Case Study

Project Introduction

Thingworx®, a PTC® company, is arguably the most advanced Industrial IoT (IIoT) platform on the market providing connectivity to an endless number of devices. Berkshire Technology Solution, LLC., a PTC® partner and OEM solution provider for the discrete manufacturing industry, has developed a manufacturing software application utilizing the Thingworx® platform to assist with increasing production efficiency while reducing material waste, system downtime and lowering production costs. Recently, a well-known government defense contractor has invested in upgrading their current Distributed Numeric Control (DNC) software to BTS's, Progressive DNC™ & Machine Data Collection (MDC) all powered by Thingworx®.

Constructing a secure and reliable wireless connection to each CNC machine for part program transactions and Overall Equipment Effectiveness (OEE) data collection was the most important prerequisite for this project. For example, a CNC operator needed to securely download specific part program files to a CNC machine directly from the CNC control via that attached Moxa NPort IAW5150A-6I/O utilizing its local serial RS-232 port and wireless network connection. The integrity of Moxa hardware, paired with the sophistication of Progressive DNC™ powered by Thingworx® ensures the end-user will have reliable access to

designated network locations for part file downloads. Furthermore, Progressive MDC™ actively monitors all TCP/IP connections from the corporate network to each Moxa hardware unit while simultaneously monitoring CNC machine state and calculating OEE data provided by the Moxa I/O ports and barcode scanner. The ability to calculate OEE data in real-time has allowed managers to quickly evaluate and finetune CNC operational efficiency in order to increase productivity.

As a result of utilizing this combined hardware and software architecture, BTS's client has effectively increased their OEE score from an original benchmark of 44% to an industry average of 61% in only a few short months. Their increase in machine availability, performance and part quality has more than justified the costs incurred by this project and significantly reduced production expenses that are typically passed on to the consumer, in this case the Department of Defense (DoD).

System Requirements

- Interoperability with various CNC machine control manufactures
- A unified hardware solution that delivers MTConnect® functionality, secure wireless connectivity, one imbedded Ethernet port, robust industrial Serial-to-Ethernet capabilities and a minimum of 4 I/O Ports to monitor the state of CNC controls.
- Secure, reliable, industrial-grade wireless communication hardware for CNC controls.
- Meets or exceeds current AES-CCMP wireless security standards as defined in the IEEE 802.11-2007 standard.
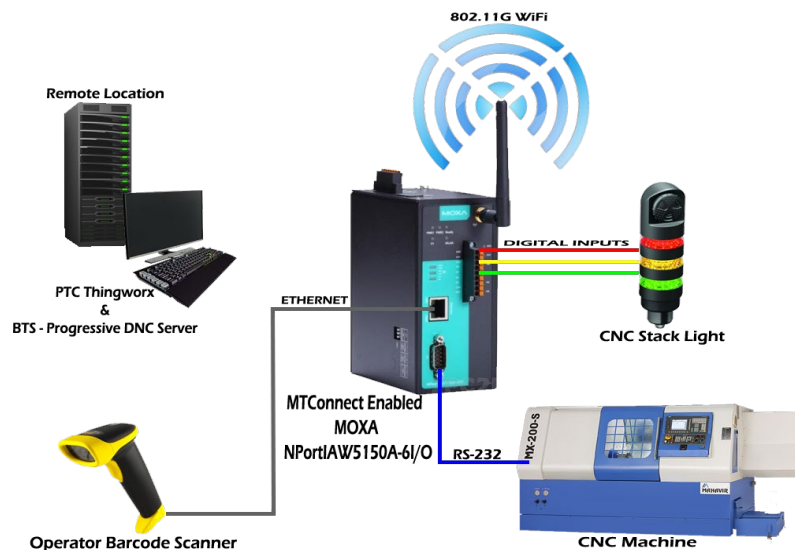
Why Moxa

This defense contractor required robust connectivity coupled with the most advanced security features available on the market. Additionally, the hardware needed to withstand the elements faced in an industrial machine shop all while meeting their budgetary guidelines.
- Moxa's IAW5150A-6I/O…

- Includes an imbedded RJ45 port which allows integration to Ethernet based barcode scanners.

- Provides robust 802.11 G wireless connectivity with the most advanced security features available.

- Supports RS-232 functionality

- Contains digital inputs enabling MTConnect® tagging of a CNC stack light.