Catalog | June 2019



EcoStruxure™ Machine Expert

A single software environment to automate machines

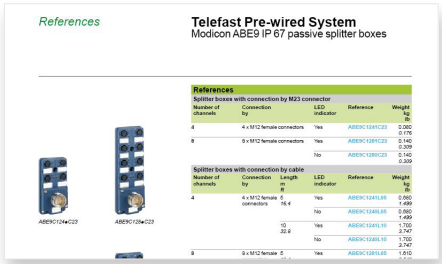
schneider-electric.com

Life Is On | Schneider Electric



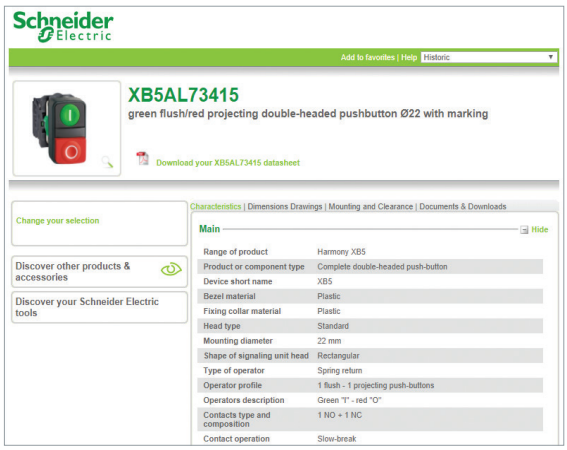
Quick access to product information

Get technical information about your product

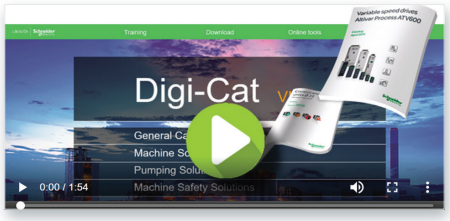


Each commercial reference presented in a catalog contains a hyperlink. Click on it to obtain the technical information of the product:

- Characteristics, Dimensions and drawings, Mounting and clearance, Connections and schemas, Performance curves
- Product image, Instruction sheet, User guide, Product certifications, End of life manual

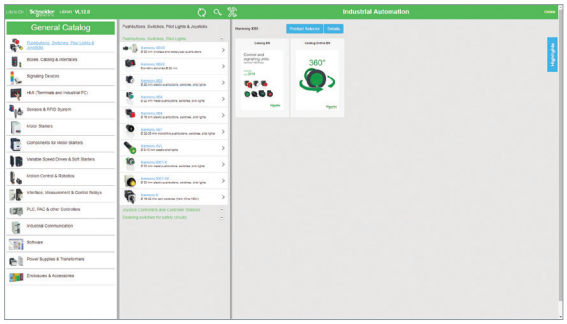


Find your catalog



> With just 3 clicks, you can reach the Industrial Automation and Control catalogs, in both English and French

> Download Digi-Cat with this link

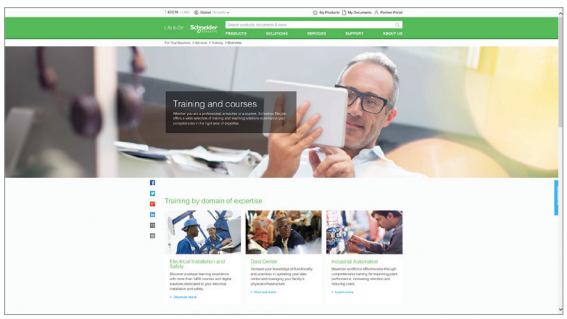


- Updated quarterly
- Embeds product selectors and configurators, 360° images, training centers
- Optimized search by commercial reference

Select your training

> Find the right Training for your needs on our Global website

> Locate the training center with the selector tool, using this link



Life Is On Schneider Electric

General content

Introduction to EcoStruxure Machine . . . . . *page 2*

Selection guide: controllers for industrial machines . . . . . *page 4*

Machine automation . . . . . *page 6*

EcoStruxure™ Machine Expert
A single software environment to automate machines

- **Presentation**
  - EcoStruxure Machine Expert software . . . . . *page 8*
  - HMI programming . . . . . *page 8*
  - Configured devices . . . . . *page 9*
  - Related functions configured . . . . . *page 9*
  - Learning, Training and Examples . . . . . *page 9*
- **Functions**
  - Project management,
  - Installation with Machine Expert Installer,
  - Application Function Block (AFB) libraries . . . . . *page 10*
- **Characteristics**
  - IEC 61131-3 programming languages,
  - Programming services,
  - HMI-based services,
  - Motion control,
  - PLCopen MC,
  - Global services . . . . . *page 11*
  - Integrated Fieldbus configurators,
  - Connectivity services and networks,
  - Expert and solutions libraries . . . . . *page 12*
  - Advanced software development,
  - Software Tools,
  - Transparency – FDT/DTM . . . . . *page 13*
- **Description**
  - Free download,
  - STANDARD license,
  - PROFESSIONAL license . . . . . *page 14*
- **EcoStruxure Machine Expert – Safety** . . . . . *page 15*
- **References**
  - Software installation,
  - Software licenses,
  - Software addons . . . . . *page 16*
  - Software update licenses . . . . . *page 17*
- **Index** . . . . . *page 18*

To be competitive in today's digital era, machine builders must be innovative. Smart machines, those that are better connected, more flexible, more efficient, and safe, are enabling machine builders to innovate in ways never before possible.

EcoStruxure, Schneider Electric's open, IoT-enabled architecture and platform, offers powerful solutions for the digital era. As part of this, EcoStruxure Machine brings powerful opportunities for machine builders and OEMs, empowering them to offer smart machines and compete in the new, digital era.

EcoStruxure Machine brings together key technologies for product connectivity and edge control on premises, and cloud technologies to provide analytics and digital services. EcoStruxure Machine helps you bring more innovation and added value to your customers throughout the entire machine life cycle.

Innovation at Every Level for Machines is full systems across three layers:

– Connected products
Our connected products for measuring, actuating, device level monitoring, and control adhere to open standards to provide unmatched integration opportunities and flexibility

– Edge Control
We are IIoT-ready with a proven set of tested and validated reference architectures that enable the design of end-to-end open, connected, and interoperable systems based on industry standards. Ethernet and OPC UA facilitates IT/OT convergence meaning machine builders reap benefits from web interfaces and cloud.

– Apps, Analytics & Services
Seamless integration of machines to the IT layer allows the collection and aggregation of data ready for analysis – for machine builders and end users alike this means increased uptime and the ability to find information faster for more efficient operations and maintenance.

These levels are completely integrated from shop floor to top floor. And we have cloud offers and end-to-end cybersecurity wrapped around.

EcoStruxure Machine makes it easier for OEMs/ machine builders to offer their customers smarter machines. The advent of smart machines is driven by the changing needs of end users:

– Evolving workforce
– Reducing costs
– Dynamic markets
– Shorter life cycles
– Prioritizing safety and cybersecurity

EcoStruxure Machine provides one solution for the whole machine life cycle:

– With Smart Design & Engineering the time to market is reduced by up to 30% using our automated engineering and the simulation capabilities

– During Commissioning & Operation of the machine, resources such as energy, material and loss can be improved, and with seamless integration to the IT world efficiency can be improved by up to 40%

– Smart Maintenance & Services reduces the time for corrective actions up to 50%

EcoStruxure™ Innovation At Every Level **Machine**



* The Schneider Electric industrial software business and AVEVA have merged to trade as AVEVA Group plc, a UK listed company. The Schneider Electric and Life is On trademarks are owned by Schneider Electric and are being licensed to AVEVA by Schneider Electric.

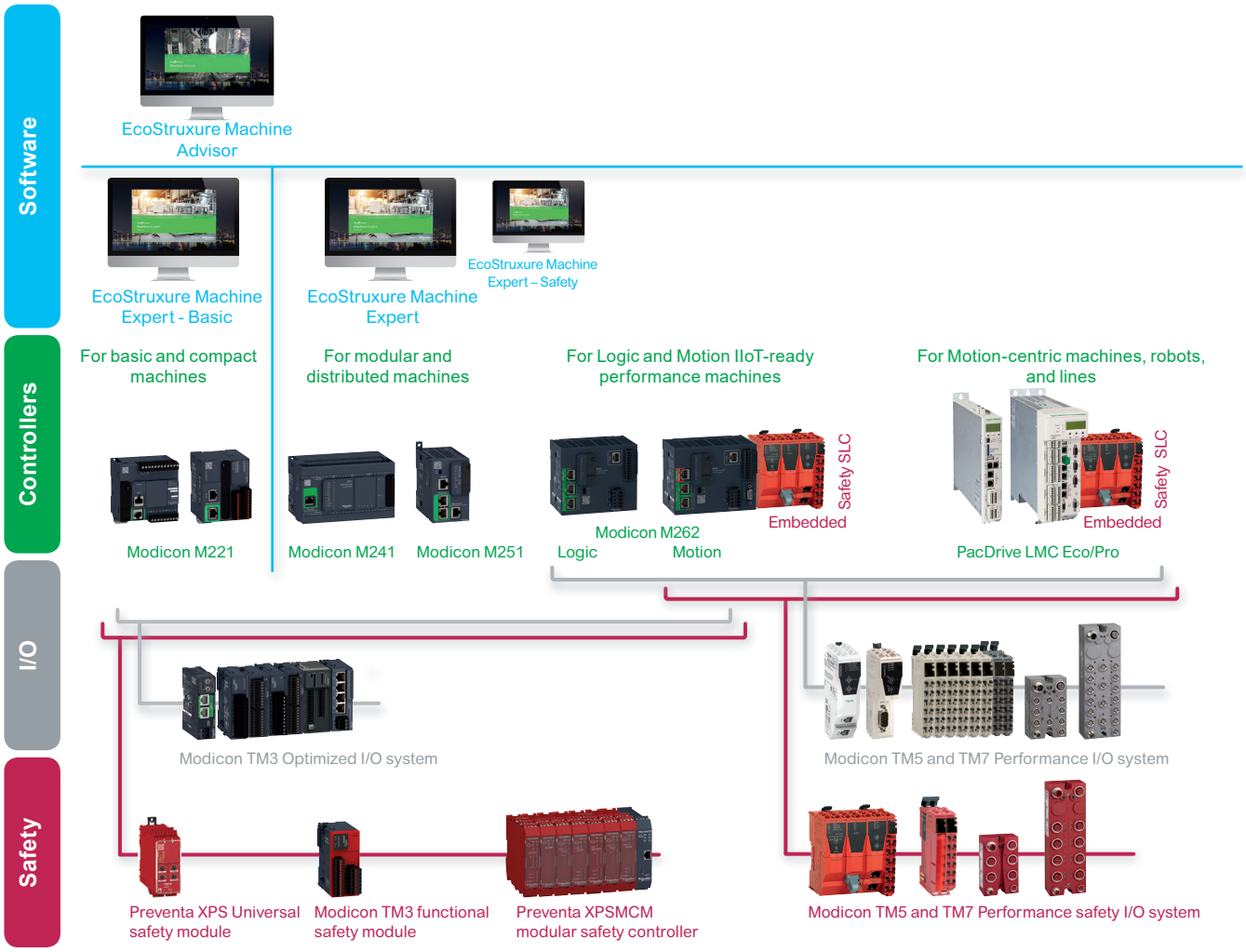
EcoStruxure Machine Expert
Controllers for industrial machines

Applications	Type	Logic controller			Logic/Motion controller	Motion controller
	Specification	For hardwired architectures	For performance-demanding applications	For modular and distributed architectures	IIoT ready for performance machines	For automating machines/lines with 0 - 130 servo or robot axes
						
Performance		0.2 µs/inst	22 ns/inst	22 ns/inst	3...5 ns/inst	0.5...2 ns/inst
Memory		640 KB RAM, 2 MB Flash	64 MB RAM, 128 MB Flash	64 MB RAM, 128 MB Flash	256 MB RAM, 256 MB Flash	128 KB to 256 KB NV RAM 512 MB DDR2 to 1 GB DDR3L
Supply voltage		24 V ⎓ or 100...240 V ∿	24 V ⎓ or 100...240 V ∿	24 V ⎓	24 V ⎓	24 V ⎓
Communication fieldbus and networks	Embedded	■ EtherNet/IP ■ RS 232/RS 485 serial link ■ USB mini-B programming port	■ Ethernet ■ CANopen (master) and SAE J1939 ■ 2 serial links ■ USB mini-B programming port	■ EtherNet/IP ■ CANopen (master) and SAE J1939 ■ Serial link ■ USB mini-B programming port	■ EtherNet/IP ■ Sercos III ■ Modbus TCP ■ Serial link ■ USB mini-B programming port	■ EtherNet/IP ■ Sercos III ■ CANopen ■ Profibus ■ Profinet ■ EtherCAT
	Optional	■ 1 Serial Line	■ Ethernet ■ Profibus DP	■ Ethernet ■ Profibus DP	■ Ethernet ■ CANopen	■ CANopen ■ Profibus DP ■ RT-Ethernet
Embedded I/O	Input types	Up to 40 logic inputs Up 2 analog inputs	Up to 24 logic inputs	–	4 fast digital inputs	Up to 20 digital inputs Up to 16 touch probe inputs Up to 4 interrupt inputs Up to 2 analog inputs
	Output types	Up to 16 relay outputs Up to 16 tansistor outputs	Up to 16 tansistor outputs	–	4 fast digital outputs	Up to 16 digital outputs Up to 2 analog outputs
Synchronized axes		–	–	–	Up to 16 synchronized axes	Up to 130 synchronized axes
Configuration software		EcoStruxure Machine Expert-Basic *(1)*	EcoStruxure Machine Expert V1.1 *(2)*	EcoStruxure Machine Expert V1.1 *(2)*	EcoStruxure Machine Expert V1.1	EcoStruxure Machine Expert V1.1 *(2)*
Compatible expansion I/O module ranges (consult the catalog**)**						
	Local I/O	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN)	–
	Remote I/O	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN)	–
	Distributed I/O on Ethernet	● Modicon TM3 (DIA3ED2140109EN)	● Modicon TM3 (DIA3ED2140109EN) ● Modicon TM5 (DIA3ED2131204EN)	● Modicon TM3 (DIA3ED2140109EN) ● Modicon TM5 (DIA3ED2131204EN)	● Modicon TM3 (DIA3ED2140109EN) ● Modicon TM5 (DIA3ED2131204EN)	● Modicon TM5 (DIA3ED2131204EN)
	Distributed I/O on CANopen	–	–	–	● Modicon TM5 (DIA3ED2131204EN) ● Modicon TM7 (DIA3ED2140405EN)	● Modicon TM5 (DIA3ED2131204EN) ● Modicon TM7 (DIA3ED2140405EN)
	Distributed I/O on Sercos	–	–	–	● Modicon TM5 (DIA3ED2131204EN)	● Modicon TM5 (DIA3ED2131204EN)
	Safety I/O	Modicon TM3 (DIA3ED2140109EN)	Modicon TM3 (DIA3ED2140109EN)	Modicon TM3 (DIA3ED2140109EN)	Modicon TM3 (DIA3ED2140109EN) Modicon TM5 (DIA3ED2131204EN) Modicon TM7 (DIA3ED2140405EN)	Modicon TM5 (DIA3ED2131204EN) Modicon TM7 (DIA3ED2140405EN)
Controller range		**Modicon M221/M221 Book**	**Modicon M241**	**Modicon M251**	**Modicon M262**	**LMC Eco, LMC Pro2**
More details in catalog		DIA3ED2140106EN	DIA3ED2140107EN	DIA3ED2140108EN	DIA3ED2180503EN	DIA7ED2160303EN

(1) Formerly named SoMachine Basic.
(2) Formerly named SoMachine, EcoStruxure Machine Expert merges both former software ranges, SoMachine and SoMachine Motion.

EcoStruxure Machine Expert
Machine Automation

Machine Automation



Machine control

> From basic to motion- and robot-centric machines with the PacDrive 3 offer, Modicon controllers and solutions bring a consistent and scalable response to achieving flexibility, performance, productivity, and digitization.

The scalability and consistency of I/O ranges allow you to select the right offer depending on your needs

> Modicon TM3 Optimized I/O system for more compact and modular machines
> Modicon TM5 for more performance-demanding machines, with Modicon TM7 for harsh environments; Both Performance I/O ranges (Modicon TM5 and TM7) allow safety functions to be implemented using the Modicon TM5CSLC safety logic controller

Embedded Safety provides holistic solutions to Modicon M262 and PacDrive LMC controllers, increasing overall safety demand in Machine Automation

> Preventa XPS Universal safety modules cover a wide range of safety functions, suitable for small applications with 4-5 safety functions, with diagnostic information provided to controllers via a single wire connection
> Modicon TM3 safety functional modules are suitable for small applications covering E-Stop functions and diagnostics via TM3 bus
> Preventa XPSMCM modular safety controllers are suitable for medium size applications with up to 20 safety functions and diagnostics via Modbus TCP, EtherNet/IP, EtherCAT, or Profinet

All these devices are managed within a single software, EcoStruxure Machine Expert, a powerful and collaborative engineering environment

> **EcoStruxure Machine Expert – Safety** optional addon for programming safety logic controllers
> **EcoStruxure Machine Expert – Basic** software for programming Modicon M221 logic controllers: an intuitive standalone environment accessible to basic skilled technicians
> **EcoStruxure Machine Advisor** is a cloud-based services platform designed for machine builders to track machines in operation worldwide, monitor performance data, and resolve exceptional events, while reducing support costs by up to 50%

Machine Automation

Comprehensive Schneider offers for machine builders

> Lexium servo drives, motors, and robotics are designed to control applications ranging from a single independent axis up to high-performance synchronized multi-axis machines requiring high-speed and precise positioning and movements


Robotics

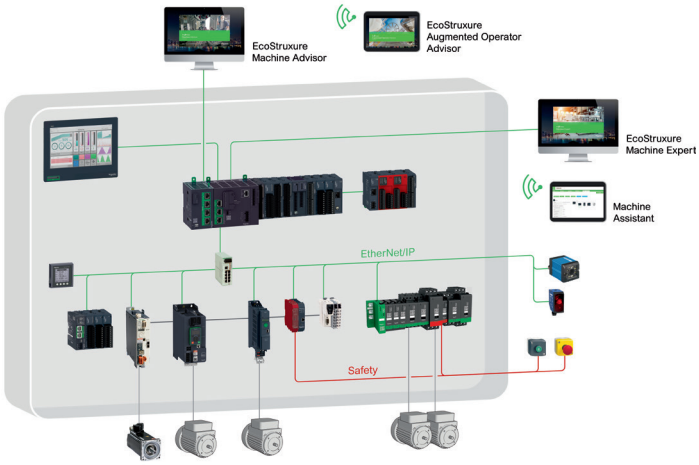

Integrated drives


Servo Drives & Motors


Steppers Drives & Motors

> The Lexium offer is designed for a broad range of motion-centric machines in applications such as Packaging, Material Handling, Material Working, Food and Beverage, and Electronics

> Schneider Electric has developed Tested Validated & Documented Architectures (TVDA) applicable for generic machine control applications as well as for dedicated segment applications such as Packaging, Material Working, Material Handling, Hoisting, Pumping, or generic Machine Control applications



Choose Schneider Electric to help secure your investment and benefit from worldwide services at every step of your project

Renew
Being your expert to control and renew your aging equipment at the right time and at optimal cost

Optimize
Identifying how you can get even more out of your equipment and further improve your return on investment



Plan
Discussing your maintenance policy and needs arising from it

Install
Delivering services to help ensure your equipment is set up reliably and starts to operate efficiently from day one

Operate
Providing services to support you during normal operations as well as during maintenance breaks and in unexpected situations
Collaborating to maximize your uptime and performance as well as become more proactive in operations

> From planning and inception to modernization, we help ensure optimal technical and business performance. Our field service engineers combine 30+ years of manufacturer-level experience with the latest technology to bring innovation to every level of our offer, and every step of your project.

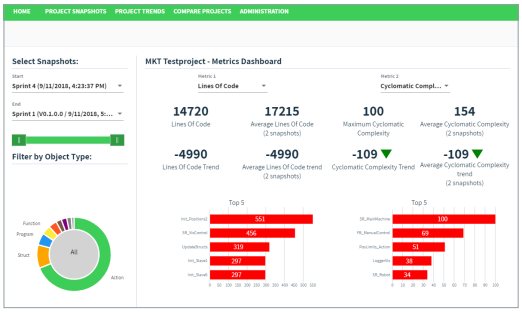
> Our machine control dedicated services empower you to maximize your business infrastructure and face increasingly stringent demands on productivity, safety, equipment availability, and performance optimization.

EcoStruxure Machine Expert

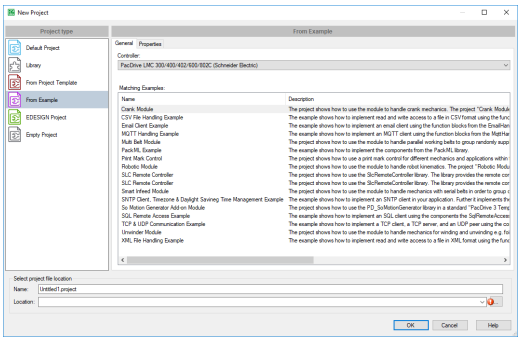
A single software environment to automate machines



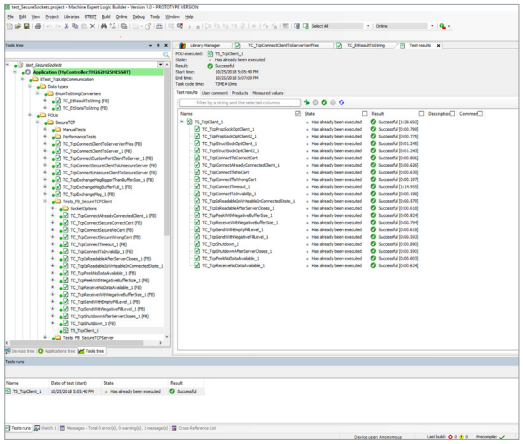
EcoStruxure Machine Expert V1.1 programming software



Cloud based code analysis



New project



ETEST result view

Presentation

EcoStruxure Machine Expert software V1.1

EcoStruxure Machine Expert V1.1 is the machine builder's solution software for developing, configuring, and commissioning the entire machine in a single software environment, including logic control, motion control, remote IO systems, safety programing, motor control, and related network automation functions.

EcoStruxure Machine Expert is a single software environment with:

- **One** software package
- **One** project file
- **One** connection
- **One** download operation

EcoStruxure Machine Expert is a software environment covering the full engineering lifecycle:

- Version management
- Testing
- Deployment
- Diagnostics and remote services
- In addition Machine Expert interfaces with various engineering tools via open interfaces

It supports all the IEC 61131-3 languages, integrated fieldbus configurators, expert diagnostic and debugging functions, motion design as well as multiple capabilities for commissioning, maintenance and visualization.
EcoStruxure Machine Expert V1.1 is the new name and the next release of the three-engineering software: **SoMachine** and **SoMachine Motion** and **SoSafe Programmable**, now merged into one single environment.

EcoStruxure Machine Expert introduces innovative features for efficient machine development:

- Collaborative work with SVN client
- New IIoT standard libraries (MQTTs, HTTPs, JSON...) to connect the controller to web APIs our cloud services like EcoStruxure Machine Advisor or third party systems. Project examples and function templates help the usage of these technologies.
- Machine code analysis to improve coding efficiency, code quality coding consistency in teams and now uses cloud technology to store the evolution of your code quality:
  - Check code convention using standard or customized rules
  - Understand the DNA of the code with structured graphical code exploration and identify critical sections in the code
  - Get metrics with quality indicators
- Machine Advisor Code Analysis is a cloud based service. It helps you to track deviations from your code quality over the life time of the application. Find more information on our website.
- New Functional view in the project tree to program machines in a modular way
- Python programming language interface:
  - Increase Programming Efficiency, by automating development and project generation
  - Integrate **Machine Expert** in the company's individual environment and automatize workflows
- ETEST framework for higher quality of application code, thanks to automated IEC software unit test
- Import projects from **SoMachine** and **SoMachine Motion** software
- Import projects from **SoSafe Programmable** software
- New HTML5 browser responsive documentation accessible offline or online from any smart device with an internet connection

HMI programming

EcoStruxure Machine Expert V1.1 embeds:

- Vijeo Designer to program a wide range of Magelis industrial HMI
- A Webvisu editor to design and program a visualization screens that are running on the controller's runtime. A controller Webvisu can be accessed remotely via any web browser on many different devices (computers, tablets…)

EcoStruxure Machine Expert
A single software environment to automate machines

Presentation

Configured controllers with EcoStruxure Machine Expert V1.1 software

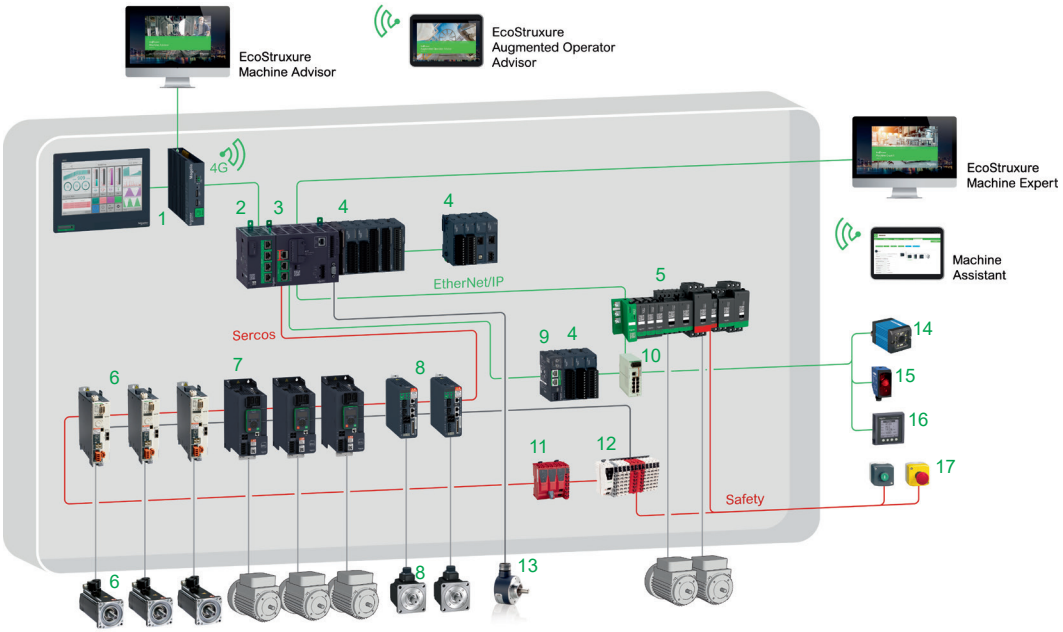
- **Motion controllers**: PacDrive 3 LMC Eco/LMC Pro/LMC pro2 (catalog ref. DIA7ED2160303EN)
- **Logic controllers**
  - Modicon M241 (catalog ref. DIA3ED2140107EN)
  - Modicon M251 (catalog ref. DIA3ED2140108EN)
- **Logic/Motion controller:** Modicon M262 (catalog ref. DIA3ED2180503EN)
- **HMI controllers:** Magelis SCU (catalog ref. DIA5ED2130505EN)

Configured devices with EcoStruxure Machine Expert V1.1 software *(1)*

Devices can be easily inserted to the project from the Hardware catalog window using simple drag & drop.

- **Servo drives**: Lexium 28, Lexium 32, Lexium 52 stand-alone, Lexium 62 multi axis, Lexium SD3
- **Integrated drives**: Lexium ILA/ILE/ILS, Lexium 62 ILM, Lexium 32i, Lexium 62 ILD detached
- **Robotics**: Lexium STS, Lexium T series, Lexium P series, Lexium PAS/CAS/TAS/MAX
- **I/O systems**
  - Modicon TM3: I/O modules and bus coupler (catalog ref. DIA3ED2140109EN)
  - Modicon TM5: IP20 I/O modules, and fieldbus interface module (catalog ref. DIA3ED2131204EN)
  - Modicon TM7: IP67 I/O blocks (catalog ref. DIA3ED2140405EN)
- **Safety logic controllers**: Modicon TM5CSLC
- **HMI**: Magelis GTO standard panels, Magelis GK advanced Touchscreen/Keyboard panels, Magelis XBTGH advanced held panels, Magelis GTU high performance modular HMI, Magelis STO compact panels
- **Variable speed drives**: Altivar Machine ATV320, Altivar Machine ATV340, Altivar Machine ATV600, Altivar Process ATV900, Altivar 71
- **Sensors**: RFID sensors XG, Vision sensors XUW
- **Battery-less and wireless pushbuttons:** Harmony XB5R /XB4R (Ø 22 mm)
- **Connected load management system:** Tesys island

Managed TVDA with EcoStruxure Machine Expert V1.1 software



Solution breakdown

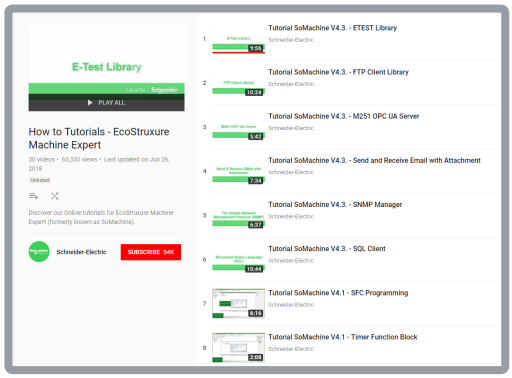
1 Magelis iPC: Touchscreen display and IIoT Edge Box
2 Modicon TMSES4 Ethernet Smart communication module
3 Modicon M262 Motion controller
4 Modicon TM3 expansion modules (Digital, Analog and Expert I/O)
5 Tesys island load management system
6 Lexium 32S servo drives and BMH/BSH servo motors
7 Altivar Machine ATV340S variable speed drives
8 Lexium 28 servo drives and BCH2 servo motors
9 Modicon TM3 Ethernet bus coupler
10 Modicon Ethernet switch
11 Modicon TM5CSLC Safety logic controller
12 Modicon TM5: Sercos interface module and I/O modules (Digital, Analog and Safety I/O)
13 Encoders
14 Bar code reader
15 Telemecanique Sensors proximity sensors
16 Power Meter
17 Harmony® XB5 Plastic pushbutton and Emergency stop



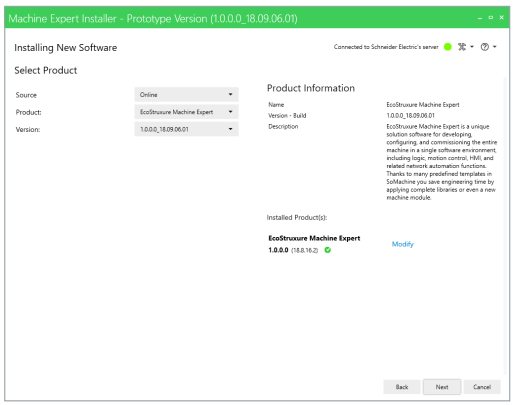
(1) Please refer to our catalogs on Digi-Cat (download Digi-Cat)

EcoStruxure Machine Expert

A single software environment to automate machines

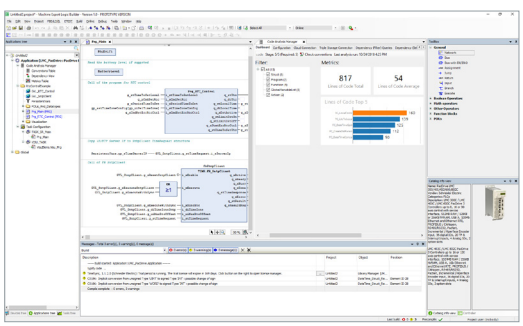


Video tutorials on YouTube



Machine Expert installer

Download installer



Logic Builder

Functions

Related functions configured with EcoStruxure Machine Expert V1.1 software

Hardware related functions can be configured:

- Discrete, analog I/O: from simple IO to sophisticated features like controller to controller communication.
- High speed counter (HSC) inputs
- High speed outputs:
  - Pulse width modulation (PWM)
  - Pulse generator (PLS)
  - Pulse train output (PTO)
  - Frequency generator
- Communication ports (Ethernet, Sercos, serial links):
  - Ethernet: EtherNet/IP, Modbus TCP client and server, Exchange table
  - Sercos bus
  - Serial links: Modbus RTU or ASCII, ASCII protocol, Display
  - The Modbus Serial IO Scanner and Modbus TCP IO Scanner protocols are used to automatically configure an Altivar variable speed drive, other Schneider devices, or a generic device.

Learning, Training and Examples

From the help menu, several tools and links help you to get started with EcoStruxure Machine Expert. This section provides content access to both beginners and advanced users to learn how to use and take advantage of the software:

Discover:

- Project examples and their documentation
- Project templates
- How to guides
- Video tutorials to be consulted on YouTube

Project management

The project management function is used to:

- Create a new project from scratch or by using project templates or examples
- Open a project from the PC (hard disk, CD-ROM, USB flash drive, etc.)
- Retrieve a project from a controller (logic, safety, motion or motor controller) or a servo drive
- Open a project from former SoMachine or SoMachine Motion versions
- Open a Twido or M221 project using conversion tools
- Print a project as a customized report

It is possible to define additional project specific information properties (company & creator details, project protection information, application information…), attach documents and custom or configuration pictures.
The software also supports automatic versioning.

Installation

- EcoStruxure Machine Expert software can be installed directly from the cloud. Either perform a full installation or select the components you need. **Machine Expert Installer** downloads the required components only. Offline installation from a local folder is also possible. The installer can be downloaded from Schneider Electric website.
- EcoStruxure Machine Expert software V1.1 can be also installed from a USB drive, available in catalog, see page 16.

Application Function Block (AFB) libraries for dedicated solutions

EcoStruxure Machine Expert includes application function block libraries for selected machines. Their simple configuration speeds up design, commissioning, installation, and troubleshooting.
These libraries cover the following applications:

- Packaging,
- Hoisting,
- Handling,
- Pumping,
- Material working,

and more ...

EcoStruxure Machine Expert
A single software environment to automate machines

Characteristics (Depending on the controller capabilities)		
Feature		**Description**
IEC 61131-3 programming languages		■ IL (Instruction List) ■ LD (Ladder Diagram) ■ SFC (Sequential Function Chart) ■ ST (Structured Text) ■ FBD (Function Block Diagram) ■ CFC (Continous Function Chart)
Programming services		■ Multi-tasking: Cyclic, Fast, Event ■ Functions (Func) and Function Blocks (FBs) ■ Data Unit Types (DUTs) ■ On-line changes ■ Watch windows ■ Graphical monitoring of variables (trace) ■ Breakpoints, step-by-step execution ■ Simulation ■ Visualization for application and machine set-up ■ “ETEST” automated unit testing system to improve the quality of the application
HMI-based services		■ Graphics libraries containing more than 4,000 2D and 3D objects ■ Simple drawn objects (points, lines, rectangles, ellipses, etc.) ■ Preconfigured objects (button, switch, bargraph, etc.) ■ Recipes (32 groups of 256 recipes with max 1,024 ingredients) ■ Action tables ■ Alarms ■ Printing ■ Java scripts ■ Multimedia file support: wav, png, jpg, emf, bmp ■ Variable trending
Motion control	For PacDrive controllers	■ Motion design (cam editor/motion, intelligent line shaft, software motion generator…) ■ Ready to use function blocks for motion applications like:  Multi-belt,  Smart infeed,  Unwinder,  Crank,  Robotics, and more ...
PLCopen MC		■ PLCopen Motion Control Function Blocks Motion and drive function block libraries for variable speed drives, servo drives, and stepper drives ■ Visualization screens for commissioning
Global services		■ User access and profile ■ Project documentation printing ■ Project comparison (control) ■ Variable sharing based on publish/subscribe mechanism ■ Library version management ■ Machine energy efficiency monitoring

EcoStruxure Machine Expert

A single software environment to automate machines

Characteristics (Depending on the controller capabilities)

Feature	Description
Integrated Fieldbus configurators	■ Fieldbus - EtherNet/IP - Modbus TCP - Modbus Serial link - Sercos - CANopen (supported CANopen protocols: J1939, CANmotion) - EtherCAT - PROFINET - PROFIBUS
Connectivity services and networks	■ FTP Client library - The controller can send or get files to/from a FTP server on the network ■ FTP server - Some controllers also have an embedded FTP server ■ SQL Client library - To read or write in the databases from the controller ■ Machine to cloud connectivity - MQTT Handling (Message Queue Telemetry Transport) - JSON (JavaScript Object Notation), a lightweight data-interchange format ■ HTTPs library - To access to web services/servers, call APIs and push data to cloud services in a secure, simple and standard way ■ Email library - To send and receive emails with attachments to/from the controller ■ SNMP Manager (Simple Network Management Protocol) - To control or read information about SNMP devices on the network ■ TCP/UDP library ■ SNTP (Simple Network Time Protocol) Client function blocks for synchronizing the clock with other systems ■ OPC UA Server embedded in the controller - For direct communication with OPC UA clients ■ File Format utility library - For reading and writing XML (eXtended Markup Language) and CSV (Character Separated Values) files - To simplify and standardize communication between the controller and external systems
Expert and solutions libraries	■ PLCopen function blocks for motion control. Examples: MC_MoveAbsolute, MC_CamIn, ServoDrive, etc. ■ **Packaging** function blocks. Examples: analog film tension control, rotary knife, unwinder, AutoTune etc.. ■ **PackML** library (Packaging Machine Language) ■ **Material handling**: tracking, turntable, conveyor, multi belt, smart infeed, etc. ■ Hoisting functions: - Hoisting function blocks: anti-sway, anti-crab, hoisting position synchronization, etc. - Application template for industrial crane ■ Pumping application: - Pumping function blocks: cavitation protection, friction loss, PID, stage/destage functions, etc. - Application template for booster ■ Material working and processing: application templates, rotary knife, flying shear, temperature monitoring, etc.

EcoStruxure Machine Expert

A single software environment to automate machines

Characteristics (Depending on the controller capabilities)

Feature	Description
Advanced software development	■ Source Code Management with **Subversion** (SVN) for collaborative work on the same project ■ Import/Export in PLC Open format ■ **Machine code analysis** - It analyzes the application code with semantic web technologies which understand the DNA of the code and identify code pain-points to rework - Store the result of your code analysis to a cloud repository and follow the evolution of your code quality over the time ■ **Python** programming interface to automate development tasks and project generation ■ **Functional View** to develop a machine project (code and devices) into modules and reuse them
Software Tools	Software tools are installed with EcoStruxure Machine Expert to assist Machine Builders at every step of the machine lifecycle: > Design & engineering, > Commissioning & operation, > Maintenance & service ■ **Controller assistant** - Manage the firmware and application without opening EcoStruxure Machine Expert - Create images and backup of the controller ■ **Machine Expert Installer** - To install, modify, update and uninstall EcoStruxure Machine Expert software suite ■ **License manage**r - Activate and manage licenses for all Schneider Electric licensed products - Support registration and license transfer ■ **Software Update** - Online notification of all available updates and news about the installed Schneider Electric software products - Download and install updates, patches, and extensions from the web ■ **Diagnostics** - Be informed of the machine status, including save operations, device parameters, the state of the I/O, and a graphic view of the Sercos ring architecture ■ **Device assistant** - Firmware manager for Lexium servo drives ■ **Logic Builder Diff Viewer** - A tool to differentiate 2 source codes ■ **Motion Sizer** - A tool for CAM design and power unit dimensioning Includes a product selector feature out of more than 13000 products (Drives, Motors, and Gearboxes)
Transparency – FDT/DTM	EcoStruxure Machine Expert is a FDT (Field Device Tool) container and supports standard DTM (Device Type Manager) files. This allows any device having a DTM to be configured inside EcoStruxure Machine Expertsoftware, and reduces the number of tools to use to configure a machine

EcoStruxure Machine Expert

A single software environment to automate machines

Download installer

Presentation

EcoStruxure Machine Expert software V1.1

EcoStruxure Machine Expert software V1.1 can be downloaded and installed for free, using the Machine Expert installer. **EcoStruxure Machine Expert software V1.1** can be installed from a USB drive, available in catalog, see page 16.

At the end of a 42-days trial period, a license is required to continue to use EcoStruxure Machine Expert.

- Some maintenance features remain available and free of access and do not require a license
- EcoStruxure Machine Expert software is available in 9 languages: English, French, German, Italian, Japanese, Portuguese, Simplified Chinese, Spanish, and Turkish
- Operating systems for engineering PC: Microsoft Windows® 7 Professional 32-bit/64-bit, Microsoft Windows® 8.1 Professional 32-bit/64-bit, Microsoft Windows® 10 Professional 32-bit/64-bit
- Documentation is supplied in electronic format: complete online help with complementary documentation in pdf version

Software licenses description

	Free (No license)	**STANDARD** license	**PROFESSIONAL** license
Basic maintenance tools Open project, save, program offline, compile, download program, view online status Maintenance tools…	☑	☑	☑
STANDARD programming features Debug/breakpoints, variable forcing, pause, online change, manage project archive, Web visu, offline documentation … ETEST limited, J1939, OPC UA server. Expert libraries…	Trial *(1)*	☑	☑
Advanced features Collaborative Work (SVN), Code Analysis full, ETEST full	Trial *(1)*	Trial *(1)*	☑
Robotic libraries and toolbox	Trial *(1)*	–	☑
Machine Safety maintenance Former SoSafe Programmable maintenance software	☑	☑	☑
Machine safety development Former SoSafe Programmable software	Trial *(1)*	Trial, then EcoStruxure Machine Expert – Safety license is requested	Trial, then EcoStruxure Machine Expert – Safety license is requested
HMI design Vijeo Designer	Trial *(1)*	☑	☑

(1) Trial period lasts 42 days.

EcoStruxure Machine Expert
A single software environment to automate machines



Modicon TM5CSLC●00FS safety logic controller

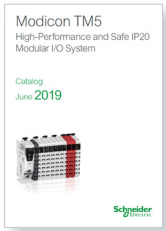
Presentation

EcoStruxure Machine Expert – Safety

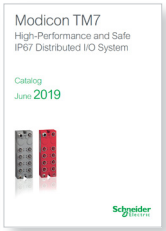
EcoStruxure Machine Expert – Safety (former SoSafe programmable software) is the software addon to program Modicon TM5CSLC●00FS safety logic controllers *(1)*. This addon is to be installed inside the Machine Expert Installer.
Apart from the maintenance features, a dedicated license is required to program this controller.

- Modicon TM5CSLC●00FS safety logic controllers are suitable for safety applications requiring distributed safety connected to physical input/output devices over Sercos common network and certified up to EN ISO 13849-1 PLe Category 4, and EN/IEC 62061 SIL3.
- They can be added to PacDrive 3 or in a Modicon M262 Logic/Motion controller architectures.
- The architectures comprises a PacDrive LMC motion controller or a Modicon M262 Motion controller (Sercos bus masters) and Modicon TM5CSLC safety logic controller (Sercos slave interface).
- Modicon TM5CSLC safety logic controller manages the safety-related application over the Sercos network.
- Input/outputs are connected to Sercos network with the use of Modicon TM5 Sercos interface module.
- Programming: Each hardware component is defined within EcoStruxure Machine Expert environment such as the controller, Modicon TM5 *(1)* and Modicon TM7 *(2)* safety I/O modules, Lexium 62 safety servo drives *(3)*, and Lexium 62 ILM integrated drives with optional safety module *(4)*. The application program and configuration of the safety hardware is managed within the EcoStruxure Machine Expert - Safety editor.

(1) Please refer to catalog Ref DIA3ED2131204EN
(2) Please refer to catalog Ref DIA3ED2140405EN
(3) Please refer to catalog Ref DIA7ED2160305EN
(4) Please refer to catalog Ref DIA7ED2160306EN



DIA3ED2131204EN



DIA3ED2140405EN



DIA7ED2160305EN



DIA7ED2160306EN

EcoStruxure Machine Expert
A single software environment to automate machines

Reference

Software installation

Description	References
Digital installation	Downloadable from our website
Physical installation with USB drive	ESEMACS11

Software license (1)

Designation	Supported controllers	Reference /number (Type)			
		STANDARD licenses		PROFESSIONAL licenses	
		Printed license	Digital license	Printed license	Digital license
EcoStruxure Machine Expert software V1.1	■ PacDrive 3 LMC Eco, LMC Pro and LMC Pro2 motion controllers ■ Modicon M241 and Modicon M251 logic controllers ■ Modicon M262 Logic/Motion controller ■ Magelis SCU HMI controller	ESEEXPCZZSPMZZ /1 (Single)	ESEEXPCZZSPAZZ /1 (Single)	ESECAPCZZSPMZZ /1 (Single)	ESECAPCZZSPAZZ /1 (Single)
		ESEEXPCZZTPMZZ /10 (Team)	ESEEXPCZZTPAZZ /10 (Team)	ESECAPCZZTPMZZ /10 (Team)	ESECAPCZZTPAZZ /10 (Team)
		–		ESECAPCZZEPMZZ /100 (Site)	ESECAPCZZEPAZZ /100 (Site)
		–		ESECAPCZZEPTZZ /100 (Floating License)	ESECAPCZZEPBZZ /100 (Floating License)

Software addons (1)

SQL gateway license
To activate the standalone "SQL Gateway" tool – Independent from any **STANDARD** or **PROFESSIONAL** license

The machine can access a database remotely and read or write data with SQL syntax: the controller configured with EcoStruxure Machine Expert has an integrated SQL Client for connecting to one or more databases via the SQL gateway.
The SQL gateway runs on Microsoft Windows and is available in 9 languages: English, French, German, Italian, Japanese, Portuguese, Simplified Chinese, Spanish, and Turkish. It includes 42 days trial.

Designation	Reference /number (Type)	
	Printed license	Digital license
License for a single SQL gateway To connect one or more controllers to one or more databases	SOMSQLCZZSPMZZ /1 (Single)	SOMSQLCZZSPAZZ /1 (Single)

SVN Client license for STANDARD license owners
Included in EcoStruxure Machine Expert **PROFESSIONAL** license

SVN acts as a control system for tracking changes to files, folders and directories. It is used to assist in recovering data and recording the history of changes made over time.
In addition to detailed recordings of changes and metadata for files and folders, Subversion's features include:
- Easy implementation of new network functions
- Consistent storage and handling of text and binary files
- Efficient creation of branches and tags
- Easy use with programming languages

Designation	Reference /number (Type)	
	Printed license	Digital license
License to enable SVN integration tool For EcoStruxure Machine Expert **STANDARD** license owners	ESESVNCZZTPMZZ /10 (Team)	ESESVNCZZTPAZZ /10 (Team)

Machine Advisor Code Analysis addon
For **STANDARD** or **PROFESSIONAL** license owners

Machine builders can track and improve the quality of their applications over their lifetime and avoid regression or deviation using Machine Advisor Code Analysis. It provides software and cloud tools to analyze, understand and improve machine application code thanks to:
- Graphical representation of the "code DNA"
- Visualize code complexity and metrics
- Check and avoid coding rules violations

The frame work is integrated inside EcoStruxure Machine Expert and the analysis results are processed and stored on the cloud. The programmer can improve his application and also share the results to his team members.

Designation	Reference /number (Type)	
	Printed license	Digital license
Machine Advisor Code Analysis addon license For EcoStruxure Machine Expert **STANDARD** or **PROFESSIONAL** license owners. With this one year validity addon license, users can: - Upload, analyze and monitor the results of one project inside the cloud portal - Multiple users can access the cloud portal and their company projects - Use all code analysis features (unlimited Convention tables, Dependency view and Metrics table) inside EcoStruxure Machine Expert desktop software for up to 100 computers	ESEMCACZZEXMZZ /100 (Entity)	ESEMCACZZEXAZZ /100 (Entity)

(1) Commercial licenses are available in two formats:
- *Printed license: delivered by regular mail with ID authorization.*
- *Digital license: delivered by e-mail after registering with Schneider Electric Customer Care Center.*

EcoStruxure Machine Expert
A single software environment to automate machines

Reference

Software addons (continued) *(1)*

ETEST full license for STANDARD license
Included in EcoStruxure Machine Expert **PROFESSIONAL** license

EcoStruxure Machine Expert integrates ETEST, a powerful innovative tool for improving the IEC program quality of your projects and helping to avoid potential setbacks throughout the life cycle of the machine.
The ETEST tool is used to program unit tests simply within a EcoStruxure Machine Expert project and to enhance the robustness of the application program.
In the **STANDARD** license, ETEST framework is available but users are limited to program a maximum number of 5 test cases objects.

The ETEST full license addon allows **STANDARD** license owners to program unlimited number of ETEST test cases.
The **PROFESSIONAL** license owners can program unlimited number of ETEST test cases objects.

Designation	Reference /number (Type)	
	Printed license	Digital license
License to enable the full ETEST features For EcoStruxure Machine Expert **STANDARD** license owners	**ESEETTCZZTPMZZ** /10 (Team)	**ESEETTCZZTPAZZ** /10 (Team)

Software license to program TM5CSLC●00FS safety logic controller
Additional to EcoStruxure Machine Expert **STANDARD** or **PROFESSIONAL** licenses

Designation	Enable device	Reference /number (Type)	
		Printed license	Digital license
EcoStruxure Machine Expert – Safety Creates complex logical conditions using logical functions and safety functions, such as muting, timer, counters, Emergency stop, light curtain etc. via a graphic configuration interface. Can be installed from the Machine Installer.	Modicon TM5CSLC●00FS safety logic controller	**ESESAACZZSPMZZ** /1 (Single)	**ESESAACZZSPAZZ** /1 (Single)
		ESESAACZZTPMZZ /10 (Team)	**ESESAACZZTPAZZ** /10 (Team)
		ESESAACZZEPMZZ /100 (Entity)	**ESESAACZZEPAZZ** /100 (Entity)
		ESESAACZZEPNZZ /100(Floating License)	**ESESAACZZEPBZZ** /100 (Floating License)
AS-Interface Safety Gateway Networking solution for connecting simple field I/O devices in discrete manufacturing and process applications using a single 2-conductor cable. AS-Interface Gateway gathers data from the AS-Interface network.	Modicon TM5CSLC●00FS safety logic controller	**ESESADCZZSPMZZ** /1 (Single)	**ESESADCZZSPAZZ** /1 (Single)
		ESESADCZZTPMZZ /10 (Team)	**ESESADCZZTPAZZ** /10 (Team)
		ESESADCZZEPMZZ /100 (Entity)	**ESESADCZZEPAZZ** /100 (Entity)
		ESESADCZZEPNZZ /100 (Floating License)	**ESESADCZZEPBZZ** /100 (Floating License)
ASi License-SoSafe Programmable V2.2SP1	Modicon TM5CSLC●00FS safety logic controller	**SOMSADCZZSPMZZ** /1 (Single)	**SOMSADCZZSPAZZ** /1 (Single)
		SOMSADCZZTPMZZ /10 (Team)	**SOMSADCZZTPAZZ** /10 (Team)
		SOMSADCZZEPMZZ /100 (Entity)	**SOMSADCZZEPAZZ** /100 (Entity)

Software update licenses *(1)*

Update licenses for SoMachine Motion license owners

Designation	Reference /number (Type)	
	Printed license	Digital license
Update licenses For SoMachine Motion V4 users to EcoStruxure Machine Expert **PROFESSIONAL** license.	**ESECMUCZZSPMZZ** /1 (Single)	**ESECMUCZZSPAZZ** /1 (Single)
	ESECMUCZZTPMZZ /10 (Team)	**ESECMUCZZTPAZZ** /10 (Team)
	ESECMUCZZEPMZZ /100 (Entity)	**ESECMUCZZEPAZZ** /100 (Entity)

(1) Commercial licenses are available in two formats:
- *Printed license: delivered by regular mail with ID authorization.*
- *Digital license: delivered by e-mail after registering with Schneider Electric Customer Care Center.*

EcoStruxure™ Machine Expert

A single software environment to automate machines

Product reference index

E

ESECAPCZZEPAZZ 16
ESECAPCZZEPBZZ 16
ESECAPCZZEPMZZ 16
ESECAPCZZEPTZZ 16
ESECAPCZZSPAZZ 16
ESECAPCZZSPMZZ 16
ESECAPCZZTPAZZ 16
ESECAPCZZTPMZZ 16
ESECMUCZZEPAZZ 17
ESECMUCZZEPMZZ 17
ESECMUCZZSPAZZ 17
ESECMUCZZSPMZZ 17
ESECMUCZZTPAZZ 17
ESECMUCZZTPMZZ 17
ESEETTCZZTPAZZ 17
ESEETTCZZTPMZZ 17
ESEEXPCZZSPAZZ 16
ESEEXPCZZSPMZZ 16
ESEEXPCZZTPAZZ 16
ESEEXPCZZTPMZZ 16
ESEMACS11 16
ESEMCACZZEXAZZ 16
ESEMCACZZEXMZZ 16
ESESAACZZEPAZZ 17
ESESAACZZEPBZZ 17
ESESAACZZEPMZZ 17
ESESAACZZEPNZZ 17
ESESAACZZSPAZZ 17
ESESAACZZSPMZZ 17
ESESAACZZTPAZZ 17
ESESAACZZTPMZZ 17
ESESADCZZEPAZZ 17
ESESADCZZEPBZZ 17
ESESADCZZEPMZZ 17
ESESADCZZEPNZZ 17
ESESADCZZSPAZZ 17
ESESADCZZSPMZZ 17
ESESADCZZTPAZZ 17
ESESADCZZTPMZZ 17
ESESVNCZZTPAZZ 16
ESESVNCZZTPMZZ 16

S

SOMSADCZZEPAZZ 17
SOMSADCZZEPMZZ 17
SOMSADCZZSPAZZ 17
SOMSADCZZSPMZZ 17
SOMSADCZZTPAZZ 17
SOMSADCZZTPMZZ 17
SOMSQLCZZSPAZZ 16
SOMSQLCZZSPMZZ 16

Life Is On | Schneider Electric



Learn more about our products at
schneider-electric.com

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.

Design: Schneider Electric
Photos: Schneider Electric

Schneider Electric Industries SAS
Head Office
35, rue Joseph Monier - CS 30323
F-92500 Rueil-Malmaison Cedex
France

DIA3ED2180701EN
June 2019 - V1.1