Automation World® TACTICAL BRIEF

The Smart Operator
**Using Decision Support HMI/SCADA
to Increase Efficiency and Reduce Costs**

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Decision Support HMI/SCADA

Fourth Generation Technology Increases Efficiency and Reduces Costs

With just a glance, your operators should be able to recognize which information requires their attention and what it indicates. They should know potential problems and the right actions to take.

You can enable Smart Operators with Decision Support HMI/SCADA to increase operational efficiency and reduce costs. With Decision Support HMI/SCADA, you can:

- Leverage your HMI/SCADA as the foundation for an efficient operation
- Drive the right response on the alarms that matter
- Increase consistency and conformance to standards
- Improve accountability on task completion
- Prevent mistakes, quickly identify problems, and get on-demand support

More than Monitoring and Visualization

Today's SCADA is not just monitoring and visualization, with alarms rolling in. Your HMI/SCADA should be a decision support system, enabling teams for their best performance.

With Decision Support HMI/SCADA, you can achieve critical business outcomes – achieving higher efficiency, reducing waste, and increasing productivity.

Real World Results
$5 million annual savings
25% reduction in plant downtime
40% faster troubleshooting

Evolution of SCADA*

Over several decades, SCADA has come a long way. Today, you can benefit by combining proven SCADA technology with new IT- and consumer-driven advances, as seen in fourth-generation systems.

First generation: Monolithic

Large minicomputers, independent systems, no connectivity to other systems, proprietary communication protocols, redundancy through a backup mainframe.

Second generation: Distributed

LAN-networked and task-dedicated stations, information becomes near real time, protocols still not standardized.

Third generation: Networked

Process control network with more than one LAN now possible, geographically dispersed systems, distributed SCADAs running in parallel with a single supervisor and historian.

Fourth generation: Internet of Things

The Industrial Internet driving real-time data, advanced algorithms for analytics, data models, and cloud technologies – combining to help users connect, analyze and optimize.

*Source: Wikipedia

Real World Result
40% reduced waste

Think You Can't Afford the Best HMI/SCADA?

You can! Check out GE's HMI/SCADA including the new iFIX Value Packages. Don't settle for less than the best. Proven, powerful AND economical. GE HMI/SCADA – decades of award-winning support, thousands of customers around the globe.

Decision Support HMI/SCADA and the Industrial Internet

Today's fourth generation HMI/SCADA systems leverage the latest IT technologies to make them more powerful and versatile than ever. These technologies improve:
• Perception and comprehension of problems to help operators quickly identify problems and causes
• Collaboration and analytics to deliver intelligent warnings and drive operators to the right action
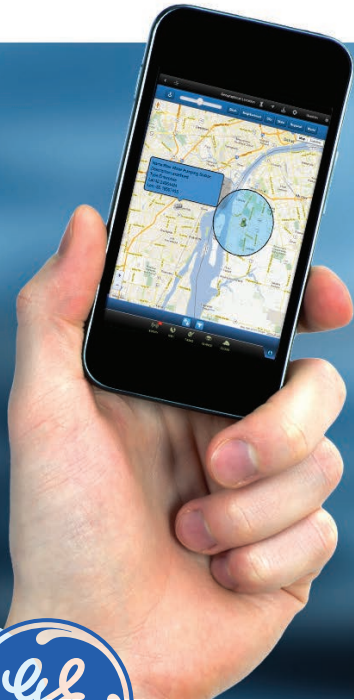
Technologies and Benefits of Decision Support

Efficient HMI

Information Anywhere, Anytime

DECISION SUPPORT

Identify Problems & Causes

On-Demand Support

Prevent Mistakes

Intelligent Warnings

Integrated Work Processes

Operational Analytics

Quickly Identify Problems and Causes

Some HMI/SCADA screens are almost a work of art – many objects, lots of color. But, what's the best design for efficiency, allowing operators to quickly identify problems and causes for fastest resolution?

In earlier generation HMI/SCADA systems, users took advantage of object libraries and extensive color palettes. Those are still important today, but we also know that well-designed visualization is critical.

From Art to Design

More than a simple user interface, modern HMIs deliver a new user experience. They facilitate the operator's situational awareness, reduce the reaction time, and more importantly, decrease the risk of making errors.

Starting with the human factor ... How well and how fast do the operators perceive their environment? What is the thought process, from the visual or acoustic detection of an event, to the decision?

Situational Awareness

With Decision Support HMI/SCADA, visualization is all about improved situational awareness. Situational Awareness is the ability to identify, process, and comprehend the critical elements of information about what is happening. More simply, it's knowing what is going on around you.

Well designed, standardized HMIs and Alarm Management systems are key to delivering the User Experience required to make the right decisions and positively impact performance. Decision Support HMI/SCADA is not about screens that are works of art. More importantly, it delivers seamless, context-driven, intelligent information, based on each user's role.

Continued

Quickly Identify Problems and Causes

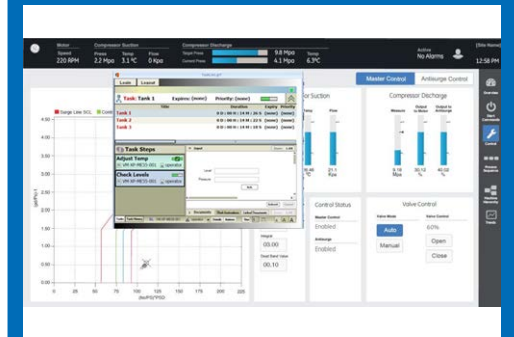### Example Tips for Designing an Efficient HMI Screen
Do's:
• Use color to draw attention
• Less color = less operator cognitive workload
Don't:
• Too much color is distracting
• More color increases operator cognitive workload

Colors are distracting –no valuable information for the operator!
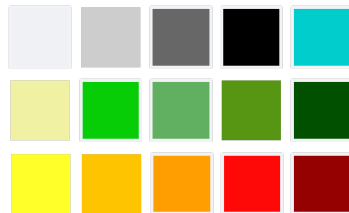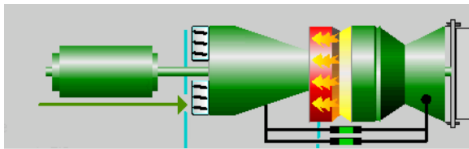
Use limited palette instead

Real World Result
2X efficiency

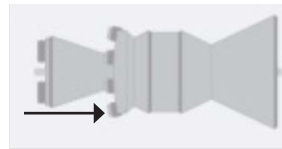### Guide Operators to the Right Actions

Trust your operators all the time? Now, you can drive operators to the right actions, anytime, anywhere, with GE Workflow's interactive, step-by-step task management. Reduce variation in performance, cost and quality with more consistent work processes.

Provide On-Demand Support

Real-time intelligence, anywhere anytime, to support the modern operator

Today's operators don't spend their time in the control room waiting for something to happen. They have to perform other tasks. Mobile devices allow them to access their favorite HMI screen from anywhere in the plant. They deliver unprecedented visibility over the actual processes.
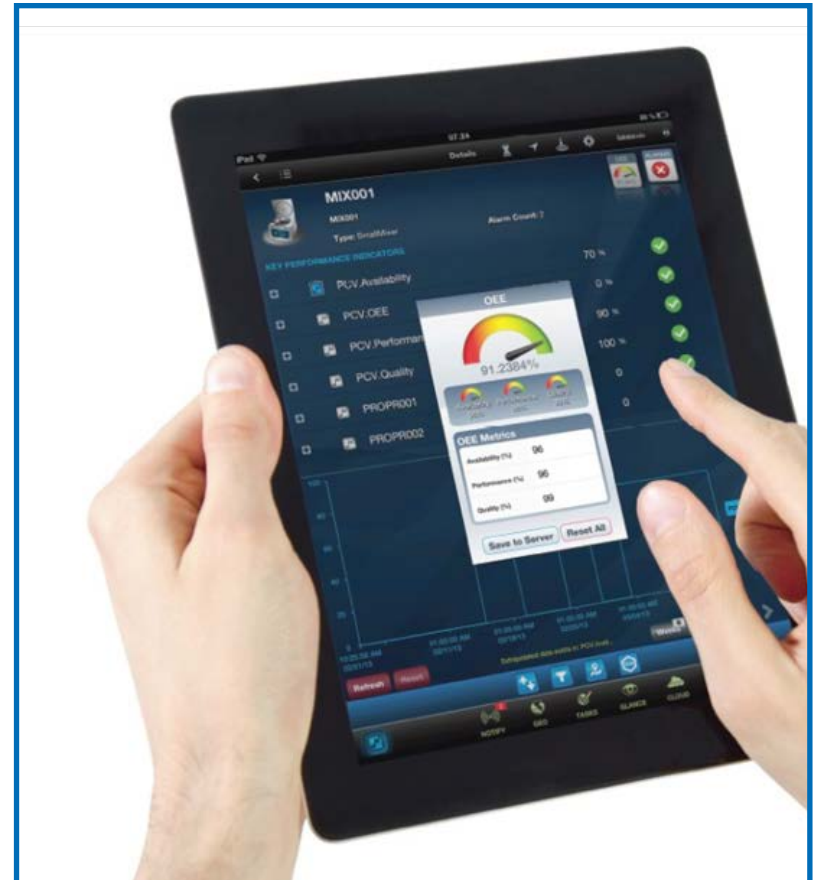
However, "mobilizing" the HMI is just the first step in providing on-demand support. True value goes beyond just showing the same information, the same old way, just on a handheld device.

Not the Same Old, Same Old

Instead, Decision Support HMI/SCADA presents users with actionable KPIs, alarms and notifications delivered on a tablet or a smartphone. You can intelligently transform vast amounts of operational data into actionable information that is accessible anywhere, anytime and across many devices. This capability marries the data in context in a way that is meaningful to each of the operators and managers who need to use it.

Furthermore, fourth generation HMI/SCADA offers operators easy access to step-by-step instructions or workflows, collaboration notes,
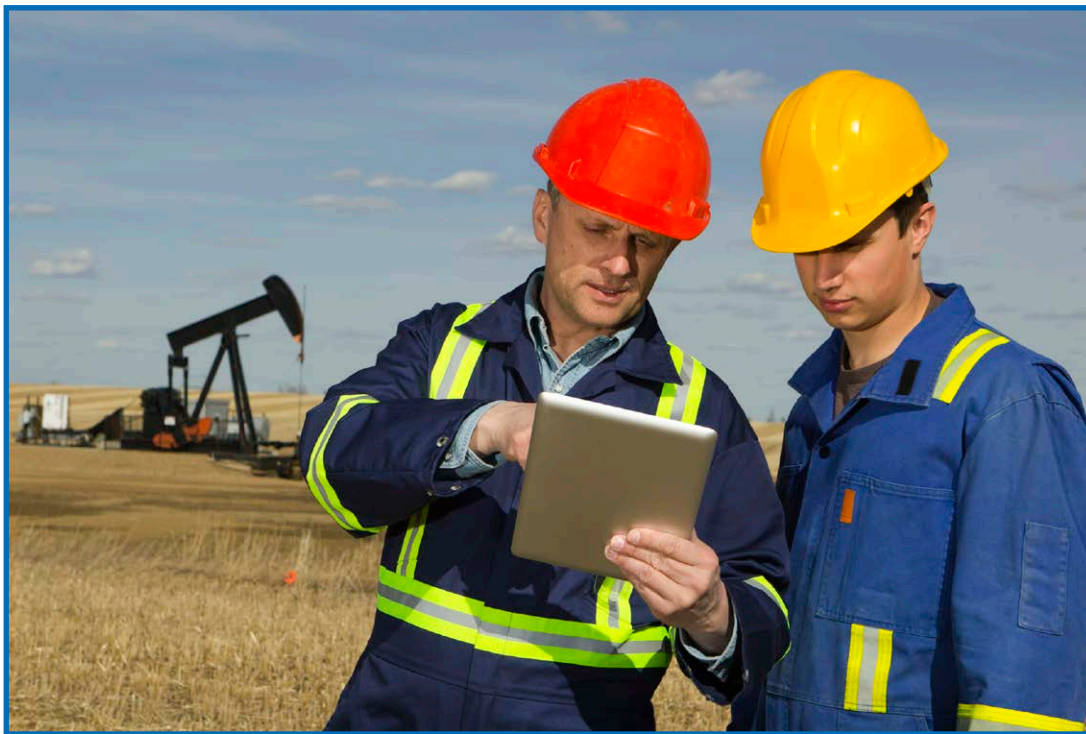
Continued
Provide On-Demand Support

MSDS and other documents, live video, trouble-shooting trees, and more. The information needed to do a job right is just a touch away.

The Management View

Beyond operators, plant managers and executives need another view of the plant. They need scorecards, which combine production information and data from the enterprise applications such as the ERP. Decision Support HMI/SCADA offers them a mobile app to know what's happening in real time, even when they are away from their office, and take action to keep things on track.

Reporting for Continuous Improvement
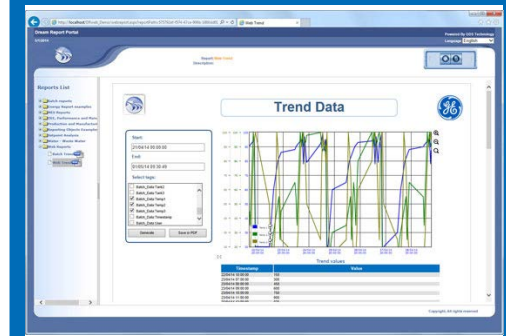
Get the reports you need to improve your operations with Dream Report. Access open and proprietary databases to generate professional reports by schedule, on event or manually. Publish and distribute, all through an easy interface.

Real World Result
5X increase in problem detection

When field
reps must
do more and
train less...

Put the right information in the right hands.

www.ge.com/digital/software-services

Prevent Mistakes and Speed Response

Don't just acknowledge SCADA alarms – drive the right actions

Even with your best operators, manual processes lack consistency. You can't be sure which procedures your operators followed or even whether they knew the right steps to take. With fourth generation HMI/SCADA, you can guide operators through the right steps and verify their actions.

By moving from manual or paper-based procedures to electronic work instructions in your HMI/SCADA, you can:

- Ensure the right actions, fast, anywhere anytime
- Increase consistency – less errors, rework and waste
- Capture best practices before experts retire
- Minimize training time and costs

- Compare staff performance and processes to optimize
- Ease compliance by enforcing procedures

Make Every Operator an Expert

Decision Support HMI/SCADA takes you beyond alarm acknowledgement to driving the right corrective action. With a guided and consistent event response, you can reduce troubleshooting time and those midnight emergency phone calls.

Tracking and reporting on work processes allows you to identify and eliminate nuisance events, compare operator performance and evaluate opportunities for improvement. Additionally, a digital log entry reduces labor and increases the information collected on events (no more lost sheets of paper).

GE
Digital

When the
C-Suite needs
today's
metrics

Put the right information in the right hands.

Continued
Prevent Mistakes from Happening and Speed Response

Bridging Operations and Maintenance

The fourth generation HMI/SCADA also bridges the gap between Operations and Maintenance – finally achieving real-time, condition-based asset performance management.

When an out-of-spec event takes place in the SCADA, you can trigger a work process to interface with the CMMS system, secure a work order number, send specific instructions including GIS location information to an operator, and facilitate the corrective action to remediate a problem.

Then, you can close out the work order with the CMMS, whether plant or GIS centric, and record the actions taken for historical records.

You can reduce the need for operators making scheduled rounds and device readings – and automate the process of moving from condition detected to creating work requests and the right corrective action. That means less downtime, maintenance, risk – and lower costs.

Real World Result
70% increase in productivity

Give Intelligent Warnings

Use operational analytics to detect what the human eye cannot detect

Analytics are a key component of Decision Support for operations. They have the power to turn vast amounts of data generated by processes and smart devices into relevant information – thereby providing the real-time insight you need for accurate and timely decisions.

The traditional way to manage your assets is to perform regular maintenance based on vendor recommendations and monitor it, in case of a failure. Also, key running parameters may be logged into the control system for further reporting. This strategy usually can avoid the most serious downtime events and keep the equipment running but not optimized.

A smarter way: real-time analytic plug-ins that constantly check the health of the equipment based on a model. This requires expert knowledge and contextual information captured in the model. This is real-life detection! If a deviation from the "normal condition" occurs, the model can provide an operator or technician with a possible cause.
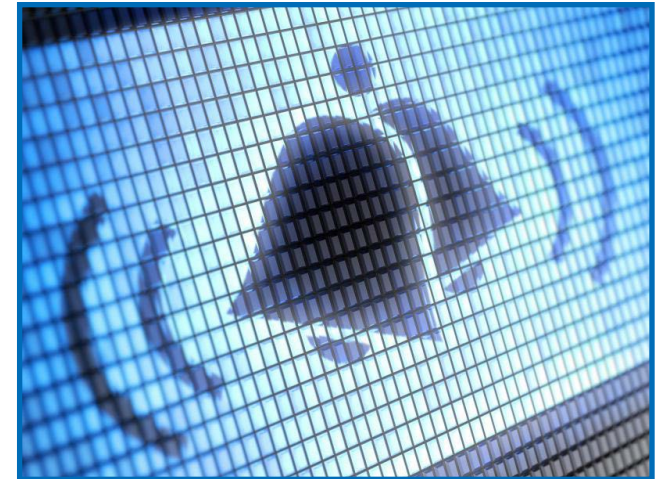
From Fix It to Prevent It

Fourth generation HMI/SCADA technology is a major change in the control strategy, evolving from "this happened … fix it" to a prediction based on a simulation. Decision Support HMI/SCADA can answer the questions: "What is most likely going to happen? What should I do to prevent it?" Analytic plug-ins, or Reasoners, act as watch dogs for your processes.

The benefit is twofold. You can prevent the issue from happening by taking the right action as recommended by the system, based on the likely occurrence of the problem. This avoids unplanned downtime events and, secondly, optimizes your equipment for the best performance.

Use Real-Time Optimization to Exceed Operational Goals

- Avoid: "Not Running" situation (downtime)
- Common: Running / Not Optimized
- Goal: Running and Optimized

Real World Results
33% increase in operations capacity
40% faster troubleshooting

Decision Support HMI/SCADA in Action

Imagine this field crew scenario at your organization – as illustrated on the following page. With fourth generation HMI/SCADA technology, can this team combine mobility, collaboration and analytic tools to prevent downtime?

- Bill, the chief operator, is sitting in the control room, enjoying a cup of coffee.

- Alert! Bill receives a notification from the HMI/SCADA about an upcoming issue based on results on a real-time analytic algorithm.
- Yikes, a downtime event is imminent! The system triggers an electronic workflow.
- Joe, from the maintenance department, is doing some work on a piece of equipment located in the area where the problem just occurred
- From his desk, Bill easily transfers the workflow to Joe. (alternatively, the system could automatically send the workflow to Joe, based on geointelligence)
- Joe receives the notification and quickly starts the work process. Go, Joe!
- Joe follows the instructions as defined by the steps listed on his tablet and acknowledges that the work has been properly done.
- From his desk, Bill can see Joe's progression through the steps in real time, all the way to successful completion of the workflow. Whew!
- Thumbs up! The team resolved the issue before it turned into a serious problem, avoiding a possible downtime event and a loss for the company.

geautomation.com/decision-support-hmiscada

Joe
Maintenance Team

Mobile Client & Mobile Tasks

Bill
Chief Operator

HMI/SCADA + Workflow

Real World Results

- Cost savings thanks to improved efficiency and optimal use of resources
- "Close-to-no-downtime" thru proactive maintenance by anticipating negative events
- Faster troubleshooting and responsiveness – the user is able to make more informed decisions
- Increased process visibility translates into better facilities management overall

Learn More
GE Decision Support HMI/SCADA