



OPC Gateway and data Communication configuration of WinCS Control system

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Abstract: First of all, this paper introduces the development background of OPC technology, and points out the main characteristics of OPC technology. As the server of OPC, WinCS control system can transmit the data from process station and connected fieldbus instrument to other systems with OPC Client interface through OPC Server interface. The WinCS control system can also be used as a OPC Client, to access the data of its automatic instruments and systems through a third party OPC Server, to realize operation and monitoring. By using an example of WinCS OPC configuration application, this paper expounds the realization ways of the above two functions, introduces the key steps and matters needing attention, and verifies the powerful OPC function of WinCS control system.

Keywords: WinCS, OPC Client, OPC Server, OPC Tunnel, WinAdmin.

1. Introduction

With the continuous development of industrial production, industrial control software has made great progress. However, due to the expansion of production scale and the improvement of process complexity, industrial control software design is facing great challenges, that is, to integrate the increasing number and types of field information. In the traditional control system, the information sharing between intelligent devices and control system software is realized through drivers, and different manufacturers use different drivers. Industrial control software is forced to contain more and more underlying communication modules. In addition, because the drivers for relatively specific applications generally do not support changes in hardware characteristics, it is extremely inconvenient to upgrade and maintain the hardware and software of industrial control. Also, at the same time, two customer applications are generally unable to read and write data to the same device because they have different, independent drivers and operate on the same device, which can cause access conflicts.

Even caused the system to crash. The emergence of OPC technology has solved these problems very well.

OPC is the abbreviation of OLE for Process Control. It is the application of Microsoft's object linking and embedding technology in process control. OPC is based on OLE/COM/DCOM technology and adopts client / server mode, which provides a unified standard for the object-oriented development of industrial automation software. This standard defines how to exchange automated real-time data between PC-based clients using the Microsoft operating system. After adopting this standard, hardware developers will replace software developers to develop unified OPC interface programs for their hardware products, and software developers will be exempted from the work of developing drivers and give full play to their strengths. Put more energy into the development of its core products. This not only avoids the repeatability of development, but also improves the openness and interoperability of the system.

2. OPC function in WinCS system

The intelligent circuit breaker monitoring system is constructed by using the OPC function of WinCS control system. As shown in Fig 1, data from the process station and fieldbus instrumentation in the WinCS system can be transferred through the OPC server to other systems where the OPC client is configured. Then the collected data is displayed on the screen through WinConfig or WinHMI on the OPC client.

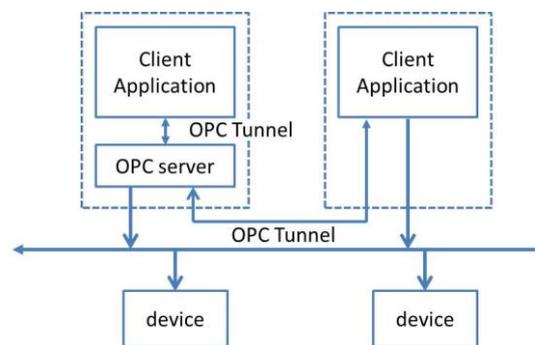


Fig. 1 OPC Server

2.1 OPC Client

WinConfig enables lists of variables from other OPC servers to be read and imported. The imported data can be used to configure graphical displays, trends, and logs. During the debugging phase, imported variables can be displayed in the value window and in the trend window in exactly the same way as variables from the process station. WinCS as a OPC client is shown in Fig 2. By using the WinHMI OPC client feature, variables from other systems can be read from their OPC servers. Once the variables required for graphical objects, trends, or logs called in WinHMI come from a remote OPC server,

OPC Client integrated in WinHMI can retrieve and recover these variables in groups from an external OPC Server.

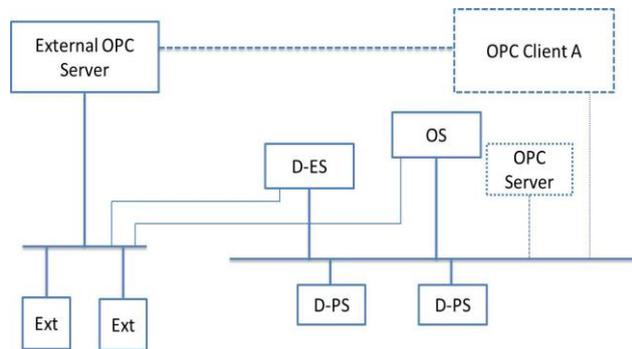


Fig. 2 External OPC Server

2.2 OPC Server

The WinCS as a OPC Server is shown in Fig 3. Through the OPC server gateway, the data in the WinConfig can be used in other systems, such as some visualization software, such as MCGS, Operate IT, Plant Connect, InTouch, iFix, etc., can access the data through the WinCS system process station and field equipment instruments. The OPC server can be installed on any personal computer, and a gateway of type OPC needs to be established in the WinConfig project tree. During debugging, the remote signal can be downloaded to the gateway station. Therefore, the OPC function of WinCS is compatible with Windows, with OPC function, which can access data from process stations and field devices.

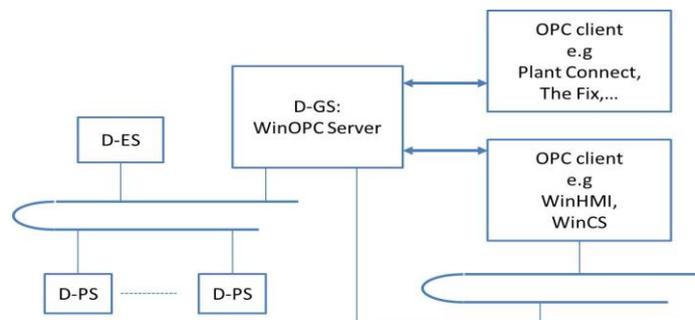


Fig.3 WinOPC Server

3. WinConfig configuration application

3.1 Establishment of OPC Gateway

In order to make the data in the lower computer WinConfig project can be collected by the host computer, the gateway must be set in the lower computer WinConfig project. Only by adding the gateway resource in the project tree can we determine which variables and tags can be sent through the gateway. Create a new gateway station DG-S resource under the project tree Software, and select "WinOPC- Gateway" for the

gateway type. In the hardware architecture, a gateway must be inserted at the control level and specified in the OPC gateway resource in the project tree. As shown in Fig 4, OPC read and write permissions are set on variables in the tag list.

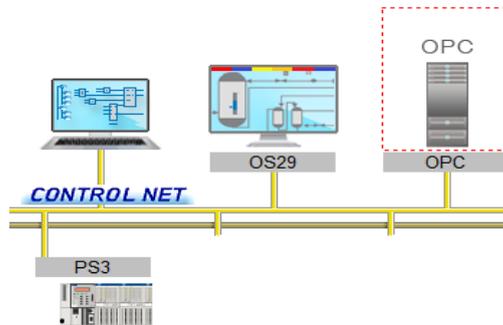


Fig.4 hardware structure of OPC

3.2 OPC gateway test

The new resource ID in the WinOPC server option of WinAdmin is written to ID:31. As shown in Fig 5, open Configurator, and enter the fixed name WinOPCserver.31 in the ServerName of the DA line. The resource ID:31 must be the value set in the WinAdmin.

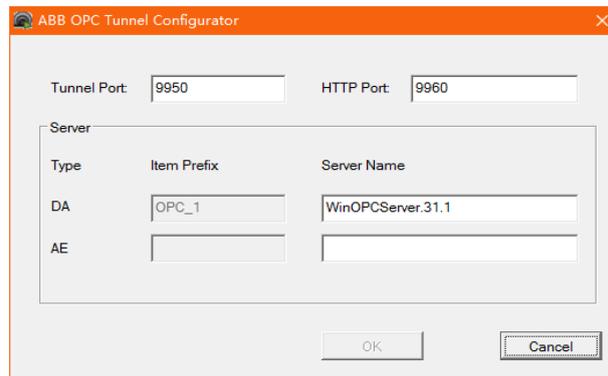


Fig.5 OPC Tunnel Configurator

The OPC gateway is debugged with the virtual simulation controller OPC Quick Client, OPC quick client address of 127.0.0.1, the WinConfig engineering configuration of the lower computer is turned on for network configuration, and the OPC gateway IP setting is consistent with the virtual simulation controller address, ID:31. When OPC Server, OPC Server is turned on, it is displayed in the taskbar.

WinConfig enters online mode and loads the PS, before loading the OPC (GWY) to open the OPC quick client. Select the Win OPC Server.31.1, on the local host to select the variables M102H, M102_Hz and other variable points to be tested, Add Leaves to add variables after the, OPC Client and wincs variable connection is established. At this time, the starting motor observes the changes of the collected data, as shown in Fig 6, indicating that the OPC gateway is set correctly.

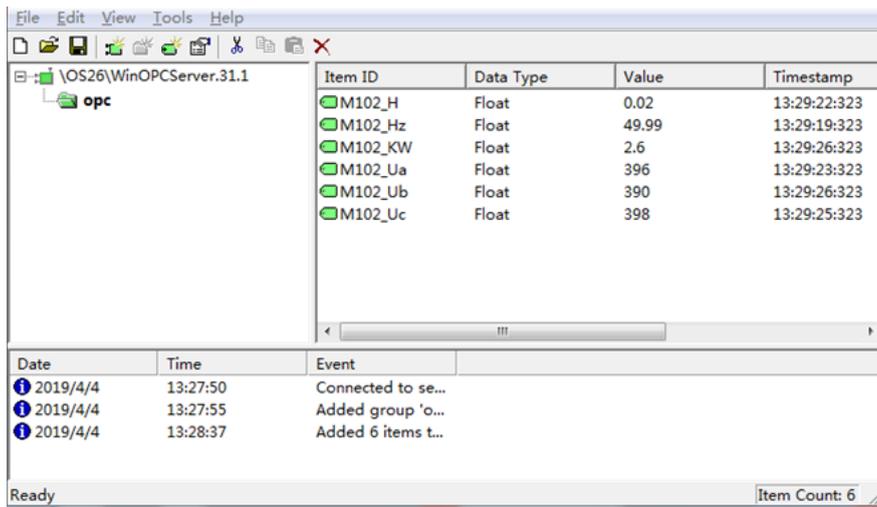


Fig.6 OPC virtual simulation

4. OPC data access

During the WinConfig configuration process, the list of variables from the OPC gateway of the lower computer can be read through the OPC server of the upper computer. Select the variables that will be displayed and recorded in WinHMI from a list, and enter the WinConfig variable label list, which can be used in graphical display and trend display. Create a new OPC server in the host computer engineering configuration project tree, as shown in Fig 7, set the host computer IP address and port number of OPC Tunnel, open the WinOPC rule mode dialog box, and select Winmation Control System.

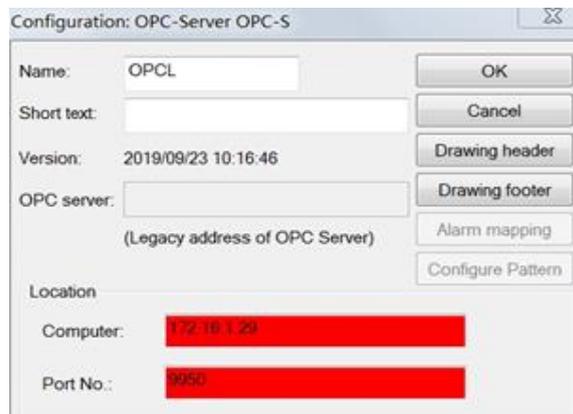


Fig.7 OPC server establishment

After the host computer and the lower computer have added the OPC gateway and the OPC server, and the OPC Tunnel is 31, open OPC Server, and turn on OPC Tunnel to use the data of the external OPC Server connected to these resources on the WinHMI. WinConfig needs to first use Advanced Configurator to collect external data and then use the OPC project list to browse and import external OPC data and set variables for that data to import into the variable list of the WinConfig project. Back in WinConfig configuration mode, click the OPC tab list under the system options to open the OPC

data item window as shown in Fig 8. The OPC server window connects to the external OPC Server, specified by the OPC-S object by "selecting the OPC Server, server" After browsing the data items in it, select the variables that need to be imported into the WinCS control system, and after assigning and renaming the variables, import the variables into the list of variables in the WinConfig project.

The OPC variable newly imported into the variable list, select OPCL in the resource bar to view the variable, use the graphic display or trend to draw the upper computer screen, and use WinHMI to display the OPC variable online. These variables can be graphically displayed, trended, or recorded in the configuration operator station.

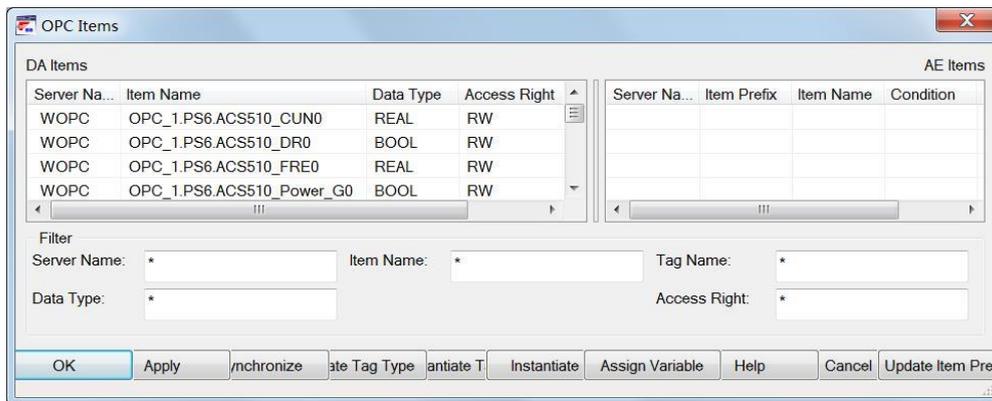


Fig.8 OPC Items

5. Conclusion

This paper first summarizes the basic knowledge of OPC and the OPC framework of WinCS, and introduces the configuration and use of OPC Server and OPC Client of WinCS control system, respectively. The WinCS control system provides both server and client functions of the OPC, allowing other control systems to access the data of the WinCS control system through the OPC interface. At the same time, the data of the third party system or equipment can be integrated into the WinCS control system through OPC technology. Then, through a specific example to illustrate how to make use of WinOPC Tunnel and OPC Quick Client do not need tedious DCOM settings, you can easily integrate the data variables in the OPC server.

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