

Networking Solution for CNC Control Systems

Project Background

The initial solution was for the engineers to use CNC (Computer Numerical Control) to run a new manufacturing program. This solution requires off-line development in the design room, and then manual transfer of the program to the factory floor PC using a floppy disk or USB Storage. The factory floor PC will implement the program by sending instructions to various manufacturing machines over an RS-232 interface connection. However, the environment of the factory floor is not suitable for PCs (due to high humidity, oily and dusty surroundings, and extreme temperatures); it is highly probable that PCs in such environments will crash frequently.

Moxa's Solution

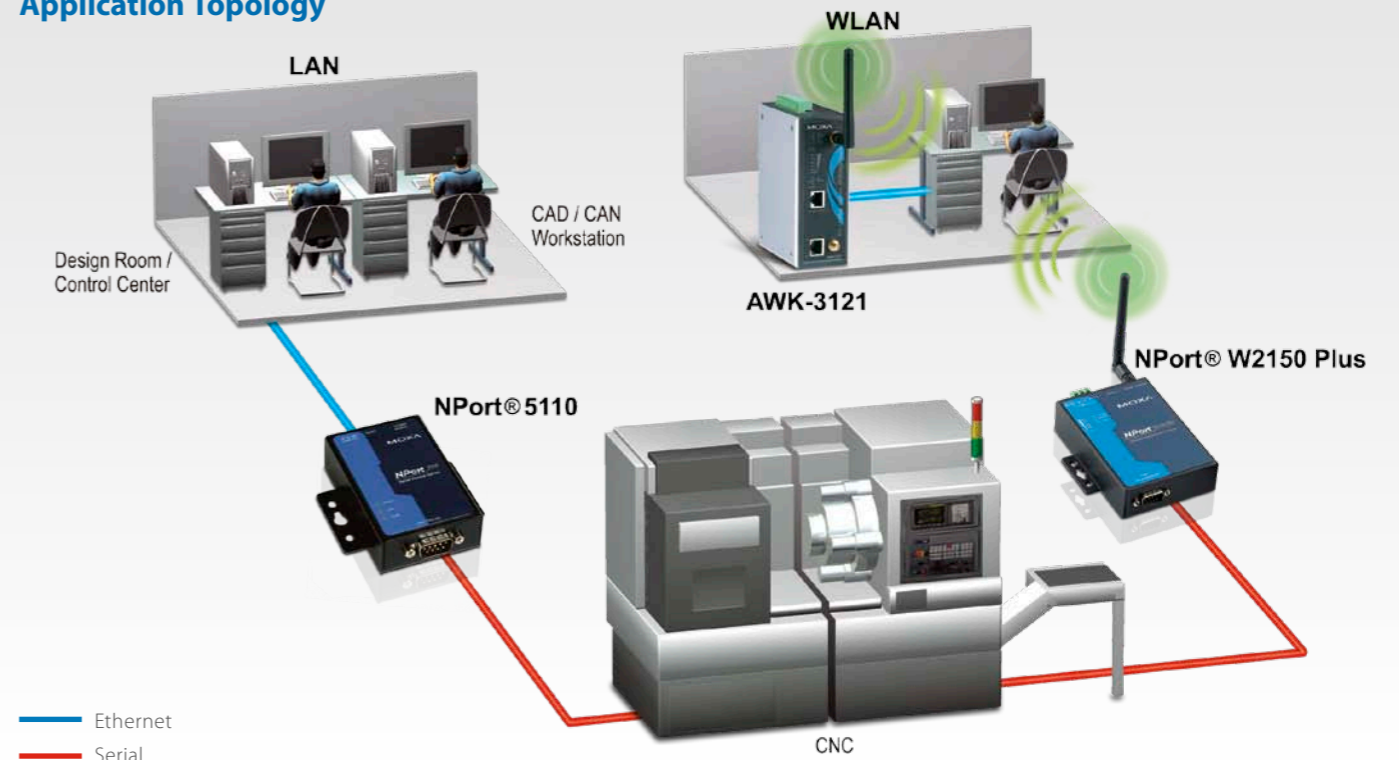
Moxa's NPort® 5110 and NPort® W2150 Plus device servers were chosen since they meet all of the requirements. The NPort® is perfectly suited for rugged environments and is much smaller than a PC.

The control center sends instructions to the CNC in TCP/IP packet format through an Ethernet/Wireless connection to the NPort®. It is no longer necessary for personnel to physically transport the program to the site, and multiple CNC machines can receive the data simultaneously.

Advantages of implementing this solution:

- ◆ System costs are reduced by lower equipment expenses (the cost of NPort® is much lower than a PC) and by the time and human resources saved.
- ◆ Changing the CNC layout when expanding is quick and easy.
- ◆ Moxa's driver technology reroutes COM data through the computer's Ethernet card; users do not need to spend time to make changes to their existing manufacturing programs.
- ◆ Centralized feedback of the CNC's status ensures organized and simplified maintenance.
- ◆ Wireless NPort® save on cabling costs and time.

Application Topology



Benefits

NPort® 5110

- ◆ Small size for easy installation
- ◆ Reliable serial-to-Ethernet solution for data transmission
- ◆ Monitoring and troubleshooting utilities are included

NPort® W2150 Plus

- ◆ 802.11a/b/g wireless connectivity to a CNC
- ◆ Seamless roaming with a user-definable signal strength threshold
- ◆ Off-line port buffering and serial data log
- ◆ Secure data access with WEP, WPA, WPA2, and secure remote management with SSH/SSL configurations

Products Implemented



NPort® 5110

- Real COM/TTY drivers for Windows and Linux
- Standard TCP/IP interface and versatile operation modes
- Easy-to-use Windows utility for configuring multiple device servers
- Built-in 15 KV ESD protection for all serial signals
- -40 to 75°C operating temperature (T models)

NPort® W2150 Plus

- 921.6 Kbps baudrate for RS-232/422/485 transmissions
- Enhanced remote configuration with HTTPS, SSH
- Secure data access with WEP, WPA, and WPA2
- Wireless roaming with a user-defined signal strength threshold
- 20 MB off-line port buffering and 64 KB serial data log



AWK-3121

- IEEE 802.11a/b/g compliant
- Power input by redundant 24 VDC power inputs or Power-over-Ethernet
- Powerful security with WPA/WPA2/802.11X filters
- Turbo Roaming for seamless wireless connection
- Long-distance communication support
- -40 to 75°C operating temperature range (T model)



CNC Control System Global