

A detailed industrial training setup featuring three yellow robotic arms (FANUC LR Mate 200iD) mounted on a complex metal frame. The frame is densely packed with various electronic components, including circuit boards, sensors, and wiring. In the foreground, a computer workstation with a monitor displaying a software interface, a keyboard, and a mouse is visible. The background shows additional industrial equipment and a clean, well-lit environment.

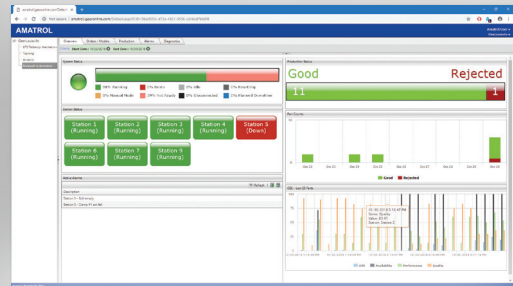
SMART FACTORY **ENTERPRISE**



Next-Level Industry 4.0 Training

SMART FACTORY ENTERPRISE

Smart Factory Enterprise teaches hands-on Industry 4.0 skills at the enterprise level via a fully-functional smart manufacturing system with secure communications and data analysis capabilities.



Manufacturing Execution Software

Smart Production & Maintenance Software

Machining Center

Smart Conveyor System

Smart Robot Workcells

Visual Communications & SCADA Software

Autonomous Mobile Robot System

Smart Product ID RFID/Barcode

Smart Sensors

Laser Scanner System

Smart Factory Assembly

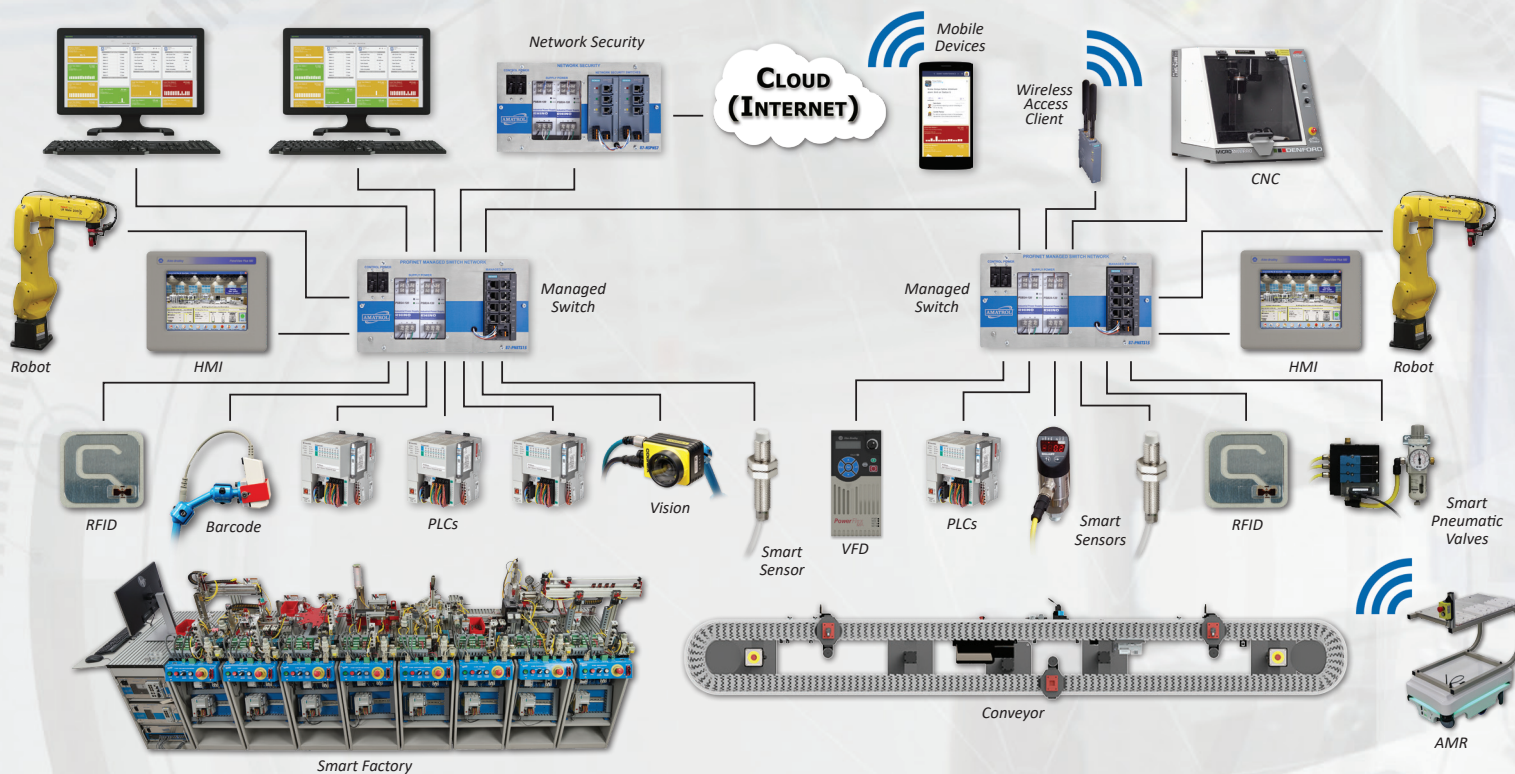
Enterprise-Level Industry 4.0 Training

DATA ANALYTICS & COMMUNICATIONS

Amatrol's Smart Factory Enterprise System integrates a wide variety of IIoT components and software to users to learn how Industry 4.0 technologies are applied in industry to collect and analyze real-time data system wide.

It's All About BIG DATA ANALYTICS

Smart devices & sensors collect large amounts of real-time data ("big data") about production processes, which is collected by industrial PLCs & passed via secure networks and cloud technology to end users who monitor production status & maintenance needs.



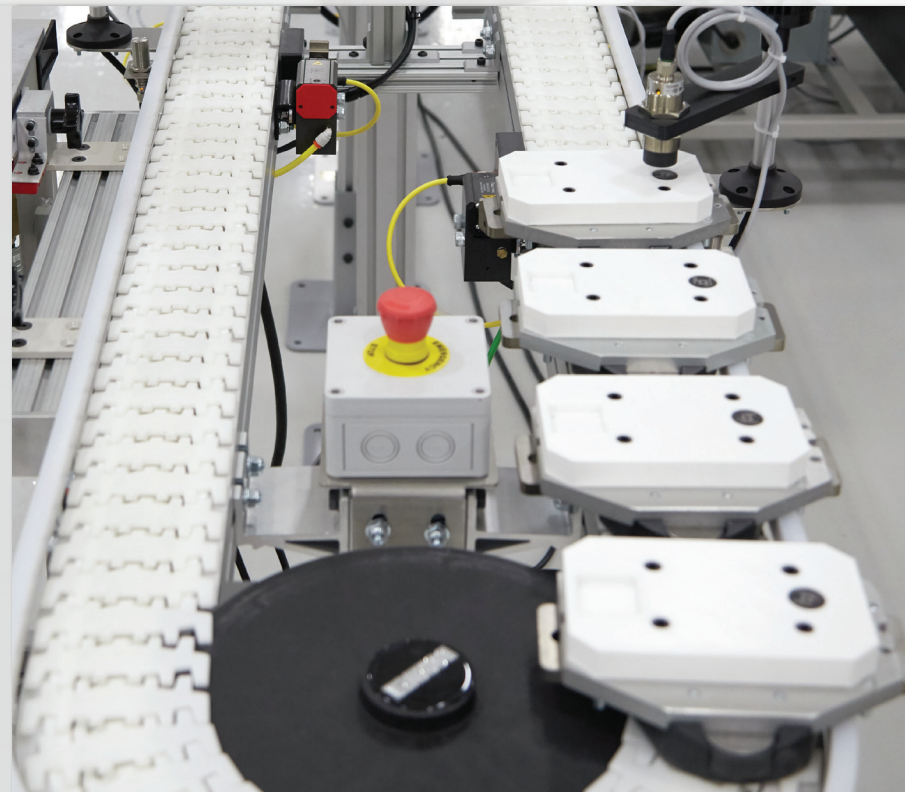
Smart Sensors & Product Identification

Smart Product ID:

- RFID
- Barcode
- Collect & automatically send real-time data to PLCs via ethernet

Smart Sensors:

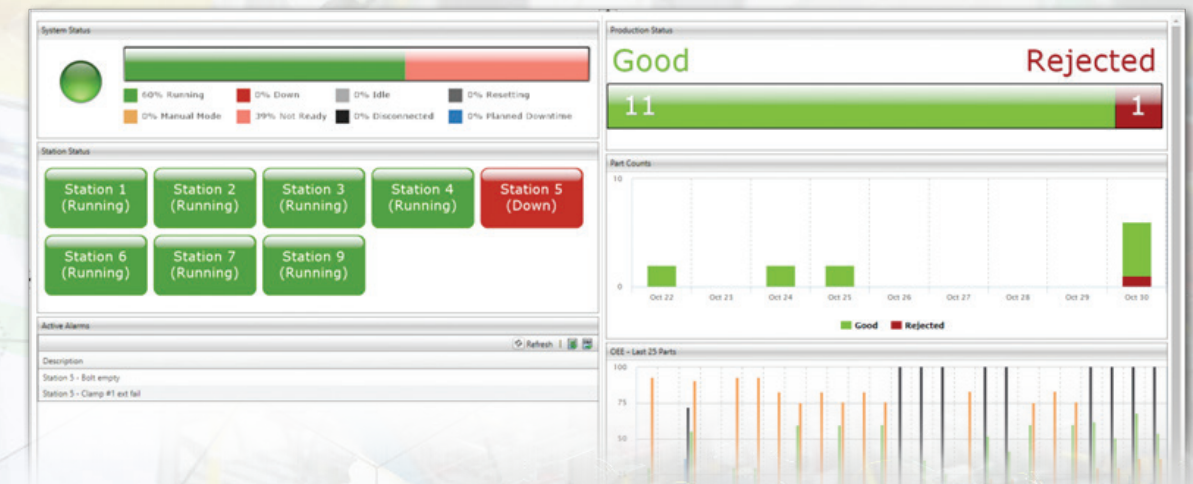
- Analog position
- Analog pressure
- Photoelectric
- Electrical current
- Pneumatics/vacuum
- Ultrasonic



Smart Maintenance & Production Software

Cloud-Based Manufacturing Execution Software (MES)

- Industry-relevant software configurable by users
- Real-time manufacturing data (system status, alarms)
- Real-time production data & equipment performance (quality, history, parts rejection, OEE statistics)
- Enter & track orders
- View system diagnostics & analyze production trends



Cloud-Based Visual Communications + Supervisory Control & Data Acquisition Software (SCADA)

- Data from smart sensors & product ID devices accessible anywhere
- Monitor real-time process status via graphic display
- Receive mobile push notifications re: malfunctions or maintenance needs
- Messaging allows teams to collaborate remotely to solve problems
- Enables proactive preventive maintenance to minimize downtime



Network Communications & Security

Wireless Communications

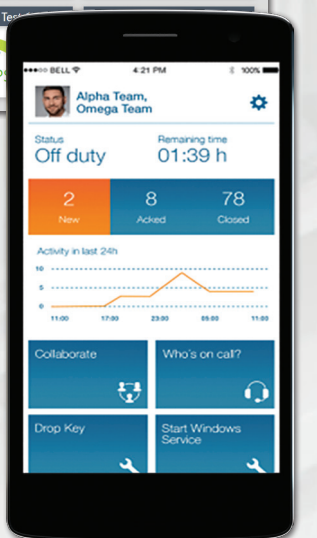
- Send real-time maintenance data to smartphones or tablets

Network Security

- Secure network communications

Ethernet

- Manage Ethernet network communications between the system & the cloud



SMART MANUFACTURING & MATERIAL HANDLING

The Smart Factory Enterprise system seamlessly connects a Smart Conveyor System with multiple Smart Robot Workstations, an Autonomous Mobile Robot System, and Machining Centers to create a smart manufacturing & material handling system. The Smart Robot Workstations work with the Autonomous Mobile Robot System and Smart Conveyor System to move materials efficiently between stations.

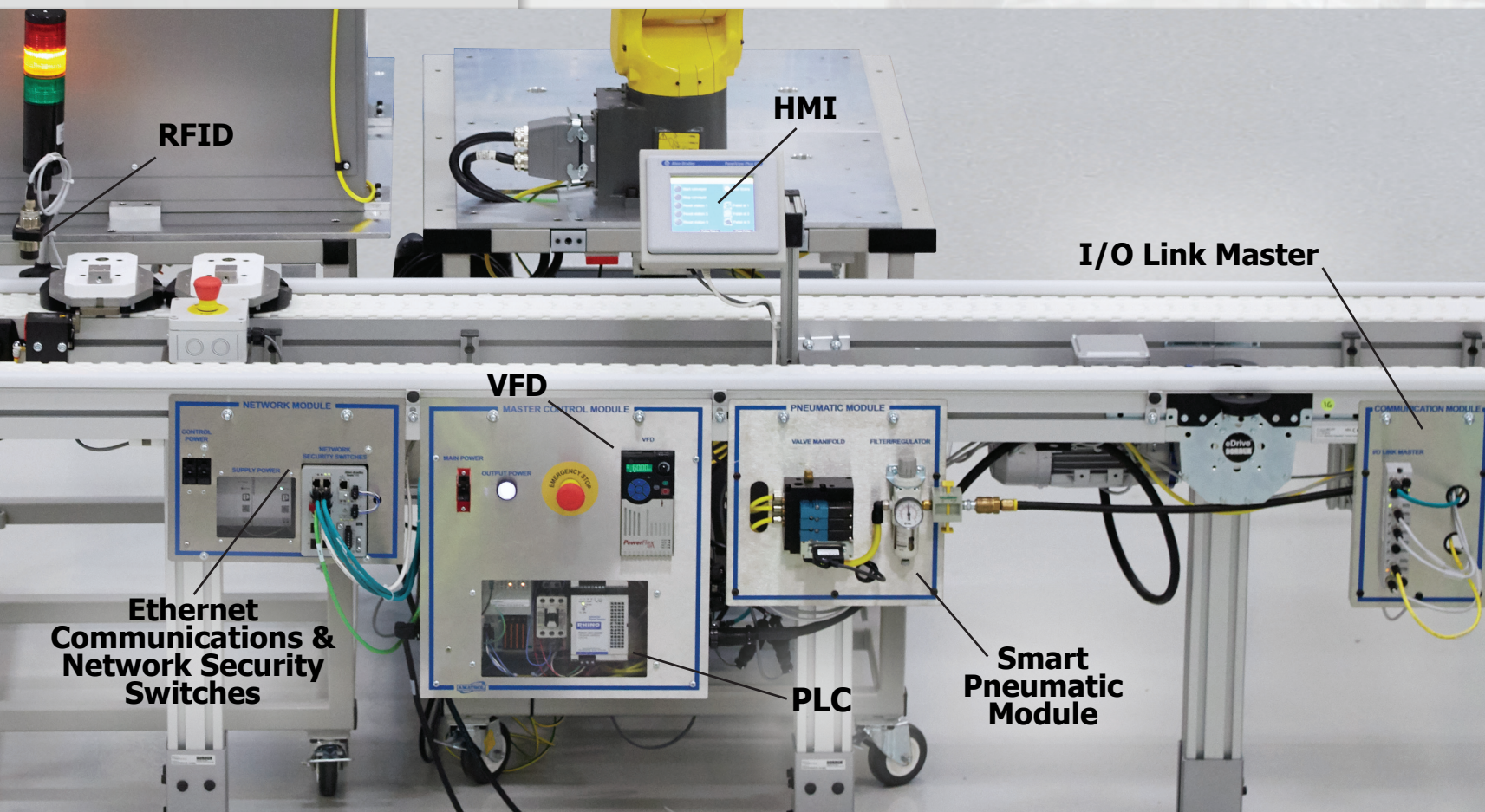
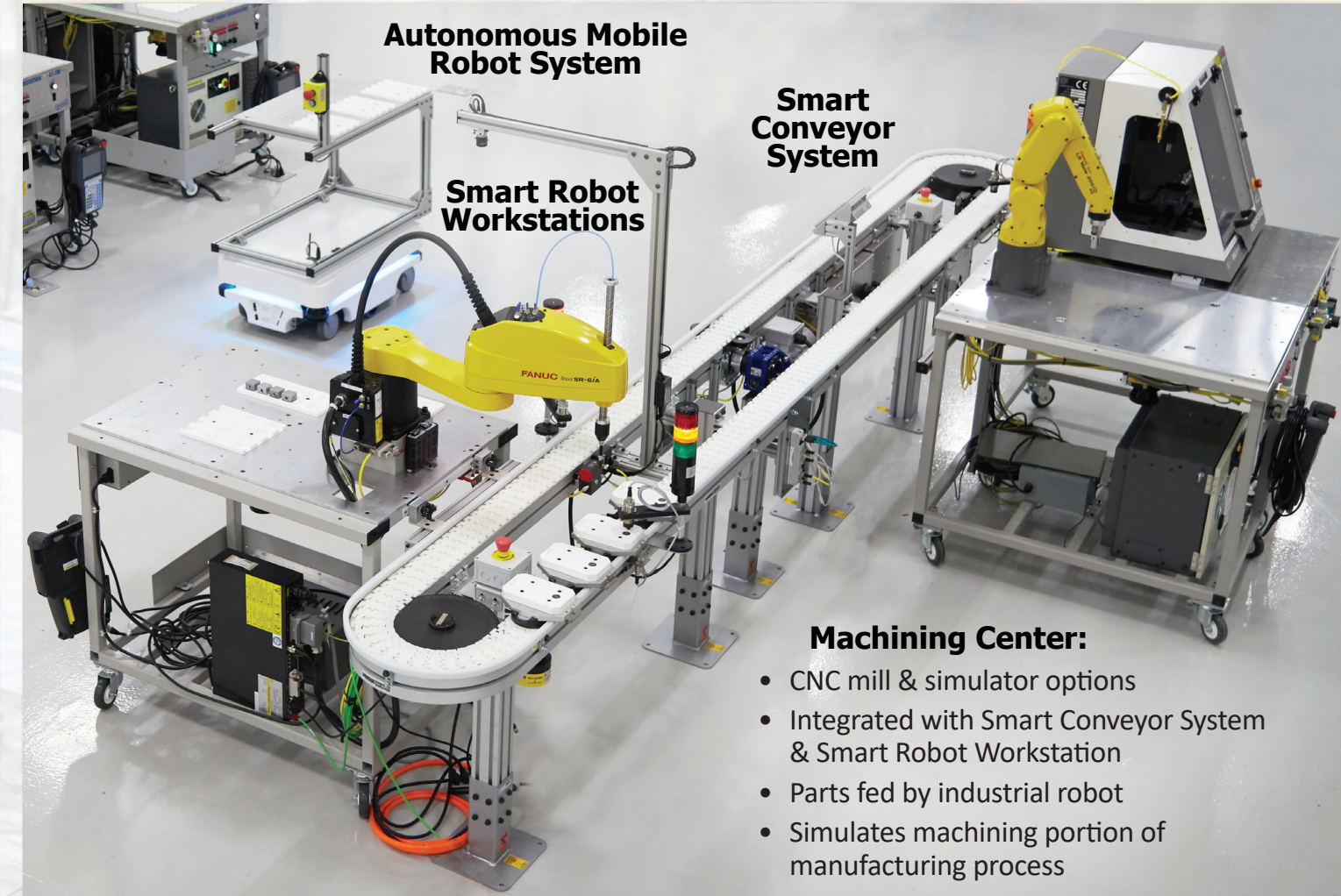
Smart Conveyor System

Applications include:

- Material handling
- Quality & inspection
- Machine loading
- Product transfer
- RFID pallet tracking

Components include:

- Variable frequency drive (VFD)
- Programmable logic controller (PLC)
- Human-machine interface (HMI)
- Ethernet communications & network security switches
- Pneumatic valve manifold & filter/regulator
- I/O Link Master



Smart Product Id

- Smart product identification integrated with the Smart Conveyor System
- Multiple RFID sensors
- Pallet tracking capabilities

Ethernet Communications & Network Security

- Ethernet communications with network security are integrated with the Smart Conveyor System, which can be located in a different room - or even building
- Enables networked, secure communications all the way down to the pneumatic valves

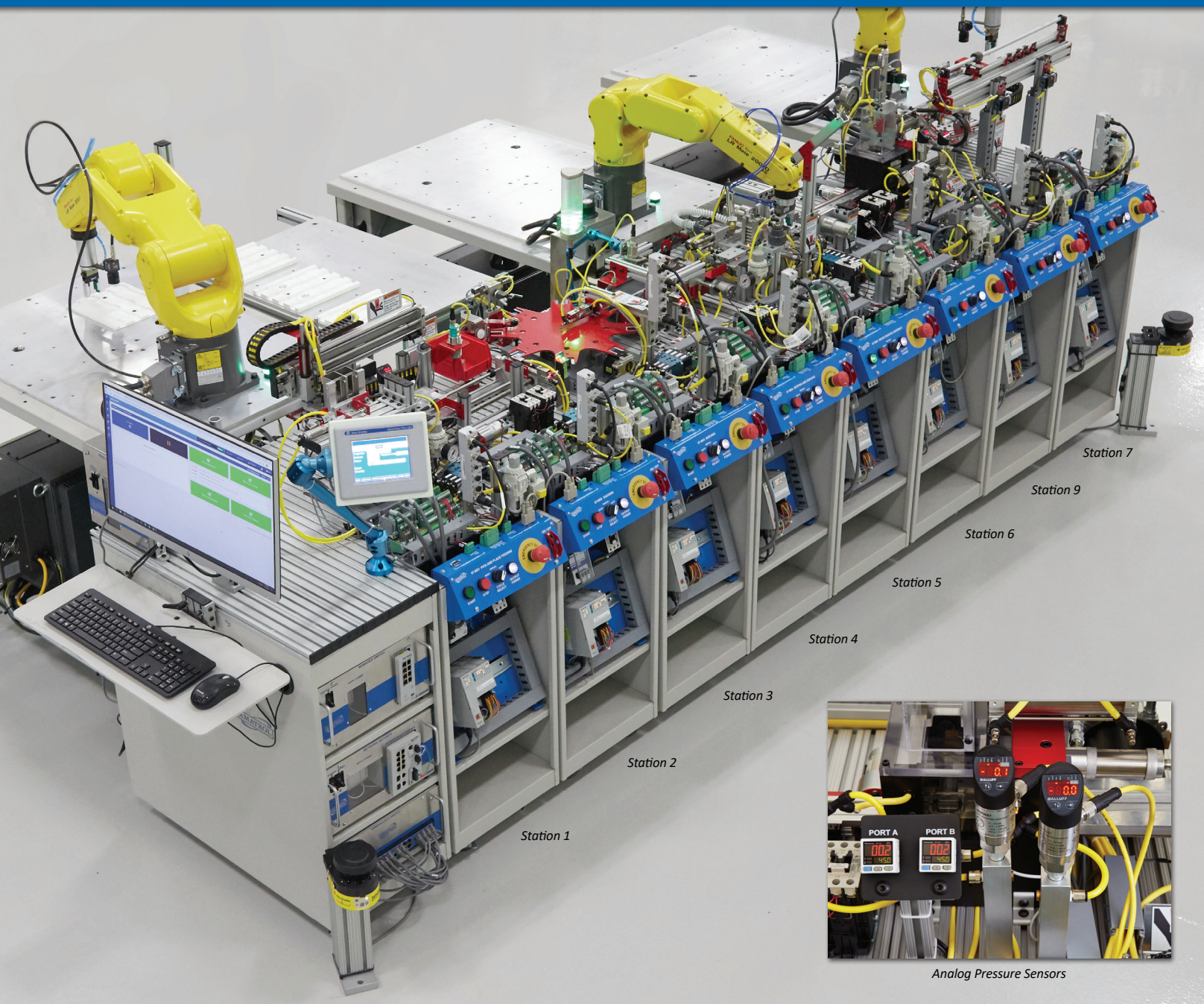
Integration & Flexibility

- The Smart Conveyor System integrates seamlessly with the other Enterprise components
- The conveyor and AMR can also be used as standalone systems or in other combinations

SMART FACTORY ASSEMBLY

The Smart Factory Assembly system is a fully-automated production system that assembles functioning PLCs & industrial robots. The system features real Industrial Internet of Things (IIoT) components, monitoring software with data analytics & mobile apps; network

pneumatic valves. Learners build key Industry 4.0 automation skills by programming including: smart sensors; product identification; cloud-based maintenance and production (Ethernet/IP or PROFINET) and wireless communications; and cybersecurity.



Assembly Operation

Station 1 - Vacuum pick & place feeding
Station 2 - Gauging/linear transfer
Station 3 - Orientation processing & part ID
Station 4 - Valve body sorting & buffering
Station 5 - Robotic valve placement
Station 6 - Torquing of fasteners
Station 9 - Electro-hydraulic valve testing
Station 7 - Valve inventory storage

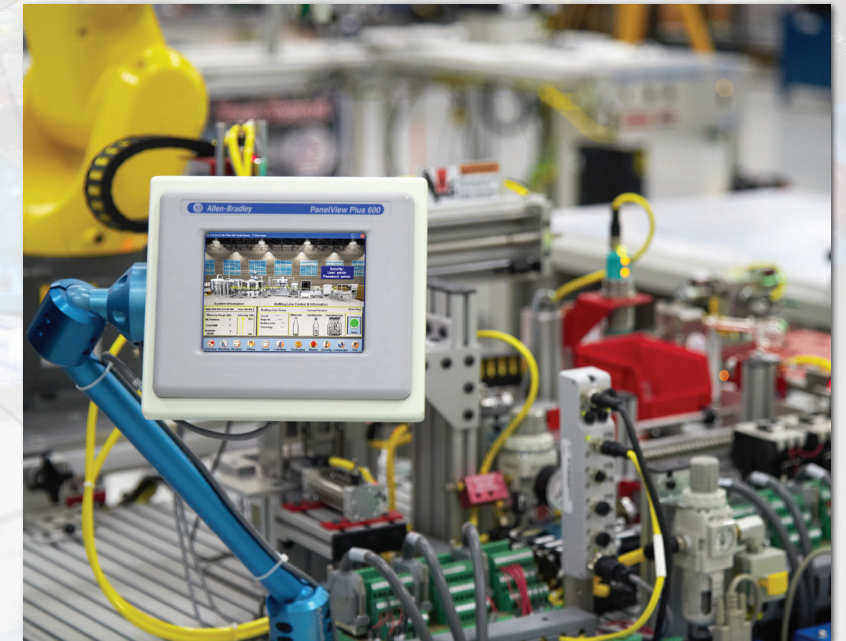
Real-World Components

- Wide variety of technologies gives users experience with more types of I/O
- Electrical variable speed motors
- Pneumatic actuators & vacuum grippers
- Conveyors
- Programmable logic controllers (PLCs)
- Electro-hydraulic valves



Mix & Match Flexibility

Individual stations can be mixed and matched to create smaller versions. Stations can be used independently of system for individual student training.



Industry 4.0 Technologies

- Wide variety of smart sensors using different types of technologies
- RFID & barcode product ID
- Production & maintenance software
- Data analytics
- Ethernet & wireless communications & network security

Integration & Flexibility

- Integrates seamlessly with smart manufacturing & material handling system
- Quick connect cables make maintenance easy
- Can be used as a standalone system or integrated in a variety of custom combinations
- Modular system allows users to begin with a few carts and add more later

SMART FACTORY ROBOTICS

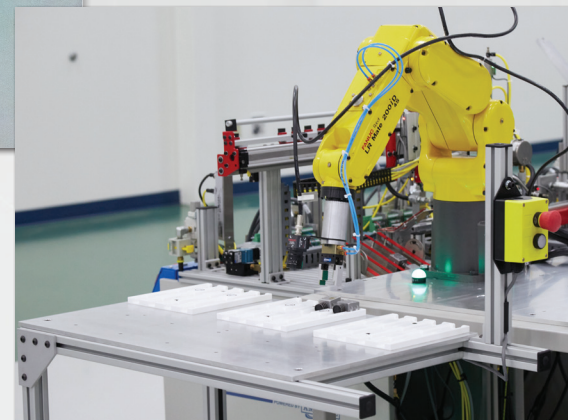
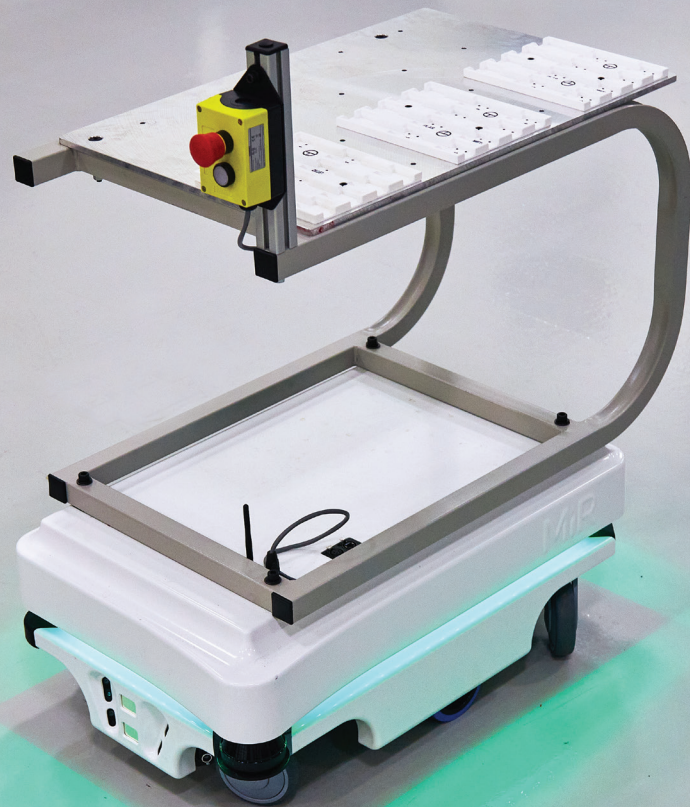
When you think of automation, what comes to mind? Robots, of course! Amatrol's Smart Factory Enterprise system integrates an Autonomous Mobile Robot with multiple industrial robot workstations to create a connected system in which all the parts communicate securely via Ethernet network and/or wireless signals to facilitate efficient material handling and transfer.

Autonomous Mobile Robot System

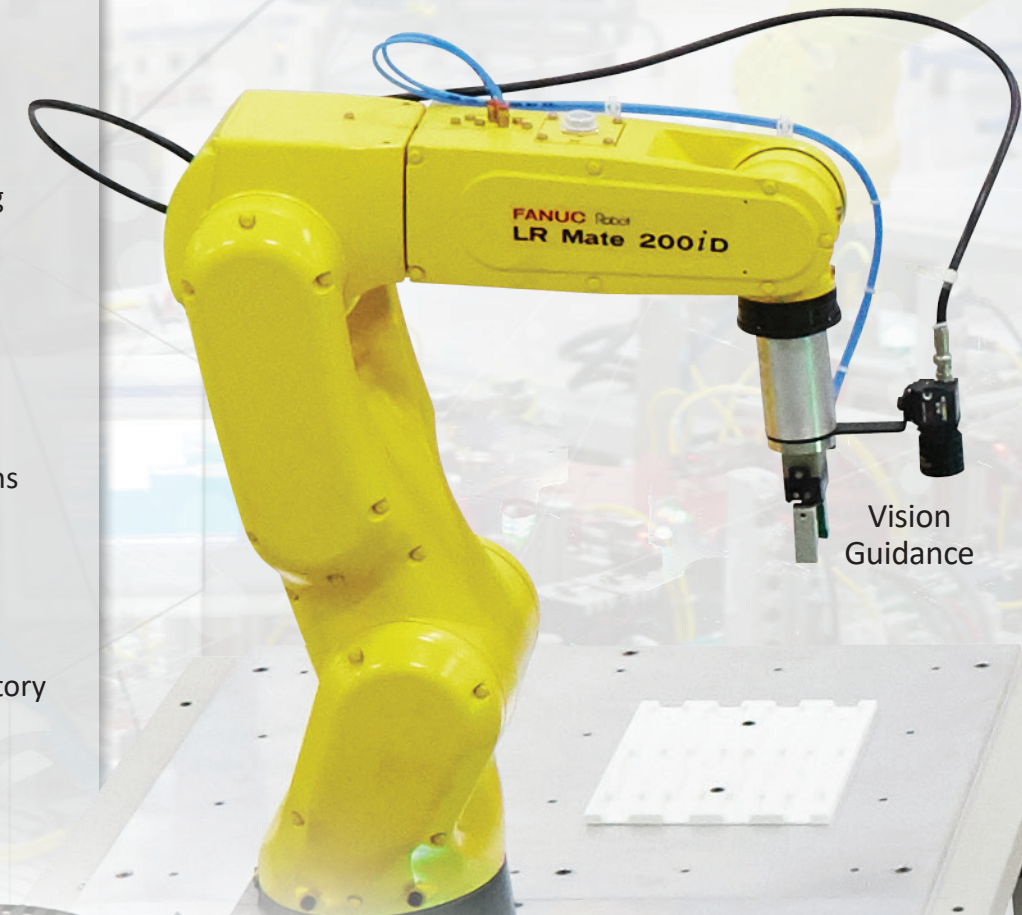
- Teach autonomous mobile robot (AMR) programming skills
- Automated internal transportation of materials, parts, & inventory between Smart Factory Manufacturing & Assembly systems, which can be located in different rooms or buildings
- Create & configure custom applications to learn how to optimize processes & improve workflows in a Smart Factory environment
- Use as a standalone system or integrate in various combinations with other Smart Factory Enterprise components

Smart Robot Workstations

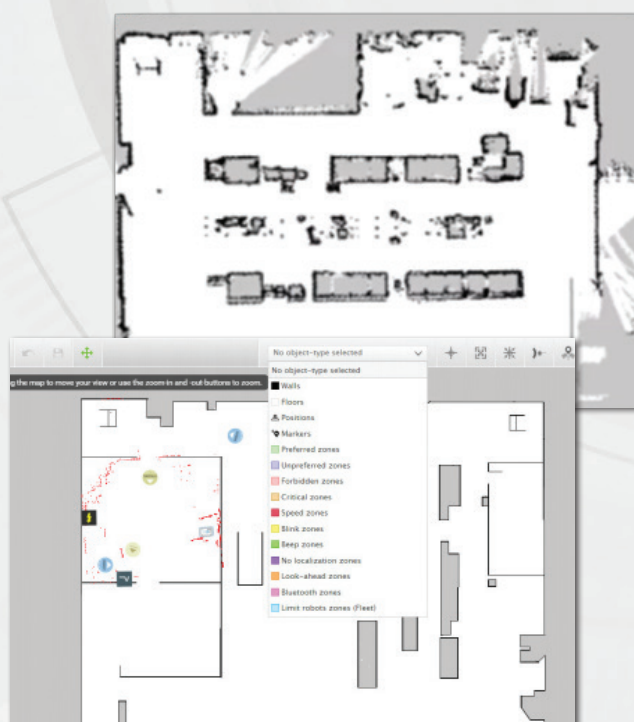
- Teach industrial robot programming skills
- Variety of industrial FANUC robots, including the 200iD/4S, 200iD, and SCARA SR-6iA available
- Laser scanners allow safe operation without bulky guards
- Optional vision system cameras for advanced pick and place applications
- Discrete I/O, pneumatics, Ethernet, & lockout/tagout controls on front interface panel for easy access & use
- Can be integrated in various combinations with other Smart Factory Enterprise components



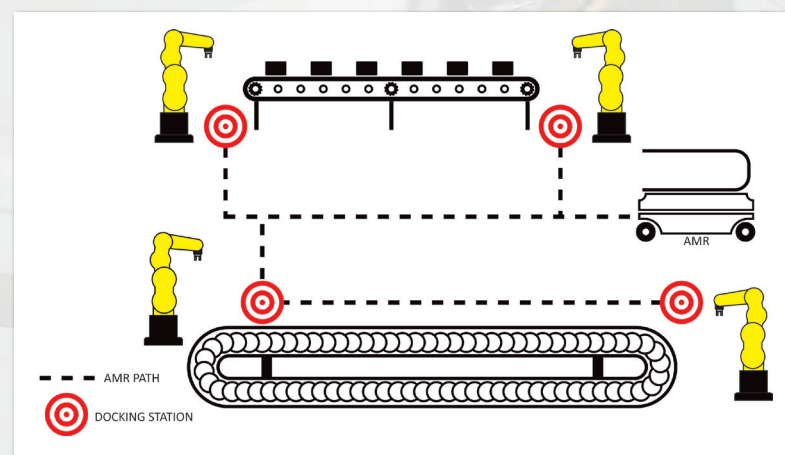
Material Handling & Transfer with Vision Guidance



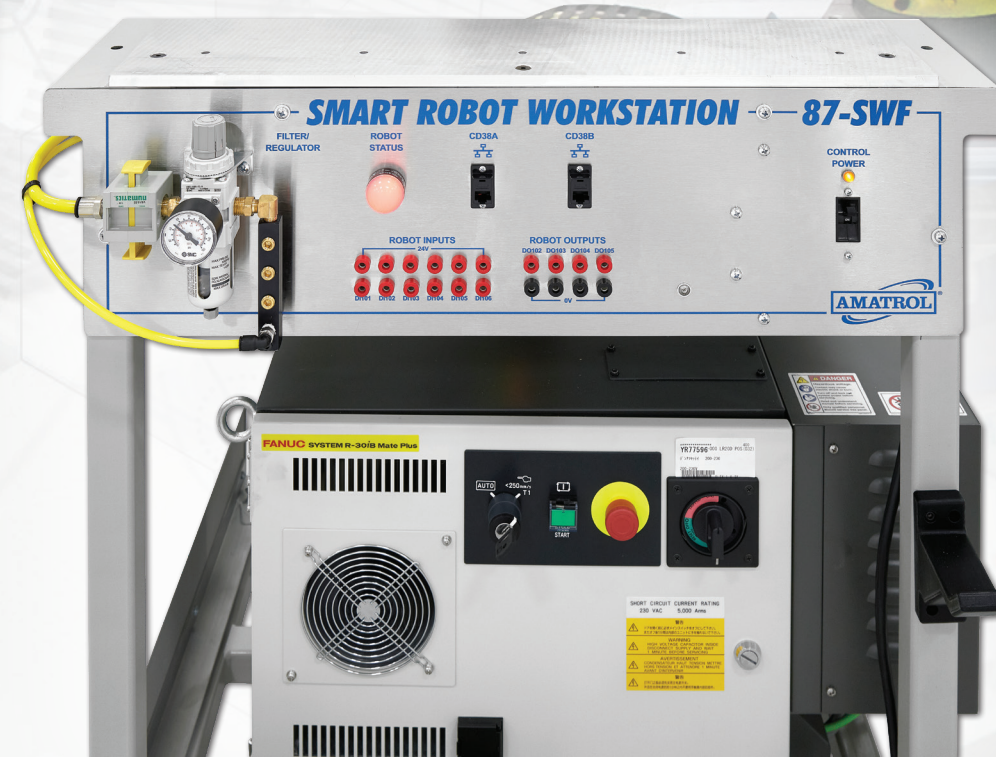
Vision Guidance



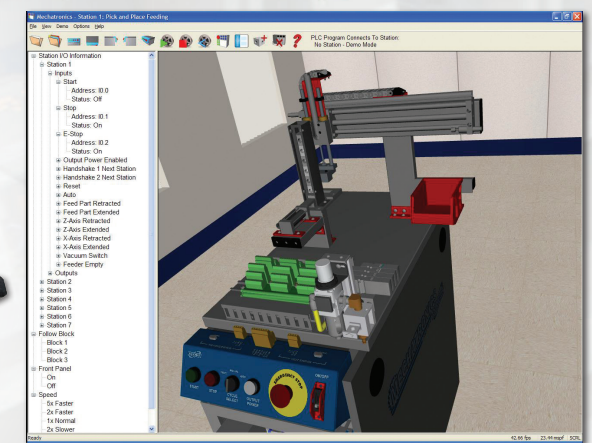
AMR Mapping Software



Sample AMR Path



Smart Robot Workstation Interface Panel

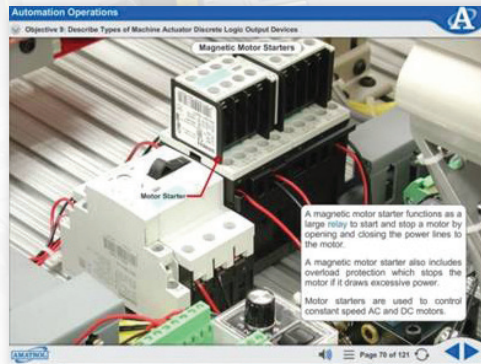


MechaSIM

STRY 4.0

both key concepts and ha
nces the learning experi

Its interactive format engages learners and enhances the learning experience.



- Student assessment
- Student tracking
- Focus on problem solving
- Available online 24/7
- Self-directed & flexible for students & instructors
- Impressive interactivity
- Virtual trainer options
- Hands-on skill development

Learning Management System (LMS) Included

- User-Friendly Navigation with Skills On/Off Control
- SCORM to Other LMS Systems
- Custom LMS Branding Available
Put your school or organization's logo and colors on the LMS homescreen
- Pre-/Post-Course Quizzes
Create a valuable metric to track progress
- Easy-to-Use Reporting Tools
Customizable reporting tools will help evaluate progress
- Custom Course Set-Up

Put your school or organization's logo and colors on the LMS homescreen

Create a valuable metric to track progress

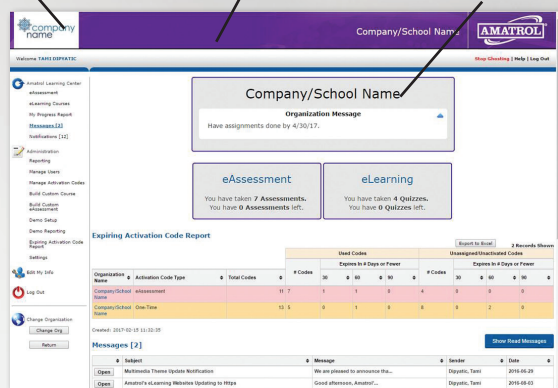
Customizable reporting tools will help evaluate progress

Choose from thousands of eLearning modules to create an almost innumerable combination of courses that can exactly fit your training need

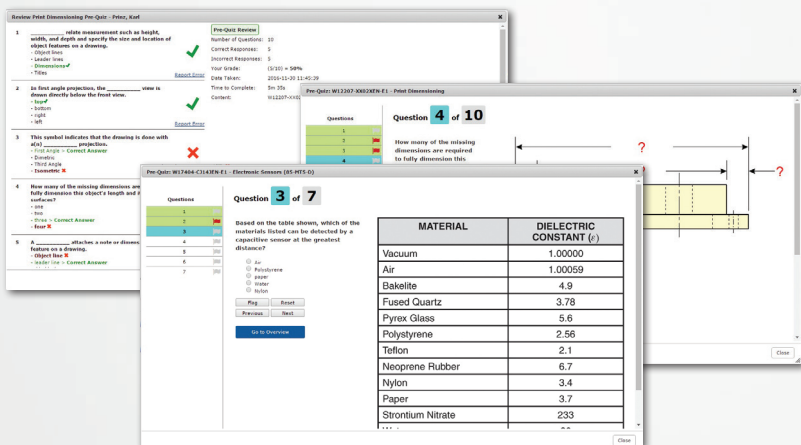
Your Organization's Color Scheme

Your Organization's Logo Here!

Your Organization's Name Here!



Custom LMS Branding Available for Organizations



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- Reduce training cost & time investment



2400 Centennial Blvd.
Jeffersonville, Indiana 47130 U.S.A.
Phone: 812.288.8285 | Fax: 812.283.1584
Toll Free in USA & Canada: 800.264.8285
Email: contact@amatrol.com | www.amatrol.com

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