KNX Universal Interface 1K.04 and 1K.02

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1 Introduction

This manual is intended for use by KNX® installers and describes functions and parameters of the 1K029030 KNX and 1K049030 KNX modules and how you can change settings and configurations using the ETS software tool.

The 1K029030 KNX and 1K049030 KNX devices are back-flush modules with 2 4 inputs and 2 4 LED outputs. The inputs are for clean contacts (free from potential); the outputs can drive low voltage LEDs.

The 1K029030 KNX and 1K049030 KNX modules are designed for use in domestic and building installations (eg. offices, hotels, private homes, etc.).

2 Product Overview

2.1 Main input functions

Digital inputs can be connected to buttons or switches and can be used for:

- 1-bit commands: loads activation / deactivation commands (ON / OFF / TOGGLE) with short pressure or with long and short pressure differentiation.
- 1-byte commands (0…255 or HVAC commands or % value commands).
- Sending long action telegrams to the same short action address or to a different group address.
- Commands for cyclic sending.
- Sequences (3 commands that mix 1-bit / 1-byte objects) with different group addresses - in short and long press mode or in switching mode.
- Dimmer management (with single button or with double button).
- Roller shutters and blinds management (with single button or with double button).
- Control sequences with 1 bit to manage switching on / off lights or rows of lights.
- Input counter.

2.2 Logic functions

- 2 input object and 1 output object for every logic.
- Delay, retransmission of telegrams.
- NOT / AND / OR / NAND / NOR / XOR / XNOR.
- Bit to Byte conversion.
- Byte to Bit conversion.
- 1 2 4 Bytes Threshold.

3 Installation instructions

The device may be used for permanent indoor installations in dry locations within wall box mounts.

⚠ WARNING

- Device must be installed keeping 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 prevailing safety rules must be heeded.
- 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. Always make sure that the execution of remote commands do not lead to hazardous situations, and that the user always has a warning about which commands can be activated remotely.

4 General parameters

4.1 PAR_ Delay on Power-up (5...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.

5 Digital Inputs

Each individual input can be configured to perform one of the following functions:

- Activation on press
- Activation on press / release
- Activation on short and long press
- Dimming
- Shutter and blinds
- Scene
- Command sequences (short and long press)
- Command sequences (toggle function)
- Command sequences 1 bit
- Input counter (pulse counter)

5.1   Activation on press

"Activation on press" allows you to configure the sending of telegrams when the button is pressed; device can also be configured to send periodic messages with repetition period.

Configurations for 1-bit object:
- On
- Off
- Toggle

Configurations for 1-byte object:
- Valori 0…255 (generic signed int)
- Valori 0…100% (scaling value in 5% steps)
- HVAC Mode (DPT_HVACMode 20.102)

5.1.1 Cyclic sending when button pressed

As long as the button is pressed, the telegram with selected size and value is sent cyclically. This parameter defines the time interval between two sendings.

5.2   Activation on press/release

"Activation on press / release " allows you to configure the sending of telegrams when the button is pressed and when it is released.

Parameters are identical to the choice "activation on press"; one parameter is added:

5.2.1 Communication object on release

If enabled, this parameter displays an additional communication object DPT_<Button x> Release Action that is transmitted on the release event, this object can be associated with a group address other than the one that sends the value associated with the pressure.

5.3   Activation on short and long press

The different duration between short and long press is defined by the parameter "Minimum time long press button".

You can set to send a telegram with different values on short and long press or decide to send commands only on one of these events.

When button is pressed then counting time starts. If the button is released before time exceeds TPL time, device executes the command associated with the event of "short press" and if, on the contrary, TPL timeout expires and button is still pressed then the command associated with the event of "long press" is executed.

The parameters and mode of transmission of telegrams can be managed through "activation on long and short press" are the same set with the configuration "Activation of press/release " except for the function of cyclic sending that is not provided here.

5.4   Dimming

Through the dimming function it's possible to control a light dimmer using short and long press of the buttons.

Each button uses 2 communication objects:

- 1-bit dimension for ON /OFF command associated to short press operation.
- 3-bit dimension for brightness regulation associated to long press operation.

Parameter **PAR_Minimum time long press button** can set the minimum duration of long press. **PAR_Dimming mode** and **PAR_Dimming step** can define brighter or darker behaviour and step of each long press action.

5.5   Shutter and Blinds

Through the Shutter and Blind function, it's possible to control Roller Shutters or Blinds using short and long press of the buttons.

Each input uses 2 communication objects:

- 1-bit dimension for STEP /STOP command associated to short press operation.
- 1-bit dimension for UP / DOWN command associated to long press operation.

Parameter **PAR_Minimum time long press button** can set the minimum duration of long press. **PAR_Command drive shutter** can define up or down behaviour associated to long press action.

5.6   Scene

In this configuration page it's possible to set the button for scene management: learn and recall scene commands.

These different behaviour (recall and learn) are performed through two different actions (short and long press) of the button.

Learn scene on long press action is enabled by a parameter. **PAR_Minimum time long press button** can set the minimum duration of long press.

5.6.1 Scene Number (1…64)

This parameter sets the value of the scene you intend to learn / recall (one per channel).

Remember that output devices (i.e. actuators, etc.) generally can manage several scenes, each identified by a value (that varies from 0 to 63); therefore is important to set this parameter correctly and matching the number set on the actuators.

5.6.2 Store scene on long press

If disable, long press action is ignored and no telegram is sent to the bus; if enable on long press action a learn scene telegram is sent to the bus.

5.6.3 Object enable scene learning from bus

If this parameter is enabled you have a communication object (size = 1 bit) in order to enable/disable runtime from bus the sending of the **DPT_Learn scene telegram**.

When this object receives a telegram "1" then the function associated to the long press of the button (send the telegram storage scenario) is enabled, when it receives a telegram "0" the command associated with the long press is not sent.

5.7   Commands sequences

This function allows you to associate to short and long press, sequences of different commands on the bus.

For each button this function is available for short and long press or as toggle function.

The sequence consists of 2 or 3 commands which can each be sized as 1 bit or 1 byte.

Once defined the number of elements in the sequence (2 or 3) and their size (1-bit / 1 byte), you can associate different commands to each element of the sequence or decide to send commands only on one of the two events.

The waiting time between a command and the next is fixed in 1 second.

Each object communication can be connected to a different group address.

5.8 Command Sequences (1 bit)

This function allows you to send sequences of 1-bit commands to multiple objects. The sequence can be defined on 2 or 3 objects. Each time the switch/button connected to the input is pressed, the next step of the defined sequence is sent.

5.8.1 Number of objects

This parameter defines the number of 1-bit objects that will be visible and will send values 0 or 1 on the bus. The available datapoints could be two or three.

5.8.2 Number of steps in the sequence (2…8)

Indicates the number of steps of which the sequence is made up.

5.8.3 Long press to restart sequence

Allows to associate to a long pressure of the switch/button connected to input channel an action of "restart" of the sequence.

5.8.4 Restart Function

5.8.4.1 Restart and send first
The long press determines the sending of step 1.

5.8.4.2 Send long step and restart
The long press determines the sending of the next step and brings the sequence to the initial step.

5.8.5 Send only changed objects

This parameter defines whether, in the transition from one step to the next, all values associated with single-bit objects or only those that change are to be sent.

5.8.6 Value step <X>

Determines the combination associated with a sequence using 2 or 3 1-bit objects.

5.9 Input counter (pulse counter)

Using the Input Counter function, it is possible to count the pulses of a contact connected to the input. It is possible to define the size of the counter (1 2 or 4 Bytes), the initial value and the final value. It is possible to associate the sending of a value with 1 bit or 1 byte each time the counter reaches the final value (overflow). the counter can be reset by a writing on a dedicated 1-bit object.
Using the **PAR_Condition of increase counter** parameter, you choose whether to count only the rising, falling or both edges.
The **PAR_Software filter frequency** allows to manage a software filter that allows to count 2 pulses too close each other as a single impulse; this is necessary when the contact connected to the input has a debounce for a certain time.

6 LED output

Each output can be connected to a LED and configurated as:

- Always OFF: Default setting.
- Always ON: LED is always ON.
- Piloted by BUS: LED is lit ON or OFF upon the telegram receive from bus. Initial state and led behaviour (fixed or blink) can be configured.

7 Logics

The logic functions are organized into groups of 3 objects: 2 inputs and 1 output, **except the one called "logic expression" that will be described later. The scheme of logics is as follows**.

7.1 Inputs

Input datatypes can be bit, byte, float etc according to the selected logic.
Input 1 is always present. Input 2 maybe unused (or hidden directly by ETS).

7.2 Delay

The logic output can be delayed according to the ETS parameter, if a new value is received, the output is overwritten and the delay reset.

7.3 Cyclic

The delayed output can be retransmitted n times according to ETS parameters.

7.4 Logic function

Logic function type is defined by an ETS parameter.
Here the list of functions:

- <u>Disabled</u>: default value, logic gate disabled.
- <u>Bit no transfer function</u>: bit delay and retransmission.
- <u>Byte no transfer function</u>: byte delay and retransmission.
- <u>NOT</u>: NOT logic gate.
- <u>AND</u>: AND logic gate.
- <u>OR</u>: OR logic gate.
- <u>NAND</u>: NAND logic gate.
- <u>NOR</u>: NOR logic gate.
- <u>XOR</u>: XOR logic gate.
- <u>XNOR</u>: XNOR logic gate.
- <u>Bit to byte conversion</u>: an input bit is associated to an output byte.
- <u>Byte to bit conversion</u>: an input byte is associated to an output bit.
- <u>Byte threshold</u>: setting a threshold value, depending on parametrization, an input is read then a boolean output if bigger or smaller than threshold.
- <u>2 byte float threshold</u>: setting a threshold value, depending on parametrization, an input is read then a boolean output if bigger or smaller than threshold.
- <u>4 byte float threshold</u>: setting a threshold value, depending on parametrization, an input is read then a boolean output if bigger or smaller than threshold.