



Control system upgrade replaces two Siemens® S7-317 with one CTI 2500-C400 and increases production by 90%

In Ningbo, China a nickel plating facility built in 2006 produces exhaust components for the automotive manufacturing industry.

The original plant's control system used two Siemens® S7-317 PLC processors as master controllers for the process, a Siemens® S7-315 PLC processor on each crane, and a WinCC supervisory control and data acquisition (SCADA) system. Due to memory and performance limitations of the control system the plant was operating at less than fifty percent throughput. The plant is designed for a throughput of 3 million pieces per year but had never exceeded 1.3 million pieces per year.

CTI's distributor Automation ApS in Denmark proposed a CTI 2500 Series based design to upgrade the control system and allow the plant to reach its designed throughput. The upgraded control system consists of:

1. One CTI 2500-C400 processor as the master controller (replaced the two S7-317 PLC processors).
2. iFIX SCADA (replaced WinCC).
3. A new Profibus network design to control the cranes
4. The original S7-315 PLC processors to control the cranes' internal operations.
5. A CTI 2500-C400 control program written in APT.

The new OptiGalv® system running on the CTI 2500-C400 PLC processor controls the process, pumps, valves, motors, levels, temperatures, and other input and output devices except for the internal operations of the cranes that is under the control of the S7-315 PLC processors.

A new software optimisation project is scheduled for August 2008 to increase production throughput to 3.3 million pieces per year. With 3 Megabytes of memory and processing power to spare the CTI 2500-C400 PLC processor is providing a platform for process and speed improvements well into the future.



The main PLC processor issues individual instructions to the cranes based on plating container status, product type and crane availability. This complex calculation formerly took about 2 seconds to compute, but on the new CTI 2500-C400 PLC processor it has been reduced to about 60 milliseconds. This performance gain has substantially improved the plant's production throughput.

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Parker CTC Interact Xpress HMI. No tag count and free display clients

Interact Xpress server

- ☑ XPR Powerstation connected via Serial/Ethernet to I/O, PLC, RTU, and DCS systems.
- ☑ No display, 6", 8", 10" and 15" touch screens
- ☑ No tag count
- ☑ Supports Display clients (max 8)
- ☑ Project stored on removable Compact Flash card



Engineering stations

- ☑ Interact Xpress Manager for online and offline edits.
- ☑ Internet browser for online edits.



Connected via TCP/IP network (LAN, WAN, GSM/GPRS, Internet, Wireless, Telstra Next-G)

Interact Xpress display clients

- ☑ XPC Powerstations running Windows CE for dedicated HMIs.
- ☑ XPC/HPC Powerstation Industrial PCs running an Internet browser.
- ☑ Standard PCs running an Internet browser.
- ☑ Mobile devices such as PDAs and Windows mobile phones running an Internet browser



The need for speed

Here are ten programming tips to save every millisecond in your applications.

1. X, Y, and C memory is accessed up to five times (5x) faster than other memory types. Bit of word is the slowest memory access i.e. WX9.16 or V12.2.
2. RLL PID fast loop instructions for loops requiring a faster sample time than 100ms or precise time intervals.
3. Cyclic RLL for logic requiring fixed time updates with immediate I/O instructions to update critical I/O.
4. CTI 2500 Series processors execute special function programs and subroutines 10 to 20 times faster than Siemens SIMATIC 555 compiled programs and 25 to 10,000 times faster than Siemens SIMATIC 505 interpreted programs.
5. IMATH instead of MATH instructions when floating point maths is not required.
6. Temporary memory (T) for dummy variables in Special Function programs.
7. Configure the asynchronous Profibus DP baud rate to achieve no more than 2-3 update cycles per PLC scan.
8. Install Special Function modules in the local base (Base 0).
9. Disable unused remote I/O bases in the I/O configuration.
10. Poll from Engineering, SCADA and HMI systems at the lowest data rate acceptable.