

# Application Highlight:

## CTI 2500 Series™ CPU's Save Space, Reduce Cost, Enable MES Interface at Medical Device Manufacturer

A medical device manufacturer has been manufacturing polished metal pieces utilizing Siemens® TI 505 series PLCs controlling the processes for over 15 years. The initial system (shown below in Figure 1) included two PLCs, two SCADA systems, and an Oracle based Computer Integrated Manufacturing (CIM) system to control a line executing two processes (Welding and chemical polishing). The CPUs for the line were upgraded in 2000 to Siemens® TI-555 CPUs to mitigate the Year 2000 risks.

The manufacturer's engineers were asked to upgrade the control system to accomplish multiple improvements:

1. Relieve the plant's dependency on Windows-based operating systems. This will reduce long term costs of upgrading factory floor computers and associated SCADA software
2. Enable a direct data collection path to the PLCs for automatic retrieval of validation and production planning information. (Rather than moving production and validation data through an HMI device to the PLCs)
3. Enhance the communication throughput to the HMIs by communicating to the PLC via Ethernet rather than serial protocols
4. Enable easier and more robust PLC program backups by connecting directly to the network servers.
5. Allow the existing CIM system to stay in place while the plant creates, tests and validates the new MES system

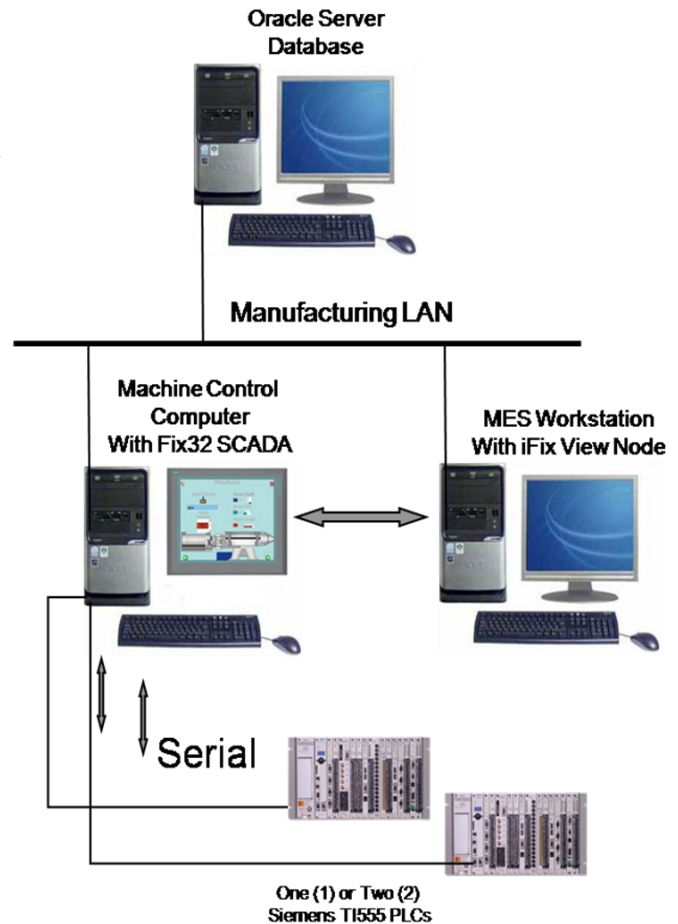


Figure 1: Existing Control System Architecture

### SOLUTION

As shown in Figure 2, the new control system architecture includes:

- Ethernet communications for the two PLCs to communicate to a single HMI
- Ethernet communications from the two PLCs to a data collector / historian
- Ethernet communications between the two PLCs for better line integration



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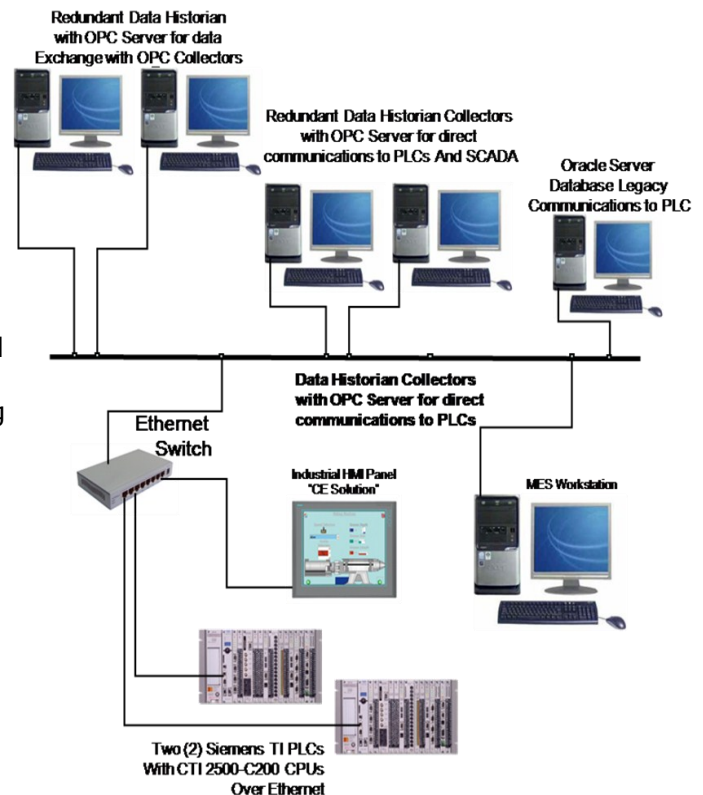
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- Ethernet communications to the existing Oracle Database CIM
- Ethernet communications to the new MES system when completed

When the manufacturer's engineers evaluated the proposed architecture, they found that all of the PLC's had no open slots to simply add an Ethernet module to accomplish the target architecture.

The solution to this opportunity was found by using a CTI 2500 Series™ processor. Since CTI incorporated both PROFIBUS and Ethernet into their 2500 Series™ CPUs, replacing the existing 505 CPUs with the CTI CPU, no re-engineering was required to make room for a new communications module. If an extra slot in the PLC rack was required, discrete I/O would have to be re-designed, causing one or more of the following scenarios:

1. Retrofitting I/O modules from 16 point to 32 point and re-designing and re-wiring the existing panel, including PLC program modifications.
2. Removing an I/O module and replacing with a PROFIBUS remote I/O module, requiring re-design and re-wiring including PLC program adjustments
3. Upgrading the existing 505 Power Supply to handle the additional power requirements of an added Ethernet Module



**Figure 2: New Control System Architecture**

1. Easy expansion of manufacturing data collection to increase production and streamline validation
2. No PLC programming modifications required to move to the CTI CPU
3. CTI supplied communications driver is included in the price of the CPU alleviating the purchase cost and configuration costs of communication modifications
4. The CTI CPUs communicated to both the existing SCADAs and the new HMIs at the same time allowing flexibility and time savings migrating the control system
5. Manageable retrofit schedule for the system upgrade

Encore Systems, the CTI Preferred Automation Partner for the CTI PLC hardware was very supportive during the project execution. Encore staged and delivered product as proposed, and provided timely technical phone support as required securing correct versions of Ethernet communications drivers.