Success Stories

A Tobacco Production Automation System for Controlling and Monitoring Tobacco Plants in China

Project Introduction
Without the aid of computers, calculating production volume in a tobacco plant is troublesome and error-prone. PC-based monitoring systems that automatically collect production data and keep records can greatly improve in-factory logistics management and machinery maintenance. Combined with the use of networking communications, a Manufacture Executive System (MES) can be developed to improve the overall management of the factory.

Our customer is a branded tobacco producer in China. When they came to Advantech, their production lines were already automated with the deployment of Programmable Logic Controllers (PLCs). However, they were still dependent on manual labor to count the amount of cigarettes and other materials, and their engineers had to manually check and record the data-logs stored in the PLCs to produce analyses for repair and maintenance purposes.

But with Advantech’s PC-based monitoring machines, installed next to manufacturing machines, related data is shown on touch screens and transmitted to the control center, helping to reduce errors and improve management efficiency.

System Requirements
A tobacco plant is a complicated environment with a variety of manufacturing machines, including tobacco shredding machines, drying machines, cigarette making machines, packing machines and more. Throughout the plant, there are also a wide range of temperatures and voltages used; thus, the industrial computers (IPC) applied must be robust and reliable.

Additionally, the IPCs need to have PCI expansion slots for inserting cards to link with legacy PLCs at the production lines. On the other hand, as the monitoring system has to collect and transmit large amounts of data, powerful CPUs for the industrial PCs, and rapid and reliable Ethernet are required.

Project Implementation
UNO-3282 Intel Core 2 Duo M Automation Computer with PCI/PCIe, 2 x GbE, 4 x COM, and DVI Ports
FPM-3191G 19” SXGA Industrial Monitor with Resistive Touchscreen, Direct-VGA and DVI Ports
System Description

The monitoring machines provided by Advantech to this tobacco plant are stand-alone machines specially designed for this customer. Each of the machines contains a fanless industrial computer (UNO-3282) inside and a 19" TFT LCD touch screen (FPM-3191G) as a front panel human-machine interface (HMI). The FPM-3191G with stainless steel chassis and NEMA4/IP65 compliant aluminum front panel provides reliable functionality in the harsh and dusty environments.

Additionally, the UNO-3282 is a high-performance automation computer with a powerful Intel Core 2 Duo processor. Its expansion capability, a choice of two PCI expansion slots or one PCIe plus one PCI slots, provides connection to the device level PLCs. The UNO-3282 also has dual teaming-capable gigabit LAN Ethernet ports linking to an Ethernet network with the monitoring machines. Its LAN redundancy and battery-backup SRAM both ensure the consistency of Ethernet networking and data transmissions even in the event of Ethernet breakdown or power breakdown.

At the device level, tobacco manufacturing machines and PLCs are connected using the Profinet protocol. The UNO-3282 then collects data from these PLCs and transmits the data up to central control room. The data is also shown on the FPM-3191G monitor, which allows the operators in the plant to easily read information displayed on the screen and give orders with a touch of their fingers.

Conclusion

With the use of this monitoring system, all data related to production and machine operation can be shown on terminals and stored on the database in real time, including: the amount of cigarettes produced, defect rate, the status of PLCs, and so on. It saves using manual labor for cigarette counting, and reduces maintenance work for engineers. More importantly, it improves the efficiency of in-factory logistics and the overall management of the factory. Advantech brings the benefits of technology with a high performance-to-price ratio.

Related Products

UNO-3082
Intel® Core™ 2 Duo Automation Computer with Dual DVI, 2 x PCI and FireWire

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