Bridging the CMMS to the IoT

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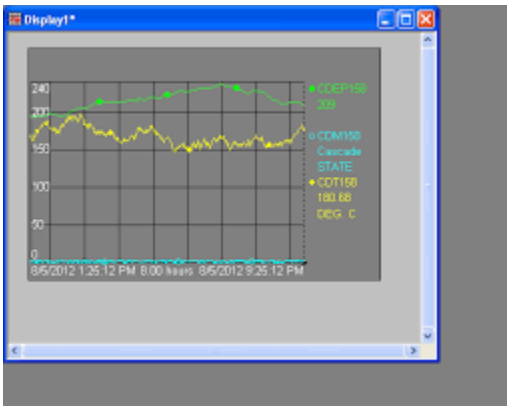
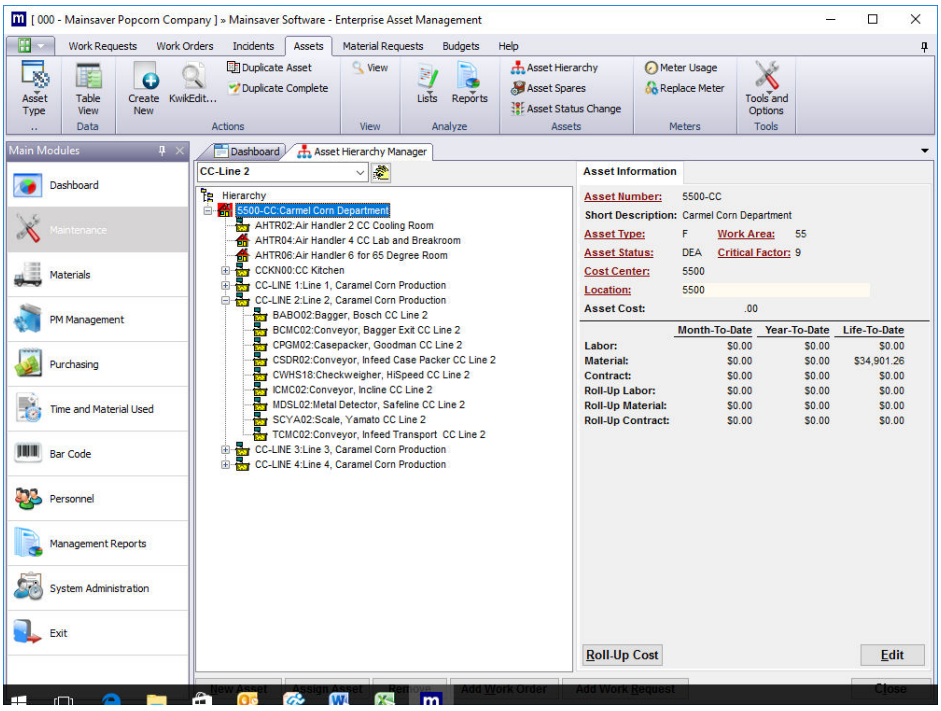
Enterprises utilize a Computerized Maintenance Management System (CMMS) for asset management whether in a facility, production or process environment. The CMMS systems are adept at providing leading (looking into the process) and lagging (looking at the result of the process) key performance indicators to help measure the effectiveness of the maintenance organization and evaluate asset repair costs. However, in order to do effective asset management there needs to be more levels of data available through the CMMS system. The Internet of Things (IoT) is one new technology that can provide CMMS users with data related to downtime, process variables and scrap rate in real time.

The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data. Just think of specially purposed sensors such as proximity, temperature, pressure and speed which are feeding data over a network to a server based database and associated application (often referenced as 'the cloud'). One example is a cutting tool dispensing machine or a CNC shop. When each cutting tool is dispensed to the pre-defined order point or sensed inventory level, the machine will release a reorder request directly to the tool vendor for items to be shipped with the next order.



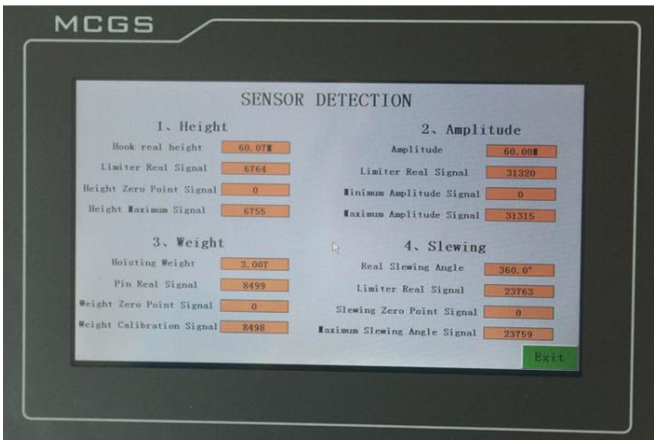
Historian Data

The CMMS system provides an asset hierarchy that provides users with a graphical representation of the equipment and other assets in use. From the hierarchy users can see machine history, spare parts, PM status, documentation and other snapshots of data. Expanding this view the IoT provides users with real time operational data as well as detailed history including trends and other analytics. Many systems provide a means to link an asset to one or more URLs. This link to IoT might provide early detection link to other systems providing process or quality deviation and other red flags to indicate possible equipment failure.



Typical Asset Hierarchy

Taking this link one step further, the data provided by a sensor is imported into the CMMS database to initiate some action to create a countermeasure work order or work request. An example is a PLC (Programmable Logic Controller) tracking the runtimes on various components. A work order is initiated through this type of data import when that component reaches a trigger level. A PM is triggered by a condition such as temperature or vibration reaching a high or low limit trigger.



Typical PLC data

Not to be dismissed is In related is the topic of security risks. In his article “Critical infrastructure: Off the web, out of danger?” Taylor Armerding states “The billions – and growing billions more – of connected devices are bringing both unimaginable benefits to society and unprecedented dangers.” Fortunately, the guardians of the US infrastructure such as the North

American Electric Reliability Corporation (NERC) are well aware of the risks and do not allow control systems to connect to the Internet thereby mitigating such risks.

CMMS application owners should review the reliability strategy of their organizations and determine if any external IoT data points could enhance the detection of potential failures of critical equipment. This will provide another tool in the mission to keep assets effective.

Sources

1. Armerding, Taylor. "Critical Infrastructure: Off the Web, out of Danger?" *Network World*. CSO, 22 Mar. 2017. Web. 24 Mar. 2017The Internet of Things: Opportunities and Applications across Industries, December 2015 Jason Mann

2. Mann, Jason. *The Internet of Things*. Meppel *lianalytics.com*. 1 Dec. 2015. Web. 24 Mar. 2017.