[machine name:local] [event type:station] [station time:02:23:53]
[machine name:local] [event type:station] [station time:02:27:14]
```
Chapter 3  Strong Communication Capabilities

KingView supports hundreds of different types of hardware, including PLCs, intelligent modules, boards, transducers etc. Without a doubt KingView stands among the best of these products in the world market today.

KingView uses drivers to communicate with industrial control devices; all the drivers are included in a CD, which comes free as an appendix when you buy the KingView software.

The majority of KingView’s drivers are based on COM technology, which makes the drivers and KingView form an integrated system. This not only ensures a highly effective TouchView, but also enlarges the scale of the system.

KingView can also communicate using DDE, which was widely used in early editions of Windows. Some applications can only communicate with KingView in this way.

KingView takes advantage of the OPC server’s strong performance to fully provide engineers with an efficient and convenient way in which to access data. Users can connect to a number of OPC servers in KingView. Each OPC server is taken as a peripheral device that you can define, add or delete. KingView creates a connection with each OPC server in
TouchView and exchanges data with them automatically. In addition, KingView itself can act as OPC server to provide data for the control system, thereby satisfying the OPC criteria. The device, which is supported by KingView, can be seen in Appendix A.

KingView supplies the client server with the control KvTcpipClientOcx.ocx, which, users can call by a third party program to obtain real time data, users can also subscribe it.

### 3.1 Communication Drivers Auto-wizard

KingView software has no relation with specific PLCs or scene devices. It only needs to configure to the responding communication drivers for different hardware. KingView redesigns drivers to make the configuration easier.

The control engineers do not need to worry about the protocol and simply select the device type from the KingView device library and follow the “Device configuration wizard” to finish installation step by step.
3.2 Efficient Data Collection

As one of the key aspects of the technology, KingView has taken many measures to optimize the communication program in order to reduce interference with the system and at the same time assure punctual and precise data transmission. The specific measures are as follows:

- Tag group collection strategy

It takes 55 milliseconds to collect data from a source.
higher the tag priority the more frequent the collections. For example, the collection frequency of tag A is 110 milliseconds and the collection frequency of tag B is 220 milliseconds, if tag B collects data once, then tag A must collect data twice. Sometimes, tags need to be collected at the same time, and then structure tags connected to the same device and belonging to the same structure, collect all member tags at the same time using the minimum collection frequency of all the member tags.

Using dynamic optimization

KingView uses dynamic management for all the communication processes. If a tag does not define historical records or alarms, the system will only collect data when it is needed. KingView reduces communication with data, which does not need to be updated for a while. Thus improving the speed of serial port communication and can improve system efficiency.

For example, users define one thousand I/O tags for an OMRON PLC. But at any given time, maybe only a few of the I/O tags are used for animation links, historical records, alarms, scripts etc in the picture, these tags must be collected in real time (named active tag); and the other I/O tags do not affect the system. Under such circumstances, KingView only collects active tags by dynamic optimization.
When the number of I/O tags obviously increases, the communication mode can ensure the data collection period remains almost the same.

◊ Combining demand
The communication requests of one device (animation display, historical data record, creating report, etc) will be combined as soon as it possibly can, so that the data collected will be used to serve multiple function modules at one time.

◊ Packing
Most lower-computers support multi-data collection at one time. When KingView communicates to lower-computers, it will optimize and combine tags as soon as it possibly so that it can just collect all the valid information at one time. This type of optimization effectively reduces the communication times.

3.3 Strong Device Testing Functions and Perfect Detecting Methods

To ensure the easy use of hardware, KingView tests devices in the development environment after the configuration and connection of devices. For example, to accomplish read-write operation for the hardware without running TouchView. In WindowMaker, designers can change the communication
parameters at any time according to the device communication specifications, which greatly reduces the debugging time. Testing the device includes: serial port device, board device and OPC device.

KingView also has a new method for device detection—two tag fields have been added: a time stamp and a quality stamp, which can be used to check the collection time of every tag collected. When collecting data, time quality stamps are regarded as two tag fields; in WindowMaker, designers check them through device testing; in TouchView, users can check them directly.
through animation links directly. The time stamp changes according to the collection time; whilst the quality stamp shows the communication quality every time.

3.4 Fault Detection and Recovery

Fault detection and recovery are important features in KingView. In the industry scene, the loss caused by communication malfunctions can be enormous, to avoid this loss, KingView optimizes the judging mechanism of communication fault elaborately (I don’t really understand this bit). It reports any fault quickly (in 1-2 collection periods) and locates the source of the fault in the lower-computer, which helps the scene engineer to fix the problem swiftly.

What we call KingView’s self-recovery function means: when the lower-computer changes or recovers, KingView can commence communication with the lower-computer automatically after a short period without interference from the scene engineers. The self-recovery function is necessary to ensure a reliable running system.

When a fault happens in a lower-computer, KingView will automatically optimize the LOC to prevent any disruption to the communication between KingView and the lower-computer, which is the way in which we ensure communication efficiency.
3.5 Support for Remote Dial-up and Wireless Data Collection

KingView supports the dial up MODEM function that means you can access remote devices through a dial up MODEM. Define the MODEM devices directly in WindowMaker, define the registers of the Modem to establish relations between KingView tags and MODEM registers. Then, by operating the MODEM tags, you can control the MODEM.

Figure 3.3: Communicate with the remote device by MODEM dial-up
3.6 Supports GPRS Communication

GPRS has so many advantages such as fast communication speed, low cost, easy to connect to the Internet and so on. A GPRS data transmission terminal has a TCP/IP protocol conversion function and therefore does not need users to support TCP/IP. It fits all of the terminals with serial ports and can achieve wireless and transparent data transmission using the GPRS network platform; it provides GPRS communication ability for the terminals without the TCP/IP protocol processing ability.

The GPRS service program developed by Asiacontrol supports communication with serial port device drivers developed by Asiacontrol using GPRS data transmission units (for short GPRS DTU). KingView supports the following companies GPRS DTU devices: Shenzhen Hongdian, Shenzhen Yitian, Xiamen Sangrong, Tangshan Landi, Beijing Yineng, Beijing Hanzhitong, Taiwan Weipu, Beijing Ericsson, Fujian Shida, etc.
Fig 3.4 GPRS communicates with Kingview

You can refer to KingView 6.52 user's guide for more details on how to use the GPRS, or contact Asiacontrol technical support engineers.

3.7 Expandable Device Library

KingView drivers are based on COM technology and supply driver development toolkits, through, which users or the third party software suppliers can easily develop their own new drivers, and extend the KingView device library.
Chapter 4  Advanced Alarm and Event Management

New and Advanced alarm and information management

A perfect “monitor and data collection system” can detect abnormal states, accurately write alarm information to the database, prevent the loss of any data and enable users to view and analyze the data as soon as possible. KingView notifies the operator of the process state in two ways: alarms and events. The alarm and event driver as well as KingView’s compact and efficient structure ensures all alarm information is perfectly recorded regardless of the number of alarms that occur at once.

An alarm occurs when there is a fault in the process. The alarm system in the new version of KingView is easier to navigate, more flexible and more reliable. KingView’s distributed alarm management system provides various functions for alarm management, including: alarms based on events, alarm group management, alarm priority levels, alarm filtering, deadband and delay, remote network alarm management functions and so on. Operators do not need to respond to event in the normal state, they only respond to alarms. KingView can record application events and operational information.

Alarm and events have multiple means of output: Files, databases, printers and alarm windows.
4.1 Alarm System Based on Network

Alarms in KingView 6.52’s distributed alarm system are based on the network; all alarms are raised in alarm server sites, however, any other site can act as client servers and be used to directly browse alarm information in the alarm servers.

4.2 Raising Alarms and Events

Defining an alarm

When tag alarm setting has been completed, designers are still able to refer to them and modify them easily.
**Improved Alarm Conditions**

The improved alarm conditions reflect the flexibility of KingView when dealing with alarm information. KingView has three types of alarms and seven subtypes of alarm conditions for analog tags and long integer tags, and has 3 alarm conditions for discrete tags.

Analog tags and long integer tags:

- Over the Limit Alarms—HiHi-limit, High limit, Low limit, LoLo-limit
- Deviation Alarms—two kinds of alarm limitations: big, small
Rate of Change Alarms

Discrete tag

Tag Value——Open, close or change

The alarm output text can be randomly defined, over the limit and deviation alarms for analog and long integer tags introduce the concept of delay and dead band. Various alarm conditions can coexist for each tag, information from all alarm conditions will be recorded separately. Alarms can be grouped for easier management; alarm groups and priorities can be defined.

Alarm Classification: Alarm Groups and Priority

KingView introduces the concept of alarm groups and priority levels to facilitate management of alarm information.

When defining tag alarm conditions, designers can define which alarm groups the tag belongs to, for example, all tags (process parameters) are used in the “reaction workshop” are in the “reaction workshop” alarm group. When operators look over alarm information, they can specify the alarm group “reaction workshop” and display alarm information for the tags in the “reaction workshop”

Operators define the alarm groups. Alarm groups are organized in a tree like structure in accordance with the actual industry product status. Enabling Tag Alarms

KingView 6.52 provides an alarm enabling field for tags—
AlarmEnable. Users can control whether KingView tags raise an alarm by changing the values in this field, and thereby reducing the amount of unnecessary alarm information.

Fig 4.3 Defining alarm group

Operators can refer to alarm information according to the priority level. Alarm priority level (level 999 at most) and tag alarm conditions are defined at the same time. If operators specify a value, it is only when the priority of the tags is higher than the specified value that alarm information can be displayed.

**Definition of an Event**

When operating analog and discrete tags, production event
information will be recorded in the alarm. Users can select whether an event is created when defining the tags. Users can trace the operational status of the system through alarm information.

KingView has seven event comments:

- **Restore Events**: After alarms, if a tag change does not raise an alarm or does not raise a new type of alarm, a restore event is raised.
- **Confirmed events**: confirms one or more events when an alarm is triggered.

Fig 4.4 Defining whether creating event
Operator Login Event: an event is created when an operator logs in.
Operator Logout Event: automatically or manually logs out current operators.
Application Event: it is an operation for non-operators; for example, some events are created when changing data using script, DDE, OPC and etc.
Operation Events: it is an operation for operators; for example, some events are created when changing tag values or fields.
Work Station Events: some events are created when work stations startup or quit.

4.3 Alarm and Event Output

KingView system provides four ways to output alarm and event information: alarm windows, files, databases and the printer.

**TouchView Alarm Windows**
Through alarm windows, operators can refer to alarm information, confirm alarms, delete alarms and also change alarm types, event types, operators, alarm priority, alarm groups, site names, the sever name and other information.
When an operator makes modifications in the alarm window, the alarm information, operator name and operation are recorded at
the same time, so that users can trace and analyze.

![Alarm window](image)

There are three ways to operate a window: Using the icon shortcut button, right-click the mouse anywhere and keyboard operations.

**File**

The system records alarm information to an alarm file (*.al2) according to the user-defined format.

Users can also record Login and Operation Events in detail in a file.

Users can specify store time of file; edit alarm file, print and etc.

**Database**

The system records alarm, login and operation events information to a user-defined database, such as; Access, SQL
Server. Alarm events can be recorded monthly to a table in the database. The configuration of the alarm interface is as follows:

Saving alarm data on a monthly basis means data is stored in different tables of the database monthly. Taking the “Alarm” table as a template, users can auto-create a new table in the database every month to save alarm data. The new table is labeled “Alarm” + “year month”. Users can specify a username and password for the database to assure security.
Printer

According to the user-defined format, the system can send alarm, operation and login events to the printer port and print them in real time print.

Real time print content:

[Alarm time: 01:05:15:210] [Tag name: num3 ] [Alarm value: 1. ] [Limit: 5. ] [Alarm type: 低低] [Quality place: 192][Alarm date: 01/2/8] [Event type: alarm ] [Alarm group: plant level ] [Event type: workstation run] [Workstation time: 09:05:13]
4.4 User-defined Alarm Functions

KingView provides three preset user-defined functions for alarms; analog tag, n integer tag and discrete tag functions. When a tag raises, confirms or restores an alarm, or when operators double-click a certain alarm, confirm alarm, restore alarm in the TouchView alarm window, the system will automatically call the corresponding function. Users can program each function for alarms. Sometimes users need to record information related to the tag which raised the alarm to the report for saving. Users can obtain the alarm time, alarm tag name, tag value at that time and other information from the preset self-defined function, and then
write this information to the report in KingView to either print or save.
Chapter 5  Processing Data

Generally, devices in the industrial scene make up the control network, which enable the auto-control function that ensures the run of the factory. But it is difficult to operate when the operators are not about to see the actual running status of the production process. KingView can easily resolve this problem by taking data from different data sources and displaying them intuitionally (this isn’t the right word and I am not sure what you are trying to say) and visually, so that operators and administrators can monitor operations and analyze the data.

The open structure of KingView allows the system to exchange data with variety of data sources, for example; IO drivers, ODBC databases, OPC servers, DDE, ActiveX controls etc. Data can also be displayed in the form of trend curves, reports etc.

5.1 Drivers

KingView supplies high performance I/O drivers; it currently supplies over four hundred popular hardware drivers across china. High performance I/O drivers come with auto-check function enabling them to detect which of the computers is malfunctioning and report it quickly. When the connected to a
normal device, KingView can quickly try to auto-restore communication with a lower computer.

5.2 Open the ODBC Database Connection

ODBC is the open interface defined by Microsoft, because of similarities with this interface, KingView can connect with any ODBC database, for example; Microsoft Access, SQL Server and Oracle and etc. KingView uses SQL as its standard language to exchange data with ODBC databases, its typical application is to refer product reports to the MIS system and from them produce a product plan, product recipe etc. This data includes collected tag values, alarm logins, alarm records, operation events, login events etc.

KingView SQL accessing function is made up of two parts: KingView SQL accessing manager and the SQL function. SQL accessing manager mainly manages the table template and bind list. The table can be created in database through the table template; this kind of table possesses specified field names, types and length and index types.
Fig 5.1 Creating a table in the database using the table template

The bind list is used to create relations between a field in the database and a tag in KingView. Bind list can be searched, added, deleted, modified etc.
Fig 5.2 Bind list

Bind lists and table templates are set in WindowMaker, users can operate databases using the SQL function in TouchView. The following is shows how to select the function, its purpose is to select the personnel information over fifty years old, and place the results in the bind list’s responsible tag in age order.
Fig 5.3 A example for SQL function

Selection results are as follows:
Scene devices are used in the industry field; applications need to continuously exchange data with these devices. Before the OPC appeared, application developers needed to develop a lot of drivers for devices, which required a mass of repeated development work, and caused many problems. If hardware suppliers change their hardware in anyway, applications may be need to be rewritten; in addition, different devices and even different cells in the same device may be different, it is difficult for us to access and optimize these devices at one time. The following figure portrays the development of traditional
industrial control programs, and its need to develop drivers for different devices.

The OPC (OLE for process control) foundation introduces Microsofts’ OLE/COM technology to the process control field. It sets down a series of standard OLE/COM interface protocols in order to read/write data between applications and process control devices flexibly and effectively. The OPC standard specifications adopts a client/server model, it sets down a series of “game standard specifications” between hardware suppliers and software suppliers. As long as they follow the regulation and data interaction between the two is transparent, hardware suppliers do not need to think about multiple demands and transmission protocols of applications, and also software developers do not need to understand the hardware essentials and operation processes.
KingView 6.52 fully supports OPC standard specifications. KingView itself can be an OPC server and an OPC client. Developers can obtain dynamic data directly from any OPC server and integrate it into KingView.
In addition, KingView as an OPC server can refer data to other control systems in accordance with the OPC standard specifications.
Fig 5.7 the OPC as a server is accessed by the OPC client.

The OPC saves workload and expense related information to different control systems from different manufactures and makes it possible for multi-level connections between two or more computers with KingView. Multiple OPC clients with KingView do not need to be connected to the production process to see all the factory data, they only need to be connected to the KingView OPC server.
5.4 Dynamic Data Exchange（DDE）

DDE is the communication mode for data exchange between applications that share memory. KingView also exchanges data with other applications by DDE. Through DDE, developers can use rich software resources in the PC to extend KingView functions. DDE tags exchange data with not only drivers but various other applications (such as; Excel, VB) which are compatible with DDE based in Windows.
5.5 Strong ActiveX Controls

KingView fully supports ActiveX control. Any standard Windows ActiveX control can be called in KingView, users can
program ActiveX controls according to their needs or select controls from other manufacturers. The control can interact with KingView tags and the self-defined function in TouchView. Through script connections, users can change or quote control properties, call control methods and execute the control operations.

Fig 5.8 Curve value changes with tag value in KingView

5.6 High-speed, High Performance Historical Databases

Data storage is very important for any industrial system, with
the improvement in automation software, the demand for improved storage space, speed, and searching capabilities as well other aspects has increased. KingView 6.52 supplies a high-speed historical database with the following features:

1. Historical data can be stored and searched quickly. Speed of Storing historical data up to millisecond level.

2. The amount of storage space needed has been greatly decreased; data compression percentage can be under percentage of 20 (I don’t understand this), which has help to save a lot of space.

3. Realize late data inserting and uniting perfectly, such as dial-up network system (not sure what you are trying to say). When connected to the network, KingView combined the historical databases from every collection station and the original responding station with the one from the central control station and therefore achieves fill integration of the historical data.

4. The transmission and combination of historical data in the network is done using data compression, which makes the transmission of data quicker and more convenient. Advanced network malfunction detection systems and transmission technology avoid the omissions and errors in data transmission.

5. Some data collection devices also have the function of data storage, however saving data to the upper computer and combining the original database can be a problem. The historical
database in KingView 6.52 supplies an interface for this and, users can completely combine the historical data stored in the device and the data in KingView’s historical database.
Chapter 6  Strong Network and Redundancy Function

KingView 6.52 is entirely network based, it can run in networks with TCP/IP protocol and realize upper computer, lower computer and higher level network accessing in the form of large scale businesses (not sure what you mean). As networks expand, KingView’s Internet function ensures your data can be sent to any location at any time. Data collected from each of the data collection stations in the industrial scene can be directly accessed by any other station in the network. KingView also supports distributed historical databases, distributed alarm systems and so on, which, enables stronger and a more stable and reliable, performance.

The KingView network is based on a distributed process, flexible structure. The distributed system can assign applications to many servers, which increases the capacity of the projects and improves system performance.

Based on hot standby, KingView 6.52 supplies rich redundancy functions.

You can flexibly configure KingView according to your needs.
6.1 Independent Application

Independent application means there is only one operator interface for each monitor process. For example, if a computer acts as an operator interface and is not connected to network, it can also connect to the industrial process by connecting directly to the industrial device (for example, using a serial cable).

To maintain this kind of structure is easy, but is only suitable for single node systems. For complicated industrial processes, we should use KingView’s distributed network.

6.2 Distributed Network.

The computer based on the TCP/IP protocol can communicate with multiple remote computers (that is, remote nodes). In KingView’s network structure, PCs, which directly control the industrial scene, act as servers, and all other stations act as clients in the network but can share the servers’ data. KingView
is designed such that several servers control the industrial applications synchronously, therefore important functions are decentralized from a single server and should any single server break down the system will still be able to run, figure 6.2 shows the system’s structure:

In KingView network, server assignment may be based on physical structure of device or different functions (I don’t understand what this means). Users can set special Login Servers, IO Servers, Alarm Servers and History Servers.
Set special servers to decrease workload of a single computer and make the system run more efficiently according to system requirements.

**Login Server:** The network username list can be created in the login server station. When a network user logs in, the login server will validate it.

**IO Server:** Defines the devices used for data collection in the IO server.

**Alarm Server:** The alarm server specifies which IO server is needed to create alarms, and gets data from it, generates alarm information and saves it. Any other station in the network can act as a client to directly browse the alarm information in the alarm server.

**History Server:** The history server specifies which IO server is needed to save the historical data. All the historical data is saved in the history server, any other station in the network can act as a client to directly browse the history server.

Servers work independently, they can get data from other computers in the network. This structure ensures that when a server breaks down, the whole network is not affected.

Clients can use NetView instead of TouchView. The only difference between them is that NetView cannot connect to drivers, so it can not directly exchange data with lower computers. The data used by NetView come from the servers.
Using NetView in a client computer will save system resources.

6.3 KingView for Internet

KingView 6.52 support Internet/Intranet. It is a Web based Server, which adopts three-layer structure. You can access the industrial data anytime and from anywhere. Managers and producers can easily see the change in the KingView Visual via the Internet/Intranet, and they can refer to or operate data depending on their authorization levels.

Figure 6.2 shows the system structure:

KingView can publish WEB pictures by grouping (I think you have to explain a bit more), and they can be browsed just like a website, making it easy for operators. The security management for WEB publishing is divided into two parts: common users can only browse the pictures, they cannot modify data; advanced users can browse all the published pictures, in addition, they can read/write related data and operate symbols for which they have the requisite authorization level in the pictures.
Figure 6.3 In WEB server, it’s easy to use the wizard to create files for remote browsing.

You can browse the WEB picture in the same way you would browse a website. Input the WEB server’s node name and group name in the IE address bar, then, you can enter the WEB station of this group. There are two ways to access pictures: select the picture name from the list or use the menu.
Figure 6.4 Use browsers to remotely monitor process control

KingView’s Internet functions has the following features

✦ **Web Based, remote search**
Users can use standard WEB browsers (such as Microsoft IE) to monitor the industrial scene, get graphs, real time curves, historical curves, alarm information, etc, and users can respond to alarms, modify tags, search data in reports, print reports, download data etc.

✦ **Remote troubleshooting**
When problems occur in the industrial scene, the ability for users to browse the industrial scene in real time enables quick troubleshooting of any problems with technicians at the scene.
✧ **Can create easy to use HTML files: do not need professional programming knowledge**

Follow the wizard to publish pictures; engineers do not need to learn HTML and JAVA.

✧ **High security: user register**

KingView Web Server is based on the security mechanism of the Web Server, and can be used to setup and validate passwords for accessing the database. Once users input correct password, the KingView Web Server can exchange data with the database.

✧ **Web Server: parallel processing with greater efficiency**

Based on the Web Server, the client/server mode is good at parallel processing; it allows access to multiple clients at one time without congestion, which is especially important in a large-scale system.

✧ **High performance/price rate: Low price and easy to expand**

One KingView package is all that is needs to set up the Web based KingView system, clients need a JAVA compatible browser. Users can choose different WEB server software as needed (from 5 clients to infinity). KingView can not only administrate information what personnel needs, but also control users budget effectively (I don’t know what you mean).
6.4 Rich Redundancy Function

In single computer/device system, if a computer or device breakdown, the whole system stops working and production ceases. The redundancy system has been designed to avoid this situation. KingView supplies multiple redundancy methods according to the various needs of the industrial scene, thus providing users with multiple choices to construct a reliable system. KingView supplies three redundancy types: double device redundancy, hot standby and double network redundancy.

6.4.1 Double Device Redundancy

Double device redundancy is the mutual redundancy between two external devices. In a single device system, data collection has to be stopped when the external device breaks-down. In the double device redundancy system, the primary computer can communicate with two peripheral devices at the same time. Once the primary device disconnects, the secondary device can quickly collect and transmit the data to KingView, ensuring the integrity and continuity of data collection.
Under normal circumstances, the primary device collects data and transfers it to KingView for communication. If the primary device has a communication fault, KingView will disconnect from the primary device and automatically create a connection with the secondary device. When the primary device recovers, KingView stops the connection with secondary device and re-connects with the primary device, and the system returns to normal.

### 6.4.2 Hot Standby

Hot Standby is the redundancy method for monitoring the primary computer in the control system; it maintains stability in the running system running. In a single primary computer system, the whole system stops when the primary computer is in trouble or needs to be repaired. Hot Standby prevents this...
situation.

- **System structure**

**Figure 6.6**
Redundancy system with double computer, double system (I am not sure if this is right)

In normal state, the primary computer and the secondary computer all startup; the secondary computer gets real time data from the primary computer via the network instead of collecting the real time data itself. The secondary computer is also responsible for monitoring the primary computer. If the secondary computer detects abnormalities in the primary computer, the secondary computer will act as a substitute for the primary computer until it recovers.
Redundancy Function

Hot standby is the redundancy function for real time data and historical data.

When a primary computer and a secondary computer are in their normal states, the primary computer collects data from the device and the secondary computer gets data from the primary computer via the network. At certain intervals the secondary computer sends requests to the primary computer, if the primary computer responds to the request, it means the secondary computer is working normally. If the primary computer does not respond, the secondary computer will consider the primary computer to be malfunctioning, cut off data transmission with it, whilst at the same time connecting with the lower computer to directly collect the data. When the primary computer returns to normal, the secondary computer will stop data collection and begin obtaining data from the network again. The above is the redundancy function for real time data.

When the secondary computer is on standby, it records the data obtained from the network, so the secondary computer also backs up historical data. When the primary computer breaks-down, the secondary computer will replace the primary computer and collect data, whilst continuing to record the collected data from the lower computer. When the primary computer recovers, the secondary will copy its data to the primary computer’s historical database.
● **Redundancy System and Network Time Checks**

It is necessary to setup a Time Server to accurately maintain the time in all the computers on the network. In general, the primary and secondary computer is set as the Time Server. When the primary computer works accurately, it sends Time data to other computers at certain intervals in order to keep the network time as accurate as possible. When the primary computer is in trouble, the secondary computer will replace the primary as the Time Server. When the primary computer recovers, the primary computer will check its time according to the secondary computer first, and then continue as the Time Server again; which maintains the accuracy of the network time.

### 6.4.3 Double Network Redundancy

In order to avoid a situation where all the nodes are paralyzed when a single network is in trouble, users can use double network redundancy. Double network redundancy means establishing two physical networks in the control system (two network cards are installed in every node), the systems can communicate with either network, which assures system stability and security.
Hardware and software configuration:
Two network cards are installed in every node and the IP address is set in different network sections. As shown in Figure 6.7, the double network redundancy system is composed of a main Ethernet and secondary Ethernet. Computers communicate with each other through the network cards in the same network section.
When the main Ethernet disconnects, KingView switches communication to the secondary Ethernet and monitors the main Ethernet. When the main Ethernet recovers, KingView automatically switches communication to the main Ethernet, and the whole system returns to normal.

Users should use all three-redundancy types as they make the
system more stable and more reliable in the event of a malfunction.
Technology Index

System Requirement

Hardware: upwards of P4 1G, recommend using that upwards of P4 2G  
Memory: 256M at least, recommend using 512MB  
Display: VGA, SVGA or any graphic adapter that supports desktop operating system. It is demanded to display 256 colors at least, recommend using 1024*768*16 bit color  
Mouse: any mouse that is compatible with PC  
LPT or USB interface: insert KingView encryption key when using hard authorization  
Operating System: Win2000 (SP4) / Win XP (SP2) Professional
Appendix A  Drivers and Driver Development Software Toolkit

KingView supports multiple automation industry device drivers, includes many world famous brands such as:

PLC
Siemens: S5, S7-200, s7-300, s7-400
Modicon: MODBUS， MBPLUS， MICRO37
OMRON Series
Panasonic: FPx series
Salon: FX2, Q, MELSECA
AB: SLC503
GE: SERIES 90
B&R: all series
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