

Industrial IoT: Staying Connected

The quest for extreme optimization in manufacturing from days of Frederick Taylor’s “Scientific Management” in the early twentieth century to Lean Manufacturing, Six Sigma and Business Process Reengineering a few decades back resulted in significant efficiency improvements in all spheres of economic activity – well beyond manufacturing and resource industries.

With the coming of Internet of Things, IoT’s application to the Industrial world was imminent. Fortunately, much of the foundational work were already in place with PLCs, SCADA and M2M networks. The Industrial Internet of Things (IIoT) was a natural progression.

What exactly is Industrial IoT? It has been defined as the use of IoT principles to enhance manufacturing and industrial processes. IIoT incorporates machine learning and big data technologies to harness sensor data, and machine-to-machine communication.

Its main strength lies in its accuracy and consistency in not only capturing but also analyzing real-time data for instant optimizations and course corrections, minimizing time lags inherent with pre-IIoT methods.

Why is it so important? The same reasons which led to the early days of Taylor’s Scientific Management - How to improve productivity and operational efficiencies? - How to reduce costs and finally, how to gain competitive advantage? Technology and process improvements

provide first mover advantages before leveling out with mainstream adoption. Industrial IoT and Industry 4.0 is today in the early stage of its lifecycle. Early adopters, even with pilot implementations, have seen significant gains. There are now enough successful proof points across different industries to propel its adoption from the visionaries to the early majority.

GFS Crane CIM – an Industrial IoT application - comes with advanced monitoring, controls, analytics and management capabilities for mission critical physical infrastructure systems, machines & sensors.

GFS Crane CIM as Industry 4.0 Enabler

GFS Crane CIM provides number of business benefits, commonly labeled as Industry 4.0 outcomes:

- ✓ Mitigates risk of machine, system & infrastructure failures
- ✓ Improves field service through remote machine monitoring
- ✓ Improves energy efficiency (power & fuel), reduces carbon footprint
- ✓ Ensures quality consistency and logistics in manufacturing and distribution
- ✓ Enhances industrial & institutional safety

GFS Crane CIM Application Coverage

GFS Crane CIM is seeing active application in the following areas:

1. Field Service
2. Energy Efficiency
3. Quality Management
4. Safety Management
5. Logistics Management

1. Field Service

Remote and centralized monitoring of distributed assets and machines:

- Reduces costs of deploying manpower to locally monitor machines or take periodic readings manually
- Helps prevent an

outage when an out-of-range behavior is detected in a device

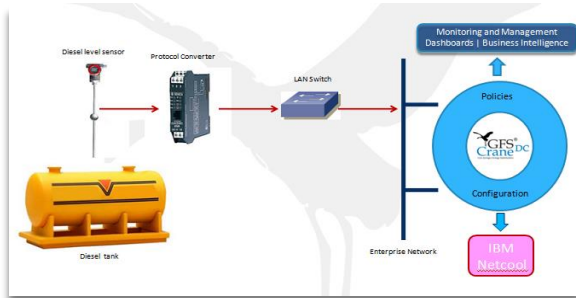
- Accelerates time to correct a situation when an adverse situation is detected
- Analytics of device behavior at each site helps to determine optimal level of spares at location

2. Energy Efficiency

- GFS Crane CIM, through central monitoring of HT Panels, Transformers, LT Panels, helps to identify

efficiency of power distribution and distribution losses

- Through monitoring of major power consumption units like HVAC systems and correlating with their throughput, can determine equipment efficiency
- Through monitoring of diesel generating sets and fuel tanks, helps organization save thousands of liters of diesel.



- Provides sustainability reports: CO₂ equivalent derived from power and diesel consumption

3. Quality Management

GFS Crane CIM takes advantage of modern shop floor systems to deliver Quality Manager's expectations:

1. Captures data from computerized integrated manufacturing Systems, such as CNC machines, SCADA systems and robotic sensors through machine protocols: fetches streams of machine data on quality-determining parameters identified by customer
2. Sends alerts if there's any threshold breach of quality-determining parameters to enable foreman at the concerned shop floor to take immediate corrective action

GFS Crane CIM Product Overview

- ✓ Built on Java EE: 3-tier architecture
- ✓ Deployed on Docker Container
- ✓ Multi-protocol Support to connect with legacy and newer machines, PLCs, SCADA, BMS and industrial sensors
- ✓ Support on Mobile UI
- ✓ Near real-time monitoring of machine & sensor parameters
- ✓ Provides warning and critical alarms when min/max thresholds breached
- ✓ Reports & Analytics of monitored data per customer requirements
- ✓ Central installation monitors multiple installations
- ✓ Architected for Central & Edge deployments where local controls are desired

3. Delivers baseline reporting of captured data with trend graphs that helps the Quality Manager get insights to areas for improvement.

4. Safety Management

GFS Crane CIM, through its multiple protocol support and ability to monitor and send alerts from smoke sensors, fire alarm and suppression systems, gas sensors, water leak detection systems, can be deployed in environments like hospitals, mines and industrial units where safety of patients, miners and factory workers are of paramount importance.

Besides monitoring and sending alerts, GFS Crane CIM provides analysis of monitored data, alerts and other situational parameters. This provides insights that can help prevent adverse events in the future.

5. Logistics Management

The widespread adoption of hand-held scanners and item-level tagging — using low-cost devices such as RFID — has paved the way for IoT-driven warehouse operations. IoT-driven warehouse management now provides real-time visibility into inventory levels. For quality management, sensors monitor the condition of an item and alert warehouse managers when temperature or humidity thresholds are about to be breached.

Refrigerated cold chain industry has started to adopt sensor analytics to ensure complete integrity during transportation. As delivery takes place, IoT ensures improved energy efficiency without

impacting food quality.

Industrial Internet has begun playing a pivotal role in logistics and food supply chains.