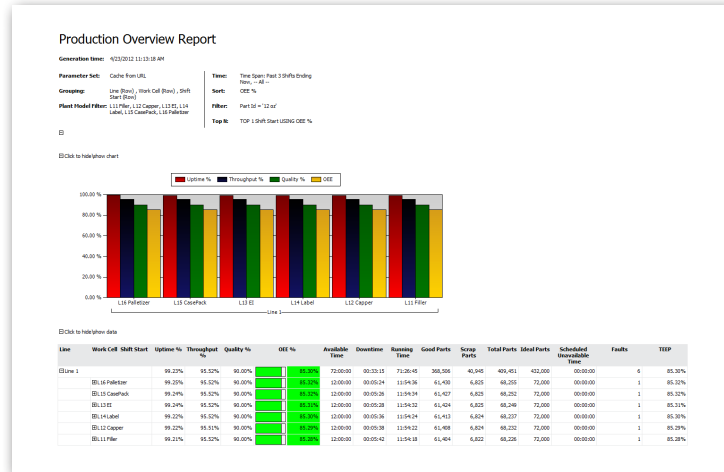


## Reduce Costs and Increase Profitability

The fastest way to reduced costs for manufacturers is to utilize existing production equipment more efficiently. The key areas are reducing machine downtime, achieving optimal performance, and increasing quality. Using FactoryTalk Metrics to increase efficiency can bring you the following benefits to the bottom-line:

- **Increased capacity**  
More product, revenue, and profit in the same amount of time
- **Decreased manufacturing costs**  
Less overtime, reduced labor costs, lower per-unit costs
- **Deferred capital expenditures**  
Make your current equipment produce more
- **Decreased overhead costs**  
Save time by eliminating manual data collection and report preparation
- **Empowered continuous improvement**  
Accurate data puts the focus on improvement

*Gather real-time information to measure and improve the performance of manufacturing assets and overall equipment effectiveness (OEE).*



## Overview

With FactoryTalk® Metrics, you can increase production, reduce costs, and increase quality using existing equipment and labor more effectively. This is accomplished through accurate reporting of real plant-floor activity, allowing you to make focused improvements that will result in higher equipment efficiencies.

FactoryTalk Metrics monitors plant-floor equipment and helps provide accurate, timely, granular, and specific information on machine production, performance, and activities. This data is the basis for understanding the real causes of inefficiency, waste, lost capacity, and higher costs.

FactoryTalk Metrics can help you refine, streamline, and prioritize your process improvement initiatives, resulting in reduced downtime, decreased cycle time, and increased overall production.

## Features

FactoryTalk Metrics is a complete system for efficiency monitoring data collection and analysis. It offers:

- Preferred integration with ControlLogix. The use of specific UDTs can increase the consistency and velocity of deployments.
- Implements the widely-accepted OEE (Overall Equipment Effectiveness) method of measuring equipment efficiency
- Easy, flexible, scalable configuration with no custom code required
- Reliable, automatic 24/7 data collection
- Compatibility with any PLC or HMI using OPC standards
- Data storage in a standardized, efficient, usable form
- Flexible web reporting and analysis of data
- Includes FactoryTalk VantagePoint, providing the basis for a total Manufacturing Intelligence solution

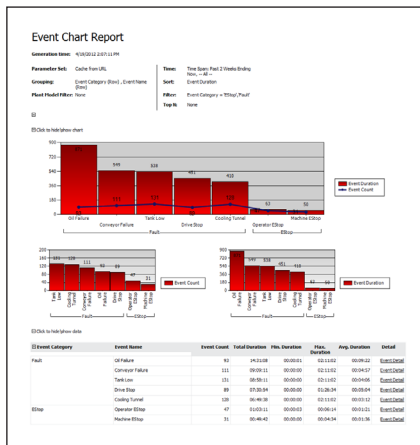
Is an “OEE Solution” what you need?

Reporting on OEE metrics is quite popular because the principles and calculations can be applied to any machines in any industry. For tracking efficiencies, OEE is ideal. But if the objective is to improve efficiency, OEE is not enough. High-level KPIs are not sufficient to drive machine-specific improvements. In addition to the KPIs, you need machine-specific tracking of downtime root causes, faults, line events like blocked and starved, procedures like setups and changeovers, quality parameters, all logged to the second and available for analysis. This enables your plant to move from “monitoring” to “improving”.

## Data Collection

FactoryTalk Metrics requires just a few data points from the control system for calculating Overall Equipment Efficiency (OEE) and other default KPIs:

- Total/good/scrap production counts
- Part ID and ideal cycle time
- Available status and shift – either through defined time patterns or shift and availability data points.
- User-defined fields or “Flex Fields” such as Operator, Work Order, Batch, etc.
- Running indicator



In addition, and unlimited number of machine events can be monitored for each configured workcell. Data collected for each event can include:

- Event trigger
- Event value(s) or reason codes

FactoryTalk Metrics can collect data from any OPC-compliant device or HMI application. All data is collected in real time, and FactoryTalk Transaction Manager, provided with FactoryTalk Metrics, is used as the data-collection engine. FactoryTalk Metrics data is stored in an open SQL Server™ or Oracle® database with a documented schema. Once data collection begins, it operates 24/7 and monitors workcells continuously so that events are never missed. Configuration changes can be made to the FactoryTalk Metrics application without interrupting data collection.

## FactoryTalk Metrics Data Model

FactoryTalk Metrics takes the raw control system input and creates a rich relational data model that is ideal for reporting and analysis, making it easy to uncover and monitor the root causes of inefficiencies. The data model can be thought of as consisting of 4 integrated parts:

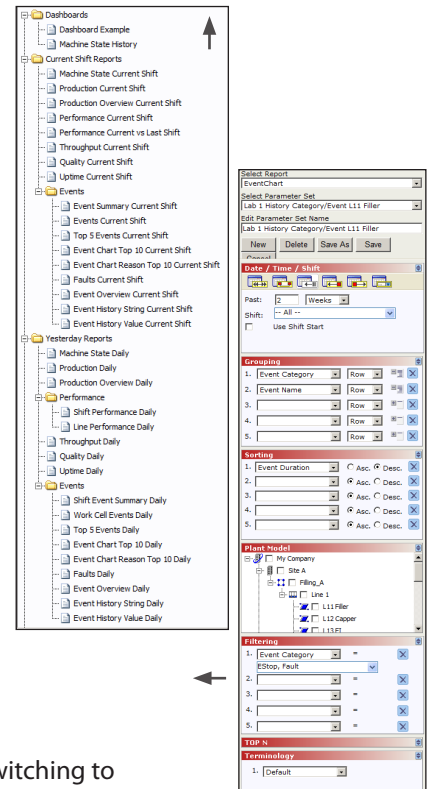
- OEE and KPIs – 16 Key Performance Indicators are computed by default (see sidebar).
- Production Data – this is the data used to calculate the KPIs, and includes part counts, and various categorizations of time – Available time, Running Time, Downtime, etc.
- Event and State Data – Detailed event and activity data for each machine. This data takes a broad category like “Downtime” and provides critical insight into root causes. A built-in State Engine accounts for every minute of every day in defined Machine States.
- Context Data – this data is used to “slice and dice” other data in reports. Nine dimensions of context data are included in the data model, including Date/time, Shift, Plant Model, Part, and five user-defined categories.

## Reporting

The FactoryTalk Metrics provides both out-of-the-box reporting capability, and support for extensive customization. There are 69 pre-configured reports provided, and users may create parameter sets to apply to standard report templates that customize both report content and behavior, all through an easy-to-use web interface.

Custom parameter sets can be created and applied to any report template, or reports can be rendered dynamically. The following can be configured in a parameter set:

- Time filtering (date range, relative time, shift, named time filters)
- Grouping (page, row, and column grouping on any of 25+ data fields)
- Sorting (on any of 69+ data fields)
- Plant Model filtering (on any workcells, lines, areas, and more)
- Filtering by data value (on any of 18+ data fields)
- Top N pareto filtering (on any of 69+ data fields)
- Language/terminology switching to support company or location-specific terms

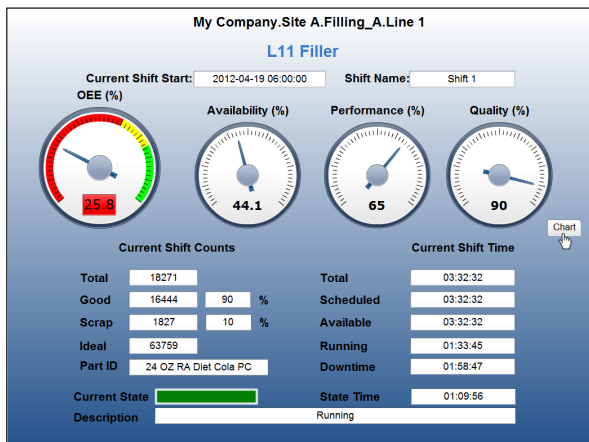


Report templates and parameter sets provide a powerful capability for users to both create custom reports that can be shared among users, and to generate ad-hoc reports. Reports also provide built-in drill down and drill-through capabilities to view more or less detailed information as required.

Includes FactoryTalk VantagePoint

FactoryTalk Metrics now includes FactoryTalk VantagePoint EMI, which collects, aggregates and correlates disparate data from your manufacturing and production processes and business systems. It then enables you to organize and present that information in an integrated way – tailored to the user’s needs. FactoryTalk Metrics is a rich source of manufacturing data, which through FactoryTalk VantagePoint, can be correlated with data from other sources such as plant historians or databases.

A FactoryTalk Metrics connector for FactoryTalk VantagePoint is included, which allows for all of the FactoryTalk Metrics plant model, data, and Report Expert reports to be imported automatically into the FactoryTalk VantagePoint model. It also includes default dashboards and Excel reports for visualizing FactoryTalk Metrics data using FactoryTalk VantagePoint tools.



### FactoryTalk Metrics Deployment

FactoryTalk Metrics is designed to be tailored to each unique plant environment allowing for flexible configuration of the plant model, schedules, the use of control system data points, custom events, and reports. Custom programming is not required to configure the product, and changes to the control system are often not required.

FactoryTalk Metrics is configured by authorized users using the Configuration Console. Configuration wizards guide the author through the process, which can scale from very simple to very detailed, depending upon requirements and the data available in the control system. Tools are available to streamline the implementation of large systems. Since FactoryTalk Metrics applications often evolve over time as new opportunities for improvement are uncovered, previous configurations are easily modified and new reports may be added without the need to interrupt ongoing data collection.

### OEE Defined

FactoryTalk Metrics uses an Overall Equipment Effectiveness (OEE) model to measure the performance of manufacturing equipment. The OEE model yields a single performance rating for every activity area (workcell, line, area, or plant) being monitored, thereby providing a simple way to determine quickly if an activity area is performing adequately.

The OEE value can be used to assess a single machine’s performance over time or to compare the performance of machines to each other. Three components contribute to an OEE value: availability, throughput, and quality. Each is a percentage, and the OEE value is the product of these three percentages.

$$\text{OEE} = \text{Availability} \times \text{Throughput} \times \text{Quality}$$

The OEE calculation that is used by FactoryTalk Metrics is the product of these three components.

**Availability** is a ratio of running time to available time. Available time may be defined by a schedule or modified by planned downtime events such as preventive maintenance.

**Throughput** is the performance of a machine when it is running compared to its ideal cycle time.

**Quality** is the percentage of good parts that are produced.

OEE is a valuable method of analyzing performance because it is widely recognized and can be applied to any type of industry, factory, or machine. OEE is the default efficiency calculation performed by FactoryTalk Metrics; additional or alternate calculations can be implemented. Furthermore, FactoryTalk Metrics supports the collection of detailed event data, which can be used to analyze the specific causes of inefficiencies.

## Key Performance Indicators

Depending upon FactoryTalk Metrics configuration, up to 15 default KPIs are available for reporting. The KPIs include:

- Good Parts %
- Scrap Parts %
- Ideal Capacity
- Running %
- Downtime %
- Fault %
- Availability %
- Performance %
- Quality %
- Failure Rate
- OEE (Overall Equipment Effectiveness)
- MTBF (Mean Time Between Failure)
- Available % (vs. Schedule)
- MTTR (Mean Time To Repair)
- Failure Frequency Rate
- TEEP (Total Effective Equipment Performance)

Like all other data, these KPIs can be reported on using any of the 9 dimensions of the FactoryTalk Metrics data model.

## Get More Information

For ordering information contact your local Rockwell Automation sales office or Allen-Bradley distributor. Or learn more by visiting <http://www.rockwellsoftware.com>.

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