Adding Intelligence with Industrial Automation

CNC Machines Adding Intelligence
Through IO-Link Master

The Application

A machine builder wanted to provide an advanced CNC machine to their customers. They had been using standard, non IO-Link spindles. These performed as designed, but provided minimal access to diagnostic information.

The Application

Your automation, our passion.

PEPPERL+FUCHS

The Goal

The machine builder wanted to provide the customer with more insight into the operation and state of the CNC machine by adding intelligence and giving access to additional data. They needed a spindle that could communicate necessary data and diagnostic information.

The Advantages

The solution combined an IO-Link spindle with the ICE2-8IOLK45S-RJ45 from Pepperl+Fuchs. This IO-Link master packages the spindle data into MODBUS TCP messages and sends it to the customer's MODBUS TCP CNC.

Since the spindle is an IO-Link device, communication is automatically established with the ICE2 block. The IO Device Description (IODD) file that the manufacturer creates lists all parameters, diagnostics, and service data and is loaded to the web interface IODD Handler. This allows the spindle parameters to be viewed easily and assists with programming by listing all parameter indexes, options, and thresholds. The web interface enables adjustment of protocol-specific settings—in this case MODBUS TCP.

Additionally, IO-Link features such as data storage for quick device replacement can be set up. This means that the machine builder can also take advantage of the load/save function to back up all ICE2 block settings, IODD files, and IO-Link features so the configuration file can be loaded to the next ICE2 block.

The Solution

By upgrading to an IO-Link-enabled spindle, the machine builder was able to free up trapped data. The end user has additional insight into the core spindle component and can extract more information. The customer is better equipped to perform predictive maintenance, with access to valuable insights about temperature, vibration, collision detection, and cycle counters.

The IO-Link spindle is the only IO-Link device inside the CNC machine, but the customer also has the flexibility to add other IO-Link devices or non-IO-Link digital inputs or outputs in the future. Connecting the spindle to the Pepperl+Fuchs IO-Link master with MODBUS TCP support enables customization of data type and how it is sent to the CNC controller. For example, the byte size of data can be adjusted port-by-port (4 bytes to 36 bytes). Indexed service data units (ISDU) IO-Link commands can be used with MODBUS TCP messaging to read and write the various parameters available on the spindle.

At a Glance:

- Powerful web interface provides easy configuration, diagnostics, data storage, and more.

- Exclusive MultiLink™ technology gives the flexibility to communicate using EtherNet/IP, MODBUS TCP, or both.

- SDU unit handles all programming to provide PLC access to IO-Link device ISDU blocks with a flexible and simplified interface.

For more information:
www.pepperl-fuchs.com/comtrol