AUAPL
Applied Automation

exxer Skills for
the Future

THE UNION OF EXPERTISE AND SKILLS A NEW LEVEL OF EXCELLENCE IN EDUCATION!

EXXER was born from the merger of two companies passionate **about technology, innovation, and education.**

With the purpose of offering more and more excellence tools to assist in technological education, we believe the union of practical and theoretical learning is what makes the difference in accelerating human and world develop–ment!

TECHNOLOGY ● INNOVATION ● EDUCATION

AUAPL
Applied Automation

⚙ To adequately train people for industrial automation skills, it is not enough just to learn the syntax of different programming languages and make basic applications with PLCs. It is necessary to exercise logic and problem–solving skills by carrying out projects involving more complex and realistic scenarios. To meet this need for practices with applied automation, we developed the AUAPL series, consisting of kits that present challenges in realistic situations, such as:

- Elevator automation
- Garage door automation
- Traffic light system automation

⚙ The AUAPL series equipment was developed for a multidisciplinary and practical approach to the topics covered, allowing the experience of problem situations found in day–to–day automation. They are composed of sensors and actuators applied in real challenges that allow the student to develop programming logic and problem–solving skills while exploring the technology of the sensors.

They are equipped with modern PLCs that support industrial networks and IoT protocols, increasing the application of kits for connectivity and communication systems of controlled processes.

The development tools with included licenses are professional and their use is facilitated by learning material and tutorials.

Software and applications complement the learning solution, ensuring greater effectiveness through more dynamic and modern learning.

📚 All kits in this series have a comprehensive courseware, focused on teaching by skills and easy to use by teachers.

We have complete solutions for training and updating teachers, ensuring the best use of the kit's resources.

👤 **Ask our experts for more information and the detailed technical features of each equipment in the series.**

www.exxer.com

MAIN SKILLS AND COMPETENCIES

– Understand the characteristics and operating principle of different types of digital sensors;
– Understand and use actuators;
– Solving multidisciplinary practical problems;
– Implement Automatic Systems;
– Development of complex logic;
– Use digital inputs and outputs in PLCs;
– Implement control systems in real situations;
– Frequency inverter operation through digital and analog commands;
– Design and apply state machines;

– Understand the characteristics and operating principle of different types of digital sensors;
– Understand and use pneumatic actuators (valves, pistons, etc.);
– Understand, configure and use electrical actuators and their controllers;
– Interpret, analyze and assemble pneumatic systems
– Implement Automatic Systems;
– Use digital inputs and outputs in PLCs;
– Implement control systems in real situations;
– Design and apply state machines;
– Use Petri nets to solve automation problems;
– Understand and use PROFINET and IO–link industrial networks;
– HMI (Human–Machine Interface) programming.

PROJECTS

- – Automation of an elevator;
- – Garage door automation;
- – Automation of a traffic light system.
- – Ideal kits for project–based learning, as they present real challenges of increasing complexity.
- – PLC programming using the Simmaq 3D simulator, which virtualizes 05 real environments on the computer.

TECHNOLOGY
HIGHLIGHTS

The sensors and instruments used are industrial ones, allowing the student to become familiar and learn to use equipment they will certainly find in the field.

Siemens is one of the most well-known and used brands in the world, presenting a development platform for all its Automation solutions, the TIA Portal.

The Simmaq simulator allows expanding the use of the kits in this series, bringing new virtual environments that can be controlled by the real or simulated PLC and can be used by students beyond the school environment (thanks to its web licensing system), enabling to use it in e-learning or blended courses.

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PRODUCTOS

⚙ The usability and learning process of each student are extremely important, so we developed learning solutions to provide benefits and differentials for users.

KEY BENEFITS

– Protected components;
– Industrial devices;
– Multidisciplinary.

KEY DIFFERENTIALS

– Safety;
– Simulator;
– Courseware.

⚙ DEVICE SETTINGS

PARTNUMBER	DESCRIPTION	OPTIONS	TOOLS DEVELOPMENT	USE
AUAPL2000–Lxx–001	Elevator with 4 Floors	–	TIA Portal	SimMaq Exxer App
AUAPL2000–Lxx–003	Traffic Light Control	–	TIA Portal	SimMaq Exxer App
AUAPL2000–Lxx–005	Garage gate	–	TIA Portal	SimMaq Exxer App

PARTNUMBER	DESCRIPTION	OPTIONS	ENERGY
AUAPL3000–L21–001	Pneumatic Parts Sorting System	SIEMENS	Single phase 110/220VAC 50/60Hz
AUAPL3000–L21–002	Pneumatic Parts Sorting System	ALTUS	Single phase 110/220VAC 50/60Hz
AUAPL3000–L21–003	Electropneumatic Parts Sorting System	SIEMENS	Single phase 110/220VAC 50/60Hz
AUAPL3000–L21–004	Electropneumatic Parts Sorting System	ALTUS	Single phase 110/220VAC 50/60Hz

⚙ FEATURES

With modular configuration, safety with nr–12, development software included, protection of main components and courseware included.

AUAPL2000–Lxx–001

Elevator with 4 Floors

Settings

– Control panel with control and power circuits;
– Power and command panel with emergency button.

DIMENSIONS	
Height	600mm
Width	1800mm
Depth	600mm
Weight	150Kg

ELECTRICAL FEATURES	
Energy	Bivolt 110/220Vav – 50/60Hz
Connections	Terminales de seguridad de 4 mm

⚙ FEATURES

With modular configuration, safety with nr–12, development software included, protection of main components and courseware included.

AUAPL2000–Lxx–002
Garage Gate

Settings

– Control panel with control and power circuits;
– Power and command panel with emergency button.

DIMENSIONS	
Height	600mm
Width	1400mm
depth	600mm
Weight	100Kg

ELECTRICAL FEATURES	
Energy	Bivolt 110/220Vav – 50/60Hz
Connections	Terminales de seguridad de 4 mm

⚙ FEATURES

With modular configuration, safety with nr–12, development software included, protection of main components and courseware included.

AUAPL2000–Lxx–003
Traffic Light Control

Settings

– Control panel with control and power circuits;
– Power and command panel with emergency button.

DIMENSIONES	
Height	250mm
Width	150mm
depth	340mm
Weight	8Kg

ELECTRICAL FEATURES	
Energy	Bivolt 110/220Vav – 50/60Hz
Connections	Terminales de seguridad de 4 mm

⚙ FEATURES

With modular configuration, Safety with NR–12, development software included, protection of main components and cour–seware included.

AUMAN2000

Pneumatic Parts Sorting System

Settings

– Steel structure with electrostatic coating;
– Pneumatic actuators;
– Miscellaneous sensors.

DIMENSIONS	
Height	1600mm
Width	1400mm
Depth	700mm
Weight	180Kg

ELECTRICAL FEATURES	
Energy	Monofásica 220Vav – 50/60Hz
Pneumatics	min pressure 6 BAR

⚙ FEATURES

With modular configuration, Safety with NR–12, development software included, protection of main components and cour–seware included.

AUMAN2000

Electropneumatic Parts
Sorting System

Settings

– Steel structure with electrostatic coating;
– Pneumatic actuators;
– Miscellaneous sensors.

DIMENSIONS	
Height	1600mm
Width	1400mm
Depth	700mm
Weight	180Kg

ELECTRICAL FEATURES	
Energy	Monofásica 220Vav – 50/60Hz
Pneumatics	min pressure 6 BAR

⚙ MAIN DEVICES

CLP S7–1200 CPU 1215 DA SIEMENS	
INTERFACES	· 2 RJ45 ETHERNET PORTS
NETWORKS INDUSTRIES	· PROFINET IO e CBA, MODBUS/T-CP, ISO on TCP;
PROTOCOLS INTERNET	· TCP/ IP, SNMP, DCP, LLDP, UDP, WEB Server ;
IoT	· OPC–UA Server e MQTT.
TICKETS DIGITAL	· 14 (24VDC) with 6 fast count
DEPARTURES DIGITAL	· 10 (24Vdc, Transistor) with 4 fast outputs (PWM)
TICKETS ANALOG	· 2 (0..10Vcc)
DEPARTURES ANALOG	· 2 (0..10Vcc / 4..20mA)
LANGUAGE OF PROGRAMMING	· LD – Ladder Diagram, · FBD – Function Block Diagram · ST – Structured Text

MAIN DEVICES

The AUAPL3000 models are equipped with the devices below, depending on each configuration (partnumber):

	Siemens S7–1200 CPU 1215	Altus Nexto Xpress CPU XP340
Interfaces	2 Ethernet RJ45 ports	1 Ethernet RJ45 ports 1 host USB 2.0 port 1 RS–485 serial port 1 CAN port
Industrial networks	PROFINET IO and CBA, MODBUS/TCP ISO on TCP;	PROFINET, MODBUS/TCP,EtherCAT EtherNet/IP,Modbus/RTU (master and slave) and CANOpen;
Protocols Internet	TCP/ IP, SNMP, DCP, LLDP, UDP WEB Server ;	TCP/ IP,DHCP, SNMP, DCP, LLDP UDP, WEB Server
IoT	OPC–UA Server e MQTT.	OPC–UA Server e MQTT
Digital Inputs	14 (24VDC) where 6 are quick count	16 (24VDC) where 4 are quick count
Digital Outputs	10 (24Vdc, Transistor) 4 fast outputs (PWM)	16 (24Vdc, Transistor) 4 fast outputs (PWM)
Analog Inputs	2 (0..10Vcc)	5 (0..10Vcc / 4..20mA) 2 RTD
Analog Outputs	2 (0..10Vcc / 4..20mA)	4 (0..10Vcc / 4..20mA)
Programming Language	LD – Ladder Diagram, FBD – Function Block Diagram ST – Structured Text	LD – Ladder Diagram, FBD – Function Block Diagram ST – Structured Text IL – Instructions List SFC – Sequential Function Chart

	Siemens KTP700 Basic Color	Altus P2070N Série P2
Display	HMI 7" color	HMI 7" color
Resolution	800x480 pixels	800x480 pixels
Interfaces	1 Ethernet RJ45 ports	1 Ethernet RJ45 port 1 RS232 serial port 1 RS485 serial port
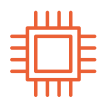
DEVELOPMENT TOOLS

Our training solutions are complemented with the development tools and professional software necessary for student training.

Licenças Inclusas

TIA Portal:
– Development and simulation tool for PLC programming;
– Plataform: Windows;
– Licensing: 1 license per kit.

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USE

Guidelines on the recommended use of the kit!

We suggest this configuration for better use in class. Kits and activies are designes according to the team sizes listed on the side.

The minimum necessary infrastructure is a prerequisite to fully use all functionalities of the training kits.

We recommend the computing and connectivity requirementes below for using the software and applications provided with the kit.

Partnumber	Description	Team (student/kit)	Use
AUAPL2000	applied automation kits	3 a 4	Eventual 1 kit for 3 teams
AUAPL3000	Pneumatic Parts Sorter	3 a 4	Eventual 1 kit for 3 teams
AUAPL3000	Electropneumatic Parts Classifier	3 a 4	Eventual 1 kit for 3 teams

Note: we recommend purchasing all kit models and rotating teams for more comprehensive training

Infrastructure	
AUAPL2000	
Electrical	1 single–phase socket

Infrastructure	
AUAPL3000	
Electrical	1 single–phase socket
Pneumatic	1 point per kit, Min pressure. 6 BAR, flow min. 30 l/min

Connectivity	
Ethernet connections per workstation	2 Ethernet ports (for the kit and the computer) 1 Ethernet port for the kit (for the AUAPL3000)
Wifi network	–
Internet access	Recommended
Computer	Necessary; according to minimum requirements of software

COURSEWARE

The training kits have a rich courseware with a pratical focus, containing pratical proposals aimed at training skills and competencies.

In addition to the **User Manual,** wich contains information on operation and maintenance, the **Student Guide** is also provided, with proposals for pratical activities to be carried out using the kit, and the **Facilitator Guide,** with answers to the proposed activities and guidelines to use the kit in a didactic way. In addition, **Video tutorials** are available to help you easily master the development tools and use the kit.

All of this content is available on our website at the **Facilitator Portal.**

SKILLS AND COMPETENCIES

APPLIED AUTOMATION

- Understand the characteristics and operate principle of different types of digital sensors;
- Understand and know how to use actuators
- Solve multidisciplinary problems
- Implement Automatic Systems;
- Complex logic development
- Use digital inputs and outputs in PLCs
- Implement control systems in real situations;
- Frequency inverter operation through digital and analog commands;
- Design and apply state machines.

PROJECTS

- Elevator automation;
- Garage door automation;
- Traffic light system automation.

MOBILE APLLICATIONS

A current learning solution is not complete without software and applications. Along with the kits of this series, exlusives licenses are provided for applications on computer and mobile devices that complement and enhance the use os the kits.

Exxer App

AUGMENTED REALITY KITS
They solutions can be visualized in 3D through augmented reality, allowing the student to have a firts contact with such technology and identify their main characteristics.

Educational animations
Augmented reality animations that show the main devices in section, their assembly/disassembly process and view of the operating principles.

Exxer App

EDUCATIONAL ANIMATION
– Augmented reality animations that show the main devices in section, and their assembly/disassembly process.
– Display of operating principles.
– Animations that help to understand the physical processes involved and the application of technology.
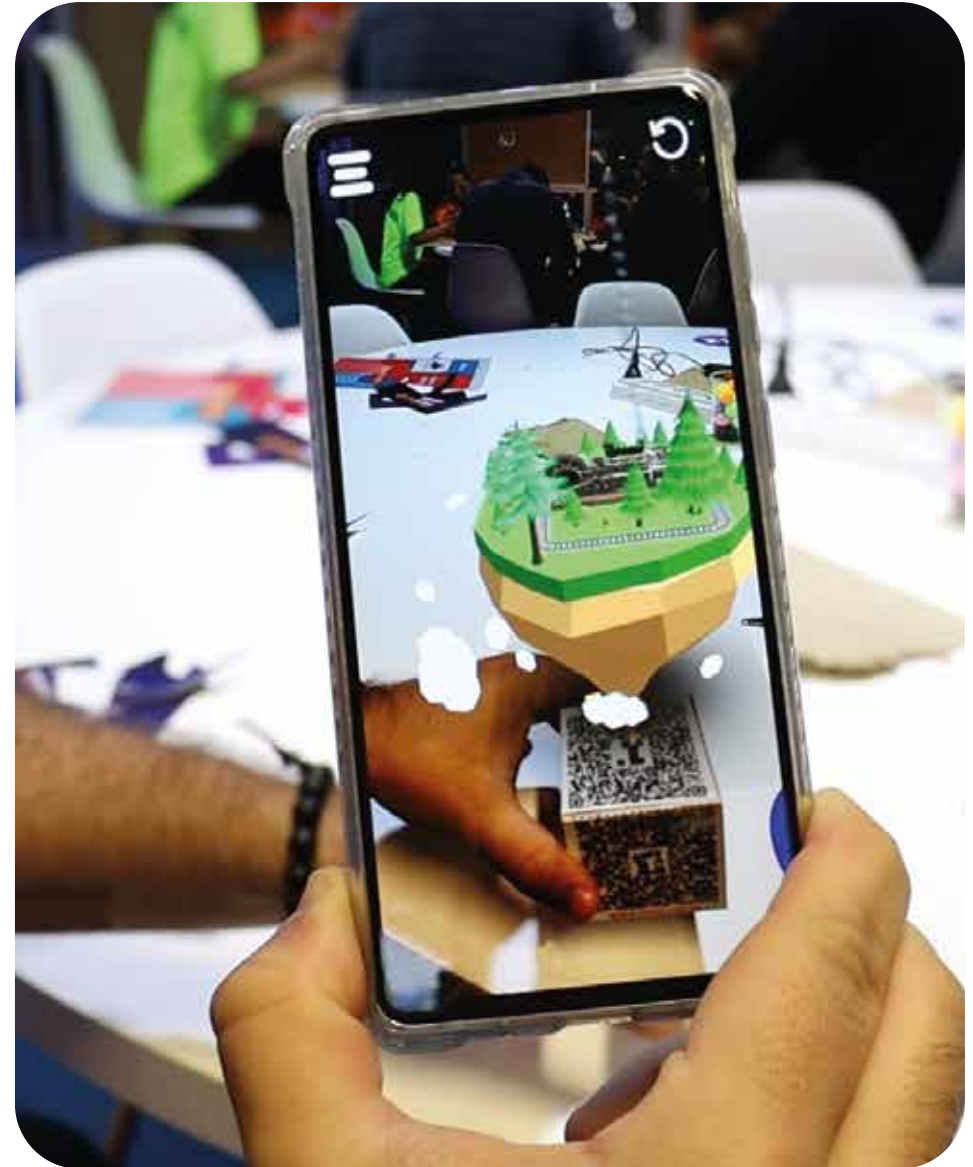
DEVELOPMENT TOOLS

Our learning solutions are complemented with the development tools and professional software necessary for student training.

For Siemens controllers

Licenses Included

TIA Portal:
– Development and simulation tool for PLC programming;
  - Platform: Windows;
  - Licensing: 1 license per kit.

Licenses Included

WinCC Basic:
– Development tool for HMI;
  - Platform: Windows;
  - Licensing: 1 license per kit.

For Altus controllers

Licenses Free

MasterTools:
– Development and simulation tool for PLC programming;
  - Platform: Windows;
  - Licensing: freeware (free delivery).

Licenses Free

FVDesing:
– Development tool for HMI;
 - Platform: Windows;
  - Licensing: freeware (free delivery).

DESKTOP APPLICATIONS

A current learning solution is not complete without software and applications. Along with the kits of this series, exlusives licenses are provided for applications on computer and mobile devices that complement and enhance the use os the kits.

SimMAQ

– Simulation according to the real kit; it allows the interaction, experience and control by other software through communication protocols.

– Through the WEB licensing system, they can be used anywhere with Internet access, and therefore, are perfect for e–learning and blended courses.
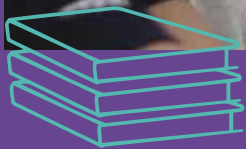
TRAINING

As important as teaching resources and tools is teacher training. We have a complete package of solutions for your training and upgrading needs.

Quick Start and Tutorials

Quick start is a quick video guide to learn, test and put the product into operation. Tutorials are videos that teach common procedures needed in classes using the kit.

Technical Delivery

In the technical delivery, our experts present the product, its features, as well as maintenance and safety precautions, and put it into operation together with the customers.

Operational Training

The purpose of operational training is to teach facilitators on how to use the kit. The kit courseware is presented and some proposed practices are carried out. It also includes all technical delivery activities.

Technological Training

Technological training is a deeper learning of technology and applied concepts. These courses are not focused on kits but on topics and technical skills to update trainers.

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Headquarter:

Rua José Pinto Vilela, 156
Bairro Centro
Código Postal 37540–000
Santa Rita do Sapucaí — MG
Phone no: (35) 3473–4050

Branch:

Av. Rubem Bento Alves, 5167
Bairro Santa Catarina
Código Postal 95030–325
Caxias do Sul — RS
Phone no: (54) 3771–6600

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