AUTOMATION STUDIO

Educational Edition

The All-in-One Tool of Choice for Automation, Electrical and Fluid Power Teaching and Training

- ✔ Create
- ✔ Simulate
- ✔ Troubleshoot

Your Mechatronics Platform

Famic Technologies Inc.

Make your circuits come to life through simulation with Automation Studio™

- Libraries of thousands of 2D CAD symbols ready to simulate, sorted by technologies using international standards (ISO, IEC, NEMA, SAE, JIC, etc.)
- Illustrated libraries to improve connectivity skills for hydraulics, pneumatics, PLCs and electrical (AC, DC, renewable energy, electronics and more)
- All technologies can be linked together to create complete systems, which reinforces students' understanding of system's interactions
- Real looking measuring instruments, such as: multimeter, clamp-meter, oscilloscope, hydraulic tester, thermometer and more
- Create or activate pre-defined failures to develop troubleshooting skills on an electrical, hydraulic or pneumatic circuits, and also to improve PLC training
- Remote access capabilities for e-Learning
- Create custom libraries containing only the required components for specific exercises
- Create a digital twin of your hardware equipment to facilitate the transition from theory to practice
- Ready-to-use 2D and 3D virtual systems
- OPC connectivity to real devices, such as PLCs (Allen Bradley™, Siemens™, LS Electric™, Mitsubishi, etc.), Arduino, Raspberry Pi and others

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If you teach subjects related to hydraulics, pneumatics, PLCs, electrical and control technologies, the illustration of concepts and the behaviour of systems are no doubt at the heart of your requirements

Since 1986, Automation Studio™ has proven its strength in technical and engineering educational institutions worldwide by helping students better understand the behaviour and interaction of technologies with an intuitive visual learning approach before moving on to the hands-on trainers.

Automation Studio™ fits multiple programs, such as:

- Mechatronics ✓
- Industrial Maintenance ✓
- Electrical ✓
- Renewable Energy ✓
- HVAC ✓
- Marine Technology ✓
- Aircraft Maintenance ✓
- Agriculture and Heavy Duty Mechanics ✓
- Automotive ✓
- Mechanical Engineering Technology ✓

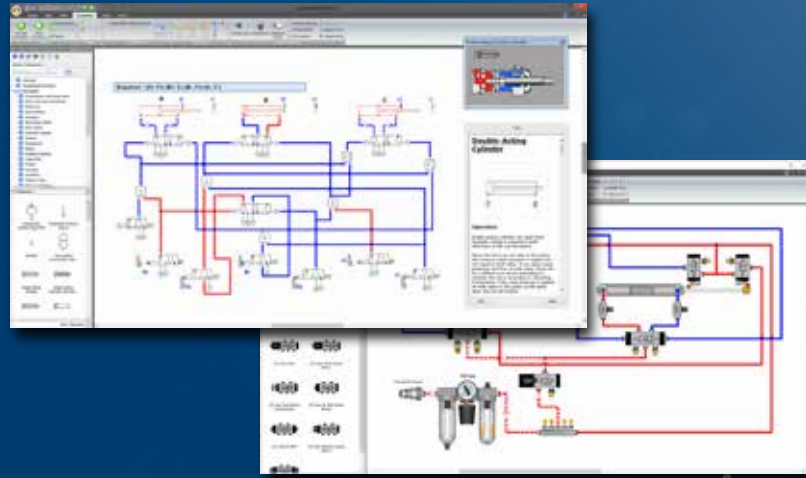## All-in-One Software Solution for Teaching Future Technicians and Engineers

- ❯ High School
- ❯ Technical Training
- ❯ Community Colleges
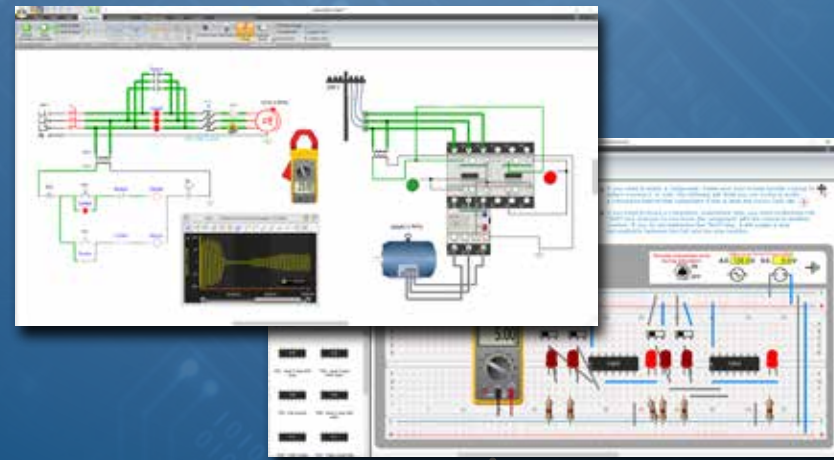- ❯ Universities
- ❯ Workforce
- ❯ Corporate Training

Technologies

Electrical AC/DC and Motor Controls

Pneumatics

Programmable Logic Controllers (PLC)
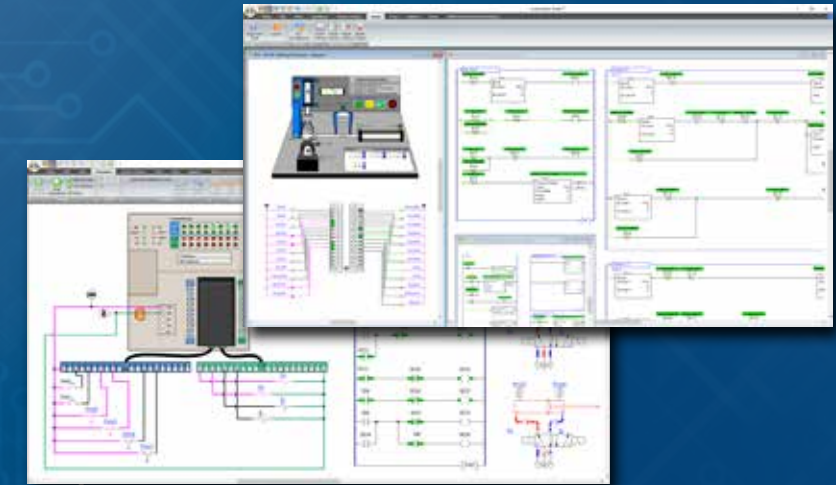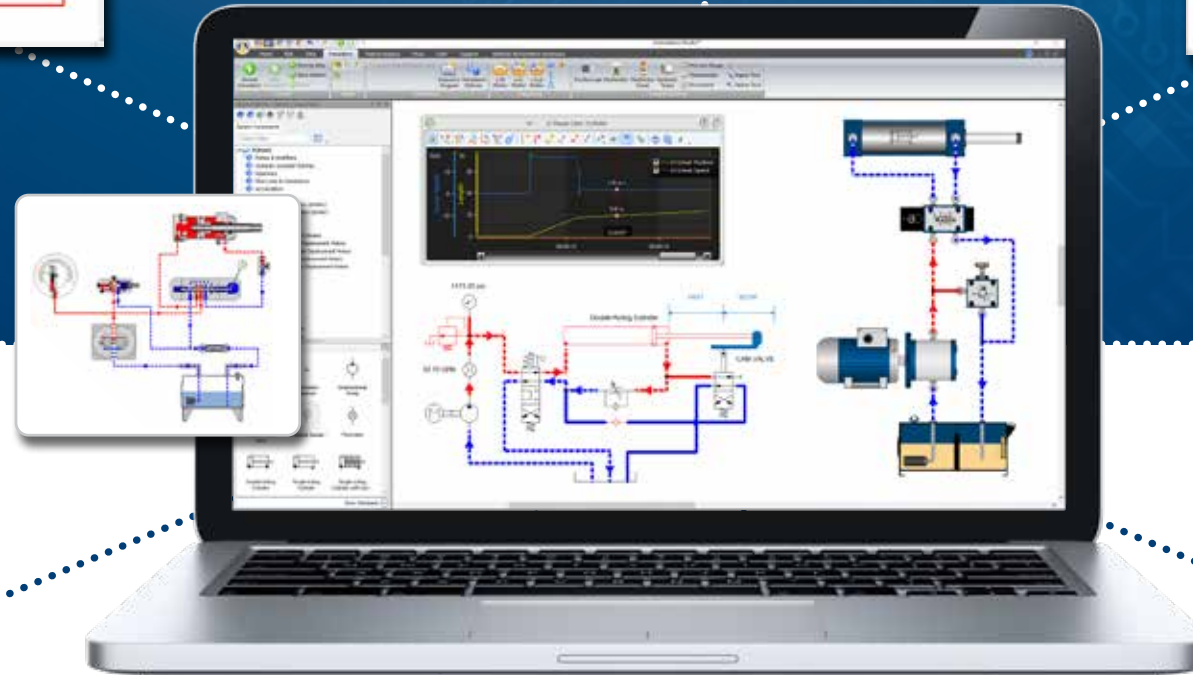
Hydraulics

Electrical Controls
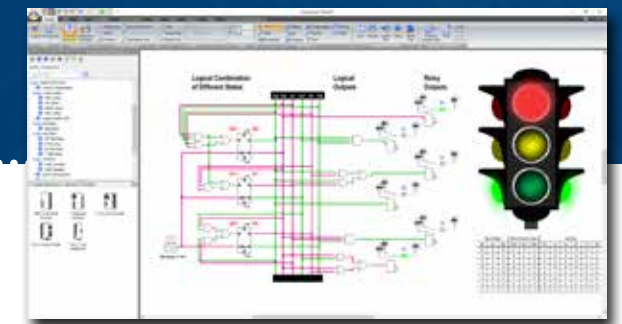
Digital Electronics
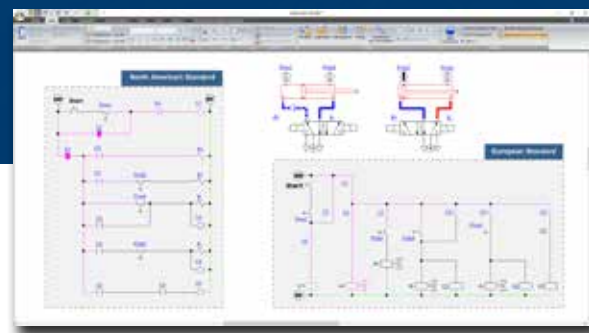
HMI 2D/3D Control Panels
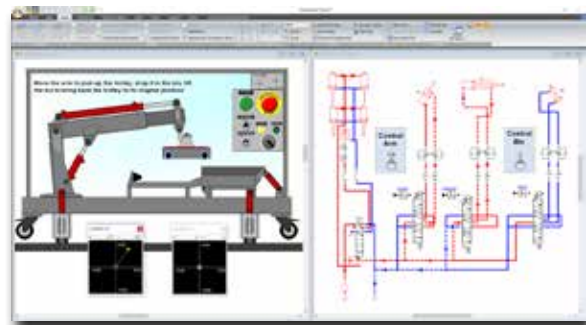
Sequential Function Chart (SFC) / GRAFCET, Structured Text
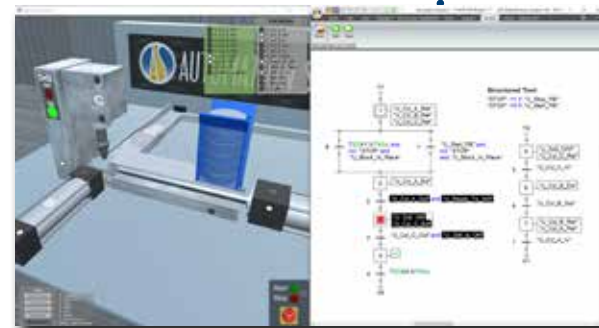
Electrical One-Line

Block Diagram-Math

AUTOMATION STUDIO™
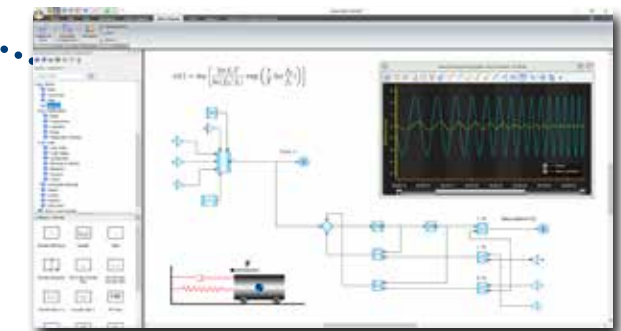
Virtual Trainers

- Create ✓
- Simulate ✓
- Troubleshoot ✓
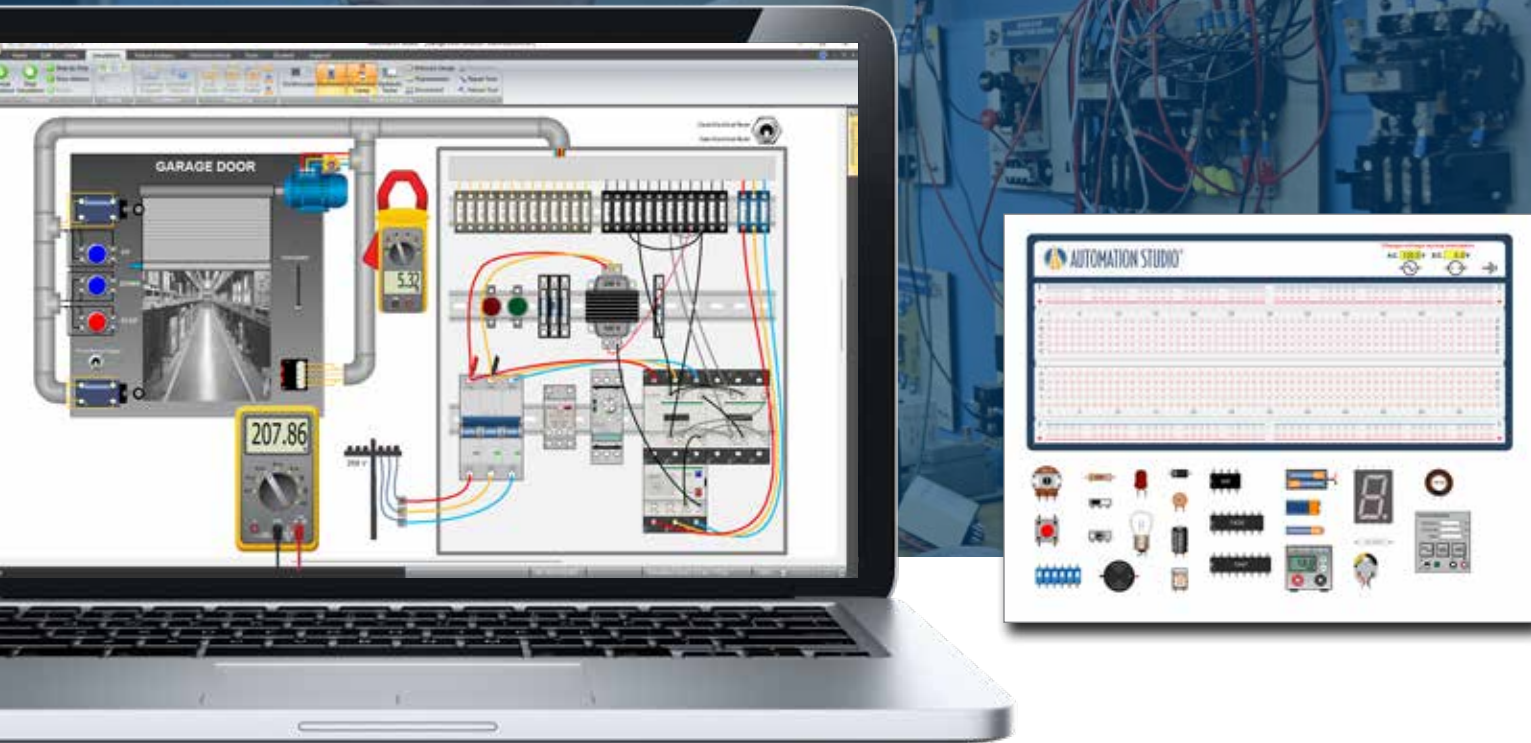
Premade virtual trainers in all technologies, ready to be connected!

Select from over 40 premade virtual trainers and rapidly start making connections. These virtual trainers can also be modified to create digital twins of your hardware trainers using the illustrated libraries.

Virtual trainers offer a different approach to introduce students to different connection scenarios. Therefore, some virtual trainers use banana cables where symbols are visible, like on most of the educational hardware trainers, an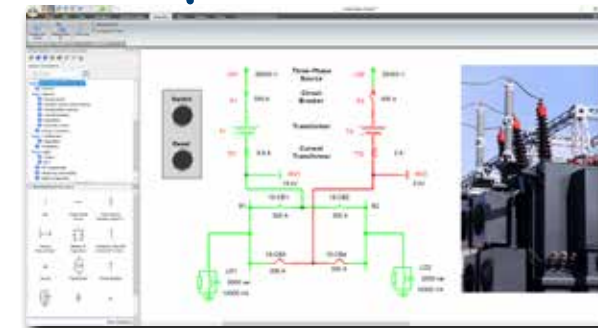d others use a more realistic approach where students wire true to life components. This will strengthen students' wiring and troubleshooting skills.

Flexible links will automatically be activated for these virtual trainers. They will offer banana cable appearance or a regular wire appearance, depending on the selected template. In addition, after making a connection, users can select the type of link. For example, on the Residential Electricity Virtual Trainer, hot, neutral and ground wires can be selected.

Basic Electrical
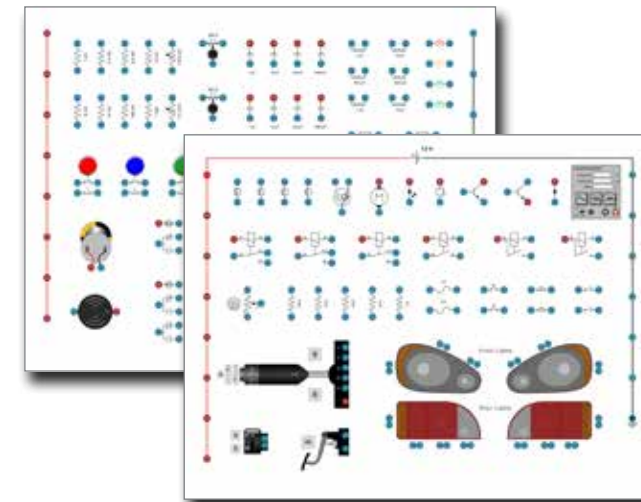
Electro-Pneumatic / Hydraulic
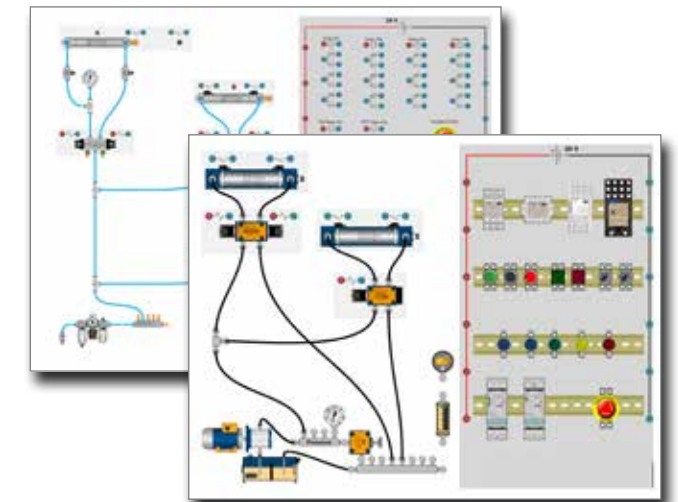
Relay Logic
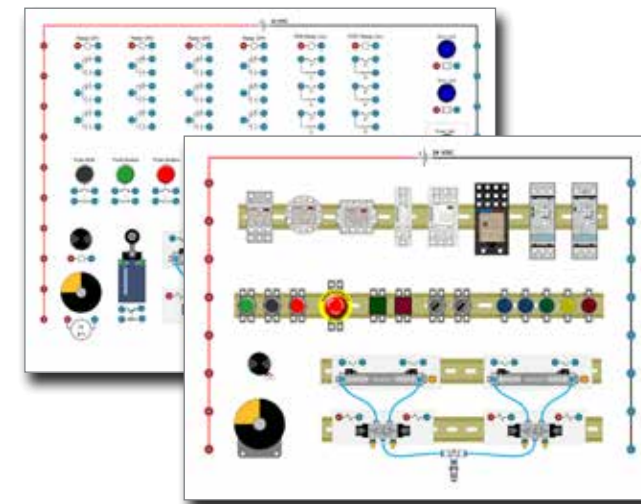
PLCs
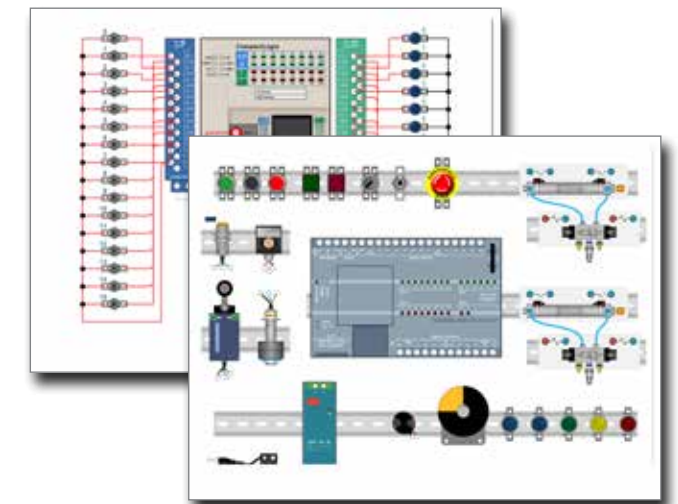
Renewable Energy / Residential Electricity
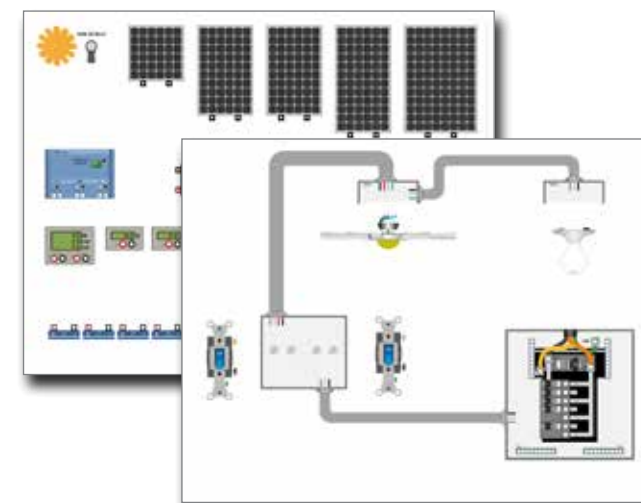
Motor Control
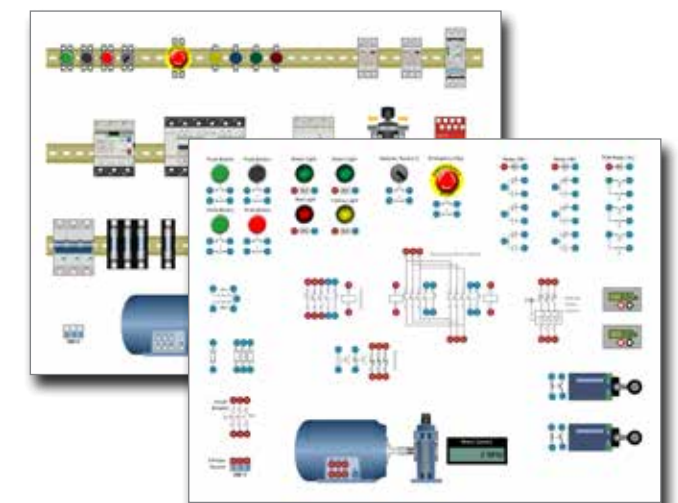
Hydraulics and Pneumatics

Create ✔
Simulate ✔
Troubleshoot ✔

The Best Solution to Reproduce Hydraulics and Pneumatics Lab Assignments That Fit Your Curriculum

The Hydraulics and Pneumatics libraries are compliant with ISO 1219-1:1991/2012 and 1219-2:1991/2012 standards. With Automation Studio™, you can create, simulate and troubleshoot hydraulics and pneumatics (ON/OFF, electro and proportional) circuits. The software offers a wide array of ISO and illustrated components to create basic to advanced circuits and enables you to create digital twins of your hardware trainers.
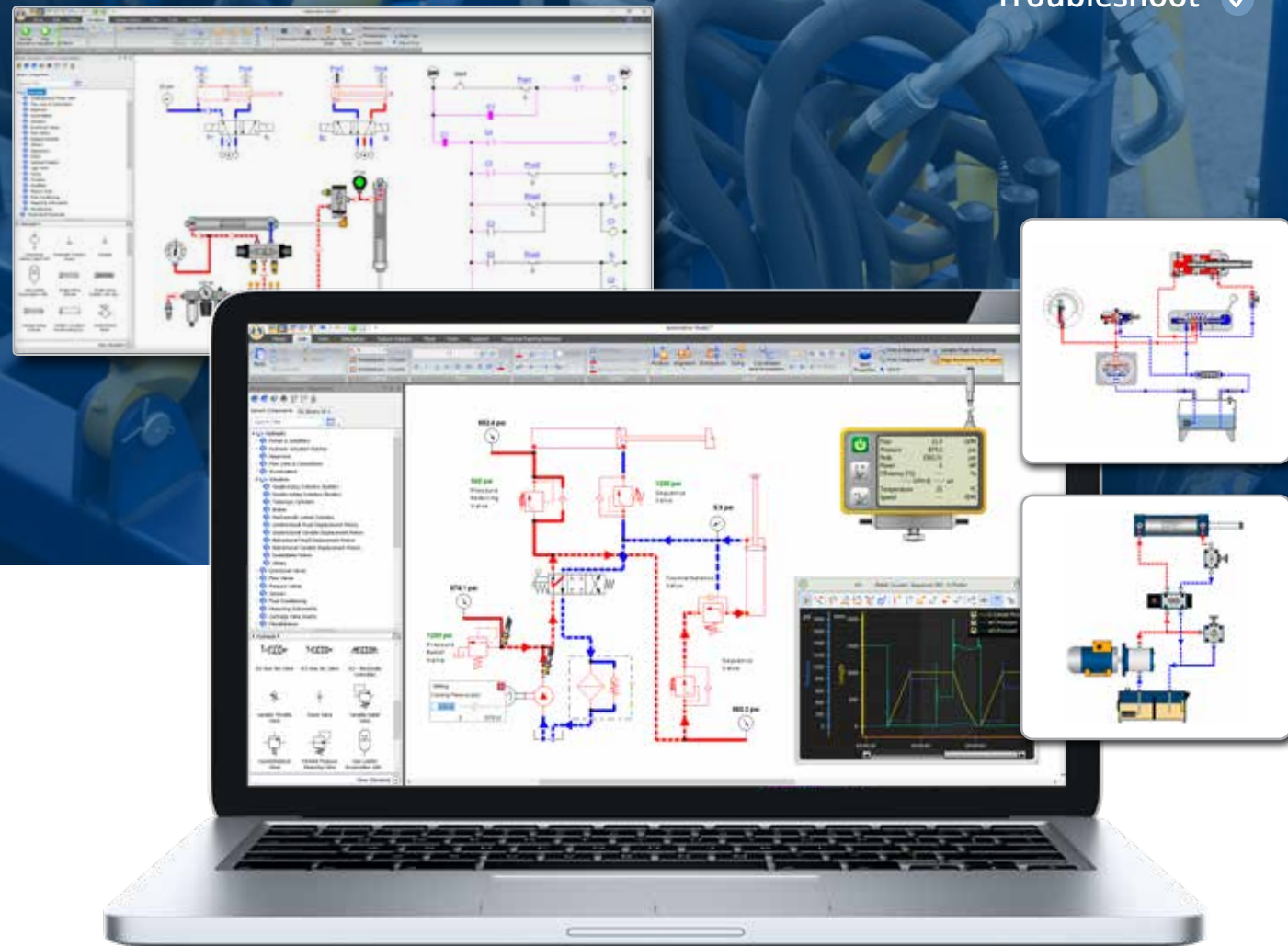
Thousands of ISO and Illustrated Components to Choose From

Create Custom Libraries That Fit Your Needs
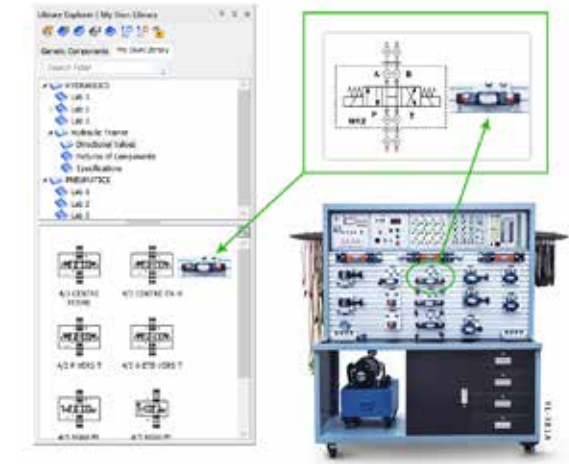
Change Properties to Simulate Different Scenarios
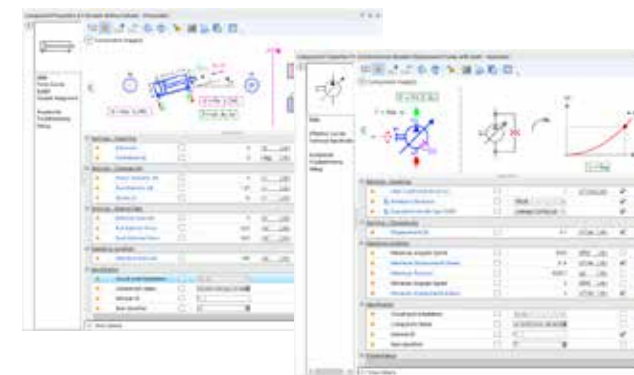
Activate Predefined Failures or Create Your Own to Improve Troubleshooting Skills
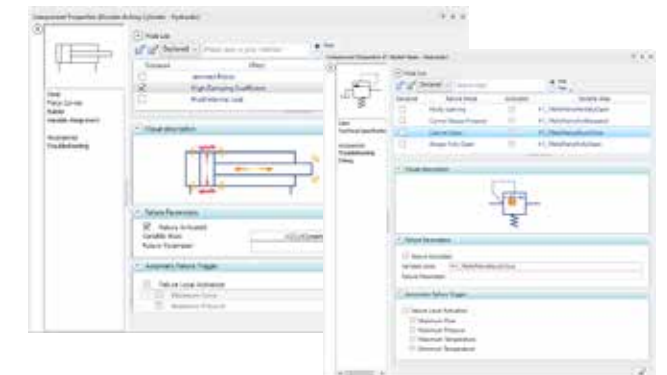
And More

- Easily drag and drop components on the schematics to create circuits
- Arrows and animated lines indicating flow direction
- Colors indicating different pressure, flow rate, or flow speed thresholds
- Measuring instruments such as pressure gage, flow meter, plotter and more
- Teachware and premade exercises
- Reproduce exercises you are currently using in your program
- Create custom libraries containing only the required components to specific exercises

- Copy and paste your circuits to other applications
- Hydraulics and pneumatics sizing sheets
- Export your schematics to PDF, DXF and more
- Print your circuit on any paper formats
- Improve blueprint reading skills by working directly with ISO symbols
- Automatic Bill of Materials generation
- Cut-away components to illustrate internal behaviour
- Pre-configured components that behave according to OEM's specifications in the Manufacturers' Catalogues

AUTOMATION STUDIO™

Electrical

- Create ✓
- Simulate ✓
- Troubleshoot ✓
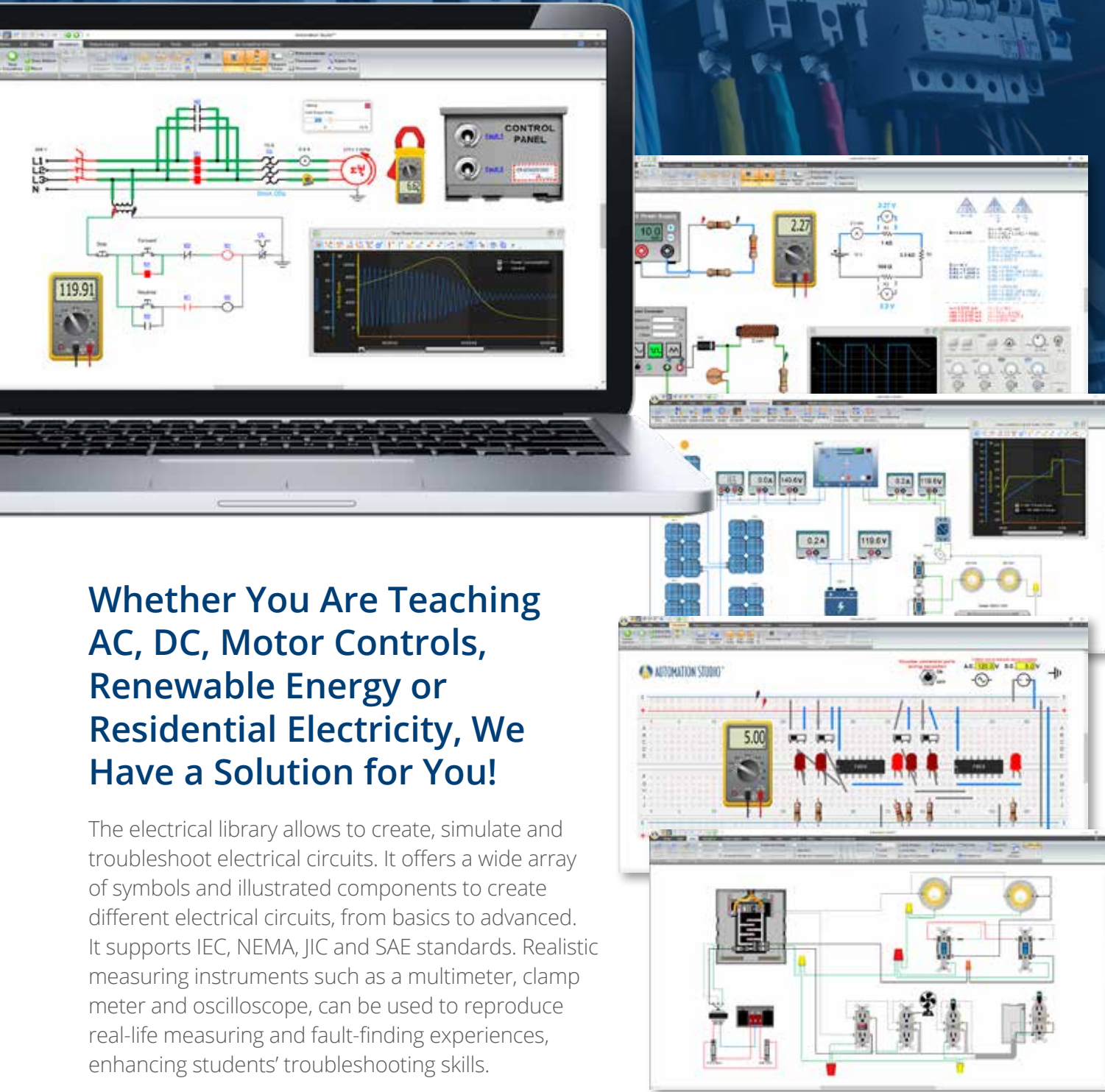
Whether You Are Teaching AC, DC, Motor Controls, Renewable Energy or Residential Electricity, We Have a Solution for You!

The electrical library allows to create, simulate and troubleshoot electrical circuits. It offers a wide array of symbols and illustrated components to create different electrical circuits, from basics to advanced. It supports IEC, NEMA, JIC and SAE standards. Realistic measuring instruments such as a multimeter, clamp meter and oscilloscope, can be used to reproduce real-life measuring and fault-finding experiences, enhancing students' troubleshooting skills.

Thousands of Symbols and Illustrated Components to Choose From

Create Wiring Diagram with Illustrated Libraries

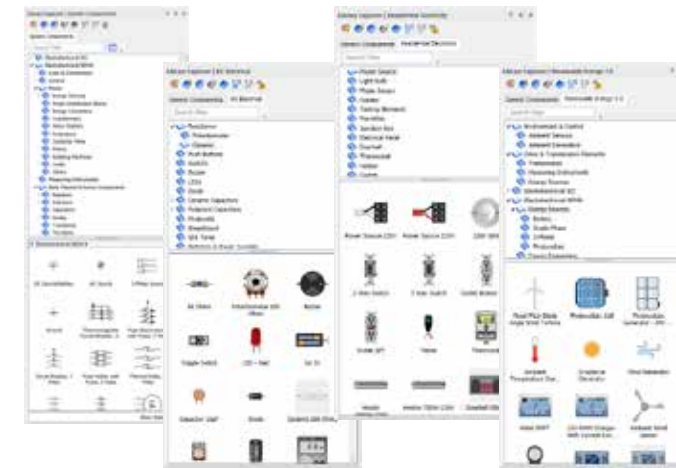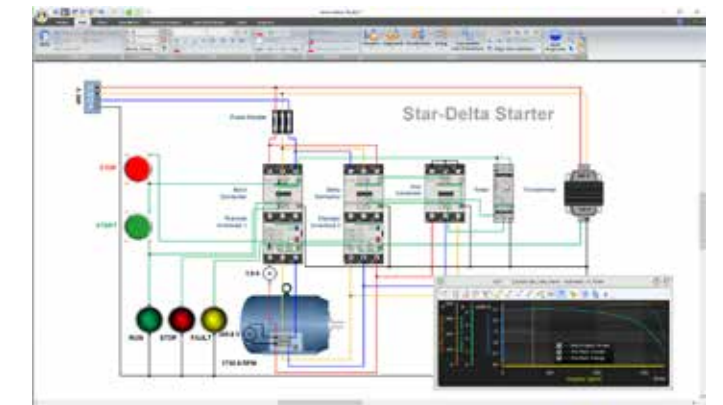## Properties Can Be Changed to Reproduce Lab Exercises

Activate Predefined Failures or Create Your Own
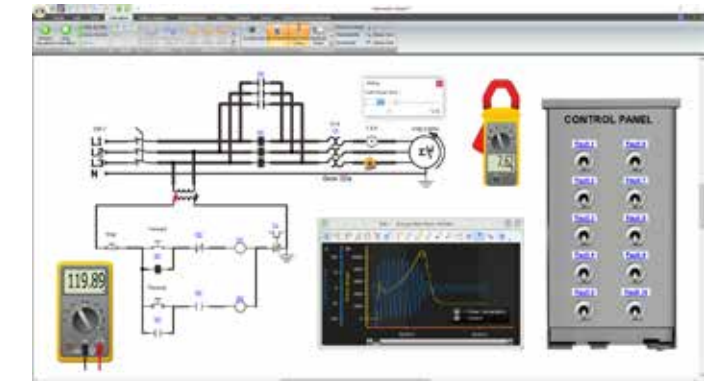
And More

- Drag and drop components on the schematics to create circuits with NEMA or IEC symbols
- A breadboard can be used to create DC circuits
- Simulation modes: normal, slow motion, step-by-step and paused
- Measure amp, volt, watt, frequency, power factor and more during simulation
- Teachware and premade exercises on basic circuits
- Copy and paste your circuit to any other application

- Variable frequency drives, electrical components, and more in our Manufacturer's Catalogues
- Electrical one-line diagram for power grid circuits
- Electrical sizing sheets
- Export your schematics to PDF, DXF, and more
- Improve blueprint reading skills by working directly with IEC and NEMA symbols
- Automatic Bill of Materials generation
- Simulation pace adjustable up to 1µs

PLC

Create ✓
Simulate ✓
Troubleshoot ✓

Components and Function Sets According to Manufacturer's Specifications
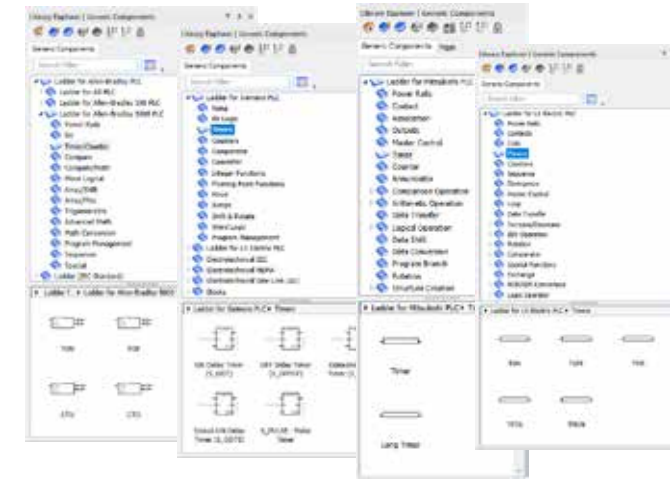
Cross Reference Inputs/Outputs
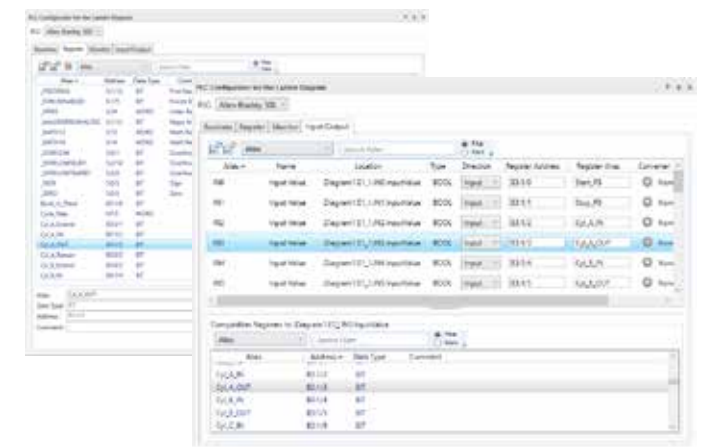
Syntax Help and Validation
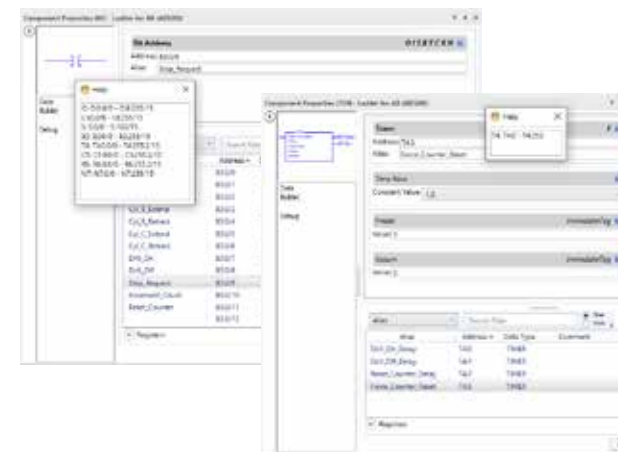
Learn How to Connect Real Looking PLCs

Write Your Ladder Logic Program to Control Other Technologies

The PLC Ladder Logic Libraries allow creating and troubleshooting of PLC circuits. They offer a wide array of components from Allen Bradley™ AB-500 and AB-5000, Siemens™, LS Electric™, Mitsubishi MELSEC iQ-R Series and IEC 61131-3. They can be used to control any circuit within Automation Studio™ using sensors, solenoids, lights, switches and more.

And More

- Control other technologies: hydraulics, pneumatics, electrical, etc.
- Monitor states during simulation
- Instructions set for Allen Bradley™ AB-500, AB-5000, Siemens S7, LS Electric™, Mitsubishi MELSEC iQ-R Series and IEC 61131-3
- Force instructions during simulation
- Insert additional rungs or columns between already made logic

Connect to Real Devices Such As PLCs and Controllers Through OPC

AUTOMATION STUDIO™
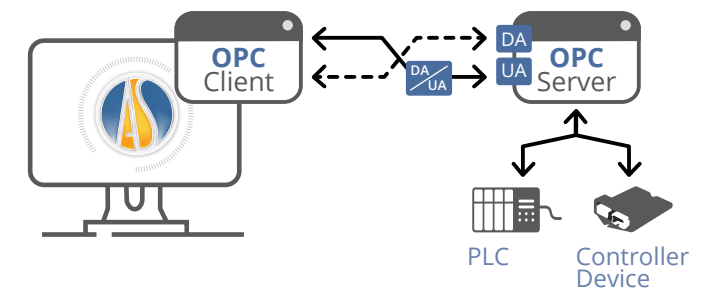
Sequential Function Chart and Structured Text

Sequential Control of Your System

Sequential Function Chart (SFC) / GRAFCET and Structured Text are methods of choice to design structured automation controls easily and efficiently. SFC is a graphical programming language among the languages identified by the IEC 61131-3 standards for PLC programming.

Dedicated Toolbar to Improve Design Time

Structured Text

- Interfacing with other technologies to control hydraulics, pneumatics or electrical circuits
- Hierarchical level management, branches and jumps
- Easily follow active steps or transitions
- Macro and enclosing steps
- Automatically insert AND and OR branches when needed

- Syntax checking during editing
- Simulation showing active steps and variable values
- Control of sequence and step activation time
- Forcing transition capability
- Macros and enclosures

2D and 3D Virtual Systems

- ✓ Create
- ✓ Simulate
- ✓ Troubleshoot

Control Real Systems

Using the Electrical and PLC Libraries as well as the SFC module, students simply link sensors, switches, lights, conveyors, etc., in order to control the pre-made Virtual Systems according to the teacher's instructions, such as traffic lights, garage doors, conveyors and more. 3D Virtual Systems are created using Unity 3D, allowing for a training experience with a high level of realism.

Garage Door

Conveyor Elevator

Painting Factory
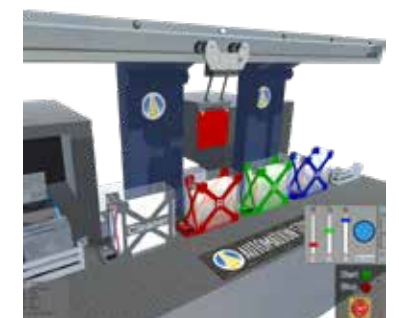
Pick and Place With Stamp
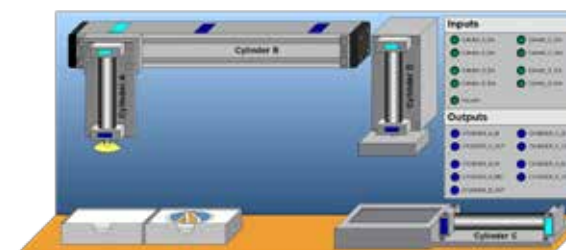
4-Way Intersection

Manufacturers' Catalogues

Manufacturers' Catalogues

Automation Studio™ is the only software solution offering teachers and students an extensive library with thousands of preconfigured components that reproduce real world functions.

Save time with ready-to-use components from renowned manufacturers:

- Manage component options
- Create circuits with manufacturers' parameters
- Access instantly updated catalogue versions
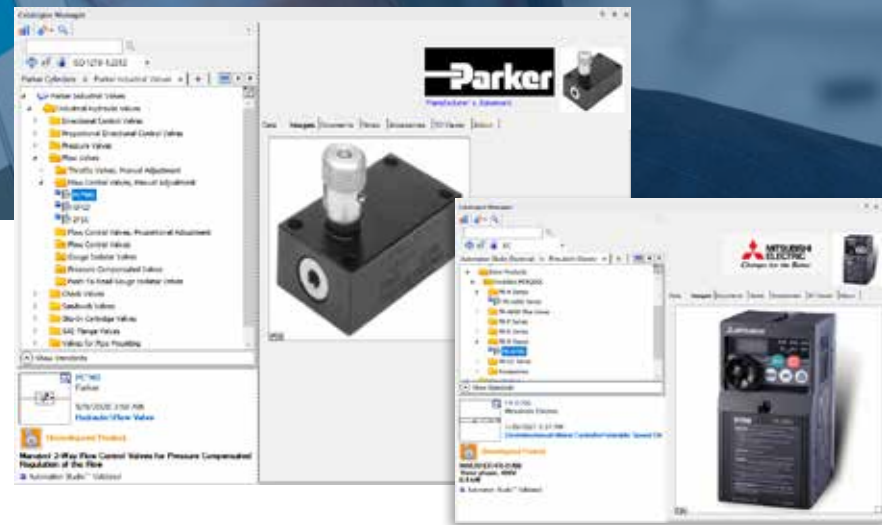
Each component has been carefully and rigorously bench-tested within Automation Studio™ to ensure that the simulation meets manufacturer's typical application and performance specifications. The virtual test benches are available for every component included in these catalogues.
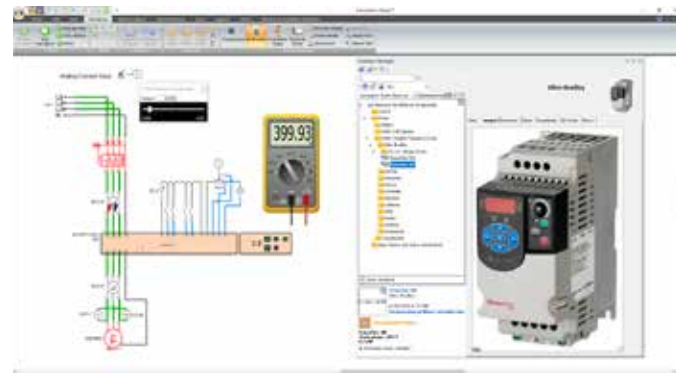
And More

- Catalogues for hydraulics, pneumatics and electrical
- Compare components behaviour
- Explain behaviour or more complex components easily with test benches
- Constantly updated with additional components from various manufacturers

Electrical Controls

- ✔ Create
- ✔ Simulate
- ✔ Troubleshoot

The Electrical Controls Library interacts with all components from other libraries to create relay logic controlled systems. It supports IEC and JIC standards.
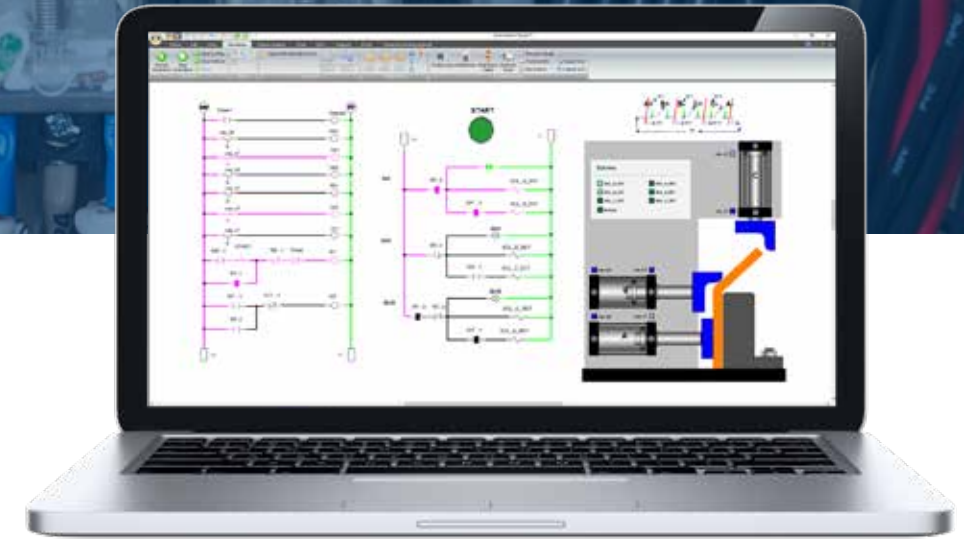
Digital Electronics

- ✔ Create
- ✔ Simulate
- ✔ Troubleshoot

The Digital Electronics Library comes complete with standard devices including inverters, logic gates, flip-flops, counters, shift registers, comparators, switches, LEDs, 7-bar displays, decoders, multiplexers, etc. Because of its output relay, you can also use this module to interact with other technologies.

AUTOMATION STUDIO™

Block Diagram
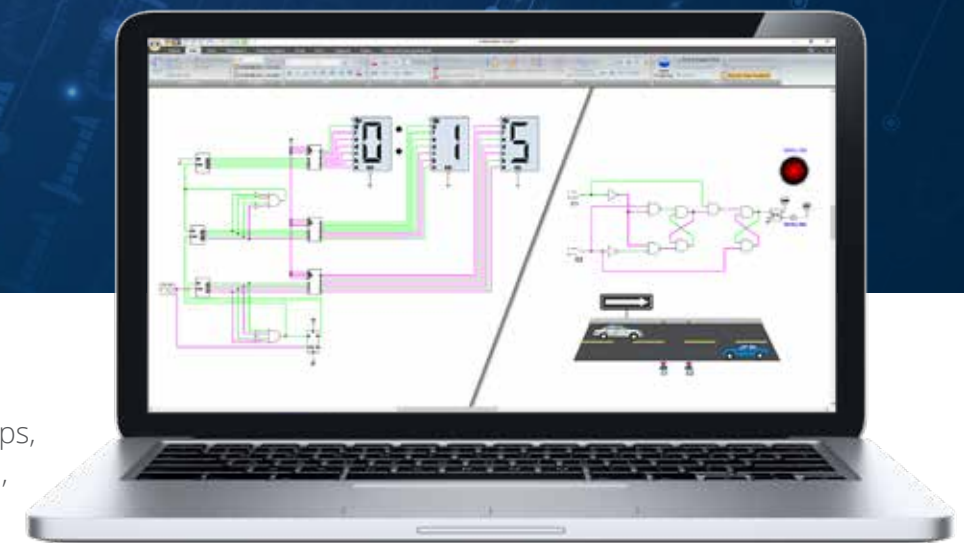
- ✓ **Create**
- ✓ **Simulate**
- ✓ **Troubleshoot**
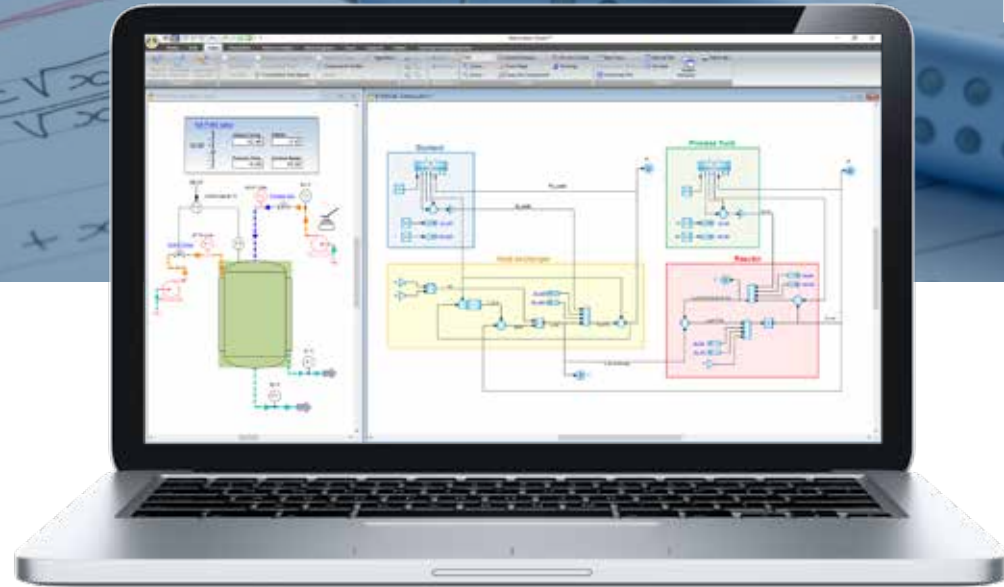
Create Your Own Mathematical Models

Users have the freedom to create their own mathematical models to represent the behaviour of custom components of any technology. This modelling capability will allow them to enrich models of all workshops. A more in-depth simulation can also be accomplished by modelling physical phenomena, such as air, resistance, friction, slippage, etc.

Control Algorithms

The Block Diagram Workshop allows to create and test control loops with multi-technology systems. As such, users can observe the effects of modifying algorithm parameters on the machine's characteristics. This helps better understand the system's behaviour for complex applications, improve performance and prevent issues before they occur.
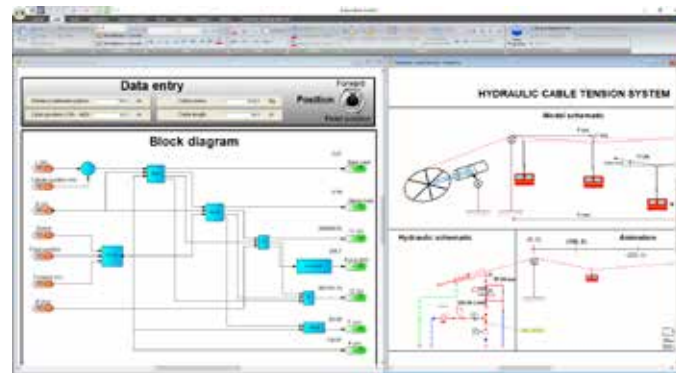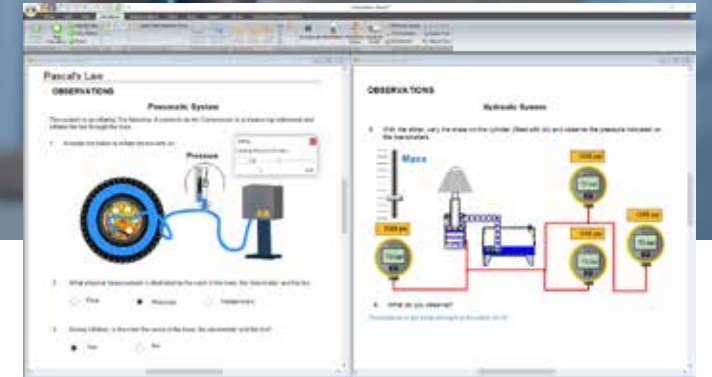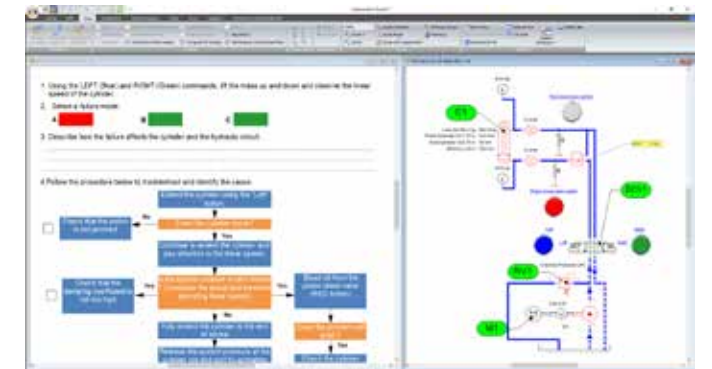
Teachware

Teachware and Lab Exercises for an Interactive Experience for Students

Interactive lab exercises are available for different technologies to test students' comprehension. These exercises include simple schematics that can be simulated with questions to be answered. Automation Studio™ offers guides, lectures, animations and lab notes for all levels of discipline. Unlike other teachware made using multimedia sequences, course content offered by Automation Studio™ is interactive and animated live by the software's simulation. Instructors have the flexibility to modify these exercises or create their own.

Interactive Exercises

Lab Exercises
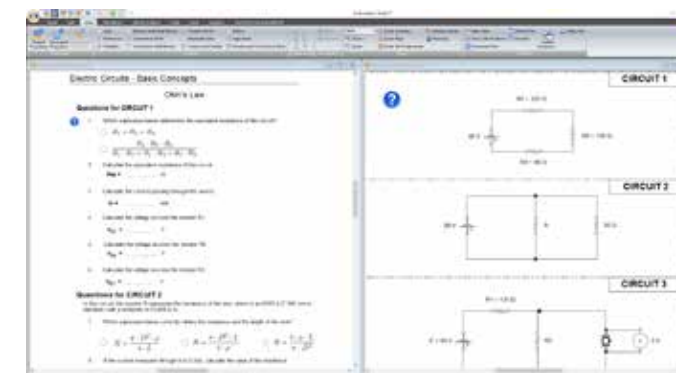
And More

- Users can insert pictures, text, external links to create interactive documents
- Parameters can be changed during simulation to compare different scenarios
- A workflow module can be added to automate functionalities
- Easily adaptable to any hardware equipment you already have
- Exercise can be saved, exported, printed or sent by email
- Record your screen and share with your students on any platform

Connectivity
With Real Devices

e-Learning
Remote Access

Exchange Inputs and Outputs With Real PLCs, Controllers or Any Devices That Are OPC Compatible

Being an OPC Client, Automation Studio™ can exchange inputs and outputs with real PLCs, Arduino, Raspberry Pi or any device that has an OPC Server.

Establish Connectivity With Communication Manager
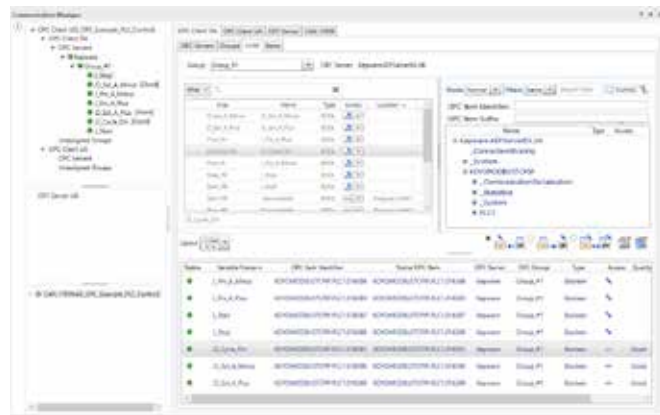
Easy To Use Linking Interface

OPC Client — DA / UA — OPC Server

PLC   Controller Device
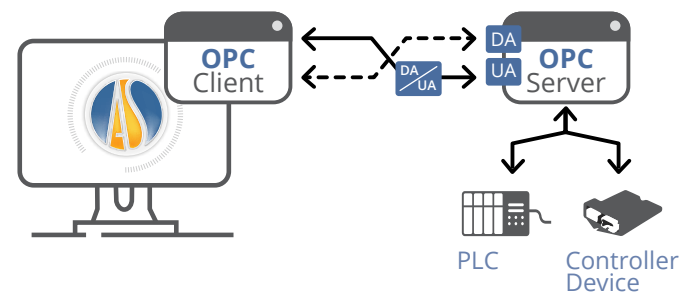
And More

- Control 2D and 3D Virtual Systems with your real PLC
- Test your PLC logic by controlling a circuit in Automation Studio™
- PLC illustrated libraries include a preconfigured connectivity with OPC Server
- Automatically detect installed OPC Server
- Linking interface between Automation Studio™ and hardware devices
- Communicate with IoT and IIoT
- Connect to Andon Studio™ Industry 4.0 software through OPC

Easy-To-Use, Reliable and Accessible, Wherever You Are!

Remote access capabilities enable teachers and students to use the software from school and from home for e-Learning. They can now do homework and perform simulations wherever they are! Permissions can be edited to allow or deny access to features of the software to the students to test their skills.

Configurable License Manager
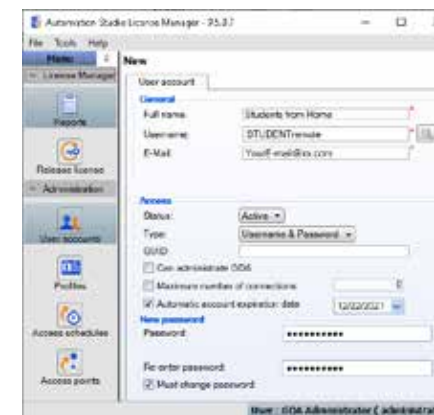
Screen Capture Your Content for Easy Sharing

Play Video   Save As   Send Video
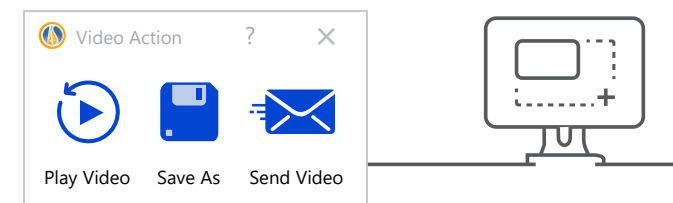
Digital Twins of Your Equipment to Be Used in Class or at Home

Complement your hardware equipment by allowing students to create the assignment virtually in Automation Studio™, prior to using your expensive lab equipment.
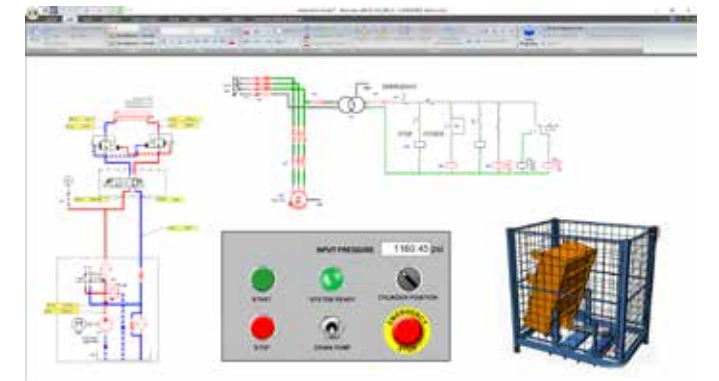
And More

- License Manager enables for accessibility, right and priority settings
- View in-use/available licenses, access schedules and license usage reports
- Share files through your favorite online application
- Record your simulation in a MP4 format and share it with your students

Andon studio™ | Industry 4.0

Integration with

AUTOMATION STUDIO™ ✓

Industry 4.0 at Your Fingertips

Andon Studio™ lets you monitor productivity in real time, optimize operations and manage processes. Make the most of Industry 4.0 potential by acquiring, sharing and using data to improve productivity and strengthen continuous improvement initiatives. Flexible, easy to use, modular and configurable, Andon Studio™ is a unique training solution.

Circular diagram with center "A" and segments:
- IoT / IIoT
- Workflow
- Big Data Analysis
- Simulation
- Cloud Computing
- Monitoring

Introduce Your Students to Industry 4.0 Workflow Simply and Efficiently With Andon Studio™

Data Analysis — **Workflow Management**

Field Devices		Andon Studio™ Variables	
Register	Value	Variable	Value
Light	200	plant1.Line1.LightSensor	200 Lumens
Speed	45	plant1.Line1.SpeedSensor	45 mp/h
Temperature	65	plant1.Line1.TempSensor	65°F
Counter_1	253	plant1.Line1.TotalCount	253
Timer_1	10	plant1.Line1.CycleTime	10 sec

- Performance Assessment (OEE) — 92%
- Report Generation
- Alert and Notifications Management

Andon studio™ | Configurable User Interface with Premade Templates
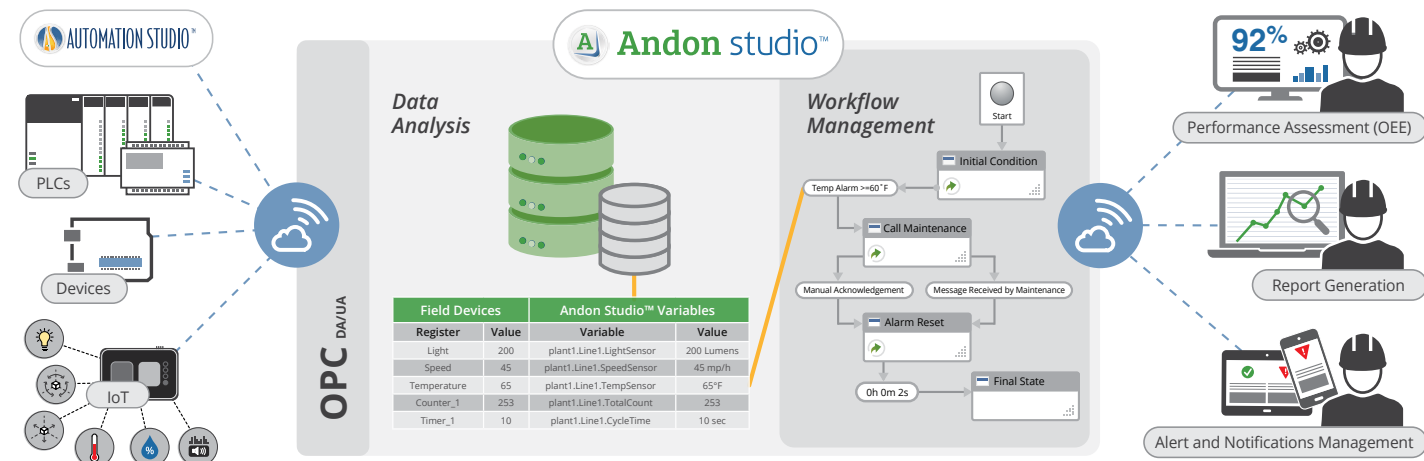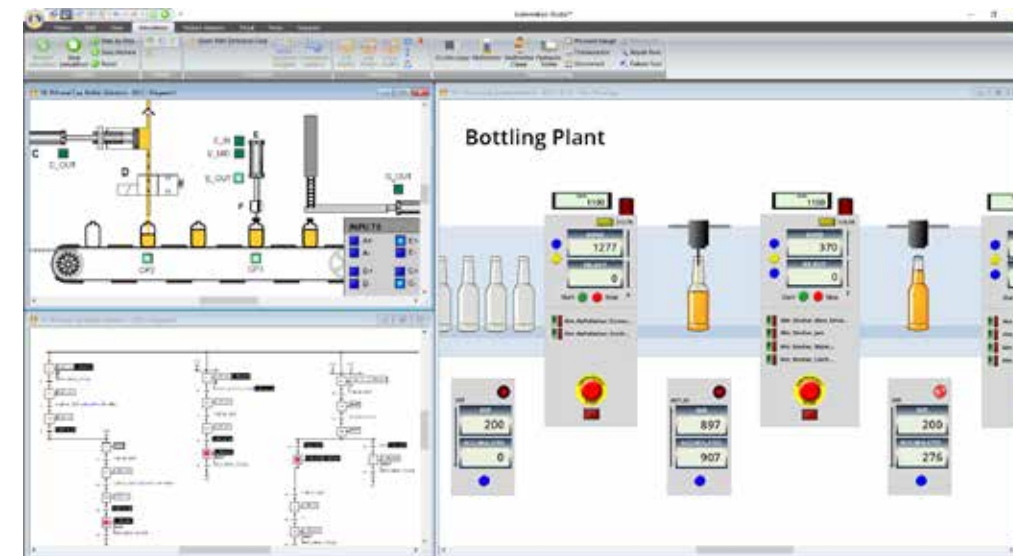
- Maintenance
- Production
- Operations
- Quality Control

Interaction With Circuits in Automation Studio™

Use the simulation power of Automation Studio™ to create a digital twin of your equipment, and link inputs and outputs to Andon Studio™. This will give you access to a completely virtual Industry 4.0 system.

Bottling Plant

Receive SMS Alarms in Real Time or Within the Andon Studio™ App

App Store — Google play

And More

- Easily introduce data acquisition, sensor's connectivity and alarms
- Control 2D and 3D Virtual Systems with your real PLC
- Reproduce desired operations within a plant
- Wireless connection between all devices
- Adapt workflows to your specific needs
- Inspection and quality reports
- The Andon Studio™ App sends alarms to your phone or tablet
- Establish hierarchy in alarm notification
- Quick start guides on establishing connection with different types of multi-sensors

AUTOMATION STUDIO
Educational Edition

Libraries and Modules

- Electrical AC/DC, Motor Controls
- Hydraulics (ON/OFF and Proportional)
- Pneumatics (ON/OFF and Proportional)
- Electrical Controls
- PLC Ladder Logic, Allen Bradley™, Siemens™, Mitsubishi, LS Electric™, IEC 61131
- Sequential Function Chart (SFC) / GRAFCET, Structured Text
- Digital Electronics
- Electrotechnical One-Line
- HMI and Control Panels
- 2D and 3D Virtual Systems
- Block Diagram-Math
- Fluid Power Component Sizing
- Electrical Component Sizing
- Troubleshooting and Diagnostics
- Mechanical Links
- CAN bus Connectivity
- Bill of Materials and Reports
- OPC Client, OPC Server
- SFC Export to Siemens and XML format (Automation Studio™ PLC)
- APIs/Script Language
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Canada (Headquarters)

Famic Technologies Inc.
350-9999 Cavendish
Montreal, QC, H4M 2X5 Canada

📞 +1 (514) 748-8050
📠 +1 (514) 748-8521

ISO 9001

Germany

Famic Technologies GmbH
Julius-Hatry-Straße 1
68163 Mannheim, Germany

📞 +49 (0) 621 39732 456

India

Famic Technologies Pvt. Ltd.
Office No. 301, Pentagon Tower–1
Magarpatta City, Pune–411013, India

📞 +91 20 4003 1020

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