eelectron

BO12F01KNX	**Universal DIN Module 12 OUT Plus**
BO12F01KNX - SD	**Universal DIN Module 12 OUT Plus with SD-CARD**
IO12F01KNX	**Universal DIN Module 12 IN / 12 OUT Plus**
IO12F01KNX - SD	**Universal DIN Module 12 IN / 12 OUT Plus with SD-CARD**
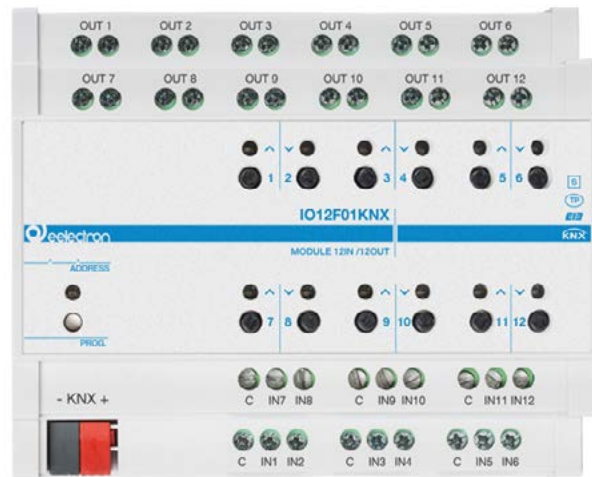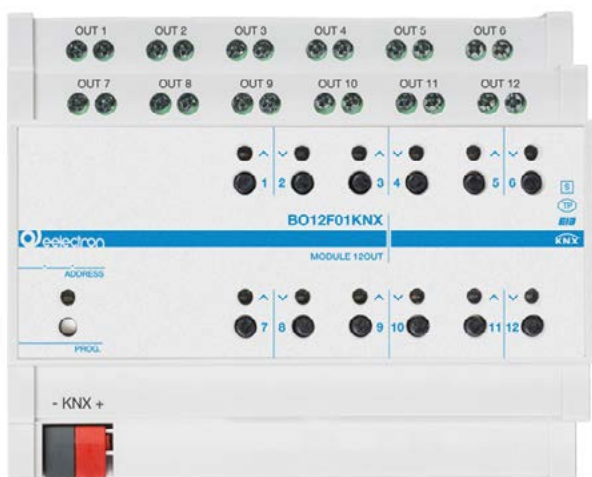
USER MANUAL

Translation of the original instructions

Version: **1.0**

Date: **14/06/2023**

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VERSION	DATE	CHANGES
1.0	14/06/2023	-

Any information inside this manual can be changed without advice.

This handbook can be download freely from the website:
www.eelectron.com

Exclusion of liability:
Despite checking that the contents of this document match the hardware and software, deviations cannot be completely excluded. We therefore cannot accept any liability for this.
Any necessary corrections will be incorporated into newer versions of this manual.

Symbol for relevant information

Symbol for warning

DISPOSAL : The crossed-out bin symbol on the equipment or packaging means the product must not be included with other general waste at the end of its working life. The user must take the worn product to a sorted waste centre, or return it to the retailer when purchasing a new one. An efficient sorted waste collection for the environmentally friendly disposal of the used device, or its subsequent recycling, helps avoid the potential negative effects on the environment and people's health, and encourages the re-use and/or recycling of the construction materials.

1. General introduction

This manual is intended for use by KNX® installers and describes functions and parameters of DIN modules "F" series with 12 channels and how you can change settings and configurations using the ETS software tool.
The BO12F01KNX and IO12F01KNX devices are EIB / KNX DIN rail actuators with 24 16A-230V AC relay outputs.

2. Products overview

BO12F01KNX and **IO12F01KNX** are designed to be installed in Home and Building installations (for ex. offices, hotels, private houses).

Main functions of outputs

The outputs can be configured as:

- 12 outputs for light / load control
- 12 channels for PWM valves (solenoid actuators)
- 6 channels for roller shutter / venetian control
- 6 channels for 3-point valve control
- 3 fan coil actuators 2 pipes / 2 fan coil actuators, 4 pipes

It is also possible to combine 2 or 3 relays with logic interlock for 4-pipe / 3-speed fan coil control or combine groups of relays (up to 6) for special function using logic interlock.

Inputs

The device **IO12F01KNX** also includes **12 inputs** that can be connected to pushbuttons, switches, or be configured as outputs to activate individual signalling LEDs (eelectron code LD00A-01ACC / LD00A11ACC) and can be used for **on / off, dimming, shutters or venetian blinds / scenarios, sequences, step-by-step commands**, etc. 4 inputs (of the 12) are configurable as analogue for the connection of NTC temperature probes (see probes eelectron code TS00A01ACC / TS00B01ACC) with which to send 4 temperature measurements on the bus and manage a simple on / off controls (e.g. thermo furniture).
It is also possible to enable **3 complete thermostat modules** combined with inputs 1, 2 and 7.
Input 2 can be enabled as a thermostat if inputs 3 ÷ 6 are not used; each thermostat module manages 2 stages with integrated PI controller for driving heating and cooling equipment.

3. Installation instructions

The device can be used for permanent internal installations in dry places and is intended for DIN rail mounting in LV distribution cabinets.

⚠ **WARNING**

- Device must be installed at a minimum distance of 4 mm

between electrical power line (mains) and input cables or red / black bus cable.
- The device must not be connected to 230V cables
- The device must be mounted and commissioned by an authorized installer.
- The applicable safety and accident prevention regulations must be observed
- The device must not be opened. Any faulty devices should be returned to manufacturer
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.
- KNX bus allows you to remotely send commands to the system actuators. Do not lead to hazardous situations, and that the user always has a warning about which commands can be activated remotely.
- Relays are always switched on before delivering but, it is possible they get closed during transportation. It is recommended, when device is installed. To connect and supply the bus before the load voltage to ensure the opening of the contacts.
- Before programming the device using ETS, the output channels are configured for shutter management in order to avoid improper control of this type of load. The frontal button is configured to switch the relay with logical interlock.

4. SD CARD

The devices whose code is marked by the extension SD include a microSD card reader with which you can save the programming of the device to be able to restore it on an identical device in order to avoid programming in field or to allow a fast restore in case of failure. To manage the SD card, a button and a led are present on the device.

SAVING CONFIGURATION ON microSD CARD
During operation, device saves the configuration at each change (ETS download) if the card is present and recognized.

IDENTIFICATION OF microSD CARD AND FIRST SAVING
With the device disconnected from the bus, insert the microSD card and press the button; connect the bus, when the LED is on steady, keep pressing the button for at least 5 seconds to start copying the configuration on the microSD card. During the copy the led will flash quickly, at the end, if procedure ends successfully, the LED will remain on steady. Any previously saved data will be overwritten.

RESTORE CONFIGURATION FROM MicroSD CARD
With the led on steady, press the button for a long time (> 5 seconds) to start the restore; during operation led will flash quickly, then it return to the on steady state to signal that the restore was successful.

LED SIGNALS

Led	Description
Led OFF	microSD CARD not present
Led ON steady	microSD CARD ok – backup executed after ETS download
2 flashes every 2 s	reading or writing of microSD CARD failed
3 flashes every 2 s	microSD CARD not initialized
4 flashes every 2 s	microSD CARD microSD CARD belongs to another device model

Once the configuration of the system is finished, it is suggested to remove the microSD card from the device, mark it with the physical address and keep it in a safe place in order to use it in case of replacement of the device to reprogram the new one,

The microSD card must be inserted into the device before any update or modification with ETS to save the new downloaded configuration.

5. General parameters

KNX PARAMETER	SETTINGS
Delay on Power up	3 ÷ 15 seconds

Through this parameter is possible to set the delay of transmission of telegrams after a power on by selecting the time by which the device is allowed to send telegrams.
In large systems after a power failure or shutdown this delay avoids to generate excessive traffic on the bus, causing slow performance or a transmission block.
If there are different devices requiring sending telegrams on the bus after a reset, these delays must be programmed to prevent traffic congestion during the initialization phase.
The input detection and the values of objects are updated at the end of the transmission delay time
At the end of ETS programming the device behaves like after a power on.

Local buttons	disabled/enabled

If this parameter is enabled, it is possible to activate the local relays by pressing the corresponding keys according to the configuration of the relays (single, shutters, fan coils, etc).

The following parameters impact the consumption of the device on the bus. The highest consumption is found at power on (bus power on) and after relay switching; it is suggested to set a configuration that reduces the peak absorptions by limiting the high consumption to only devices on which it is strictly necessary to have simultaneous switching or to have immediate operation at power-up.

Lower level: **Permitted simoultaneous relay commutation**	1 .. 12
Upper level: **Permitted simoultaneous relay commutation**	1 .. 12

Defines the maximum number of relays that can be switched simultaneously.

Relay charge priority	equal priority lower level is faster upper level is faster

Defines which level of outputs has the priority in the relay management

Maximum BUS current consumption after relay commutation	10mA .. 30mA

Defines the maximum current consumption from bus allowed for the device at power up or after relay switching; consider this parameter in designing the KNX lines.

Economy mode: switch off leds after inactivity	Never switch OFF; 1 .. 15 min.

It defines the behaviour of the front leds, it is possible to set them to turn off after a few minutes when no manual action is performed on the local buttons.

6. Outputs

Each 6-relay block can be set to manage different combinations by defining Functional Blocks.
It is possible to use the device as 3 fancoils 2 pipes 3 speed by setting the parameter in ETS.

3 FANCOIL 2 PIPES 3 SPEED	FUNCTIONAL BLOCKS					
OUT 1	**OUT 2**	**OUT 3**	**OUT 4**	**OUT 5**	**OUT 6**
D1 VALVE	D1 SPEED 1	D1 SPEED 2	D1 SPEED 3	D2 VALVE	D2 SPEED 1
OUT 7	**OUT 8**	**OUT 9**	**OUT 10**	**OUT 11**	**OUT 12**
D3 VALVE	D3 SPEED 1	D3 SPEED 2	D3 SPEED 3	D2 SPEED 2	D2 SPEED 3

Functional blocks description

Relays can be used individually or in combination with other relays to obtain more functions, the blocks are called A - B - C - D - E - F , each block can perform one of the following functions>.

Block	Relays	Description
A	1	Single Relay
		Electric valve
B	2	Shutter / Venetian
		Interlock 2 relays
		Servomotors
		Fancoil 1 speed 1 valve (2 pipes)
C	3	Fancoil 2 speeds 1 valve (2 pipes)
		Fancoil 1 speed 2 valves (4 pipes)
		Shutter with 3 contacts/limit switch
		Interlock 3 relays
D	4	Fancoil 3 speeds 1 valves (2 pipes)
		Fancoil 2 speeds 2 valves (4 pipes)
E	5	Interlock 5 relays
F	6	Interlock 6 relays

Block A – 1 Relay

Block A identifies the functions related to 1 relays which are:

Single relay (generic load)
Please refer to the "Single relay and Relays with interlock" user manual.

Electric valve

Please refer to the "Electric valve and Servomotors" user manual.

Single relay – general parameters

Please refer to the "Single relay and Relays with interlock" user manual.

Block B – 2 Relays

Block B identifies the functions linked to 2 coupled relays which are:

Shutters / Venetian blinds

Please refer to the "Shutters and Shutter 3 contacts" user manual.

Servomotors

Please refer to the "Electric valve and Servomotors" user manual.

Interlock 2 relays

Please refer to the "Single relay and Relays with interlock" user manual.

Fancoil 1 speed 2 pipes (1 valve)

Please refer to the "Fan coil management" user manual.

Block C – 3 Relays

Block C identifies the functions related to 3 coupled relays that are:

Shutter/Venetians with 3 contacts

Please refer to the "Shutters and Shutter 3 contacts" user manual.

Interlock 3 relays

Please refer to the "Single relay and Relays with interlock" user manual.

Fancoil 1 speed 4 pipes (2 valves)

Please refer to the "Fan coil management" user manual.

Fancoil 2 speed 2 pipes (1 valve)

Please refer to the "Fan coil management" user manual.

Block D – 4 Relays

Block D identifies the functions related to 4 coupled relays that are:

Interlock 4 relays

Please refer to the "Single relay and Relays with interlock" user manual.

Fancoil 2 speed 4 pipes (2 valves)

Please refer to the "Fan coil management" user manual.

Fancoil 3 speed 2 pipes (1 valve)

Please refer to the "Fan coil management" user manual.

Block E – 5 Relays

Block E identifies the functions related to 5 coupled relays that are:

Interlock 5 relays

Please refer to the "Single relay and Relays with interlock" user manual.

Fancoil 3 speed 4 pipes (2 valves)

Please refer to the "Fan coil management" user manual.

Block F – 6 Relays

Block F identifies the functions related to 6 coupled relays that are:

Interlock 6 relays

Please refer to the "Single relay and Relays with interlock" user manual.

7. Digital input

Please refer to the "Digital input" user manual.

In this device the functions "Input with Eol resistor" and " Counter Input" are not available.

8. Thermostat

Please refer to the "Thermostat and additional probe" user manual.

9. Global Objects

The following communication objects are available for global functions:

OBJECTS RELATED TO ALL OUTPUTS

"<Global All> All Valve Closed"	1 bit	CRT

It is an object connected to the outputs that manage the valves and consequently the following blocks:

A	Electric valves
B	Servomotors
B	Fancoil 1 speed 1 valve
C	Fancoil 2 speeds 1 valve
C	Fancoil 1 speed 2 valves
D	Fancoil 3 speeds 1 valve
D	Fancoil 2 speeds 2 valves
E	Fancoil 3 speeds 2 valves

Each time a block of the type listed above is configured, it is possible to relate it to the "All Valve Closed" function. This object considers the status of the valves and sends the value 1 if at least one valve is open and the value 0 if all are closed. In this way it is possible to give consent to the pump that supplies the hydraulic circuit.

"<Global All> Lock"	1 bit	CW

This object can be used to manage the block function for multiple outputs and then to subordinate the different blocks to this global function

"<Global All> Scene"	1 Byte	CW

Object used to manage the scenarios for multiple outputs then going to subordinate the different blocks to this global function

"Global All> Dyn Scene"	1 bit	CW

Object used to enable / disable dynamic scenarios

"Global All> Heat / Cool"	1 bit	CW

Object used to communicate to the actuator the status of the HVAC system to manage automatic behaviour on the shutters or on the valves and fan coil speeds.

OBJECTS RELATED TO SINGLE RELAY

"<Global Single> Command"	1 bit	CW

Object used to manage global On / Off commands on single relays; in the parameters it is possible to associate the received telegram on this object to the logic function (if enabled) or to the command.

OBJECTS RELATED TO SHUTTERS

"<Global Shutter> Up/down"	1 bit	CW

Global up / down control for shutters / venetians

"<Global Shutter> Shutter %"	1 Byte	CW

Global command position % for shutters / venetians

"<Global Shutter> Louvre %"	1 Byte	CW

Global command louvres position % for venetians

"<Global Shutter> Alarm 1"	1 bit	CW

Global alarm priority 1 for shutters / venetians

"Global Shutter> Alarm 2"	1 bit	CW

Global alarm priority 2 for shutters / venetians

"Global Shutter> Alarm 3"	1 bit	CW

Global alarm priority 3 for shutters / venetians

10. Wrong application download

If the wrong ETS application is downloaded then KNX/EIB led starts blinking and device is not operative on the bus. A power reset must be done or the correct ETS application must be downloaded.