

TC28A01KNX Universal Fancoil Controller 3 x 0-10 V - 2 IN - 5 OUT



USER MANUAL

Translation of the original instructions

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VERSION	DATE	CHANGES
1.0	30/06/2026	-

Any information in this manual is subject to change without notice.

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 reuse and/or recycling of the construction materials.



1. Introduction

This manual is intended for use by KNX® installers and describes the functions and parameters of the DIN **TC28A01KNX** module, also explaining how to change the settings and configurations through the ETS® software tool.

For the further technical data of the device and the compatible accessories, please refer to the datasheet of the device itself.

Meaning of the symbols used



WARNING - The operation or phase described must be carried out in compliance with the instructions provided and with the safety standards.



IMPORTANT NOTE - Details and specifications to be respected for the correct functioning of the device.

2. Product overview

The **TC28A01KNX** device is an EIB/KNX® secure DIN rail actuator for controlling fan coil units. The device features 3 x 0-10 V outputs and 5 x 16 A relays, all freely configurable.

In a typical application, two 0-10 V outputs can be dedicated to the management of proportional valves, while speed management can be achieved via the third 0-10 V output or with the on-board relays. If the relays are not used for speed or valve control, they can activate lights or other loads.

Additionally, there are 2 digital inputs for dry contact, for connecting push buttons, window contacts, or alarms. These 2 inputs can also be configured as analog inputs for connecting NTC temperature probes (Eelectron codes TS01A01ACC, TS01B01ACC, TS01C01ACC and TS01D01ACC).

The first input is alternatively configurable as a “Plugin Sensor” for connecting SM03E03ACC plug-in sensors, which include a temperature, humidity, CO₂, and VOC sensor, or SM03E02ACC, which includes a temperature, VOC, and equivalent CO₂ (eCO₂) sensor.

The device integrates 2 two-stage thermostats with an integrated PI controller for driving heating, cooling, valve, 6-way valve, 2-pipe, and 4-pipe fan coil equipment.

FUNCTION	N°
Outputs Relay 16 A	5
Output 0-10 V	3
Input digital or analogic for NTC probe*	2
Thermostat (control loop)	2
Logic functions	8
Virtual Holder logic	1
*the first input is configurable as a Plug-In Sensor	

The “climatic curve” function is also available, which allows the supply temperature of the heating system to be adjusted based on external conditions, optimizing comfort and reducing energy consumption.

The device features 8 logic blocks that can be used to create simple expressions with logical or threshold operators, or complex expressions with conditional algebraic operators, and to use predefined algorithms such as proportional temperature and humidity controls or dew point calculation.

The device also integrates the “Virtual Holder Logic”; its application field is the hotel room: accurate presence information is managed through a magnetic sensor installed on the door and connected to a digital input. The presence detection solution can deduce the presence of people in the room using one or more dedicated sensors. It also detects unexpected presence and is able to differentiate various behaviors.

The device is configurable via the ETS® application program and can communicate using the KNX Data Secure protocol. The KNX communication interface is included, and it is intended for installation on a DIN rail in low voltage distribution electrical panels.

3. Installation warnings

The device can be used for permanent indoor installations in dry places and is intended for mounting on DIN bar in LV distribution switchboards.

Installer Test

The following procedure allows to verify the correct connection of the 5 relay outputs and the outputs A1, A2 and A3 (0-10 V)

TEST START

with the device powered press the EIB/KNX button, the related red LED lights up press the EIB/KNX button again for 10 seconds; the device enters the test phase

EXECUTION OF THE TEST

The EIB / KNX LED indicates the test phase with a flash, each phase corresponds to a specific state of the outputs; to move on to each subsequent phase, press the EIB/KNX button.

PHASE	K1	K2	K3	R1	R2	A1	A2	A3
1	Closed	Open	Open	Open	Open	0 V	0 V	0 V
2	Open	Closed	Open	Open	Open	0 V	0 V	0 V
3	Open	Open	Closed	Open	Open	0 V	0 V	0 V
4	Open	Open	Open	Closed	Open	0 V	0 V	0 V
5	Open	Open	Open	Open	Closed	0 V	0 V	0 V
6	Open	Open	Open	Open	Open	10 V	0 V	0 V
7	Open	Open	Open	Open	Open	0 V	10 V	0 V
8	Open	Open	Open	Open	Open	0 V	0 V	10 V

TEST END

In phase 8 press the EIB/KNX button. The EIB/KNX LED will flash quickly to indicate the end of the test.



WARNING

- The device must be installed maintaining a minimum distance of 4 mm between the non SELV voltage lines (>50V DC or > 25 VAC) and the cables connected to the EIB/KNX bus and to the inputs.
- The device must not be connected to live cables and never to a 230V line.
- The appliance must be installed and commissioned by a qualified installer.
- The regulations in force concerning safety and accident prevention must be observed.
- The device must not be opened. Any defective devices must be sent to the competent office.
- The design of the systems and the commissioning of the equipment must always comply with the mandatory standards and directives of the country in which the products will be used. The KNX bus allows remote commands to be sent to the system actuators. Always check that the execution of remote commands does not create dangerous situations and that the user is always notified of which commands can be activated remotely.
- The relays of the device, leaving the factory, are configured as open; the contacts may close during transportation even if the device is not powered. It is advisable, upon the first power-up, to first connect the bus in order to ensure opening of the relays and only then the voltage to the loads.
- The device must be installed in low voltage distribution panels ensuring the IP20 degree of protection by means of the dedicated covers supplied with the electrical panels.

For information visit the website www.eelectron.com

4. General parameter Configuration

The setting of the device using the ETS software tool will be described below, with the premise that the choice of one or more options will make the related functions and options available, changing the appearance of the panel and the menu items.

General Parameter Configuration

Communication objects involved:

"<General> Heartbeat"	1 Bit	CRT
"<General> Power On Event"	1 Bit	CRT

KNX PARAMETER	SETTINGS
Delay on power-up (3-15 seconds)	3 ÷ 15
With this parameter it is possible to set a delay on the transmission of telegrams following switching on or reset of the device, selecting the time beyond which the device can send telegrams. In systems with a large number of devices, this delay makes it possible to avoid a situation whereby, in the event of a power failure or shutdown, upon restart, all the devices simultaneously engage the bus, generating excessive data traffic on the bus and causing a reduction in communication performance on the system. If there are many devices that require the sending of telegrams after switching on, this delay must be programmed in order to minimise traffic peaks. The detection of inputs and the value of the communication objects are updated in accordance with the expiry of the transmission delay. At the end of programming with ETS, the device behaves as it does when switching on, applying the delay (if set).	
Heartbeat (periodic alive notification)	nothing periodic on request
The parameter allows you to notify a hierarchically superior control or supervision system of the existence / correct online activity. Notification can occur spontaneously (periodically - settable period value) or following a query (on request). The value of the 1 bit notification telegram can be set.	
Telegram value	off / on / toggle
Defines the value of the 1 bit notification telegram. The toggle value is not available for "on demand" configuration.	
Period - time unit	seconds / minutes / hours
Defines the unit of measure of the notification time interval. This parameter is not available for the "on demand" configuration.	
Period - time value	1 ÷ 255
Defines the notification interval time. This parameter is not available for the "on demand" configuration.	
Input 1	none / digital / NTC probe / plugin sensor
This parameter defines the function of input 1.	
Input 2	none / digital / NTC probe
This parameter defines the function of input 2.	
Temperature function x	temperature function disabled / temperature sensor / thermostat
This parameter defines the temperature function x: temperature sensor: threshold evaluation of temperature readings thermostat: control of complete thermostat with integrated PI controller for heating and cooling	
Analog output 1-2	individual / coupled
This parameter defines configuration for analog outputs 1 and 2; if coupled, Output A1 = heat / Output A2 = cool .	
Analog output x	disabled / enabled
This parameter defines whether analog output x is activated or not.	
Relays outputs	block 3 relays + block 2 relays 1 fancoil 3 speeds 2 pipes 1 fancoil 3 speeds 4 pipes
This parameter defines the configuration of relays. block 3 relays + block 2 relays there are 2 groups of relays freely configurable 1 fancoil 3 speeds 2 pipes output R1 is valve, output K1 ÷ K3 are speeds, output R2 can be set as single relay or electric valve 1 fancoil 3 speeds 4 pipes output R1 is heat valve, output R2 is cool valve, output K1 ÷ K3 are speeds	

Relays K	01: 3x1 relays 02: 1x2 relays + 1x1 relay 03: 1x1 relay + 1x2 relays 04: 1x3 relays
This parameter defines the configuration of outputs K1 ÷ K3.	
Output K <x>	single relay / electric valve
This parameter defines the function for output Kx.	
Output B <x>	shutter / interlock 2 / servomotor / 4 pipes
This parameter defines the function for coupled outputs Bx.	
Output C <x>	interlock 3 / fancoil 3 speed
This parameter defines the function for block of three outputs K1 ÷ K3.	
Relays R	01: 2x1 relays 02: 1x2 relays
This parameter defines the configuration of outputs R1 ÷ R2.	
Output R <x>	single relay / electric valve
This parameter defines the function for output Rx.	
Permitted simultaneous relay commutations	5 (no limit) / 4 / 3 / 2 / 1
This parameter defines the maximum number of relays that can be switched simultaneously.	
Climate curve	disabled / enabled
This parameter is used to activate function climater curve.	
CO2 sensor	disabled / enabled
This parameter is used to activate function CO2 sensor.	
VOC sensor	disabled / enabled
This parameter is used to activate function VOC sensor.	
Virtual holder	disabled / enabled
This parameter is used to activate function virtual holder.	

5. Global Objects

Global Objects

Communication objects involved:

"<Global All> All Valve Closed"	1 bit	CRT
"<Global All> External Valve Closed"	1 bit	CW/CWTU
"<Global All> Lock"	1 bit	CW
"<Global All> Scene"	1 byte	CW
"<Global All> Dyn Scene"	1 bit	CW
"<Global All> Heat/Cool"	1 bit	CW
"<Global Single> Command"	1 bit	CW
"<Global Shutter> Up/Down"	1 bit	CW
"<Global Shutter> Shutter %"	1 byte	CW
"<Global Shutter> Louvre %"	1 byte	CW
"<Global Shutter> Alarm 1"	1 bit	CW
"<Global Shutter> Alarm 2"	1 bit	CW
"<Global Shutter> Alarm 3"	1 bit	CW
"<Global Analog Out> Limiter"	1 bit	CW

KNX PARAMETER	SETTINGS
All Outputs	
All Valve Closed	disabled / enabled
This parameter allows to enable object "<Global All> All Valve Closed". It is an object connected to the outputs that manage the valves, i.e. the blocks: - Electric valve - Servomotor - Fancoil Each time a block of the type listed above is configured, it can be subordinated to the "All Valve Closed" function. This object considers the state of the valves and sends the value 1 if at least one valve is open and the value 0 if they are all closed. It is possible to give consent to a delivery pump that feeds the hydraulic circuit.	
External Valve Closed	disabled / enabled
Only if "All Valve Closed" is enabled, this parameter allows to enable object "<Global All> External Valve Closed". The "All Valve Closed" function can also consider the valve states on other devices. It is enough to connect the "<Global All> All Valve Closed" output object of the other device to the "<Global All> External Valve Closed" communication object, in this way it is possible to connect "in cascade" more than two devices in order to have the information "all valves are closed or not" on the last communication object output and consequently drive the hydraulic pump correctly.	
External valve is closed when receiving	telegram "0" / telegram "1"
Only if "External Valve Closed" is enabled, this parameter defines the value of the telegram to be received to consider close state.	
Request telegram at power ON	no / yes
Only if "External Valve Closed" is enabled, this parameter activates a read request of the object at power on to have a correct alignment of the data after a power down.	
Global Lock	disabled / enabled
This parameter allows to enable object "<Global All> Lock" to manage all outputs subordinated to the function.	
Global Scene	disabled / enabled
This parameter allows to enable object "<Global All> Scene" to manage all outputs subordinated to the function.	
Global Dynamic Scene	disabled / enabled
This parameter allows to enable object "<Global All> Dyn Scene" to enable/disable dynamic scenes.	
Global Heat/Cool	disabled / enabled
This parameter allows to enable object "<Global All> Heat/Cool" to communicate the device the state of the HVAC system to manage automatic behaviour on roller shutters or valves and fancoil speeds.	
Single Relay	
Global Command	disabled / enabled
This parameter allows to enable object "<Global Single> Command" to manage global ON/OFF commands on single relays; for each single relay it is possible to associate the telegram received on this object as input for logic or as command.	
Shutter and Blinds	
Global Up/Down	disabled / enabled
This parameter allows to enable object "<Global Shutter> Up/Down" to control shutters movement.	
Global Shutter %	disabled / enabled
This parameter allows to enable object "<Global Shutter> Shutter %" to control shutters percentage.	
Global Louvre %	disabled / enabled
This parameter allows to enable object "<Global Shutter> Louvre %" to control louvres percentage.	

Global Alarm <x>	disabled / enabled
This parameter allows to enable object "<Global Shutter> Alarm x" to set shutter alarm object with priority x.	
Analog Output	
Global Limiter	disabled / enabled
This parameter allows to enable object "<Global Analog Out> Limiter" for analog outputs set as simple. Upon receipt of the values "0" or "1" on the object, the output adopts limiter 1 or limiter 2.	

6. Inputs

The inputs IN1 and IN2 can be configured as follows:

IN1: digital, NTC probe, plugin sensor

IN2: digital, NTC probe

Digital Input:

This input is designed for connecting a dry contact, such as a traditional wall push-button or a magnetic switch (e.g. window contact).

Please refer to the "[Digital Input](#)" user manual.

NTC Probe Input:

This is an analog input to which an NTC temperature probe is connected allowing temperature measure.

The following accessories with Eelectron code must be used for the NTC temperature probe:

TS01A01ACC (from -20°C to +100°C)

TS01B01ACC (from -50°C to +60°C)

TS01C01ACC (from -40°C to +105°C)

TS01D01ACC (from -5°C to +45°C)

It is also possible to use a custom probe with different characteristic curve.

Please refer to the "[NTC Probe](#)" user manual.

Plugin Sensor Input:

Plugin sensor allows to collect environmental data from specific probes, see eelectron codes SM03E03ACC and SM03E02ACC.

SM03E03ACC: temperature, humidity, CO₂, VOC (Volatile Organic Compounds)

SM03E02ACC: temperature, CO₂, VOC

Please refer to the "[Plugin Sensor](#)" user manual.

7. Temperature Function <x>

Please refer to the "[Thermostat](#)" user manual.

8. Analog Output

Please refer to the "[Analog Output](#)" user manual.

9. Relay

Please refer to the "[Single Relay and Relays with Interlock](#)" user manual.

Please refer to the "[Electric Valve and Servomotors](#)" user manual.

Please refer to the "[Shutters and Shutter 3 contacts](#)" user manual.

Please refer to the "[Fan Coil Management](#)" user manual.

10. Logics

Please refer to the "[Logics](#)" user manual.

 In the devices described, the logical expression can have a maximum of 32 characters.

11. Humidistat

Please refer to the "[Humidistat](#)" user manual.

12. Climate Curve

Please refer to the "[Climate Curve](#)" user manual.

13. CO2/VOC Sensor

Please refer to the "[CO2 and VOC Sensor](#)" user manual.

14. Virtual Holder

Please refer to the "[Virtual Holder](#)" user manual.

15. Behaviour on bus failure, recovery and download

Behaviour on bus voltage failure

On failure of bus voltage no actions are executed by the device; behaviour of controlled actuators must be set using their own parameters.

Behaviour on bus voltage recovery

On bus voltage recovery all the communication objects are set to 0 except for objects for which a parameter is defined for the initial value; thermostat keeps these values in memory and restore them after recovery:

- Heat / Cool mode
- HVAC Mode

- Base Setpoint
- Setpoint Adjustment
- Force value in manual mode
- Ventilation

Control values (i.e. commands to actuators) are calculated using actual setpoint and temperature.



After power on device recalculates the commands to actuators and switch them on, if necessary, otherwise does not carry out any action; you are recommended to set the behaviour of actuator in order to switch the heating / cooling equipment off after bus power on.

Behaviour on ETS Download

After download it's possible to set initial value of:

- Heat / Cool mode
- HVAC Mode
- Ventilation

For other communications objects the behaviour is identical to bus voltage recovery.

16. 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.