Application Highlight

2500 Series®
Programmable Automation Control System

Multinational Manufacturer of Nonwovens Deploys the ACP1 to Communicate and Control Motor Drives Using EtherNet/IP

A multinational manufacturer of nonwoven materials used in the manufacture of diapers, feminine hygiene products and wipes has selected the CTI 2500-ACP1 Application Coprocessor for communications and control of EtherNet/IP drives for its new production line. The company produces a wide range of nonwoven materials of a wide variety of weights using several different bonding technologies. The manufacturer is able to produce custom blends using various types of fibers and bonding technologies to meet customers' specific guidelines and requirements for absorbency, strength, bacterial barriers, and biodegradability.

Summary

In a recent plant expansion, the manufacturer wanted to replace the Profibus-DP networks used to interface with drives on its existing lines with EtherNet/IP in order to remove complexity, lower cost, improve diagnostics and troubleshooting, and simplify maintenance. CTI 2500-ACP1 modules were used as "smart communications controllers" for managing communications between the host PLC and the drives and I/O over the new EtherNet/IP network and as a failsafe controller of the drives in the event of a PLC failure.

- **All EtherNet/IP communication between the PLC and the drives performed by the ACP1**
- **Data cache interface used to transfer data between the ACP1 and the PLC**
- **ACP1 uses CAMP Client communications interface for PLC-to-PLC communications streamlining process by eliminating need for CTI 2572A modules**

CTI PLCs and I/O are used to control the material handling systems as well as the fans and blower motors in the machines used to produce the blended materials. The machines on the existing line use Profibus-DP network interfaces for control of the motor drives and I/O. This has proven to provide satisfactory performance, but installation is expensive due to costly interfaces, cable, and connectors. Also, troubleshooting and correcting communications problems with Profibus has been difficult for the maintenance personnel.

The facility is currently undergoing an expansion to add a new line to increase production capability. The manufacturer decided to replace the Profibus-DP networks used for the other production line with EtherNet/IP due to larger selection and lower cost for EtherNet/IP interfaces vs. Profibus-DP interfaces for drive controllers, and the much simpler and less expensive cable/connection system for EtherNet/IP. As a result, the manufacturer needed a new communications solution for managing data transfers between the PLCs and the motor drives and I/O.

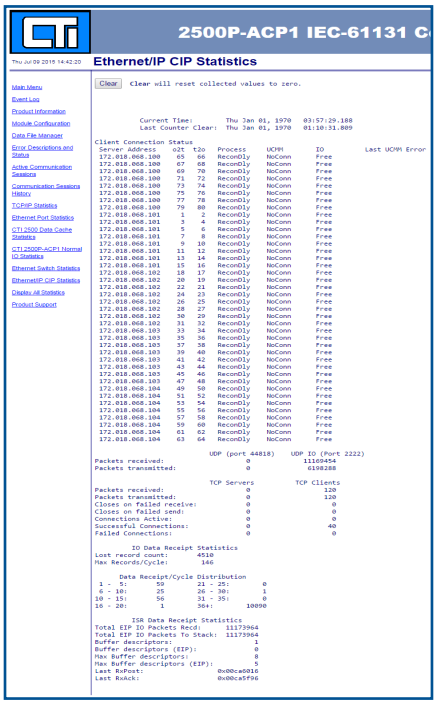
PLC logic is used to control and monitor all machine operations – so the PLC logic for the new controllers is very similar to that used for the other lines. The 2500-ACP1 functions as a "smart communications controller" for the Host PLC. The Data Cache interface is used to transfer data between the ACP1 and PLC. The ACP1 transfers the latest PLC data to the motor controllers (drives) via EtherNet/IP, and it also receives status data from the drives and transfers that information back to the Host PLC.

All EtherNet/IP communication is performed by the ACP1 based on its configuration. The ACP1 also contains LD logic for detection of a failure in PLC operation or Data Cache interface. If Data Cache communications is lost or a PLC error condition detected (i.e. Program Mode, Fatal Error, etc.), the ACP1 can then shut down the drives to prevent equipment damage. The drive controllers also are configured to shut down in case of loss of EtherNet/IP communications with the ACP1.

In addition to EtherNet/IP communications, the ACP1 is configured to use CAMP Client communications interface to transfer data to/from other PLCs – replacing the functionality previously performed by the 2572A module.

Using the ACP1 allowed the manufacturer to add another production line to its plant and switch from Profibus-DP to EtherNet/IP for control of its drives and I/O without extensive revamping to its production process. The manufacturer was able to largely replicate its existing production line architecture, including reusing existing PLC programming, since CTI PLCs can be used with both lines. The ACP1 integrates seamlessly with other CTI products and also provides the peer-to-peer Ethernet communications function that previously required an additional TCP/IP Ethernet Adapter for each PLC.

Additional benefits include lower equipment and installation costs compared to Profibus-DP and simplified troubleshooting and maintenance. Technicians particularly liked the new ACP1 webserver that allows them to quickly and easily view pages with dynamic update of connection configurations, status and error codes to simplify troubleshooting efforts. All in all, it was a relatively fast, simple, cost-effective production line expansion that allowed the manufacturer to expand and update its plant controls building on its existing control system. That's what we at CTI call Smart Modernization™.



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