

Epicor Advanced MES for Epicor® ERP

Manufacturing Execution System Overview





MES and ERP Together

Epicor Advanced MES for Epicor ERP

Manufacturing Execution System (MES)

Staying competitive isn't easy in today's evolving manufacturing space. How do you increase efficiency and reduce costs while still complying with your customers' requirements? That's where the Epicor Advanced MES Manufacturing Execution System (MES) for Epicor ERP comes in. Advanced MES utilizes Industry 4.0 technology on the shop floor—such as cyber-physical systems and Internet of Things (IoT) sensors—to help you gain the competitive advantage you need—both now and in the future.

Epicor ERP manufacturers use Advanced MES to improve quality, reduce scrap, help ensure on-time delivery, and boost production throughput. It's all about improving production execution and performance efficiency to gain a competitive advantage. How do you make more without more assets? Uncover and eliminate downtime to make more parts or cut costs. MES can improve profitability by helping you find more capacity.

Epicor Advanced MES collects data directly from equipment and operators on the shop floor in real time, minimizing inaccurate and time-consuming manual data collection. With information instantly in your hands, you can anticipate and solve production problems before they happen. Real-time insight helps you pinpoint critical issues, reduce waste, and improve quality and customer service. Everyone in the plant and throughout the business can take action to improve manufacturing performance.

“We used to run 3–4% scrap. Last month, we were down to 1.37%. You can’t get much better than that. That’s world class, and is largely attributable to Advanced MES. It’s the tool that gives us the numbers we need to make good decisions.”

Dave Rose, Quality Engineer
Johnson Controls

Designed For Your Industry

Epicor Advanced MES was designed with your industry in mind. With its origin in the rubber, plastics, automotive, and metals industries, Epicor Advanced MES has more than 20 years of domain and industry best practices built in, yet it offers you the agility to meet changing demands and requirements.

Epicor Advanced MES is an out-of-the-box, configurable MES solution that enables rapid implementation while still being fully extensible to meet the most demanding requirements.

Deploy Your Way

Epicor Advanced MES isn’t just a platform—it’s a purpose-built point solution, meaning you won’t need extensive consulting and expensive customizations to get a quick return on your investment. Out-of-the-box tools for every level of the organization make it easy to see almost immediate business results, and Epicor makes it simple to connect to your data—no matter how timeworn or modern. Epicor Advanced MES also uses open connectivity protocol (OPC), programmable logic controllers (PLC), machine interface units (MIU), and personal computer (PC) interfaces.

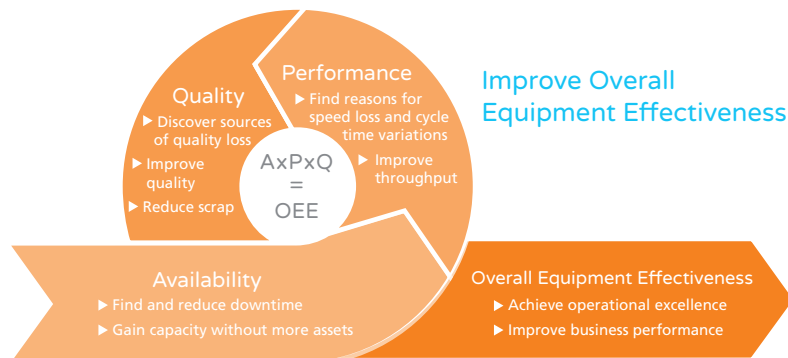
Usability

Epicor Advanced MES collects production data automatically, and it can pass this information directly to your Epicor ERP system. Operators on the shop floor use touch screen technology to add depth and dimension to the automatic production data, so you get a clear picture of the what, why, and when of downtime, cycle time, quality, and scrap. The system also has real-time alerts, notifications, and other communications, so the people who need to know are in the know when it matters most—letting them take immediate action to correct a problem or improve performance.

Whether you’re making on-the-fly production schedule changes, setting up daily operations meetings, or managing dashboards and reports, Epicor Advanced MES is easy to use and ideal for one-click, drill-down insight and reporting. Most importantly, it has been designed with bi-directional integration with Epicor ERP, so you can connect your top floor to your shop floor.

Epicor Advanced MES—value for your business

- Improve cycle times, overall equipment effectiveness (OEE), and plant productivity
- Eliminate manual data collection
- Improve scheduling agility with real-time insight into machine performance
- Monitor every cycle and every machine 24/7, giving you near-instantaneous visibility into production and quality problems
- Reduce scrap and rework with automatic part qualification and part rejection
- Capture part and machine process data for traceability purposes
- Maximize production and reduce costs by automatically capturing statistical process control (SPC) and statistical quality control (SQC) results
- Monitor utility consumption and pinpoint energy savings



- Minimize downtime with faster response and resolution
- Maximize machine loading and minimize downtime to reduce costs and capital expenditure
- Support continuous improvement initiatives and programs
- Win more business with improved customer ratings and satisfaction
- Improve equipment reliability and boost longevity
- Pinpoint energy savings opportunities and reduce energy consumption and total power demand
- Examine tradeoffs between using existing equipment and capital investments
- Support continuous improvement initiatives and programs

Real-time insight for better production and business performance

Your business isn't like anyone else's, and neither is ours. Is better productivity your goal? You need accurate data and fast information. If you've set your sights on operational excellence, you need it even faster. Either way, real-time automated production and process data direct from your machines is the gold standard in performance improvement, and we exceed that standard with analysis, reporting, and planning to help you achieve your goals.

Epicor can help with business planning and turn strategies into tactics for improvement, because getting better is easy when the facts are clear. Ready to retire your manual data collection and intervention steps? With Advanced MES, you get accurate data instantly—not minutes, hours, or shifts later. You and the entire operations and production teams can work collaboratively to reduce waste, inventory, and downtime; optimize equipment and capital and worker resources; and drive performance gains with Epicor.

Real-time production information boosts your continuous improvement initiative and lets you discover hidden opportunities to increase quality and yield. With more free capacity and jobs running

on schedule, you can consistently exceed customer expectations and gain more business.

Office, mobile, and global

Take the power of Advanced MES with you on a web-enabled mobile device or tablet with browser-based dashboards, information, and analysis. Plus, it doesn't matter if you have a single operation or a distributed network of plants internationally—Advanced MES is currently available in more than 17 languages and suitable for language customization.

Monitoring, Data, and Communication

The shop floor is a real-time environment, so your MES should be too. Things happen and change instantly. Sometimes a machine is down just a few minutes more than you thought, or perhaps the scrap or part count is off—just a couple of pieces can mean the difference between a happy or frustrated customer. Real-time, automatic production monitoring and process monitoring with Epicor Advanced MES keeps your business on track and eliminates the ripple effect to customers and vendors.

We're there to help you reconnect the shop floor by constantly monitoring data directly from the machine and turning it into information for the shop and management. You'll get automatic notifications when and how you need them, and you'll receive data to feed the rest of your Epicor Advanced MES system and your business, such as:

- ▶ Automated production monitoring for downtime and runtime
- ▶ Automated monitoring for process parameters
- ▶ Plant floor viewer with real-time machine state and job monitoring
- ▶ Automated alerts, messaging, and escalation
- ▶ Operator help calls with automatic routing and notifications
- ▶ Real-time, automatic alerts for machine conditions, cycle and process variations, efficiency and scrap rates

Epicor Advanced MES



Production Monitoring

- Machine integration using OPC or IoT sensors
- Monitor uptime/downtime
- Automatic data collection
- Monitor actual cycle times and scrap



Energy Monitoring

- Monitor and analyze energy consumption by machine, job, shift, or product
- Create optimal startup sequence to lower peak consumption
- Understand maintenance and quality in context of energy consumption
- Understand trade-offs between using existing equipment and capital investments
- Analyze direct energy required to produce any item



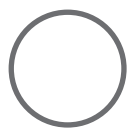
Planning and Scheduling

- Visual production scheduling and planning for machines and tools
- Labor and material requirements forecasting
- Automatic schedule adjustments
- Machine capacity planning
- Kanban scheduling
- Tool conflicts



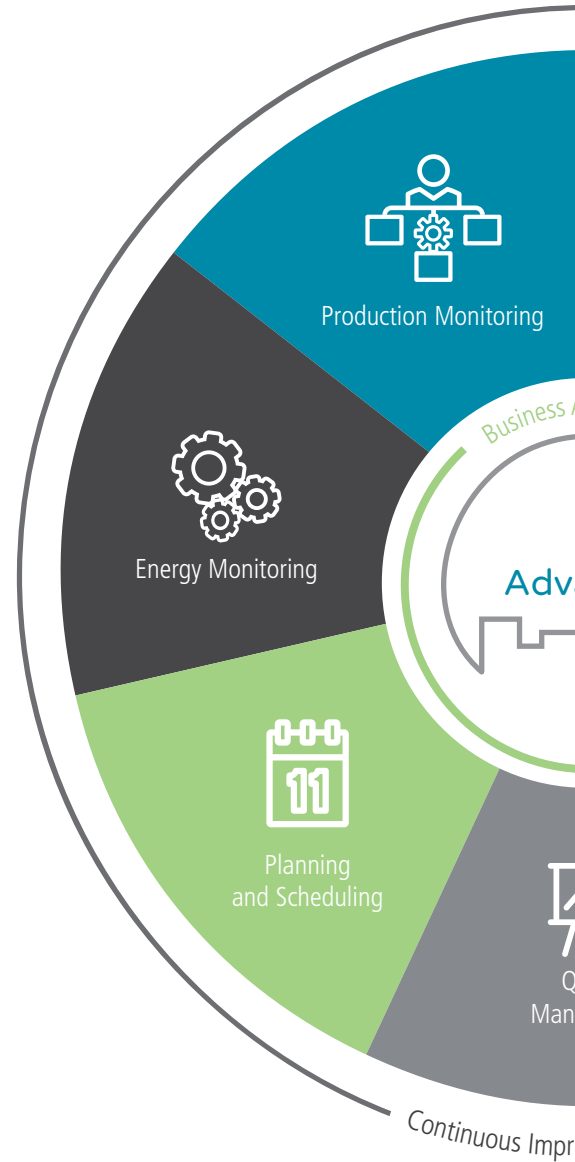
Quality Management

- Automated process monitoring and parameter violation alarms
- Statistical process control (SPC)
- Automatic part qualification/rejection
- Statistical quality control (SQC)
- Monitor every cycle and every machine 24/7



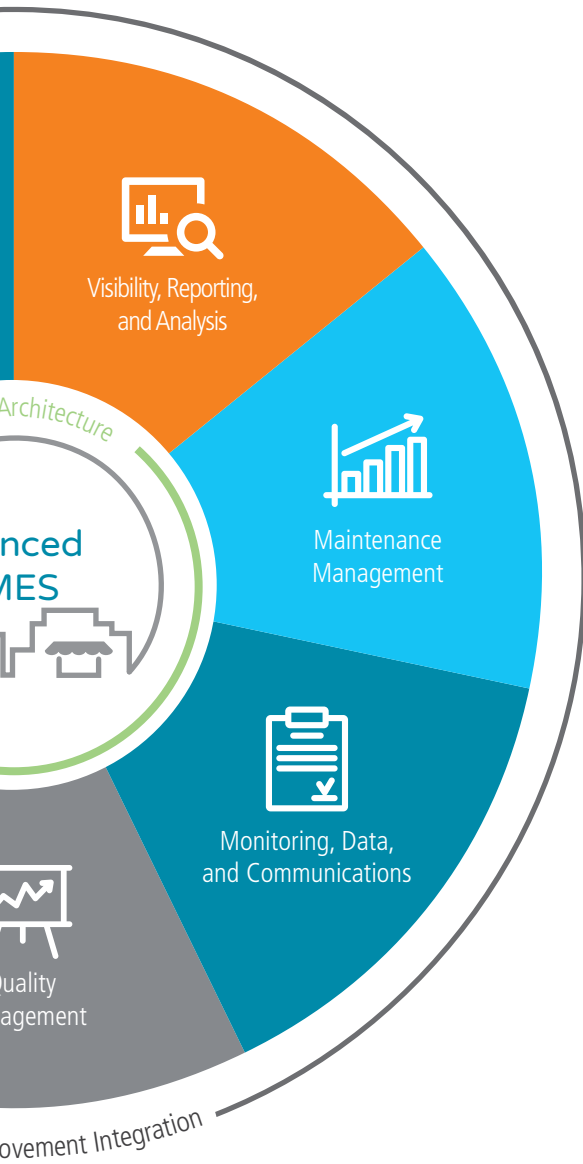
Continuous Improvement (CI) Integration

- Lean
- Six Sigma®
- Theory of constraints (TOC)
- Total productive maintenance (TPM)
- Common and custom CI metrics
- OEE, asset utilization, and capacity utilization
- Mean time between failures (MTBF)
- Minor stops per runtime hour (MS/RH)
- Mean time to repair (MTTR)
- Root cause factors





Deployment Choice—On Premises



Visibility, Reporting, and Analysis

- Automated overall equipment effectiveness (OEE)
- Accurate, consistent efficiency metrics
- Production metrics—from machine to enterprise
- Downtime and scrap analysis
- Operator labor and productivity visual root-cause indicators
- Real-time screens and views



Maintenance Management

- Preventative maintenance for machines, tools, and auxiliary assets
- Generate automatic MRO tasks
- Schedules maintenance around production
- Rules-based maintenance based on runtime, cycles, or time
- Real-time alerts and reports



Monitoring, Data, and Communications

- Get alerts about production and machine monitoring issues
- Accelerate issue response and resolution
- Operator help calls with automatic notifications
- Automated alerts, messaging, and escalation
- Automated monitoring for process parameters



Business Architecture

- Accepts digital and analog machine signals directly from sensors or PLCs or via OPC-compliant PLCs
- Includes a template specific to plastics, metals, rubber, and related industries, with complex capabilities like active cavity tracking and family molding
- Microsoft® Windows Server® and Microsoft SQL Server® (current versions)
- Open architecture for interfacing to business systems
- Out-of-the-box bi-directional interface to Epicor ERP



"It's hard to overstate how vital Epicor Advanced MES is. It doesn't solve our problems for us, but you have to know you have a problem before you can solve it. Epicor Advanced MES helps us focus our decisions and resources. That's absolutely key."

—Sam Mahon, Production Control Manager | Chrysler

We give you real-time, accurate data. You start asking the right questions. Your business makes well-informed, timely decisions.

Operational performance

- ▶ Which orders should I run next?
- ▶ Are orders completed to specs?
- ▶ Should I combine jobs or run them separately?
- ▶ Why is there more scrap during certain jobs?
- ▶ Why is OEE low? How do I improve?
- ▶ How do I increase availability?
- ▶ Where can I obtain 5% more capacity?

Financial performance

- ▶ What are my key loss categories?
- ▶ What are my best products?
- ▶ How much do specific losses cost?
- ▶ Which assets are most efficient?
- ▶ How can we boost service levels?
- ▶ Which plant is most efficient?
- ▶ Where can I cut energy costs?

Visibility, Reporting, and Analysis

From the top floor to the shop floor, it's important to know how your business is performing at all times. That's why Epicor built a powerful, out-of-the-box reporting and analytics system that delivers important information in easy-to-digest dials, graphs, and charts. Advanced MES scoreboards and displays empower front-line professionals to take action and make improvements instantly, without having to wait for days or weeks to find out how they're doing or if they face machine or tool problems. Whether it's regarding maintenance, quality, or other operations, stakeholders have facts in-hand to support their recommendations, and management has what they need to understand trade-offs from every angle. Epicor Advanced MES delivers a comprehensive picture of production.

- ▶ Consistent, automated OEE and other efficiency metrics
- ▶ Production metrics from machine to enterprise level
- ▶ Downtime and scrap analysis
- ▶ Operator labor and productivity
- ▶ Performance versus schedule, labor forecast, tool conflict, and job and part history

Real-Time Planning and Scheduling

Does your production schedule ever change on the fly? Shift supervisors probably wrestle with it every day—even when things are running smoothly. With the Epicor Advanced MES click-and-drag production schedule, you can change instantly based on new requirements or watch the schedule update and adjust automatically based on actual machine speeds, production counts, equipment status, conditions, or job specifications. Epicor makes it easy to plan by showing line availability based on machine/part/tool compatibility, and the system shows you optimal plans based on prior part performance. What-if analysis—combined with built-in machine capacity planning and labor and material forecasting—makes Epicor Advanced MES the first choice in MES. You can look to Epicor Advanced MES to do all your production planning and scheduling, you can continue to use the planning tools you're already using with Epicor ERP and pass that information directly to the shop floor.

- ▶ Use visual drag-and-drop, real-time scheduling and planning for machines and tools
- ▶ Make automatic schedule adjustments
- ▶ Perform Kanban scheduling
- ▶ Forecast labor and material requirements
- ▶ Optimize machine capacity planning
- ▶ Identify and resolve tool conflicts
- ▶ See real-time view of actual production availability
- ▶ Complete usage-based maintenance planning

“Before the mold opens, Epicor Advanced MES tells us whether the product is good or bad. That translates into a better product for our customer, because we’re actually building in the quality rather than inspecting it.”

Mitch Stein, Plant Manager | Rexam Corporation

Production Optimization

Epicor Advanced MES delivers more capacity with the same assets. When you get more free capacity and jobs run on schedule, you consistently exceed customer expectations and earn more business. Knowing which changes have the greatest impact makes it easy for everyone to work toward the same goal, whether that goal is happier customers, more product, or better cost structure. We’re here with data and information to answer key questions about performance, so the tough decisions get a little easier.

- ▶ Manage machine loading and minimize downtime
- ▶ Manage family of parts and color changes
- ▶ View cost reporting for scrap and machine downtime
- ▶ Compare actual cycle times to standard and planning rates
- ▶ Optimize assets, plants, and network
- ▶ Evaluate schedule conformance

Energy Management

Scheduling workload in a way that reduces the plant’s total power demand and takes advantage of rate variations can translate to significant savings—in terms of total energy consumed and the actual cost per kilowatt hour. Tackle power consumption and the cost of energy with Epicor Advanced MES and Energy Monitoring. We help you analyze load patterns, production requirements, and resource energy demands, giving you the power to reduce peak demand and capture energy savings. With the Advanced MES solution, you can quickly and easily capture and analyze energy performance indicators (EPIs) to reduce consumption and cut costs.

- ▶ Monitor and analyze energy consumption by machine, job, shift, or product
- ▶ Receive real-time scorecards
- ▶ Understand maintenance and quality in context of energy consumption
- ▶ Evaluate idle vs. shutdown-restart trade-offs
- ▶ Analyze price accuracy with direct energy required to produce any item
- ▶ Monitor energy by asset, job leveling, and loading

Quality Management

- ▶ Monitor every cycle and every machine—24/7
- ▶ Automatically qualify or reject parts
- ▶ Track part and machine process data for traceability purposes
- ▶ Get statistical quality control (SQC) and statistical process control (SPC)
- ▶ Enable automated process monitoring and parameter violation alarms
- ▶ View part weights and dimensions, machine process parameters, and correlation analysis

Maintenance Management

Machine maintenance planning based on calendar can result in unnecessary maintenance being done, or worse—unexpected machine downtime as a result of late maintenance. Epicor Advanced MES provides real-time preventative maintenance for peak machine effectiveness.

- ▶ Machine and tool preventive maintenance (PM)
- ▶ Cycle or run hour PM
- ▶ Automated alarms and notices for PM



About Epicor

Epicor Software Corporation drives business growth. We provide flexible, industry-specific software designed to fit the precise needs of our manufacturing, distribution, retail, and service industry customers. More than 45 years of experience with our customers' unique business processes and operational requirements are built into every solution—in the cloud or on premises. With this deep understanding of your industry, Epicor solutions dramatically improve performance and profitability while easing complexity so you can focus on growth. For more information, [connect with Epicor](#) or visit www.epicor.com.



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