

Raspberry Pi for Data Visualization

Alexander Lee

Central Piedmont Community College, Charlotte, North Carolina

At a manufacturing facility in Charlotte, North Carolina, manufacturing engineers are attempting to monitor machine downtime via a legacy Sinumerik 840D controller. Currently, the Sinumerik controller is not connected to any network and, thus, machine cycle data is trapped inside the machine. As a result, manufacturing personnel have to record machine downtime manually and this data is rarely converted into a digital format. This diminishes the machine's throughput and Overall Equipment Effectiveness (OEE). Fortunately, existing technology could enable innovative ways of monitoring OEE via the MTConnect Standard.

The "Maker Movement" has led to the widespread use of the low-cost (\$35) Raspberry Pi computer in education and home automation projects yet it still has not been commonly adopted for industrial automation. Because of its unique capabilities, the Raspberry Pi computer could be repurposed as an MTConnect adapter. In the technology and finance sectors, the Python programming language has been extensively adopted by software engineers because it is useful for data visualization applications. By utilizing the Raspberry Pi computer and the Python programming language, it is possible to create an MTConnect application that will visualize a machine's Overall Equipment Effectiveness in real-time.