

The Latest Development of PLC

I. Introduction

For a long time, PLC will always be in the field of industrial automation and control the main battlefield for a variety of automated control equipment to provide a very reliable control applications. The main reason is that it can provide for the automation control applications safe, reliable and relatively perfect solution for the current industrial enterprises in automation needs. On the other hand, PLC must also rely on other new technologies to deal with shrinking market share gradually brought about by the impact, in particular the PC industry brought about by the impact. PLC need to address the problem still is the introduction of new technology, the system of open and prices.

PLC technology exhibition is the ultimate trend that people are still the focus of controversy. Most people think, PLC will continue to lose market share; What is more, in the face of industrial PC, PLC will be step by step towards death, but there are some people believe that some special industrial applications for the PLC will continue to provide a certain market share .

In the global industrial computer-controlled areas, and re-open around the open process control system, open process control software, data communication protocol and opening up, enormous changes have taken place almost everywhere PLC, but this trend may not continue to develop. With the soft PLC (SoftPLC) configuration control software technology and the birth of further improvement and development, installation and configuration software is SoftPLC PC-based industrial control system's market share is gradually growing, the fact that traditional suppliers in terms of ideology PLC Have taken place in the dramatic change, they must face the reality, the traditional PLC technology development and raising more open to make a high-profile. The control software, this is the core of PLC controller, PLC providers are available to industrial users of open programming configuration tools, but also for industrial users was very positive. In addition, open communication network technology has also been a breakthrough, the result is the PLC into a more open industrial control industries.

Second, open and PC-based industrial control

PLC manufacturers have started watching PC-based industrial control technology brought about by the powerful impact. Some experts even believe that the new business brought about by new technology and open technical specifications will be buried traditional PLC. PLC manufacturers that, although in the industrial field installation of a large number of PLC control equipment, but they still need the Joint Control software companies to develop their own PC-based industrial process control software.

It is true that a few years ago in the industrial scene obviously there is a mix of the old and the new PLC, industrial users have to learn related to the old and new knowledge, learning and even learn from each other. The majority of PLC manufacturers for industrial users provide only a soft logic and a platform.

In the high-end applications, it is difficult to distinguish between PLC control systems and

industrial PC control system the difference between, because it both followed the same types of microprocessors and memory chips. Play the image of an analogy, if you forget the industrial PC and PLC literal meaning of those words, then the box can observe it is precisely some of the basic computer hardware technology, we observed that the more it is the complexity of those basic skills And the mixture of these technologies to be effective in combination to control system.

In addition, the adoption of the reasons for the control system functions on the one hand is the need for integration, on the other hand also because some industrial users to function due to excessively demanding. If we can give a high degree of attention, we can get more of the basic technical knowledge. PLC manufacturers to focus on system functions, while industrial users will focus on system applications. People can see that the future trend of development is to further integrate more functions to a control box. As a result sequence control and process control such incidents will be used functional approach to deal with, like the other sports can also share control of the control structure to the same system.

It is believed that, PLC technology will continue to open the direction of transfer control system, in particular, the PC-based industrial control systems. The latter addition to the flexibility than traditional PLC has distinct advantages, but also has other advantages, such as the system can be shortened to hit the market cycle, lower system cost of investment, improve the bottom from the factory to the corporate office automation efficiency of the data flow of information And so on.

On industrial PC control system for real-time response has been very good solution, perhaps the main thing is still hidden behind in technology, but the lack of corresponding track record. The PLC speaking, the strength of one of its main features, this is already a considerable number of track records to verify. Industrial users will still treat very carefully PLC, they are different from the PLC for the technical tests. In the use of a new technology, industrial users need to consider the question of how much is take the risk, and the need to consider their business activities can bring the number of opportunities and benefits.

However, industrial users are not completely believe that the open-control system brought about by the benefits. With the further development of technology, they began to gradually reduce these ideas and concepts. Industrial users are balanced by the introduction of new technology and the risks to their business activities brought about by the proceeds from the future decision-making in order to provide effective protection.

Industrial PC technology offers many features to enhance the PLC features, including containing digital video and high-speed floating-point coprocessor. Although Microsoft did not further enhance the features of the plan, but the new Windows CE 3.0 entirely to better meet the needs of process control.

Not long ago, Siemens announced a new set of control system based on open software products, that is, 3.0 version of the SIMATIC WinAC (Windows Automation Center). WinAC is based on

Windows NT, and SIMATIC S7 PLC-compatible PC suitable for industrial control system solutions. WinAC 3.0 provides a higher degree of integrated Profibus Fieldbus LAN connectivity, and remote programming. In addition, it was the scene of control equipment localization integration provides a new DeviceNet I / O device driver, used to connect the installed DeviceNet I / O devices.

Steeplechase software company has also introduced a set of hardware support for real-time process control of embedded Windows NT operating system interface components. Parts of the further integration of the Steeplechase company SBS technology and run the Windows NT environment in the industrial Compact PCI hardware real-time control software. Now, Steeplechase's visual logic controller has been upgraded to version 5.0. The controller for Windows NT 4.0 and Windows 2000 operating systems of two of its real-time engine directly with ordinary Ethernet and TCP / IP integrated. 5.0 version of the controller using a enhanced OPC server drivers, so than the previous version with a faster speed. Other features include a new network of OI, and to allow industrial users to design their own colorful screen, such as dynamic graphics.

Transysoft company recently launched a new version of the ISaGRAF series of industrial control configuration package, that is ISaGRAF PRO, it is based on IEC 61131-3 international standards and independent of any hardware platform logic of automatic control of the soft package. In a network environment in the process control system, the package can be applied to a variety of configurations and the development of distributed control system, which includes a set of development tools, application platform and the corresponding "virtual machine" run-time 目标. The run-time goal to run on a variety of hardware platforms.

CTC automation engineering company has released a new set of control package MachineLogic PCLC (industrial PC logic controller), the PC software industry can play a role in the PLC, and remain industrial PC features. The software able to complete a set by the PLC control tasks, and procedures for the implementation of time and as fast, both in less than 1 ms; can handle more tasks, but not more than 16 control tasks. Is a priority and multi-tasking core mechanism for maintaining control of every one of the tasks of tracking and control tasks can be made to ensure that the highest priority. The software can run all five IEC 61131-3 standard programming languages and PID control procedures, to support two types of I / O control equipment. One is like Profibus and DeviceNet, such as the Fieldbus I / O devices, the other is like PC/104 ISA and the industrial PC I / O template. In addition, the software also provides a control system configuration editor of the online features. Procedures in Windows 95/98 and Windows NT, developed and run, but also in RTXDOS under implementation.

SoftPLC company also provides a software industrial products Tealware, it was the very image of the software products such as wearing clothes of the PC industry PLC. Stent installed in the control system has a small form factor of the PLC, but SoftPLC's control software has been embedded in the CPU. Tealware software to meet the needs of various types of industrial users, from small, stand-alone

systems to large, decentralized and more control workstation applications. The distinctive features include the full range of I / O module, containing industrial Ethernet and serial communication interface.

Recently, Tealware software has been upgraded to version 2.3. Among them, in fact control software provides a limitless ladder logic control sequence, while allowing more than 1 million characters of data table; many OI / SCADA application interface; containing Java engine and FTP server for remote maintenance and management; support Prepared by the user's own C, C + +, Java procedures and device drivers; suitable for embedded Web server; programming online mode; rugged I / O modules to support capacity and many other standard features PLC; can run by the Entered, or the conversion of the AB's PLC-5, PLC-2/PLC, PLC-3 and SLC-500 procedures.

Third, Ethernet and further to accommodate the expansion of Web technology

At present, in all areas of process control, one of the biggest trends is the expansion of Ethernet technology. PLC also an exception, now, more and more providers begin to provide PLC Ethernet interface components. In the past few years, we have seen, the development of small faster than the existing general Ling PLC PLC is a more powerful kind of trend. PLC Ethernet will become the communication standards? » Perhaps this is the end result, but now it is still too early. In the PLC to provide Ethernet interface will be able to solve all the communication problems, widespread misunderstanding of the people. Ethernet only definition of the OSI reference model at the bottom of the layers of protocol standards, if the upper agreement can not be compatible with each other, then still impossible to handle communications between the two. Example, that as a Chinese who do not understand English with a Chinese-Americans do not know can not be between the phone like a dialogue. Therefore, the agreement between the communications equipment that is the language.

On the other hand, the pace of progress has been made, we only facing difficulties, in order to Ethernet technology will be applied to the bottom of the plant site to process control equipment, ODVA Association for the establishment of a global standard specifications, Ethernet / IP standards, in order to be able to solve the practical work of the difficulties encountered.

Ethernet and around to a view to the Internet can connect to the desired anywhere. In fact, in some unexpected places, Web server is demonstrating its rightful power. A few years ago, a number of PLC systems have built a Web server, this is undoubtedly also for the PLC has added more features. Other types of control equipment are also ready to further integrate Web server. For example, Square D company already has a connection with Ethernet interface of the engine control center and is preparing to develop a Web server containing the speed interface devices.

Built by the Web server of a wind of the benefits include the open network, the impact of commercial tools, client / server relationship. In the past, industrial users may be representative of the PLC asked some of the information, but now, because of the continuous birth of new technology and

development, industrial users can easily get the information in this regard. On the other hand, as the processor chip and large-scale production, PLC product manufacturers to provide an open network and the production of products for industrial users spent less the cost will be able to function very well to the purchase of the PLC products.

For the PLC will connect to Ethernet and on the Web to provide technical support, Schneider has become one of the pioneers. Recently, the company introduced a Premium PLC platform running on the new fast Ethernet (100 Mb / s) module. The module can be connected to the PLC for the TCP / IP Ethernet provides the adaptive full-duplex 10/100 Mb / s connection speed, on-site process controller can be shared between the real-time data, automatic scanning Momentum I / O module And any other Modbus communication protocol based on the control equipment at the scene, using an embedded Web server to provide HTML communications services, while providing a standard SNMP for network communications management. In a show, Schneider also industrial users to display their factories on the concept of transparency.

In addition, Schneider has also recently launched a company based on the company's Momentum MIE Modicon family of processors adapter, the adapter provides a standard IEC controlled performance, and further to provide e-create the perfect solution. The adapter will also provide intelligent I / O system and other process control equipment at the scene connected to the Internet and Ethernet capacity, on-site process control equipment, including all the features of real-time process controller.

A few years ago, Rockwell Automation also provide its PLC products in the Ethernet interface, and is firmly steady increase in Ethernet features. The company recently announced a flexible I / O module solutions, such flexible I / O module using the generic version of Ethernet technology can provide real-time process control performance. AB 1756 provides the type ControlLogix I / O is also based on standard Ethernet TCP / IP and UDP data transmission components of the agreement, the application layer using an open, object-oriented, based on the producer / consumer technology. This technology in ControlNet, DeviceNet and FF H1 fieldbus network system also can be found.

Similarly, many other companies have also launched a communications Ethernet interface module. For example, from IDEC's OpenNet PLC controller provided by the communications interface, with the realization of DeviceNet, LonWorks and Interbus, and other Fieldbus-compatible equipment. The controller uses a Interbus Remote I / O card were not able to handle more than 480 points of local I / O and 512 points remote digital I / O.

Sierra provided by the company's 8051 industrial communication bridge between them to allow non-compliant PLC, DCS, RTU and SCADA systems well integrated. Road communication through this industrial RS-232, 422,485, or Ethernet communication links to achieve high-speed network applications. The bridge controller at the same time provide eight RS-232 serial communication ports, two RS-485/422 isolated serial communication ports, two 10 Base-T Ethernet interface and a redundant

hot backup for the Road The connector.

From ProSoft's multi-component manufacturers interface package for the AB's PLC, SLC, ControlLogix and FLEX I / O (including 1771,1746,1765 and 1794) provided a platform for serial communication capabilities. Each module contains a 80386 processor, and at the same time embedded in a DOS operating system, thus, can be seen as with I / O capability of industrial PC, In addition, the same controller with "A>" prompt disk operation And Autoexec.bat and Config.sys file. Applications can be from simple ASCII communications to complex control algorithms 32.

Another campaign is usually in control of the company on Giddings & Lewis also for PiC (programmable industrial control) and MMC (machinery, and movement control) series for the motion control products increased by Ethernet TCP / IP interface. Parts of these units can be provided to connect to the Internet and Intranet within the plant's ability to process the scene to allow sharing of data between the controller. The scene and industrial process controllers are usually used between the PC OPC server device drivers to connect to real-time data, using Ethernet network systems and Web technology for remote file transfer, process design and system maintenance.

Now, more and more enterprises are planning to gradually all automation control equipment connected to the enterprise-wide information system to. The terms of industrial users, perhaps they have already taken note of the Ethernet for Control Series control solutions, the technology more dependent on Ethernet and Internet. Almost all PLC providers in some of its products in both series provides Ethernet connectivity, and some companies have been identified will be embedded in Web server to complete their internal equipment, the PLC in order to fully demonstrate the performance characteristics. PLC use of Web connectivity features, not only from industrial users anywhere in the operation control system monitoring the situation, but also like the use of manual systems as required to obtain any data information.

Of course, if industrial users is in the process of its control system connected to the Internet, must be set up for this release address information security. In addition, in order to prevent hackers access to the control system, must also install a better firewall security software.

SoftPLC in the network security company has invested a great deal of enthusiasm and interest, they will have a real-time and uncertainty of the Java virtual machine embedded controller to the process. Java so that it can not only run Web-based Active X control targets, the same can also run Servlets. Servlets is a Web server running on with the task of highly integrated, dynamic Web pages can provide content. Servlets code clearly visible, object-oriented design, modules, developed with a very clear and simple, Servlets also provides data and information security, to allow further restrictions on real-time data, such as only a selected industrial users, or by Selected registration data. If the process controller is effectively connected to the Internet, so their security is very important.

Hackers invaded is not the only problem, if the network system paralyzed, we first need to do it »

Hacking solution is to use redundant. In the process controller redundancy in the use of IP addresses, redundant network systems, redundant communications cables, as well as hot backup mode, when unexpected events can be a good time for the process control system to provide services.

Many PLC suppliers in its product development process is still continuing to improve performance and enhance communication, the development-oriented in the direction of the main Ethernet technology and Web-based technology.