

Operation and installation manual KNX IO 520 (1J2I)

(Art. # 5225)

Blind actuator with two binary inputs



KNX IO 520 (1J2I)

Application

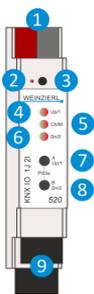
The KNX IO 520 (1J2I) is a compact blind actuator with two additional binary inputs. The actuator is used to control a blind, a shutter or a window drive. The relay contacts are electrically interlocked.

The inputs can be connected to conventional switches with an external voltage of 12 to 230 V. In the not configured state the binary inputs control the actuator channel. Via commissioning the device using ETS® software the binary inputs can be used independently.

Two push buttons and three LEDs allow a local operation and a visualization of the device state. In addition to the output and input channels the device includes 16 independent functions for logic or timer control.

1. Installation and Connection

The KNX IO 520 (1J2I) is designed for installation on a DIN rail (35 mm) with a width of 1 unit (18 mm). An installation-friendly design with pluggable screw terminals helps to reduce the cost of commissioning. It features the following controls and displays:



- 1 KNX bus connector
- 2 Programming LED
- 3 Button f. programming mode
- 4 LED Up/1 (multicolor)
- 5 LED Ch/M (multicolor)
- 6 LED Dn/2 (multicolor)
- 7 Button A (Up/1)
- 8 Button B (Dn/2)
- 9 Pluggable screw terminals

This device is powered by the KNX bus. An external power supply is not necessary.



The device is not working without bus power.

A. KNX Programming mode

The KNX programming mode is de-/activated either by pressing the flushed KNX programming button 3 or by simultaneously pressing the buttons 7 and 8. Accessing the programming mode via the device front buttons can be enabled / disabled via the ETS® by changing the value of *Prog. mode on device front*.

When the programming mode is active, the programming LED 2 and LED Ch/M 5 light red.

B. Manual operation and status display

The LED Ch/M 5 lights up or flashes if the device is powered by the KNX bus.

Default Channel

The default channel is channel A, the blind actuator. Here LED 4 lights up green if the upward relay is active and LED 6 lights up green for the downward relay.

By pressing button A 7 long, the manual operation mode will be entered for channel (A), the blind actuator. This is indicated by cyclic single flashing of LED Ch/M 5 in orange.

By pressing button B 8 long, the manual operation mode will be entered for channel (B), the binary inputs. This is indicated by cyclic double flashing of LED Ch/M 5 in orange.

Blind actuator (channel A)

The LED 4 lights up green if the upward relay is active and LED 6 lights up green for the downward relay.

Pressing the button 7 shortly steps / stops the blind actuator upward, and pressing it long starts an upward movement. Button 8 works similar for downward movement and step / stop.

Binary input (channel B)

The LED 4 lights up green if the input 1 is active and LED 6 lights up green for the input 2.

Pressing the button 7 "simulates" a signal on input 1 and pressing button 8 does the same for input 2.

The manual operation mode can be exit by pressing the buttons (Esc) 7 und 8 simultaneously.

Summary of the states of LED Ch/M 5:

LED Status	Meaning
LED lights green	Device is working in standard operation mode.
LED lights red	Programming mode is active.
LED flashes 1x orange	Programming mode is not active. Manual operation mode for channel A (blind actuator) is active.
LED flashes 2x orange	Programming mode is not active. Manual operation mode for channel B (binary inputs) is active.
LED blinks red	Programming mode is not active. Manual operation is not active. The device is not properly loaded e.g. after an interrupted download.
LED blinks green	The device is currently loaded by the ETS.

2. Ex-factory behavior

Ex-factory the binary inputs are directly connected to the actuator. Impulses to the binary input B1 induce upward movement, impulses to the input B2 cause downward movement.

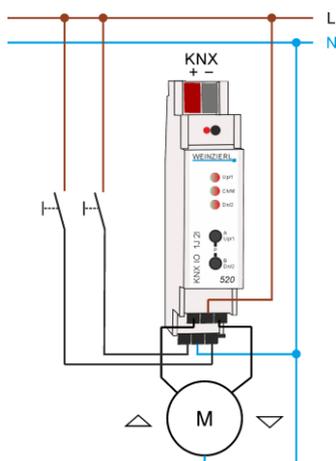
This complies with the parameter setting *Blind / Shutter DEVICE INTERNAL Up* for B1 and *Blind / Shutter DEVICE INTERNAL Down* for B2.

3. Reset to factory device settings

It is possible to reset the device to its factory settings:

- Disconnect the KNX Bus connector 1 from device
- Press the KNX programming button 3 and keep it pressed
- Reconnect the KNX Bus connector 1 of device
- Keep the KNX programming button 3 pressed for at least another 6 seconds
- A short flashing of all LEDs (2 4 5 6) visualizes the successful reset of the device to factory default settings

4. Wiring scheme



Ch A Up	Ch A Cm	Ch A Dn
Ch B In 1	Ch B Cm	Ch A In 2



Unless explicitly stated by the manufacturer of the drive, no motors may be directly parallel connected to a shutter actuator. Those drives must be electrically separated by using relays for decoupling.

C. Pluggable screw terminals

Top connector

The top connector links to the drive actuator. On Cm (common), the middle pin, the supply voltage for the drive has to be connected. On the left the cable for upward movement and on the right for downward movement have to be hooked up.

Bottom connector

The middle pin of the bottom connector shall be connected to the common wire (neutral for 230V AC and GND for DC). The left and right pin shall be connected to the corresponding switches / push buttons.

5. ETS database

The ETS database (for ETS 4.2 and ETS 5) can be downloaded from the product website of the KNX IO 520 (1J2I) (www.weinzierl.de) or via the KNX online catalogue.

ETS parameter dialog

The following parameters can be set using the ETS.

D. Description

The first page shows general information about the device.

General settings

Device name (30 characters)

An arbitrary name can be assigned for the KNX IO 520 (2O). The device name should be meaningful, e.g. „Living Room“. This helps the clarity of the ETS project.

Send delay after bus power return

A send delay for telegrams after the return of the bus voltage can be set via this parameter. In this case, telegrams from the device are sent to the KNX bus in a delayed manner by the set time. This results in a reduction of the bus load at a bus power return. Other functions such as receiving telegrams of drive operations of the actuator are not affected by this parameter.

Prog. mode on device front

In addition to the normal programming button **3** the device allows activating the programming mode on the device front without opening the switchboard cover. The programming mode can be activated and deactivated via pressing simultaneously both buttons **7** and **8**.

This feature can be enabled and disabled via the parameter „Prog. mode on device front“. The recessed programming button **3** (next to the Programming LED **2**) is always enabled and not influenced by this parameter.

Manual operation on device

This parameter is used to configure the manual operation on the device. The manual operation mode can be disabled or activated (with or without time limitation). The time limit defines the duration until the automatic return from the manual operation mode back into the normal operating mode.

The device is in normal operating mode when the manual control is not active. In the manual operating mode, received switching telegrams are ignored. When the manual operation mode is terminated (after expiry of the time limit or manually), the drive is halted.

The following options are selectable:

- Disabled
- Enabled with time limit 1 min
- Enabled with time limit 10 min
- Enabled with time limit 30 min
- Enabled without time limit

Heartbeat

Cyclic sending of values to the KNX-Bus, to indicate that the device is operational. For the *Cycle time* values between 1 min and 24h are selectable.

Group object	Type KNX	Size	Direction
GO 1 Heartbeat - Trigger	1.001	1 Bit	To KNX

Binary Inputs

In this block the general parameters for all binary inputs are displayed.

The *long button press after* parameter defines the time after an external signal is considered as a long button press. This only affects the signals through the connector inputs and not the push buttons on the device.

E. Actuator A: General

Name (30 characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named „Actuator A: ...“.

Function

The blind actuator functionality can here be disabled or enabled. Whilst disabled no drive command will be set on the outputs, but the binary inputs are still fully functional.

Position

This device is designed for three different use cases.

- Without calculation
- Calculation for blinds with slats
- Calculation for shutter

Each one of them can be selected via this parameter. The first is a general drive without any position calculation. The second and third functions differ in how the device calculates the estimated position of the hangings / slats.

NOTE: Since there is no direct feedback from the drive about the actual position, any position calculation can only be an approximation.

Send state

Only available if position calculation is set to blind or shutter mode.

This parameter defines the sending behavior for status telegrams.

- Disabled
No status group objects
- Only on Read
No active sending, reacts only on group value read requests
- On Change
Sends status values if the position has changed, but to reduce bus traffic a maximum of one status value per second is set.
- Cyclic and on change
Sends status values if the position has changed or after a given interval, but to reduce bus traffic a maximum of one status value per second is set.

Time for cyclic state

Send at least one status value after the given interval

The value of the state objects reflects always the current position, even during driving.

Group object	Type KNX	Size	Direction
GO 15 Actuator A: Blind position - State	5.001	1 Byte	To KNX
GO 16 Actuator A Slats position*- State	5.001	1 Byte	To KNX

* Only for blind drives

Behavior after bus power return

Defines which action should be performed after the bus voltage has returned.

- No reaction
- Up (move the hanging to the topmost position)
- Down (move the hanging to the bottommost position)

Emergency stop function

Enables or disables the emergency stop function. If enabled a stop telegram during reference drives or alarm / locking drives will stop the drive immediately and put the device in emergency stop state. This state can be left by sending any value to the Drive start Up / Dn group object. This allows the device to stop the drive under any circumstances in case of an emergency.



At the end of the emergency stop the last action will be continued

Scene function

One to sixteen configurable reactions to scene numbers may be specified here. For more details see ETS - page

Actuator A: Scene function

Alarm / Lock function

The device provides a lock down / alarm state. During this drive commands from the bus are ignored and it is possible to specify an action which should be performed on entering and / or leaving this state. For more details see the

Actuator A: Alarm / Lock function

Automatic mode

Only available if position calculation is set to blind or shutter mode.

Provides an additional set of group objects to change the positions of the blinds / slats. Those group objects will be disabled if an new drive command is received by any of the other group objects.

Group object	Type KNX	Size	Direction
GO 24 Actuator A: Automatic mode	1.001	1 Bit	From KNX
GO 25 Actuator A: Autom. blind position – Set position	5.001	1 Byte	From KNX
GO 26 Actuator A: : Autom. slats position – Set position *	5.001	1 Byte	From KNX

* Only for blind drives

To enable the automatic group objects after such an event two ways are provided. Enable via a fallback time. After this time the automatic mode will be enabled automatically. Or secondly via a group object. Sending 1 enables the automatic mode, sending a 0 disables the automatic mode.

Delay between direction changes

To protect the drive against abrupt direction changes, which may cause damage to the drive, a minimum time between output commands in opposite directions can be set here.

Stepping

Enable / disable stepping functionality

Stepping time

Only available if stepping is active. After receiving a step command via the group object, this parameter determines the interval length for the drive in the given direction. Eg. if set to 500 ms, a step up command will cause the up relay to switch on for 500 ms.'

F. Actuator A: Blind settings

Only visible if position calculation is set to *Calculation for blind with slats*

Total runtime of blind [s]

The time the drive needs to move the hanging from the top to the bottom position. Normally this is determined by measurement.

Additional time upwards

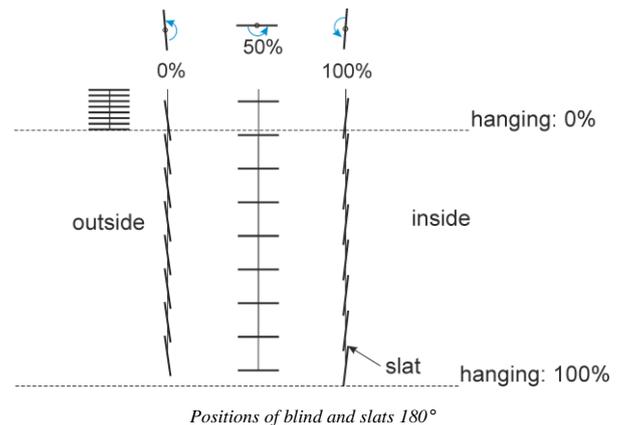
The movement speed upward and downward is for some drives not equal. So this parameter allows adjusting for differences.

Time for full turn of slats [s]

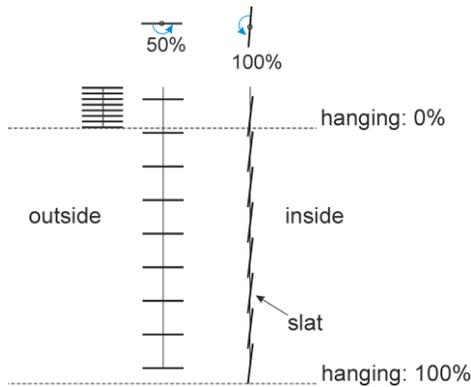
The time the slats need from one endpoint to the other. This parameter is a float value.

Max. slats rotation angle

For blinds with the following positions, choose *180 degree*.



For drives with only horizontal and closing movement choose *90 degree*.



Positions of blind and slats 90°

Group object	Type KNX	Size	Direction
GO 11 Actuator A: Up / Dn - Drive start	1.008	1 Bit	From KNX
GO 12 Actuator A: Step / Stop - Drive stop	1.007	1 Bit	From KNX
GO 13 Actuator A: Blind position - Set position	5.001	1 Byte	From KNX
GO 14 Actuator A: Slats position - Set position	5.001	1 Byte	From KNX

G. Actuator A: Shutter settings

--- KNX IO 520 (1121) > Channel A: Actuator > Actuator A: Shutter settings		
Description	Total runtime of blind [s]	60
General settings	Additional time upwards	2 %
Logic / Timer	Proportion of maximum to minimum velocity	200 %
- Channel A: Actuator		
Actuator A: General		
Actuator A: Shutter settings		
+ Channel B: Input 1		
+ Channel B: Input 2		

Only visible if position calculation is set to *Calculation for shutter*

Total runtime of blind [s]

The time the drive needs to move the hanging from the top to the bottom position. Normally this is determined by measurement.

Additional time upwards

The movement speed upward and downward is for some drives not equal. So this parameter allows adjusting for differences.

Proportion of maximum to minimum velocity

To account for the fact that most shutter drives will not provide a constant speed this parameter can be used. In most cases the drive will speed up during movement from bottom to top position due to the increased diameter of the windings.

So if the speed on the bottom is twice the speed on the top the appropriate value for this parameter would be 200 %.

Group object	Type KNX	Size	Direction
GO 11 Actuator A: Up / Dn - Drive start	1.008	1 Bit	From KNX
GO 12 Actuator A: Step / Stop - Drive stop	1.007	1 Bit	From KNX
GO 13 Actuator A: Blind position - Set position	5.001	1 Byte	From KNX

H. Actuator A: Scene function

--- KNX IO 520 (1121) > Channel A: Actuator > Actuator A: Scene function		
Description	Position strategy	Direct
General settings	Scene 1	Up
Logic / Timer	Number	1
- Channel A: Actuator	Scene 2	No reaction
Actuator A: General	Scene 3	No reaction
Actuator A: Shutter settings	Scene 4	No reaction
Actuator A: Scene function	Scene 5	No reaction
+ Channel B: Input 1	Scene 6	No reaction
+ Channel B: Input 2	Scene 7	No reaction
	Scene 8	No reaction
	Scene 9	No reaction
	Scene 10	No reaction
	Scene 11	No reaction
	Scene 12	No reaction
	Scene 13	No reaction
	Scene 14	No reaction
	Scene 15	No reaction
	Scene 16	No reaction

Position strategy

If any type of position calculation is enabled (See *Position* parameter) this parameter will become visible.

- *Direct*
Moves direct to target position
- *Indirect using top endpoint*
Moves first to top endpoint and then to target position
- *Indirect using bottom endpoint*
Moves first to bottom endpoint and then to target position
- *Indirect using nearest endpoint*
Move first to endpoint that is closest to the target position and then to the target position afterward

Scene 1 - 16

For each scene a scene number [1-64] is selectable. Receiving this number on the scene group object will trigger the chosen reaction for that scene. In all position calculation modes the three basic options are available.

- *No reaction*
- *Up*
- *Down*

Additionally two more options appear for blind and shutter mode.

- *Learnable*
The current position may be set as new target position by sending a DPT18 value with set control bit to the scene group object
- *Fixed value*
The target position is directly selectable in the ETS database

Group object	Type KNX	Size	Direction
GO 17 Actuator A: Scene – Activ./Lrn.	18.001	1 Byte	From KNX

I. Actuator A: Alarm / Lock function

This page provides options to enable or disable the security and lock function separately.

Alarm function

Meant for protecting the hanging against e.g. wind damage or ensuring a certain position in case of a fire alarm. This function moves the hanging to a given position and puts the device in an alarm state in which any other commands, except emergency stop commands, from the KNX bus will be ignored.

Polarity of object

Select whether a 1 value or 0 value sent to the alarm object will trigger the alarm.

Monitoring interval

Not receiving any value during this period of time on the alarm group object will cause the device to raise the alarm and switch

into alarm state. Every time a telegram is received the interval will start again.

Behavior on start

At the beginning of the alarm the device allows for different reactions.

- *No Reaction*
- *Up* (move to topmost position)
- *Down* (move to bottom position)
- *Stop* any current movement

Behavior at end

Whilst ending the alarm these options are available

- *No Reaction*
- *Up*
- *Down*
- *State before function*
- *State without function*

At the beginning of the alarm the current position will be stored and restored if the alarm ends

The device processes all incoming telegrams during the alarm state and at the end of the function the last one will be performed. If no telegram is received during that state the last position before the state will be restored.

The last two options are only available if the position calculation is enabled.

Group object	Type KNX	Size	Direction
GO 18 Actuator A: Alarm - Activate	1.005	1 Bit	From KNX

Lock function

Similar to the alarm function this allows locking the device. Whilst locked any telegram received via the normal move command group objects and scene commands are ignored. This function has a slightly lower priority than the alarm function. Therefore during an alarm locking doesn't change anything. But during locking a newly raised alarm will result in the desired reaction for entering the alarm state.

Enabling this function adds four additional group objects with priority function. A locked device will ignore the "normal" move command objects but still reacts to prioritized commands.

Example for the priority object:

In the case of events in public buildings or in restaurants, the normal operation can be set into an inoperative state by the lock group object. Thus it is possible to lock push buttons, which are accessible to unauthorized persons, in order to prevent unmeant movement of the blind, during the lecture or concert. Nevertheless the blinds can still be operated by use of the priority object without canceling the lock.

Polarity of object

Select whether a 1 or 0 value sent to the locking group object will trigger the locking state.

Behavior on start

At the beginning of the locking the device can provide several reactions.

- *No Reaction*
- *Up* (move to topmost position)
- *Down* (move to bottom position)
- *Stop* any current movement

Behavior at end

Whilst ending the locking state these options are available

- No Reaction
- Up
- Down
- State before function

At the beginning of the locking the current position will be stored and restored if the locking ends

- State without function
- The device processes all incoming telegrams during the locking state and after the last one will be performed. If no telegram is received during that state the last position before will be restored.

The last two options are only available if the position calculation is enabled.

Group object	Type KNX	Size	Direction
GO 19 Actuator A: Lock - Activate	1.001	1Bit	From KNX
GO 20 Actuator A: Prior. drive start -Up / Dn	1.008	1 Bit	From KNX
GO 21 Actuator A: Prior. drive stop - Step / Stop	1.007	1 Bit	From KNX
GO 22 Actuator A: Prior. blind position – Set position	5.001	1 Byte	From KNX
GO 23 Actuator A: Prior. slats position – Set position *	5.001	1 Byte	From KNX

* Only for blind drives

J. Input B1: General

Name (30 Characters)

An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named "Input ...".with the channel number, which is also used in this manual. The 1st channel will be described below, the functioning of the other channel is according to the 1st.

Function

This parameter defines the functionality of the connected contact. The following options are selectable:

- Disabled
- Switching
- Dimming
- Shutter
- Send value
- Scene
- Impulse counter
- Blind / Shutter DEVICE INTERNAL Up *
- Blind / Shutter DEVICE INTERNAL Down *

A more detailed description of the functions can be found in the individual function descriptions.

*An internal connection from the binary input to the actuator. In this case there will be no telegram on the bus, instead the actuator will be directly controlled by the binary inputs. A short impulse on the binary input will trigger either stepping or stops the actuator if the blind is currently moving. A longer impulse starts an upward or downward movement.

Function "Switching, Dimming, Shutter, Send value, Scene"

If an input function of a channel is selected, the following parameters are displayed:

Type

The mode of operation of the contact connected to the input channel can be configured here:

- Normally open contact
- Normally closed contact

Lock function

With this parameter the lock function can be enabled. If this functionality is activated, the associated group objects as well as the parameter page "Input B1: Lock function" are displayed for further configuration. If the lock has been activated via the group object, no telegrams are triggered by state changes of the connected contact.

Group Object	Type KNX	Size	Direction
GO 36 Input B1: Lock - Activate	1.001	1 Bit	From KNX

K. Input B1: Lock function

Polarity of object

This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0.

The following options are selectable:

- Lock active on 1
- Lock active on 0

Behavior of (...) on start

The telegram can be configured here, which is sent when the lock is activated.

Behavior of (...) at end

The telegram can be configured here, which is sent when the lock is deactivated.

Function "Impulse counter"

If the impulse counter function is selected, further parameters are displayed in the general settings of the input channel. Here, the general settings of the impulse counter are made, a scaled counter and/or counter of the rate of change must also be selected.

Input signal

Here it can be selected whether DC or alternating voltage is applied to the binary input.

Count on

This parameter can be used to determine whether the value of the counter is increased at the rising or falling edge at the input

Scaled counter (e.g. [kWh])

Here, the scaled counter can be activated, the parameter page "Scaled counter" is displayed when activated.

Rate of change (e.g. [kW], [m/s], [km/h])

The counter for a rate of change can be activated here. If activated, the "Rate of change" parameter page is displayed.

L. Input B1: Switching

If the switching function is selected, up to 2 binary switching telegrams can be sent via the following objects:

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Output a – Switch	1.001	1 Bit	To KNX
GO 32 Input B1: Output b – Switch	1.001	1 Bit	To KNX

Output b is only visible when activated by parameter.

User control

The parameter "User control" determines whether telegrams are sent when the input is changed (e.g. key switches) or when the input is operated short/long (e.g. switching/dimming switches).

Function of (...) on press / short press Function of (...) on release / long press

It is selectable for each object, which telegram is sent on opening/closing the contact or on short/long button press.

- No reaction
- Switch on
- Switch off
- Toggle

Output b

Here you can show/hide the parameters and the object for output b.

M. Input B1: Dimming

On selection of function Dimming following objects are visible:

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Dimming on/off – Switch	1.001	1 Bit	To KNX
GO 32 Input B1: Dimming relative – Brighter/Darker	3.007	4 Bit	To KNX

Dimming function

The dimming function parameter determines whether only one switching / dimming direction or 1-button control is to be used:

- On / Dim brighter
- Off / Dim darker
- Toggle direction

If the input detects a short button press, a switching telegram is sent via object 31. On long button press, a relative dimming is sent over the entire dimming range to object 32. When releasing after long button press, a dimming-stop telegram is sent via object 32.

The time for detection of a long button press can be set in the general parameters and is valid for all channels.

N. Input B1: Shutter

On selection of Shutter function following objects are visible:

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Drive start – Up/Down	1.008	1 Bit	To KNX
GO 32 Input B1: Drive stop – Step/Stop	1.007	1 Bit	To KNX

Shutter function

The "Shutter function" parameter determines whether only one shutter direction or 1-button control is to be used:

- Up / Step-Stop
- Down / Step-Stop
- Toggle direction

User control

The parameter "User control" determines the sending of telegrams on short and long button press:

- Long = Drive / Short = Step/Stop
Long button press: Drive command via object 31.
Short button press: Stop/step command via object 32
- Short = Drive / Short = Step/Stop
Alternately drive command via object 31 und stop/step command via object 32 on short button press, long button press is not evaluated
- Pressed = Drive / Release = Stop
On button press drive command via object 31, on releasing the button stop/step command via object 32

The time for detection of a long button press can be set in the general parameters and is valid for all channels.

O. Input B1: Send value

If function Send value is selected, the following telegrams can be sent at button press:

- 1 byte - Percent value

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send percent value (1 byte) – Set value	5.001	1 Byte	To KNX

- 1 byte - Integer value

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send integer value (1 byte) – Set value	5.010	1 Byte	To KNX

- 2 byte - Integer value

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send integer value (2 byte) – Set value	7.001	2 Byte	To KNX

- 2 byte - Float value

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send float value (2 byte) – Set value	9.001	2 Byte	To KNX

- 3 byte - RGB value

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send RGB color value (3 byte) – Set value	232.600	3 Byte	To KNX

- 14 byte - ASCII string

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send ASCII string (14 byte) – Set value	16.000	14 Byte	To KNX

- Shutter

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Send blind position – Set position	5.001	1 Byte	To KNX
GO 32 Input B1: Send slat position – Set position	5.001	1 Byte	To KNX

A field for entering the values to be sent is displayed, as well as the objects appropriate to the selected type.

If the shutter is selected as the value to be sent, height is sent on button press, lamella is sent on releasing the button, if the respective value is used.

P. Input B1: Scene

On selection of Scene function the following object is visible:

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Scene – Activ./Lrn.	18.001	1 Byte	To KNX

Scene position 1 - 8

For each position, scene 1 – 64 can be activated.

If only one scene position is activated, it is sent on short button press.

If several scene positions are used, the activated positions are switched through with each short button press.

Reset scene position

The behavior for selection and transmission of the scene positions can be determined via the parameter "Reset scene position":

- Never

Starting with the first scene position, the next scene position of the list is sent with each short button press, after the last scene position has been sent, the list starts again from the beginning.

- After execution

Beginning with the first scene position, each short button press switches the scene position by one position within the execution delay, at the end of the execution delay, the current scene position is sent

- 5 Sec. - 10 Min.

On each button press the configured delay time is started.

Starting with the first scene position, the next scene position of the list is sent with each short button press, after the last scene position has been sent, the list starts again from the beginning.

After the delay time has expired, the list starts again at the first scene position on the next short button press.

When the lock function is used, the scene position is always reset when unlocking.

Condition on long/very long button press

It is also possible to select how a long and very long button press is to be treated:

- No reaction
- Save last scene
A telegram for "save scene" with the last sent scene is triggered.
- Send scene
The scene configured in the appearing parameter is sent.
- Reset position
This function is used to override the behavior as set in the "Reset scene position" parameter.

The duration of time for detecting a very long button press is twice the time for detecting a long button press, as it is parameterized in the general settings.

Q. Input B1: Scaled counter

This counter can be used to count values on input impulses, where an integer value or a floating-point value can be selected as a counter variable. With this function, e.g. Electrical energy can be counted directly and sent to the bus via an object.

Scaling factor (Value per pulse)

Here, a floating-point value is to be entered. It determines the value by which the counter value is increased per pulse.

Datapoint type

The datapoint type of output object of the counter variable can be selected here:

- Integer (32 Bit) – DPT 13

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Counter – Value	13.013	4 Byte	To KNX

- Float (16 Bit) – DPT 9

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Counter – Value	9.024	2 Byte	To KNX

- Float (32 Bit) – DPT 14

Group Object	Type KNX	Size	Direction
GO 31 Input B1: Counter – Value	14.056	4 Byte	To KNX

Send condition

This parameter can be used to determine how the current counter value is to be sent:

- On read
No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
An additional parameter is displayed to select the minimal delta from the last sent value for sending a new counter value
- Cyclically
An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
Both sending conditions are active.

If the counter is locked by the object, also cyclic sending is stopped.

Monitoring limit value

When limit monitoring is activated, the following object is displayed:

Group Object	Type KNX	Size	Direction
GO 32 Input B1: Counter threshold – State	1.002	1 Bit	To KNX

When limit monitoring is activated, the following parameters are displayed:

Limit value

Here you can edit the checked limit value. The datapoint type is the same as the counter value.

Behavior on reaching limit value (object)

Here it is possible to determine whether a 0 or a 1 is sent via the object "Counter threshold – State" when the limit value is reached.

Behavior on reaching limit value (counter)

In addition to the limit value itself, it is possible to determine the behavior of the counter when the limit value is reached:

- Counter continue
Counter value continues increasing on ever pulse
- Counter reset and continue
Counter value is reset to 0 and continues increasing on ever pulse
- Counter stop
Counter value stays on limit value and must be reset by object

Send on device restart

It can be determined with this parameter whether the counter value should be sent when the device is restarted.

Reset via object

If this function is activated, the following object appears:

Group Object	Type KNX	Size	Direction
GO 35 Input B1: Reset – Trigger	1.017	1 Bit	From KNX

When a telegram is received via this object, the current count values are reset to 0.

Reset after ETS download

If this parameter is activated, the counter values are reset to 0 after device reset (e.g. after ETS download), otherwise they are retained.

Lock function

The lock function can be activated or deactivated here. If this functionality is activated, the following group object appears, as well as the parameter page "Lock function" for detailed configuration.

Group Object	Type KNX	Size	Direction
GO 36 Input B1: Lock – Activate	1.001	1 Bit	From KNX

If the lock has been activated via the group object, state changes at the input do not cause an increase of the counter variable.

R. Input B1: Lock function

1.0.1 KNX IO 520 (I12I) > Channel B: Input 1 > Input B1: Lock function

Description	Polarity of object	<input checked="" type="radio"/> Lock active on 1 <input type="radio"/> Lock active on 0
General settings	Behavior on start of lock	<input checked="" type="radio"/> Counter stop <input type="radio"/> Counter stop and reset
Logic / Timer	Behavior on end of lock	<input checked="" type="radio"/> Counter continue <input type="radio"/> Counter reset and continue
+ Channel A: Actuator		
- Channel B: Input 1		
Input B1: General		
Input B1: Scaled counter		
Input B1: Lock function		
+ Channel B: Input 2		

Polarity of object

This parameter can be used to determine how the lock is to be activated, either by receiving a 1 or a 0. The corresponding telegram disables the lock again.

Behavior on start of lock

With this parameter the behavior of the counter can be configured when the lock is activated:

- Counter stop
- Counter stop and reset

Behavior on end of lock

With this parameter the behavior of the counter can be configured when the lock is deactivated:

- Counter continue
- Counter reset and continue

S. Input 1: Rate of change

1.0.1 KNX IO 520 (I12I) > Channel B: Input 1 > Input B1: Rate of change

Description	Scaling factor (Value per delta in base time span)	1
General settings	Time base	<input checked="" type="radio"/> Pulses per second (e.g. [m/s], [km/h]) <input type="radio"/> Pulses per hour (e.g. [kW])
Logic / Timer	Measurement time span	10 s
+ Channel A: Actuator	Datapoint type	<input checked="" type="radio"/> Float (16 bit) - DPT 9 <input type="radio"/> Float (32 bit) - DPT 14
- Channel B: Input 1	Send condition	On read
Input B1: General	Monitoring limit value	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Input B1: Scaled counter	Example:	
Input B1: Lock function	Electricity meter with 1000 impulses per kWh	-> Scaling factor = 0.001 for kWh -> Scaling factor = 1 for W
Input B1: Rate of change	Anemometer with 4 pulses per 1s at 1m/s	-> Scaling factor = 0.25 for m/s -> Scaling factor = 0.25 * 3.6 = 0.9 for km/h
+ Channel B: Input 2		

This counter is used to connect devices to the bus where the rate of change is critical within a time interval, e.g. an anemometer.

Scaling factor (Value per delta in base time span)

A floating-point value is to be entered here. It determines the value by which the counter value is increased on every pulse

Time base

Here the time base of the rate of change can be specified:

- Pulses per second (e.g. [m/s], [km/h])
Value from parameter Scaling factor is multiplied by 1
- Pulses per hour (e.g. [kW])
Value from parameter Scaling factor is multiplied by 3600

Measurement time span

The measurement time span determines how quickly the counter can react to changes. Therefore, a short sample rate should be selected for fast processes (e.g. anemometer).

The rate of change is calculated using the 3 parameters mentioned above:

The device saves several meter readings per measurement interval, scales it with the scaling factor * time base and divides it by the measuring interval.

Datapoint type

The datapoint type of output object of the counter variable can be selected here:

- Floating point (16 Bit) - DPT 9

Group Object	Type KNX	Size	Direction
GO 33 Input B1: Rate of change – Value	9.024	2 Byte	To KNX

- Floating point (32 Bit) - DPT 14

Group Object	Type KNX	Size	Direction
GO 33 Input B1: Rate of change – Value	14.056	4 Byte	To KNX

Send condition

This parameter can be used to determine how the current counter value is to be sent:

- On read

No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.

- On change

An additional parameter is displayed to select the minimal delta from the last sent value for sending a new counter value

- Cyclically

An additional parameter is displayed to configure the sending frequency of the counter variable.

- On change and cyclically

Both sending conditions are active.

Monitoring limit value

When limit monitoring is activated, the following object is displayed:

Group Object	Type KNX	Size	Direction
GO 34 Input B1: Rate threshold – State	1.002	1 Bit	To KNX

When limit monitoring is activated, the following parameters are displayed:

Limit value

Here you can edit the checked limit value. The datapoint type is the same as rate of change value.

Behavior on exceeding limit value

In addition to the limit value itself, it is possible to determine whether the counter should transmit 0 or 1 via the object if the limit value is exceeded.

Behavior on going below limit value

Here it is possible to determine whether the counter should transmit 0 or 1 via the object if the counter variable goes under limit value.

Example: Electricity meter with S0 interface

From the data sheet of the electricity meter it can be seen that the device delivers 500 pulses per kWh. A device with constant power of 1kW is connected to this current meter for one hour.

The scaled counter measures the energy consumed:

Scaling factor: $1 / 500 = 0.002$ -> Output in kWh

The counter for the rate of change measures the current power:

Scaling factor:

- Output in kW: $1/500 = 0.002$

- Output in W: $1/500 * 1000 = 2$

Time base: Pulses per hour

Measurement time span: 300 s

Example: Anemometer

From the data sheet of the electricity meter it can be seen that the device delivers 4 pulses/s at a wind speed of 1 m/s.

The counter for the rate of change measures the wind speed:

Scaling factor:

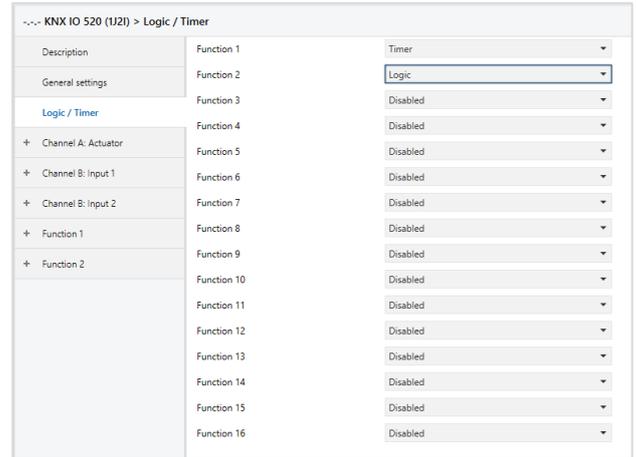
- Output in m/s: $1/4 = 0.25$

- Output in km/h: $1/4 * 3.6 = 0.9$

Time base: Pulses per second

Measurement time span: 10 s

T. Logic / Timer



Function 1 - 16

These channels contain additional functions such as timing and logic. All these 16 additional functions are identical.

The following options are selectable:

- Disabled
- Timer
- Logic

Function type (Disabled)

If the function type is set to "Disabled", no timer or logic specific parameters and group objects are available.

Function type (Timer)

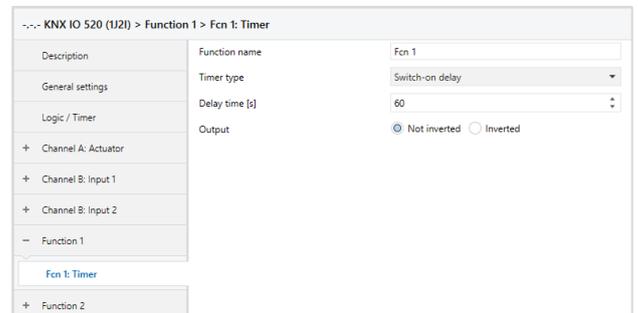
The timer-specific parameters and group objects are available.

Function type (Logic)

The logic-specific parameters and group objects are available.

Note: These additional logic and timer functions can be linked to one another by means of the associated group objects. This also allows to create complex structures. For this purpose, the output of a function is set to the same group address as the input of the next function.

Function 1 – 16 (Timer)



Function name (10 Characters)

The function name can be chosen freely.

The name is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects, because the given name is displayed there as a label.

Timer type (Switch-on delay)

A timer that switches ON after duration defined in 'Delay time [s]' parameter.

The output value can be inverted by parameter 'Output' (Not inverted / Inverted).

Input -----1-----0-----

Output -----| -T-1-----0-----

Group Object	Type KNX	Size	Direction
Timer – Switch-on delayed - Input	1.002	1 Bit	From KNX
Timer – Switch-on delayed - Output	1.002	1 Bit	To KNX

Timer type (Switch-off delay)

A timer that switches OFF after duration defined in 'Delay time [s]' parameter.

The output value can be inverted by parameter 'Output'. (Not inverted / Inverted)

Input -----1-----0-----

Output -----1-----| -T-0-----

Group Object	Type KNX	Size	Direction
Timer – Switch-off delayed - Input	1.002	1 Bit	From KNX
Timer – Switch-off delayed - Output	1.002	1 Bit	To KNX

Timer type (Switch-on and -off delay)

A timer that switches ON and OFF after duration defined in 'Delay time [s]' parameter.

The output value can be inverted by parameter 'Output'. (Not inverted / Inverted)

Input -----1-----0-----

Output -----| -T-1-----| -T-0-----

Group Object	Type KNX	Size	Direction
Timer – Switch-on/off delayed - Input	1.002	1 Bit	From KNX
Timer – Switch-on/off delayed - Output	1.002	1 Bit	To KNX

Timer type (Impulse (Staircase))

Timer with impulse that – after being switched ON – automatically switches OFF after a defined duration defined in 'Delay time [s]' parameter.

The output value can be inverted by parameter 'Output'. (Not inverted / Inverted)

Input -----1-----0-----

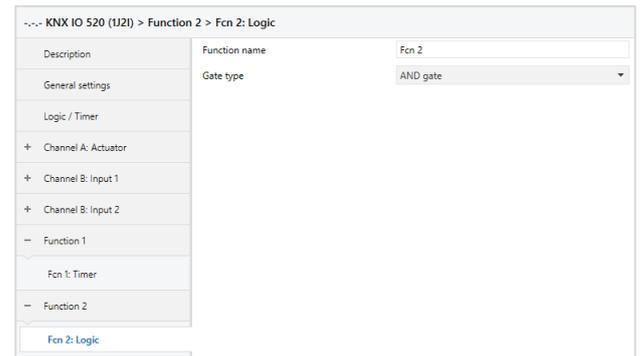
Output -----1-T-0-----

Group Object	Type KNX	Size	Direction
Timer – Switch-impulse (staircase) - Input	1.002	1 Bit	From KNX
Timer – Switch-impulse (staircase) - Output	1.002	1 Bit	To KNX



Each timer can be stopped by sending the opposite value to its input group object. For example:
An already started switch on timer can be stopped by sending OFF (0) to its input group object

Function 1 – 16 (Logic)



Group Object	Type KNX	Size	Direction
Logic – Gate input A - Input	1.002	1 Bit	From KNX
Logic – Gate input B - Input	1.002	1 Bit	From KNX
Logic – Gate output – Output	1.002	1 Bit	To KNX

Function name (10 Characters)

The function name can be chosen freely.

The name is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects, because the given name is displayed there as a label.

Gate type (AND gate)

The output is triggered on (1), if both inputs are switched on (1).

Gate type (OR gate)

The output is triggered on (1), if one or both inputs are switched on (1).

Gate type (XOR gate)

The output is triggered on (1), if the two inputs are not equal.

Gate type (NAND gate)

The output is triggered on (1), if one or both inputs are switched off (0).

Gate type (NOR gate)

The output is triggered on (1), if both inputs are switched off (0).

Gate type (XNOR gate)

The output is triggered on (1), if both inputs are equal.

Gate type (INVERTER)

Input on (1) is converted into output off (0). Input off (0) is converted into output on (1).

Group Object	Type KNX	Size	Direction
Logic – Gate input - Input	1.002	1 Bit	From KNX
Logic – Gate output – Output	1.002	1 Bit	To KNX



WARNING

- The device must be mounted and commissioned by an authorized electrician.
- The prevailing safety rules must be heeded.
- The device must not be opened.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.
- The device is a permanently connected equipment: A readily accessible disconnect device shall be incorporated external to the equipment.
- The installation requires a 10 A fuse for external overcurrent protection.
- The power rating is indicated on the side of the product.



ETS4/5 Database
www.weinzierl.de/en/products/520/ets4

Datasheet
www.weinzierl.de/en/products/520/datasheet

CE Declaration
www.weinzierl.de/en/products/520/ce-declaration

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