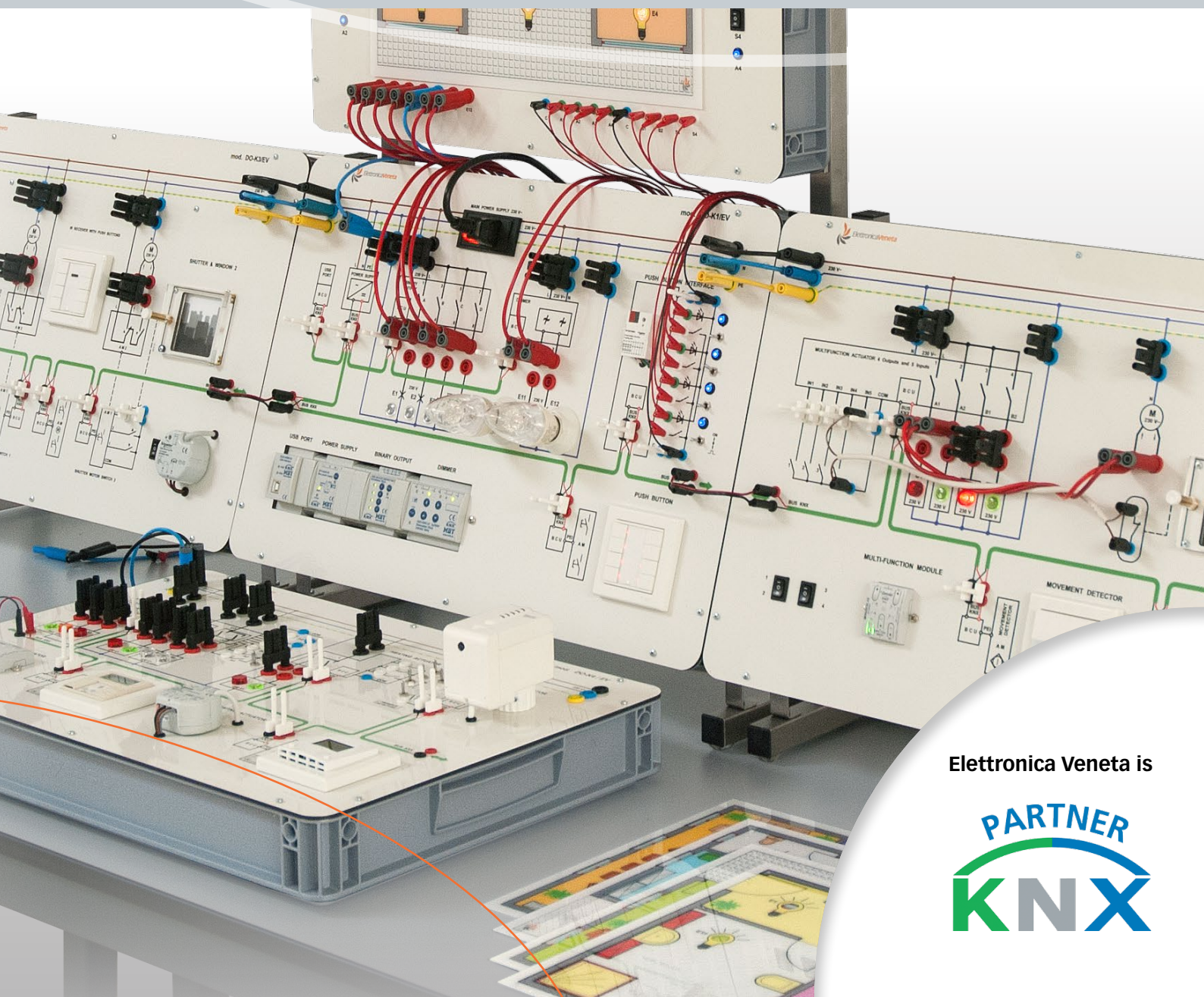


# KNX HOME AUTOMATION MODULAR LABORATORY

*For Industrial and Technical Institutes,  
Vocational Schools of Industry and Handicraft sector,  
Courses of Continuous Training, updating and retraining*



Eletronica Veneta is





# KNX HOME AUTOMATION

## KNX HOME AUTOMATION MODULAR LABORATORY

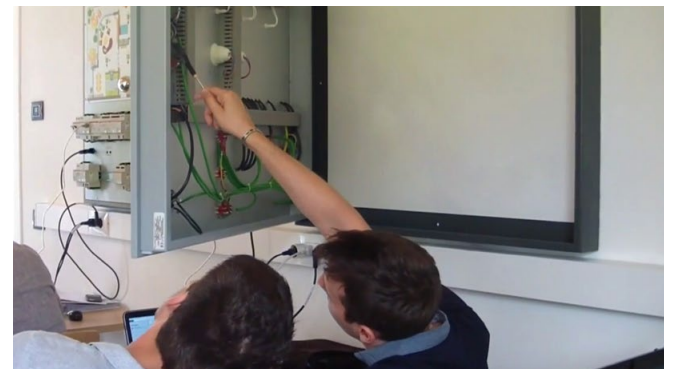
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# NUMBERLESS SOLUTIONS OF KNX HOME AUTOMATION

The electrical installations using the KONNEX (KNX) standard separate the power supply of the power consuming devices (230 V~) from the transmission of information carried out via a twisted-pair BUS. This BUS consists of a Twisted-Pair (TP) cable used to send/receive data to/from all the apparatuses connected to the system which also develops in parallel with the power line.

Standardized encoding protocols enable to decentralize the devices and make any central unit for the arrival/departure of information between sensors and actuators unnecessary.

Using the KNX Bus the control devices and the actuators are not linked any more by direct wiring, because all the associations are carried out via software and are contained in the information transmitted through the TP cable. The wide flexibility of this system is clearly evident. For instance, adding new functions merely entails connecting the necessary devices to the same Bus Line and the whole system reconfiguration only demands to reprogramme the devices without any modification of the existing wiring.



*The certified KNX laboratory realized by Elettronica Veneta at the FENICE Green Energy Park, Padua, Italy.*

Images courtesy of FENICE Green Energy Park

KNX HOME AUTOMATION MODULAR LABORATORY

www.elettronicaveneta.com

## THE REASONS FOR CHOOSING OUR LABORATORIES

- The equipment produced by our company has been present successfully in Schools and Universities all over the world for more than 50 years
- We are able to supply both stand-alone products and turnkey classrooms and laboratories; our solutions are modular, flexible, upgradeable
- As our company manufactures its own products, besides selling them, the after-sales service is guaranteed for life
- Thanks to a continuous R&D activity and a special attention to technical innovation, our products always keep pace with modern industrial technology
- We attained a high-level specialization on KONNEX protocol and on the corresponding learning programs. We have been KNX Partners since 2014.



# STRUCTURE OF THE LABORATORY

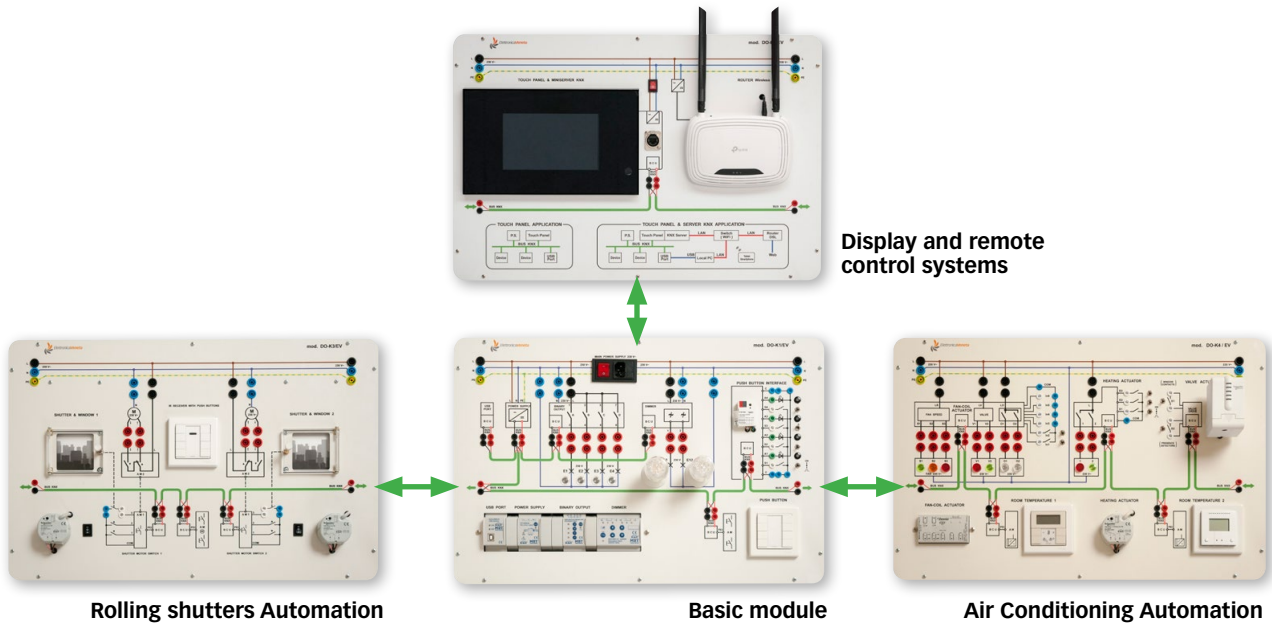
The modules of this laboratory enable to develop a technical training program starting from the principles of Home Automation up to advanced systems that integrate different types of installations such as:

- On/Off lighting systems and dimmers, even of closed loop
- Climate control
- Automation of doors, rolling shutters and sunblinds
- Access control
- Control of electric loads, even in view of priority levels
- Display and remote control of the installation

Applying the modules side by side on a wall and connecting them to each other enable to assemble a whole home automation installation which can be used for classes and for presentations (open day).

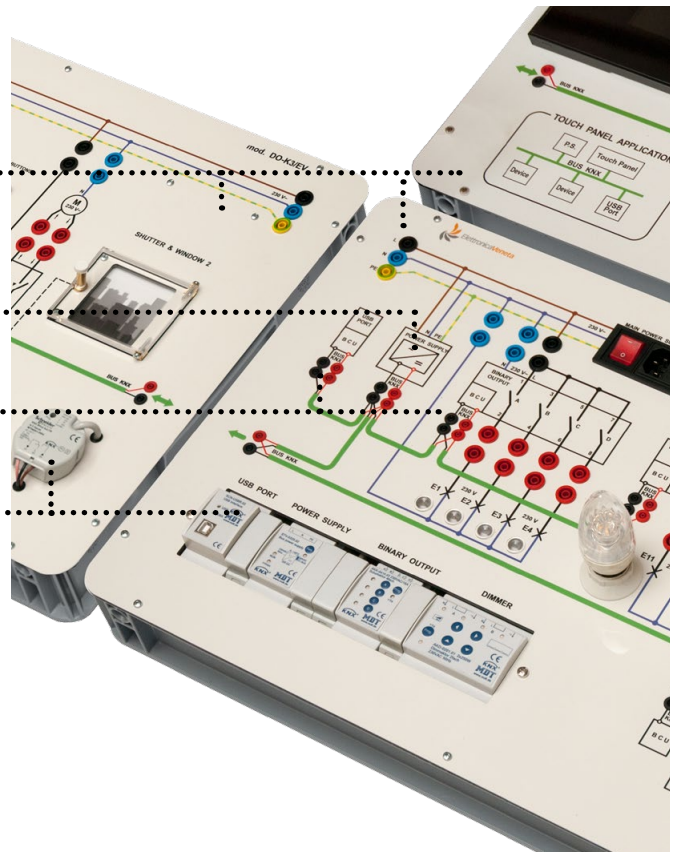
As regards the indications on the choice of the modules according to the typology of installation and to the educational level, please refer to the tables shown in the following pages.

*Example of intermediate configuration for exercises on KNX installations for the control (even remote) of lighting, rolling shutter and air conditioning.*



## MODULE MAIN FEATURES

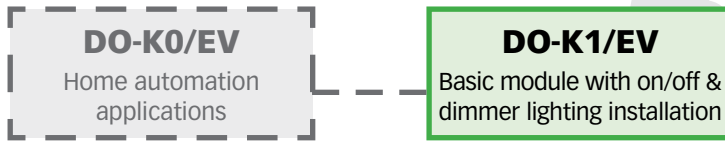
- House Automation in KNX standard
- Desk-top or wall-type modules
- They can be assembled side by side to enable the explanation of various issues from "Basic" to "Advanced" subjects .....
- Compact size for an easy handling in laboratory and storing in cabinet: 600 x 400 x 70(h) mm
- Standard electrical symbols for an easier electric wiring of the power circuit and of Bus lines .....
- Terminals and jumpers of different size for keeping separated power and Bus connections and preventing errors, thus enabling the preliminary study of each device and of their assembly .....
- Devices of leading trademarks with different designs, used in the installations according to their laying typology; modular elements, flush-mounting elements .....
- Provided with handbook of exercises and of programming examples already developed with ETS software
- Planning of Group Addresses for the creation of "compatible" installations from Basic level to the Advanced level
- Wide choice and combination among the modules for optimizing both the general education and the specific training concerning the different typologies of automation installation of the "Smart house"



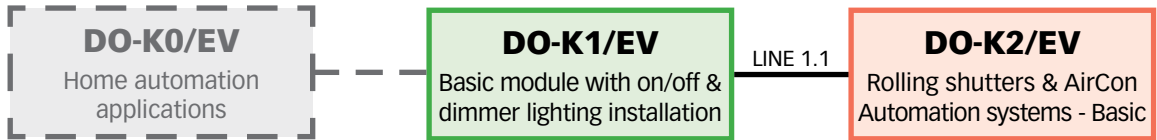
## BASIC TRAINING

Config.

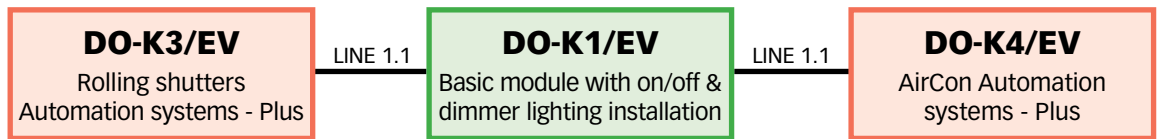
1



2



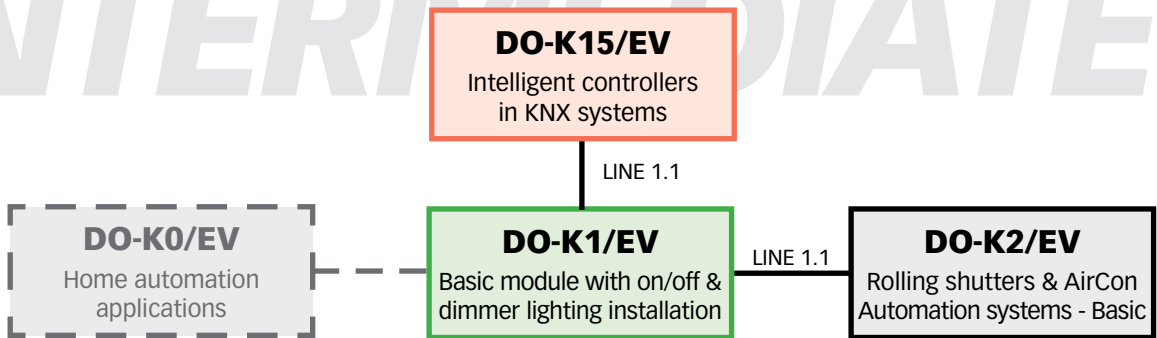
3



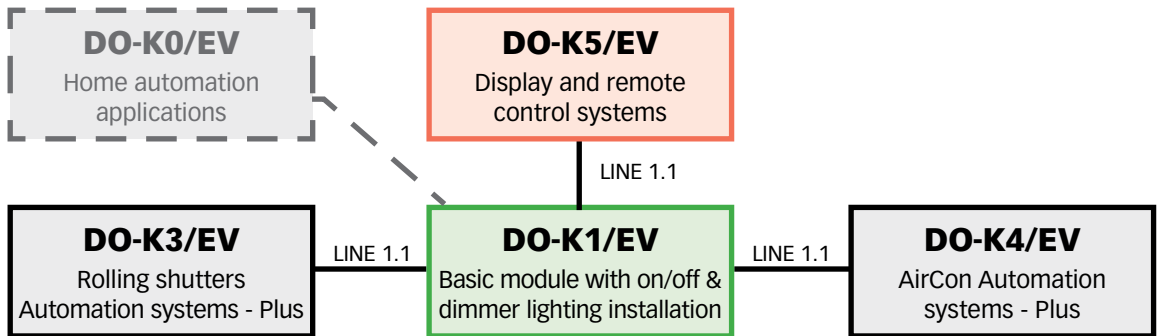
## INTERMEDIATE TRAINING

Config.

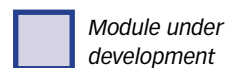
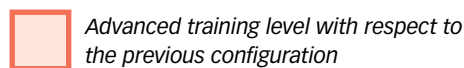
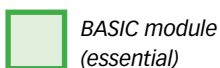
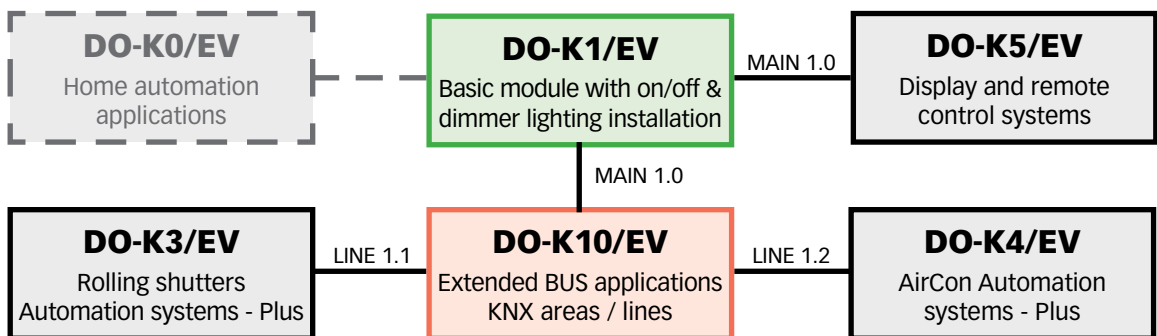
4



5

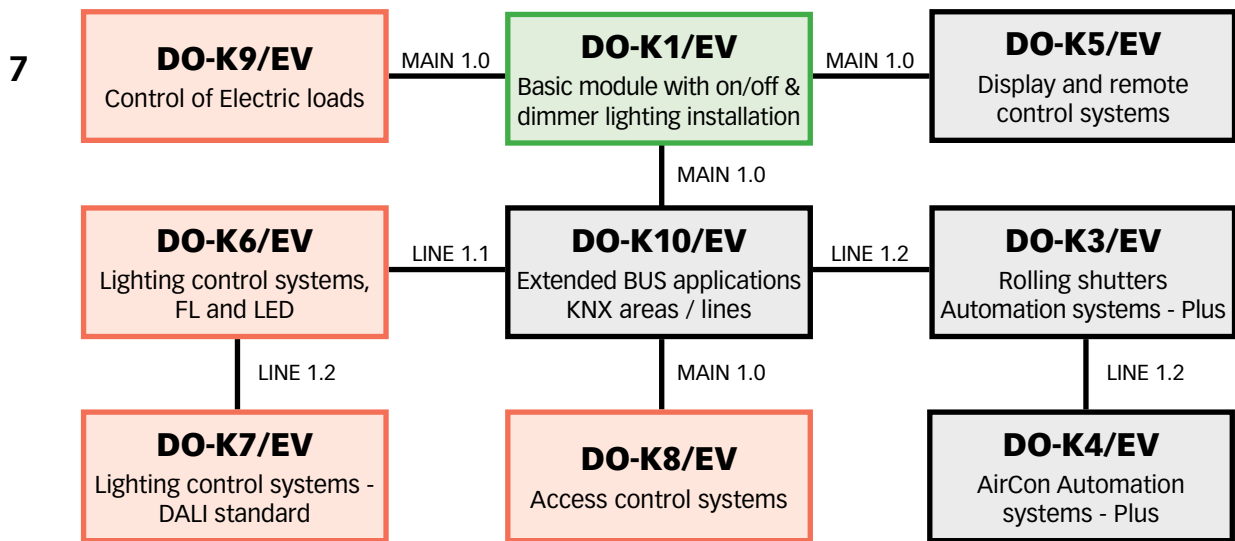


6



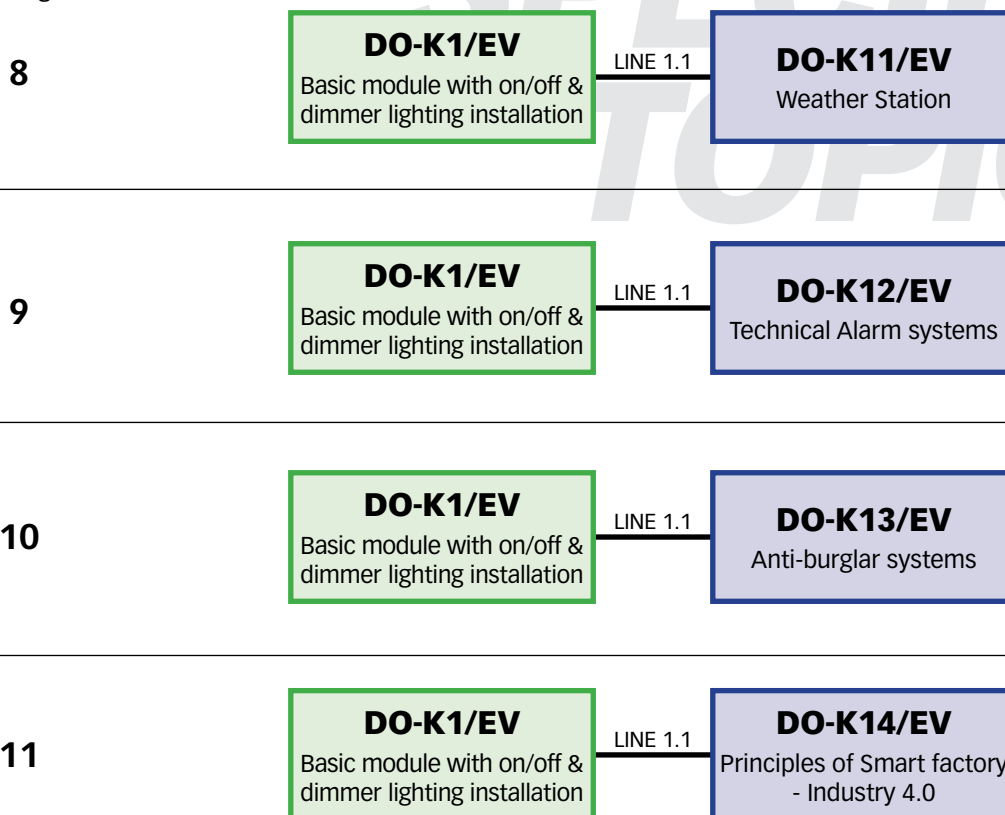
## ADVANCED TRAINING


Config.





## TRAINING WITH SPECIFIC TOPICS


Config.



 BASIC module (essential)

 Advanced training level with respect to the previous configuration

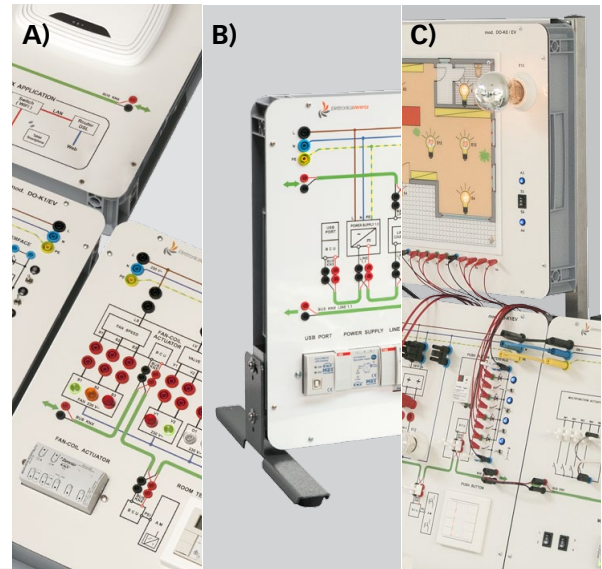
 Optional module

 Module under development

# MODULES OF THE LABORATORY

## GENERAL TECHNICAL SPECIFICATIONS

- Box made of light and insulating material
- Large color-printed front surface, with components represented by international electric symbols
- Quick connections via safety leads and terminals ( $\varnothing$  4 mm) for power circuits, and with diameter of 2 mm for Bus
- Wiring devices (Bus and power circuits), programming and commissioning of Bus KONNEX home automation installations
- Modules for use:
  - A) on a table (horizontal)
  - B) on a table with adjustable support (vertical / inclined)
  - C) wall display



## KNX LINE BASIC MODULE WITH ON/OFF AND DIMMER LIGHTING INSTALLATIONS

### Mod. DO-K1/EV

#### MAIN FEATURES

- 1 Main switch of the line of 230 V~ and power cord with French-German standard plug, protection against overcurrents by fuse
- 4 Ideograms of lights with lamps of 230 V for On/Off light sources
- 2 Lamp-sockets E14, 2 lamps E 14 230 V - 3...5 W, 2 dimmable LED lamps E14 of 230 V - 3...5 W for On/Off and Dimmer light sources
- 1 Interface for 4 traditional contacts with 4 control switches and 4 LEDs of state indication, recessed version provided with Bus coupler
- 1 Control device with 8 pushbuttons and LED of state indication, recessed version provided with Bus coupler
- 1 Power supply for BUS of 320 mA, modular version on DIN rail TH35
- 1 USB port, modular version on DIN rail TH35
- 1 Four-channel actuator of 230 V - 10 A on DIN rail TH35, provided with Bus coupler
- 1 Two-channel universal dimmer actuator, modular version on DIN rail TH35 provided with Bus coupler



230V - 50-60 Hz single-phase - 100 VA

#### TRAINING PROGRAM

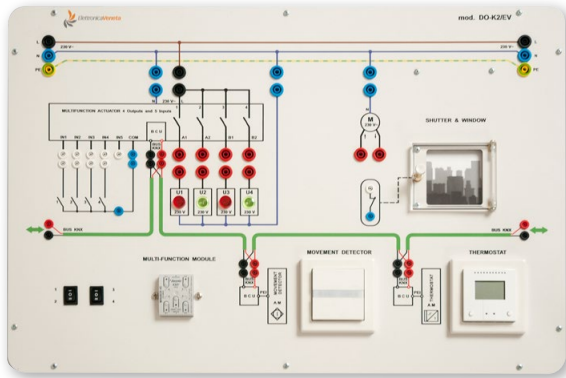
- Using the ETS\* design software (Eib Tool Software)
- Programming, commissioning and testing of KNX Bus installations
- Study and application of button control devices and of interface devices for contacts
- Study and application of On/Off and dimmer actuators
- Commands and individual controls of On/Off and dimmer lighting
- On/Off general commands and Bit and Byte scenarios

(\* ) ETS software is not included in the module, but it must be ordered separately.

The Basic Module includes also the power supply for the BUS Line and the communication port for the connection to a PC. Therefore it is essential for the integration of the other modules as shown earlier in the configuration diagrams.

# AUTOMATION SYSTEMS FOR ROLLING SHUTTERS & AIRCON - BASIC LEVEL

## Mod. DO-K2/EV



### TRAINING PROGRAM

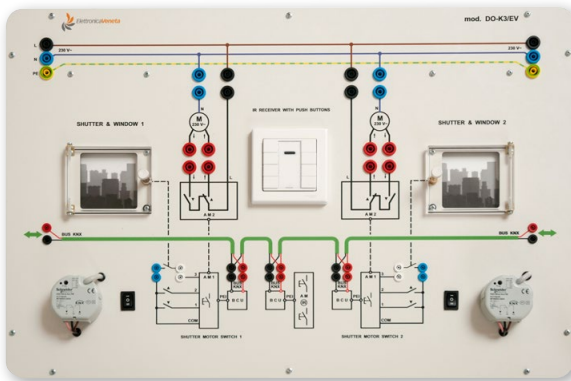
- All the basic training explained in module DO-K1/EV
- Studying and applying handling devices of rolling shutters
- Studying and applying zone control devices of heating system
- Studying and applying universal I/O (Input/Output) devices
- Assembling control devices for opening/closing rolling shutters
- Managing the air conditioning system by temperature controllers and HVAC actuators
- Controlling the air conditioning system according to the presence of people and to the opening of windows
- Controlling lights according to the presence of people



230 V~ and Bus Line, coming from DO-K1/EV

# AUTOMATION SYSTEMS FOR ROLLING SHUTTERS - PLUS LEVEL

## Mod. DO-K3/EV



### TRAINING PROGRAM

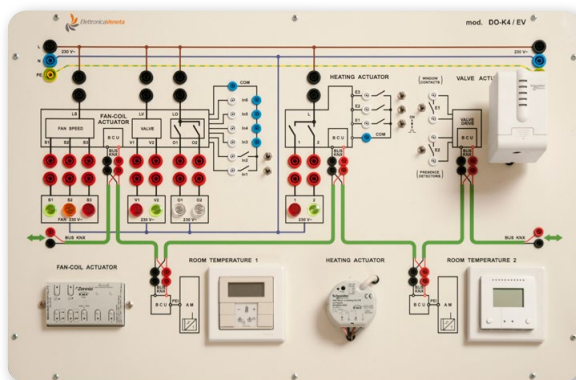
- All the basic training explained in module DO-K1/EV
- Managing rolling shutters and lighting by IR remote control
- Studying and applying handling devices for motor-driven rolling shutters
- Assembling individual control devices for opening/closing rolling shutters
- Managing the motor-driven shutters by group or global control



230 V~ and Bus Line, coming from DO-K1/EV

# AUTOMATION SYSTEMS FOR AIR CONDITIONING - PLUS LEVEL

## Mod. DO-K4/EV



### TRAINING PROGRAM

- All the basic training explained in module DO-K1/EV
- Studying and applying zone control devices of heating system
- Studying and applying actuators for fan-coils
- Studying and applying PI control valves for radiators
- Controlling the air conditioning system by an ambient temperature thermostat with display : heating / cooling
- Controlling the air conditioning system by an adjustable thermostat

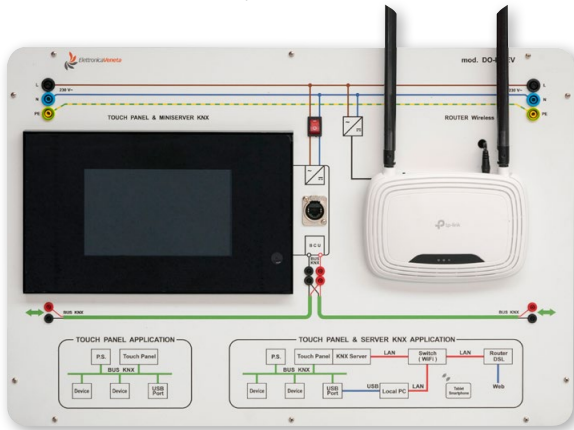


230 V~ and Bus Line, coming from DO-K1/EV



## DISPLAY AND REMOTE CONTROL SYSTEMS

### Mod. DO-K5/EV



#### TRAINING PROGRAM

Combining/referring to the different modules will enable to:

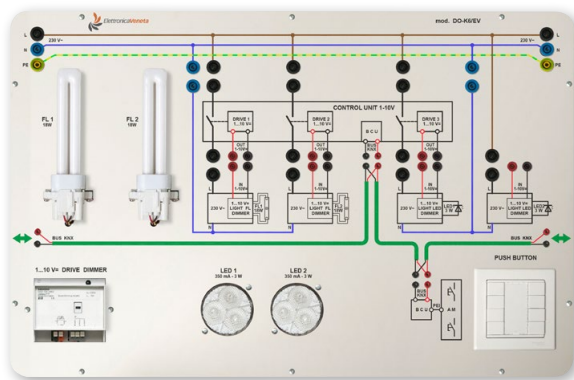
- Study and apply control devices with Touch Panel, to configure pages for the:
  - Control of On/Off and Dimming lighting, control of rolling shutters, monitoring of temperatures, control of loads / energy monitoring, realization of home automation scenarios
- Study and apply a KNX server and a (WiFi) Switch for:
  - Connecting a local PC for system configuration, connecting Tablet and Smartphone in WiFi, remote control of the system.



230 V~ and Bus Line, coming from DO-K1/EV

## ADVANCED LIGHTING CONTROL SYSTEMS - STANDARD 1-10 V

### Mod. DO-K6/EV



#### TRAINING PROGRAM

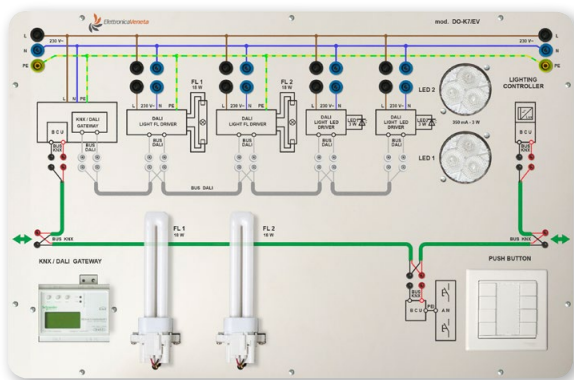
- All the basic training explained in module DO-K1/EV
- Studying and applying dimmer control units (1-10 V)
- Studying and applying actuators for dimmer 1-10 V of fluorescent lamps
- Studying and applying actuators for dimmer 1-10 V of LED lamps
- Assembling separate On-Off/Dimmer control devices of fluorescent and/or LED lamps
- Assembling general On-Off control devices of fluorescent and/or LED lamps



230 V~ and Bus Line, coming from DO-K1/EV

## ADVANCED LIGHTING CONTROL SYSTEMS - DALI STANDARD

### Mod. DO-K7/EV



#### TRAINING PROGRAM

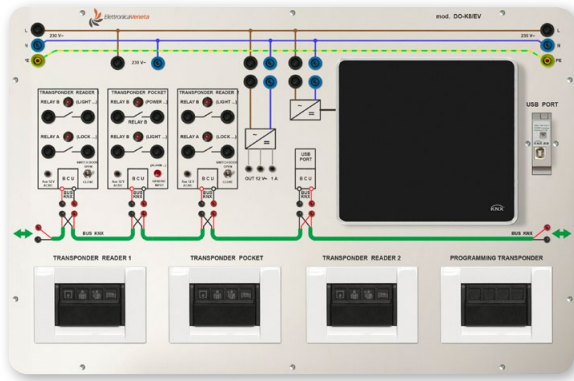
- All the basic training explained in module DO-K1/EV
- Studying and applying KNX/DALI interface gateway
- Studying and applying actuators for DALI dimmer of fluorescent lamps
- Studying and applying actuators for DALI dimmer of LED lamps
- Assembling manual control devices by networking KNX Bus of fluorescent and/or LED lamps DALI
- Automatic brightness control by illuminance sensor of fluorescent and/or LED lamps



230 V~ and Bus Line, coming from DO-K1/EV

## ACCESS CONTROL SYSTEMS

### Mod. DO-K8/EV



#### TRAINING PROGRAM

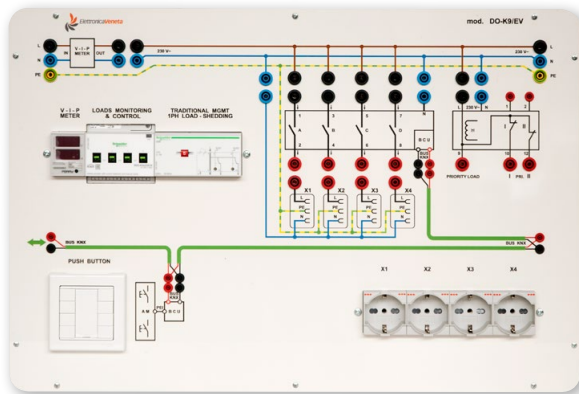
- All the basic training explained in module DO-K1/EV
- Using the eSuite software preinstalled in a server PC to develop the access control and programme the cards (server PC provided with license for 10 readers and 2 Clients)
- Using a card reader to control the access to a zone (or to a room)
- Using the card programmer to enable the cards
- Using the card compartment for various electric starts
- Using two card readers for the access to a zone with several entrances



230 V~ and Bus Line, coming from DO-K1/EV

## SYSTEMS FOR THE CONTROL OF ELECTRIC LOADS

### Mod. DO-K9/EV



#### TRAINING PROGRAM

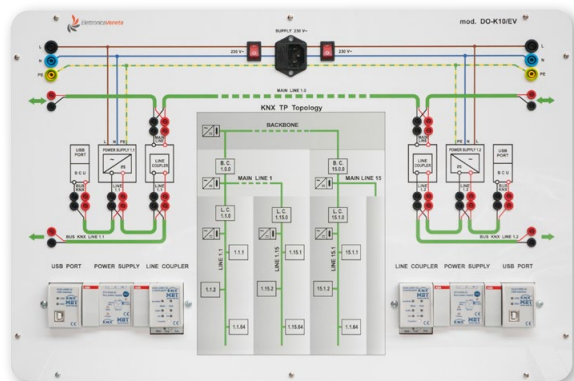
- All the basic training explained in module DO-K1/EV
- Studying and applying a digital multimeter for measuring the total absorption, adjusting the threshold value to signal excessive consumptions
- Studying and applying a threshold relay for the automatic disconnection of non-priority loads
- Studying and applying On/Off KNX switching actuators with current detection to control the « smart sockets » ; automatic control and manual control



230 V~ and Bus Line, coming from DO-K1/EV

## EXTENDED BUS APPLICATIONS - KNX AREAS / LINES

### Mod. DO-K10/EV



Devices for generating extended KONNEX topologies: Areas and Lines.

#### TRAINING PROGRAM

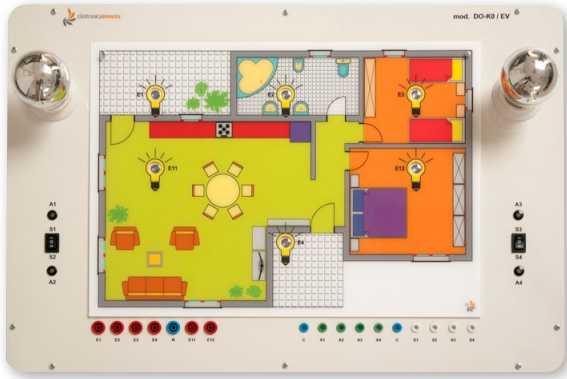
- Carrying out one or two independent Bus KNX lines (1 or 2 workstations)
- Studying and applying Area-Line couplers (BC Backbone Coupler and LC Line Coupler)
- Carrying out and study an area with 2 KNX lines (the basic module DO-K/EV module is required to generate the main line)



230 V~ (Generates up to 2 independent Bus KNX lines)

# HOME AUTOMATION APPLICATIONS

## Mod. DO-K0/EV



### TRAINING PROGRAM

Practical exercises (in combination with module DO-K1/EV) for assembling the realistic lighting installation of:

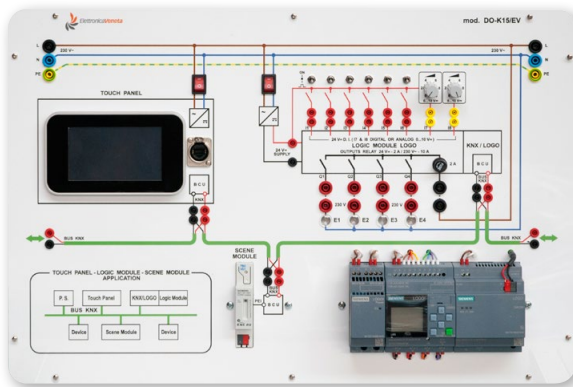
- an apartment
- a shop
- an office area
- a hotel room
- a clinic
- other typologies of spaces designed by students



230 V~ and Bus Line, coming from DO-K1/EV

# INTELLIGENT CONTROLLERS IN KNX SYSTEMS

## Mod. DO-K15/EV



### TRAINING PROGRAM

- All the basic training explained in module DO-K1/EV
- Studying and applying control devices with Touch Panel, configuring pages for : control of On/Off and Dimming lighting, control of rolling shutters, monitoring of temperatures, control of loads / energy monitoring, realization of home automation scenarios
- Studying and applying a logic module:
  - to write and test systems controlled by programmable logic, for instance, for gate automation, garden watering systems, greenhouse control, switching lights on in sequence
  - to make the KNX system interact with an industrial installation controlled by PLC; to manage the process controlled by programmable logic by commands connected to the KNX bus
- Applying scenario modules of home automation



230 V~ and Bus Line, coming from DO-K1/EV

## NOTES



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