A truly total solution for Factory Automation

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Project Introduction:

In order to optimize manufacturing management, manufacturers need visibility to accurately control workflow information. As a result, there are more companies willing to implement Manufacturing Execution Systems (MES). According to the definition of Manufacturing Execution System Association (MESA), "MES delivers information that enables the optimization of production activities from order launch to finished goods." However, the lack of bottom layer information, which is responsible for the physical control of machinery and equipment, makes MES unable to maximizethe effectiveness of factory automation. In addition, industrial grade devices to precisely acquire signals and immediately deliver data are also important for such automation applications due to the harsh environments in factories.

System Requirements:

A well-known manufacturer of various electric oven products, water heaters, cooker hoods, etc in China. was planning to improve its factory management efficiency and has implemented MES, but the critical data of the manufacturing equipment cannot connect to its system because of the outdated machinery, meaning that the company has to manually upload data that increases the chance of human errors but also substantially increases the workload. Meanwhile, the work place is filled with multiple punchingmachines and related equipment, and is therefore unable to do the network wiring. The oven manufacturing plant is a high temperature and dusty environment without air conditioning so the devices have to operate under quite stringent conditions.

System Description:

For this case, three types of ADAM modules were deployed in the factory to collect information because some of machines are too old and don?t even have data acquisition devices. This important data will affect the manufacturing quality, so Advantech addressed these issues with the robust ADAM-4100 series which are compact, versatile sensor-to-computer interface units and designed for reliable operation in harsh environments. The first is an ADAM-4117, analog input module in charge of the pressure values of the oil cylinder, and the second is an ADAM-4118, thermocouple input module to collect the machines? temperature. The last, an ADAM-4051, is an isolated digital input module with special features making it suitable for critical applications, mainly counts the number of operating times of the punching machine.

Advantech also provided a UNO-2174A Embedded Automation Computer, as a gateway next to the manufacturing equipment to acquire the on-site signals of the PLC and ADAM devices as well as delivering data to Advantech WebAccess that is installed in IT control room and is responsible for sending data to the MES. With Gigabit Ethernet ports, multiple I/O, and PCIe sockets, this embedded computer offers excellent functions for MES applications. Additionally, it features IP40 certified anti-dust ingress protection and wide operating temperature range (-10~70°C) to enable a reliable operation in severe environments.

Project Implementation:

Advantech WebAccess	Browser-based HMI / SCADA Software
UNO-2174A	Intel Atom N450 Automation Computers with 6 x USB, 8 x COM, 2 x Mini PCIe
ADAM-4117	Robust 8-ch Analog Input Module with Modbus
ADAM-4118	Robust 8-ch Thermocouple Input Module with Modbus
ADAM-4051	16-ch Isolated Digital Input Module with Modbus

System Diagram:

Conclusions:

Advantech?s total solution includes hardware, software, and professional services to truly achieve the efficient Factory Automation goal and it overshadows other competitors? incomplete HW/SW programs. At first, all of Advantech?s products passed customer?s 24-hour burn-in test to prove their stability, and then perfectly combining with a variety of PLCs, sensors, and other devices from different vendors to collect on-site information enables customer to correctly control the production conditions in real time via our open architecture software to connect MES. Consequently, our customer can not only increase its production capacity and product yield rate but also reduce management cost and solve the problem of human errors.