



AUSEN
Sensors and Instruments



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 development!




TECHNOLOGY ● INNOVATION ● EDUCATION




AUSEN

Sensors and Instruments

 For the implementation of control systems, it is necessary to have devices capable of converting physical quantities into the type of information that the controllers can understand, that is, electrical signals or data in a network, that is, sensors and instruments. Sensors are devices that convert physical quantities into simple signals, while instruments are more complex devices that convert physical quantities into electrical signals and perform many other functions, such as amplification, filtering, calibration and display of results. Both are fundamental to control systems and are increasingly important with the arrival of the Internet of Things (IoT).


The AUSEN series brings training kits developed to explore sensor and instrument technologies, their characteristics and use. This series is complementary to the control and supervision (AUSUP) and continuous (AUPRO) and discrete (AUMAN) process control series.

 AUSEN kits use modern sensors, even when it comes to basic sensors, and from the top manufacturers on the market.


The series was designed to allow the practical study of sensors, going beyond simple activation. These kits can be used with the AUSUP controller kits (control and supervision) for more complete learning.

Industrial networks such as IO-Link (sensors) and Profibus/PA (instruments) are incorporated, allowing interaction with network kits and autonomous operation compactness with direct connection to the computer.

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 instructors

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 detailed technical features of each equipment of this series.**



MAIN SKILLS AND COMPETENCIES

- Understand and apply optical sensors (diffuse, reflective, barrier types);
- Understand and apply inductive and capacitive sensors;
- Understand and apply temperature sensors (thermocouples and resistive ones);
- Understand and apply displacement and position sensors;
- Understand and apply color sensors;
- Perform temperature data reading from a PA instrument;
- Perform differential pressure data reading from a PA instrument;
- Understand and test level measurement techniques using a pressure instrument;
- Understand and test flow measurement techniques using a pressure instrument;
- Configure IO-link master;
- Read IO-link and conventional sensors via industrial networks;
- Configure a device on a Profibus/PA network;
- Read data and analyze packets in a Profibus/PA network.



TECHNOLOGY HIGHLIGHTS

Some sensors have IO-Link technology, which has become the industry's de facto standard for industrial sensor networks.

The IO-Link master with ethernet port allows to adding various intelligent functions to the sensors. First, it can be accessed by PLC through PROFINET protocol. But it can also be directly controlled by a computer for configuring the IO-Link devices connected to it. Its ports can be used both as IO-Link communication ports with smart sensors and as digital ports for conventional sensors.

The instrumentation kit has as its main component the VMV10-P multivariable transmitter. With this kit, we explore the various applications of the differential pressure transmitter as a pressure, level and flow gauge.

Using a USB/Profibus/PA converter, it is possible to communicate, configure and read the instrument without using a PLC.



 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

- Modular;
- Industrial devices;
- Easy Storage.

KEY DIFFERENTIALS

- Safety;
- No tools required;
- Augmented Reality;
- Courseware.

DEVICE SETTINGS

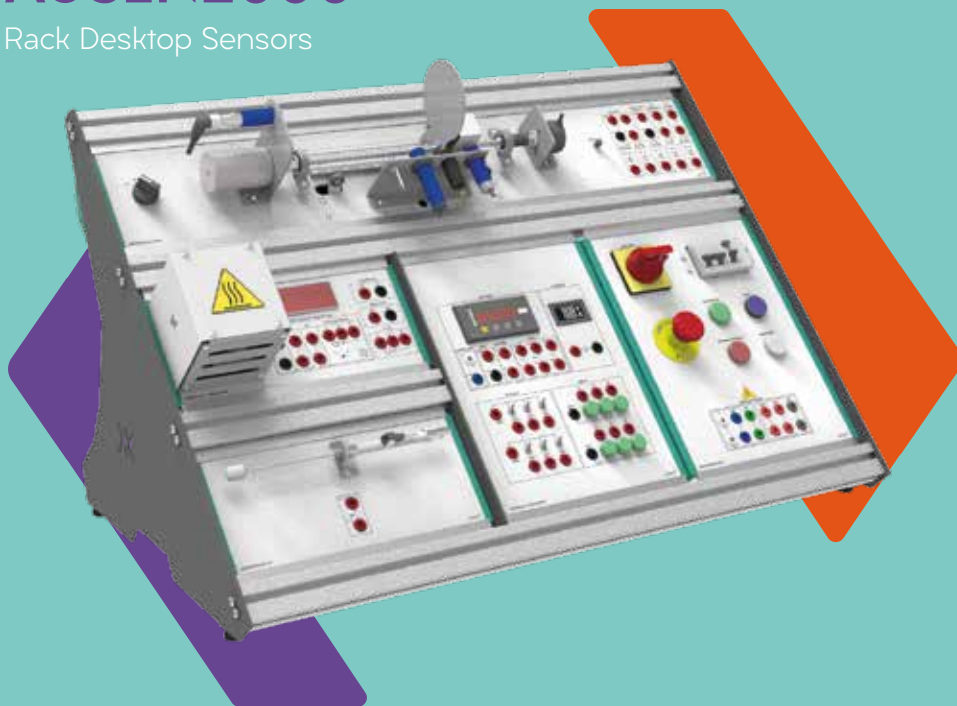
PRODUCT	DESCRIPTION	OPTIONS	DEVELOPMENT TOOLS	APPLICATION
AUSEN2000	Rack office sensors	–	–	Exxer App
AUSEN3000	sensor bank	–		Exxer App
AUSEN4000	dessert rack for PA instrumentation	–	PA Sniffer PACTware	Exxer App

FEATURES

With modular configuration, Safety with NR-12, development software included, protection of main components and courseware included.

AUSEN2000

Rack Desktop Sensors



Settings

- Desktop rack: modular structure;
- Made of steel with electrostatic coating and aluminum profile;
- Modules fixed without tools.

DIMENSIONS

Height	500mm
Width	820mm
Depth	470mm
Weight	15Kg

ELECTRICAL FEATURE

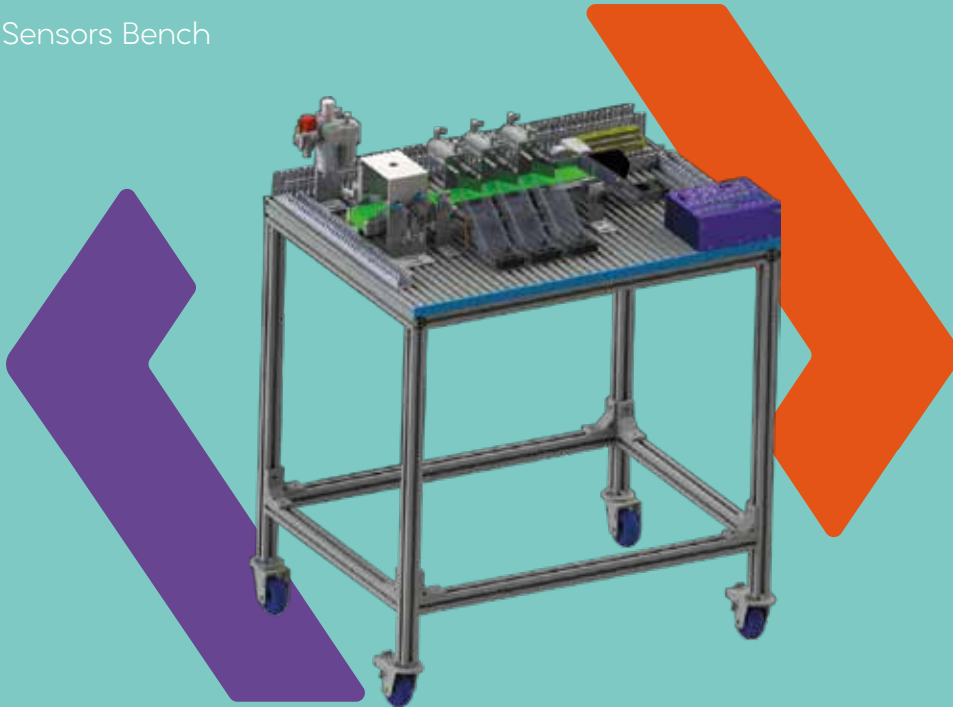
Energy	bivolt 110/220Vav – 50/60Hz
Connections	4mm safety terminals

FEATURES

With modular configuration, Safety with NR-12, development software included, protection of main components and courseware included.

AUSEN3000

Sensors Bench



Settings

- Aluminum profile structure;
- Individual sensor holders;
- M12 connection for signal and power.

DIMENSIONS

Height	300mm
Width	700mm
Depth	700mm
Weight	30Kg

ELECTRICAL FEATURES

Energy	bivolt 110/220Vav – 50/60Hz
connections	4 mm security terminals

FEATURES

With modular configuration, Safety with NR-12, development software included, protection of main components and courseware included.

AUSEN4000

PA Instruments Desktop Rack



Settings

- Aluminum profile structure;
- Tanks for measuring level, pressure and flow;
- Profinet-PA / USB converter.

DIMENSIONS

Height	500mm
Width	400mm
Depth	400mm
Weight	50Kg

ELECTRICAL FEATURES

Energy	bivolt 110/220Vav – 50/60Hz
connections	4 mm security terminals

MAIN DEVICES

VMV10-P MULTIVARIABLE TRANSMITTER

- Multivariable Pressure Transmitter (Capacitive Sensor);
- Input for temperature sensor (RTD, TC, Ohm and mV);
- Profibus/PA communication.

USB/PROFIBUS/PA INTERFACE

- Allows direct connection of the instrument to the computer;
- USB interface;
- Parameterization and calibration of equipment with FDT/DTM tools (PACTware, FieldCare, FieldMate etc.);
- It works as a message analyzer (frames) using the PA-SNIFFER tool.

IO-LINK MASTER

- 4 IO-Link ports;
- Ports connected to conventional sensors function as digital input;
- Ethernet interface on M12 connector;
- PROFINET communication;
- Direct connection to the PC for configuration and readings through embedded web server;



USE

Guidelines on the recommended use of the Kit!

 We suggest this configuration for better use in class. Kits and activities are designed 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 requirements below for using the software and applications provided with the kit.

Part number	Use	Team(student/kit)	use
AUSEN2000	desktop display Sensors	2 to 3	frequent 1 kit for 3 teams
AUSEN3000	work table of sensors	2 to 3	frequent 1 kit for 3 teams
AUSEN4000	desktop display of Instrumentation PA	2 to 3	frequent 1 kit for 3 teams

Infrastructure	AUSEN2000	AUSEN3000	AUSEN4000
Eléctrica	1 take single phase	1 take single phase	1 take single phase

Connectivity	
Ethernet connections by station of work	2 Ethernet ports (computers and kit)
WiFi	recommended for computers
Internet access	recomerecommendedndado
Computer	Required for AUSEN3000 and AUSEN4000; second minimum software configuration Recommended for AUSEN2000; according to minimal software configuration



DEVELOPMENT TOOLS

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

AUSEN4000(INSTRUMENTS)

Licenças Inclusas

PA Sniffer

Profibus PA message analyzer

- Platform: Windows
- License Included

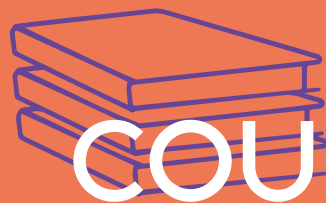


PACTware

Tool for configuration, operation and diagnosis of Profibus/PA devices.

- Platform: Windows
- License: Freeware





COURSEWARE

Los kits didácticos son acompañados de un rico material didáctico con enfoque práctico, que trae propuestas de prácticas visando la formación de habilidades y competencias.

Además del **Manual del Usuario**, con informaciones de operación y mantenimiento, son suministrados el **Guía del Estudiante**, con propuestas de actividades prácticas a ser realizadas con el kit, y el **Guía del Educador**, con las respuestas a las actividades propuestas y orientaciones del empleo didáctico del kit. Además de eso, **Tutoriales** en vídeo son ofrecidos para auxiliar en el fácil dominio de las herramientas de desarrollo y en el uso del kit.

Todo este contenido es accesible digitalmente en nuestro sitio en el **Portal del Educador**.



SKILLS AND COMPETENCIES

Sensors

- Evaluate the main physical characteristics of the sensors;
- Understand and use the different types of digital and analog outputs;
- Understand and apply optical sensors (diffuse, reflective, barrier types);
- Understand and apply inductive and capacitive sensors;
- Understand and apply temperature sensors (thermocouples and resistive ones);
- Understand and apply displacement and position sensors;
- Understand and apply color sensors;

Instruments

- Understand the main components of an instrument;
- Configure instruments;
- Perform temperature data reading from a PA instrument.
- Perform differential pressure data reading from a PA instrument.
- Understand and test level measurement techniques using a pressure instrument;
- Understand and test flow measurement techniques using a pressure instrument;

Sensor networks

- Understand how the IO-link network works;
- Configure IO-link master;
- Read IO-link and conventional sensors via industrial networks;
- Understand how the Profibus/PA network works;
- Configure a device on a Profibus/PA network;
- Read data and analyze packets in a Profibus/PA network;

MOBILE APPLICATIONS

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

Exxer App

AUGMENTED REALITY KITS

The solutions can be visualized in 3D through augmented reality, allowing the student to have a first contact with such technology and identify their main characteristics.



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.

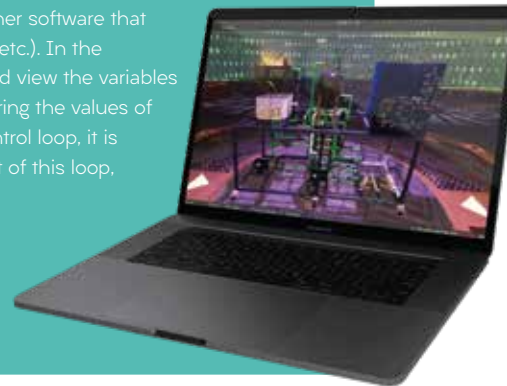


DESKTOP APPLICATIONS

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

Continuous Process Plant Simulator

- Digital twin of the AUPRO3000 plant that allows the simulation of level and flow control loops. Emulating a modbus (virtual) device, it can be controlled both by physical PLCs and by simulated PLCs, or any other software that supports the Modbus protocol (Matlab, Scilab, Labview, etc.). In the simulation, the user can work with the manual valves and view the variables through the instrument indicators, in addition to monitoring the values of all variables and IO signals. By selecting the relevant control loop, it is possible to view only the devices and pipes that are part of this loop, leaving the others invisible..





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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