

Operation and installation manual

KNX IP Multi IO 580 (48/I/O)

(Art. # 5238)

KNX IP Multi IO with 48 configurable In- and Outputs



KNX IP Multi IO 580

Application

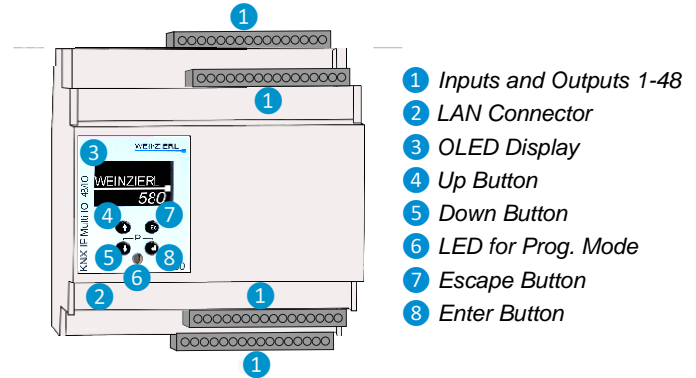
The KNX IP Multi IO 580 is a universal binary interface for building control. It provides 48 I/O lines. Each line can be used as binary input as well as binary output. The peripherals can be fed by an external voltage of 24 V_−. Channels which are configured as inputs can be used to control lights or blinds via the KNX network. They also can be used to count impulses, e.g. as interface for energy meters. Channels which are configured as outputs can directly drive signal LEDs, external coupling relays (e.g. Multi IO Extension 590) or jalousie relays (Multi IO Extension 592).

The device works using the medium KNX IP. It can be configured using the ETS (Version 4.2 or higher) with native parameters and standard group objects. Also the KNX addressing scheme, based on individual device address and group objects, is unchanged.

An easy to read OLED display on the front panel enables a manual operation to test the installation.

1. Installation and connection

The KNX IP Multi IO 580 is designed for installation on a DIN rail (35 mm) with a width of 6 units (108 mm). An installation-friendly design with pluggable screw terminals helps to reduce the cost of commissioning. It features the following controls (4 5 7 8) and displays (3 6):



A. Settings

The settings of the device can be accessed via:

1. Local display on the device (partly)
2. ETS (Version 4.2 or higher)



The KNX Programming Mode is activated/deactivated by simultaneously pressing the buttons 5 8 – when activated the programming LED 6 lights up.

B. Programming and status LED 6

The red LED on the front panel is used to display the KNX programming mode and errors. The LED can have the following states:

- **LED off:** The programming mode is not active and there is no error (normal operating mode).
- **LED lights up:** The programming mode is active, any errors are not visualized/notified by the LED, but can be read on the display.
- **LED flashes quickly:** The programming mode is not active. The rapid flashing indicates the following fault:
 - The device is not loaded correctly, for example, a cancelled download.

2. Factory default settings

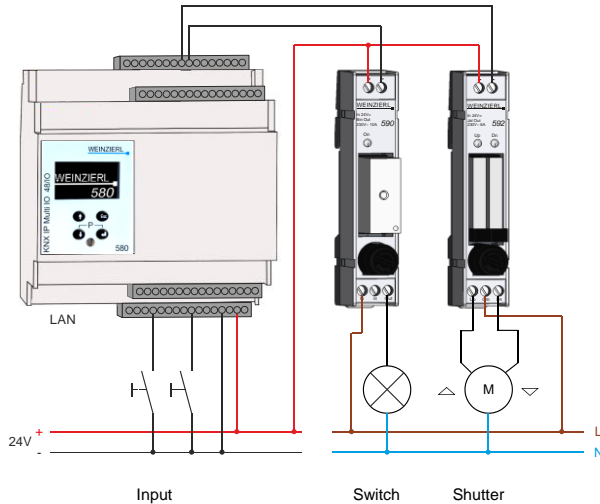
The following configuration is set by factory default:

Individual device address: 15.15.255

IP address assignment: DHCP

The device can be reset to factory default settings via the device display.

3. Wiring scheme



A. Inputs and Outputs

Each channel can be used as a binary input or as a binary output.

Channel as Input

Dry contacts or S0 counter outputs can be directly connected to the inputs ("I" terminal).

- Voltage at the input contacts: SELV
- Max. cable length 30 m
- Galvanically isolated from the bus

Channel as Output (directly)

Loads of up to 100 mA can be connected directly to a switching output. LED indicators can thus be realized via a series resistor.

Channel as Output via standard coupling relay

For switching loads like 230 V lights, each output can drive standard coupling relays with max. 100 mA.

Channel as Output via bistable coupling relay

To reduce the holding current of the coupling relay, the outputs can be used together with the **Multi IO Extension 590**. This coupling relay is controlled like a monostable relay but is implemented internally with a bistable relay. The holding current decreases depending on comparison type up to 95 %.

Channel as Output for Shutter

To use an output of the KNX Multi IOs for the control of blinds or shutters, the **Multi IO Extension 592** is required. This coupling relay is controlled with only one channel, but switches with two integrated relays both directions.

B. Power supply

The inputs and outputs are supplied with a voltage of 24 V DC. When dimensioning the power supply, ensure that appropriate loads at the outputs are considered (for example, coupling relays).

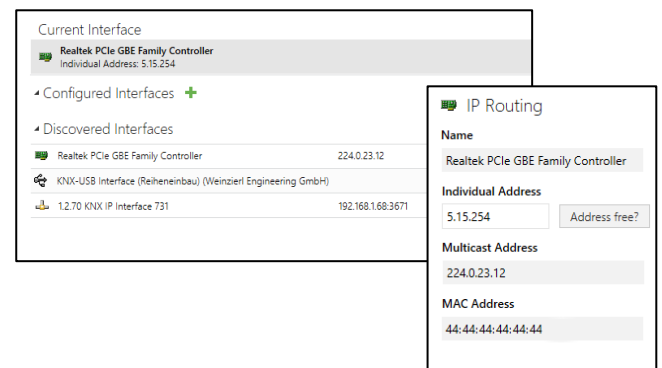
Manual operation via the display is possible when the supply voltage is applied.

4. Programming

The KNX IP Multi IO 580 can be programmed in different ways by the ETS:

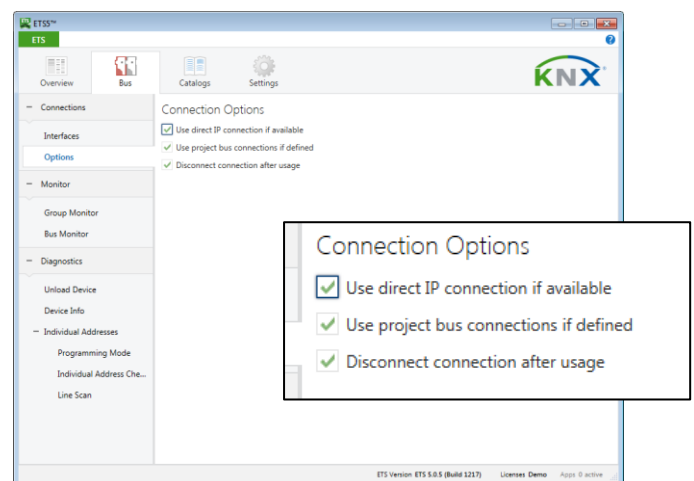
Via KNXnet/IP Routing

Programming via KNXnet/IP Routing is possible if the device already has a valid IP configuration (e.g. by using DHCP or Auto IP). In the ETS, the routing interface appears if at least one device on the network which supports routing is available. The name of the network interface appears in the PC as description. If routing is selected as interface, the programming is done from the ETS project as like with other devices. In this case LAN is used as a KNX medium like TP. There is no additional interface device required.



Via direct IP connection

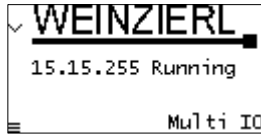
While KNXnet/IP Tunneling and KNXnet/IP Routing is limited to the speed of KNX TP the device can be loaded via a direct IP connection at high speed. The direct IP connection is possible if the device already has a valid IP configuration as well as an individual address. To do this select "Use direct IP connection if available" in the ETS menu "Bus – Connections - Options". The download is then directly performed in the device and is not visible in the ETS group monitor.



i Due to the significantly shorter transmission times, it is recommended to perform downloads via a direct IP connection.

5. Direct Setting via display on device

A. Startup and idle display



During startup of the device, the individual address and the status of the application is displayed. The device name "Multi IO" can be changed within the ETS parameter settings.

The status can be one of the following values:

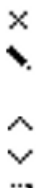
- **Running:** Application is loaded and running
- **Stopped:** The application is stopped 6 LED for Programming Mode is flashing
- **Unloaded:** The application is not loaded 6 LED for Programming Mode is flashing
- **Loading:** The application is currently loading by ETS
- **Host:** The interface KNXnet/IP (Local Device management) is opened.
- **IP local:** Data transmission via KNXnet/IP (Local Device management).



After 10 minutes of inactivity the display will turn into screensaver mode (blank screen with a bouncing dot) to save display life time. Press any key to turn the display on again.

B. Menu

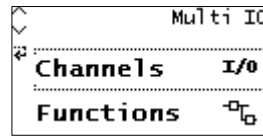
By pressing 5 (arrow down) you enter the main menu of the device. By pressing 8 (enter) you enter the submenus. Within the menus you can use 4 (arrow up) and 5 (arrow down) for navigation; 8 (enter) is for confirmation and 7 (escape) is to cancel / go back / one level higher



The left display edge shows symbols, which allow the following options of action:

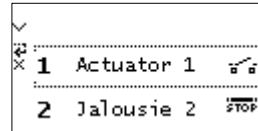
- | | |
|--------------|-----------------|
| ESC 7 | Quit menu |
| Enter 8 | Change value(s) |
| Arrow up 4 | Cursor up |
| Arrow down 5 | Cursor down |
| Enter 8 | Enter selection |

B.1 Channels

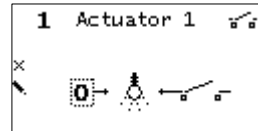


The device supports 48 channels, which can be used as output (switching, blinds) or input. The channel functions must be defined in the parameter settings of the ETS database. After downloading the application, the freely selectable channel name is displayed in the respective menu item. In the submenus, this name is used as a header. There, the status of each channel can be checked and changed manually.

B.1.1 Actuator

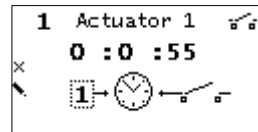


B.1.1.1 Submenu Actuator – Function: Universal output



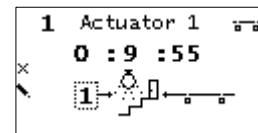
The output can be switched with the enter 8 key.

B.1.1.2 Submenu Actuator – Function: On and off delay



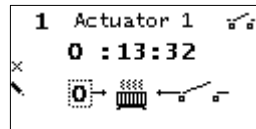
The function is activated with the enter key 8. Depending on the parameterization, the remaining switching time is displayed.

B.1.1.3 Submenu Actuator – Function: Staircase



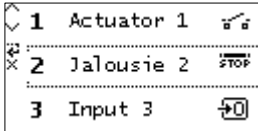
The function is activated with the enter key 8. In addition the remaining time until the output will be switched off, is displayed.

B.1.1.4 Submenu Actuator – Function: Valve actuator

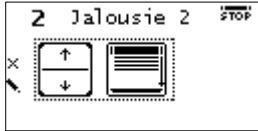


The function is activated with the enter key 8. Depending on the parameterized PWM window, this function switches the output. The remaining time to the next switching action is displayed.

B.1.2 Jalousie

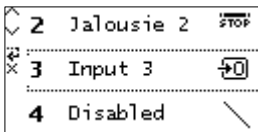


B.1.2.1 Submenu Jalousie

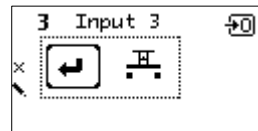


With the arrow keys **4** und **5**, a step or stop command can be realized manually by a short press. With a long press, a movement command in the respective direction is started.

B.1.3 Input

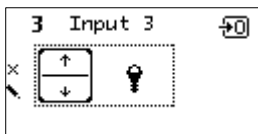


B.1.3.1 Submenu Input – Function: Switch



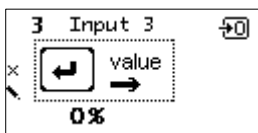
The switching state at the input is displayed upper right. The function can be triggered manually with the enter key **8**.

B.1.3.2 Submenu Input – Function: Dimming



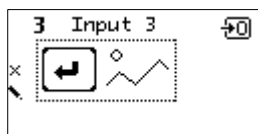
The switching state at the input is displayed upper right. The dimming function is triggered manually with the arrow keys **4** and **5**.

B.1.3.3 Submenu Input – Function: Send value



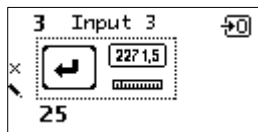
The switching state at the input is displayed upper right. The function is triggered manually with the enter key **8**. The value to send is displayed below.

B.1.3.4 Submenu Input – Function: Scene



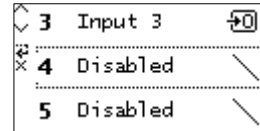
The switching state at the input is displayed upper right. The function is activated manually with the enter key **8**.

B.1.3.5 Submenu Input – Function: Impulse counter

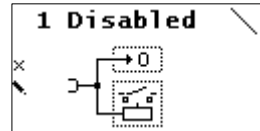


The switching state at the input is displayed upper right. The function is triggered manually with the enter key **8**. The current counter value is displayed at the bottom.

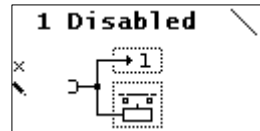
B.1.4 Disabled (Channel not active)



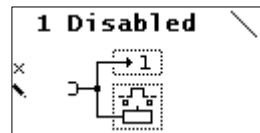
If a channel has not been parameterized, the basic functions are available for manual operation anyway.



The channel is open, indicating the logic level of the terminal. With the enter key **8**, the output can be switched over.

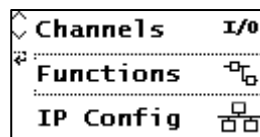


The channel is switched on. The output can be changed using the enter key **8**.



The channel is in the jalousie mode, which can be tested in conjunction with the shutter relay (Multi IO Extension 592). With the enter key **8**, the output can be switched over.

B.2 Functions

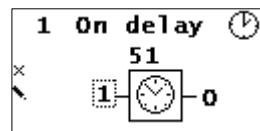
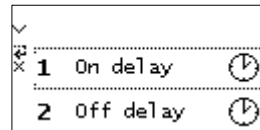


The device supports up to **16 Timer and Logic functions**. These functions have to be defined within ETS parameter settings. After application download, the freely selectable function label

will be shown in each function menu entry as well as within the function submenu as headline.

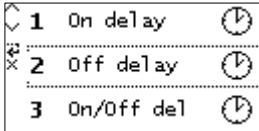
All logical inputs and outputs correspond with a group object. The current values are shown in the graphical representation. A question mark (?) is shown if the value is not yet valid because it was not yet received from bus or is not yet sent to the bus. A logical gate sends output values only if all input values are valid.

B.2.1 On delay (switch on delay)



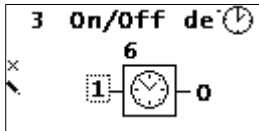
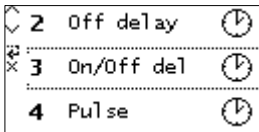
Timer that switches ON after defined duration (in seconds, set via the ETS). After pressing **8** (enter) countdown will start. To stop countdown, press **8** (enter) again during countdown.

B.2.2 Off delay (switch off delay)



Timer that switches OFF after defined duration (in seconds, set via the ETS). After pressing **8** (enter) countdown will start. To stop countdown, press **8** (enter) again during countdown.

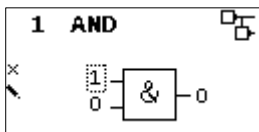
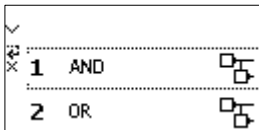
B.2.3 On/Off delay (Switch on and switch off delay)



Timer that switches ON & OFF after defined duration (in seconds, set via the ETS). After pressing **8** (enter) countdown will start and the timer will turn on. After first countdown is finished, press **8** (enter) again to start countdown to turn off.

To stop countdown, press **8** (enter) again during countdown.

B.2.4 Logic: AND

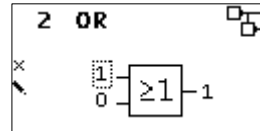
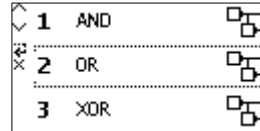


The arrow keys **4** and **5** can be used to switch between the two inputs. The enter key **8** can be used to change the logical input value.

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

Input A	Input B	Output
0	0	0
0	1	0
1	0	0
1	1	1

B.2.5 Logic: OR

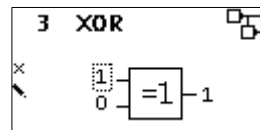
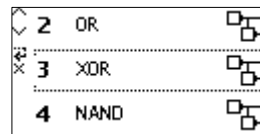


The arrow keys **4** and **5** can be used to switch between the two inputs. The enter key **8** can be used to change the logical input value.

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

Input A	Input B	Output
0	0	0
0	1	1
1	0	1
1	1	1

B.2.6 Logic: XOR

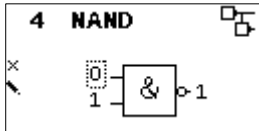
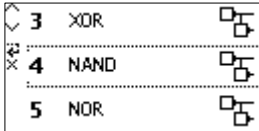


The arrow keys **4** and **5** can be used to switch between the two inputs. The enter key **8** can be used to change the logical input value.

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

Input A	Input B	Output
0	0	0
0	1	1
1	0	1
1	1	0

B.2.7 Logic: NAND

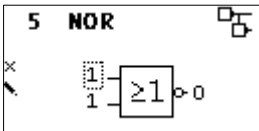
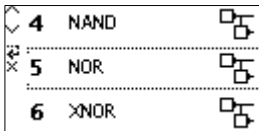


The arrow keys **4** and **5** can be used to switch between the two inputs. The enter key **8** can be used to change the logical input value.

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

Input A	Input B	Output
0	0	1
0	1	1
1	0	1
1	1	0

B.2.8 Logic: NOR

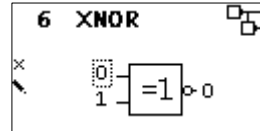
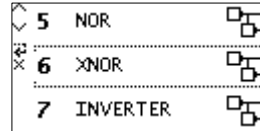


The arrow keys **4** and **5** can be used to switch between the two inputs. The enter key **8** can be used to change the logical input value.

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

Input A	Input B	Output
0	0	1
0	1	0
1	0	0
1	1	0

B.2.9 Logic: XNOR

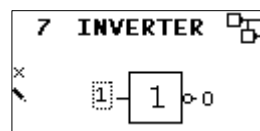
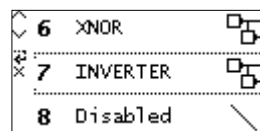


The arrow keys **4** and **5** can be used to switch between the two inputs. The enter key **8** can be used to change the logical input value.

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

Input A	Input B	Output
0	0	1
0	1	0
1	0	0
1	1	1

B.2.10 Logic: Inverter

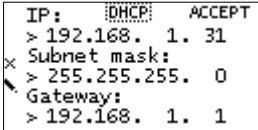
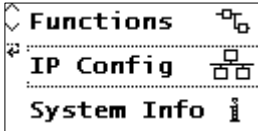


The enter key **8** can be used to change the logical input value.

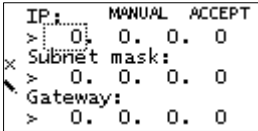
Input on (1) is converted into output off (0). Input off (0) is converted into output on (1).

Input	Output
0	1
1	0

B.3 IP Config

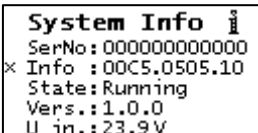
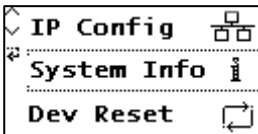


In this menu you can switch between DHCP and manual IP configuration with the enter key **8**. Use the arrow keys **4** and **5** to set the selection to "Accept" and then use the enter key **8** to accept the changes.



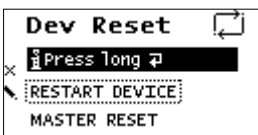
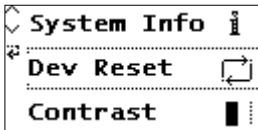
In the manual configuration, the selection can be changed using the arrow keys **4** and **5**. The edit mode can be entered using key **8**.

B.4 System Info



This submenu displays **information about the device**: serial number (SerNo), Application-ID (Info), App status (State), Firmware Revision (Vers.) and supply voltage (U in).

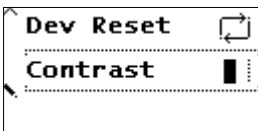
B.5 Device Reset



This submenu allows you to restart the device or **to reset to factory settings** (master reset). Select one option and keep **8** pressed until the small animation is finished and the option is executed.

i Master reset will make a new ETS download necessary.

B.6 Contrast



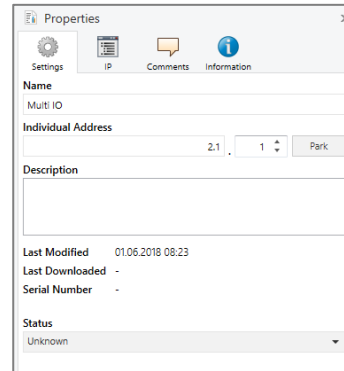
To set the contrast of the display, select this entry in the menu. By pressing **8** (enter) several times you can set the contrast to different levels.

6. ETS database

The ETS database (for ETS 4.2 and ETS 5) can be downloaded from the product website of the KNX IP Multi IO 580 (www.weinzierl.de) or from the online catalogue.

In addition to the parameter dialogue some settings are displayed in the property dialogue (on the right side of the ETS window). Thus the IP settings can be changed here.

By clicking on the KNX IP Multi IO 580 device entry within your ETS projects topology view, an information column „properties“ will appear on the right side of the ETS window. Within the „settings“ overview, you can change the device name of the KNX IP Multi IO 580.

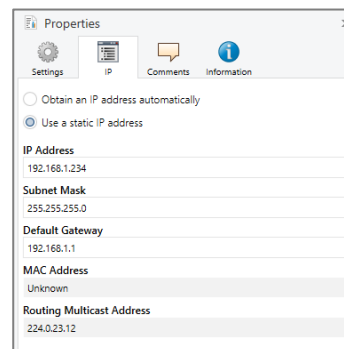


Within the "IP" overview the IP network specific options of the KNX IP Multi 580 can be changed.

By changing "obtain an IP address automatically (via DHCP)" to "Use a static IP address" (static IP address) the IP address, subnet mask, and default gateway can be set freely.



All changes in the properties menu become effective only after a successful application download.



IP address

Here the IP address of the KNX IP Multi IO 580 can be entered. This is used to address the device via the IP network (LAN). The IP addressing should be coordinated with the administrator of the network.

Subnet mask

Enter the subnet mask here. The device uses the values entered in this mask to determine whether there is a communication partner in the local network. If there is no partner in the local network, the device will not send the telegrams directly to the partner but to the gateway that routes the telegram. If the device should not be connected to external networks (e.g. internet), the subnet mask can be set to 0.0.0.0

Default gateway

Enter the IP address of the gateway here, e.g. the DSL router of the installation. If the device should not be connected to external networks (e.g. internet), this address shall be 0.0.0.0.

Routing Multicast Address

This address is used for routing telegrams on IP. The multicast IP address 224.0.23.12 was reserved (KNXnet/IP) at the IANA (Internet Assigned Numbers Authority) for this purpose. If a different multicast IP address is required, it must be within the range of 239.0.0.0 to 239.255.255.255.

ETS parameter dialogue

The following parameters can be set using the ETS.

A. Device Description:

This page provides a general description of the device and the wiring scheme.

2.1.1 Multi IO > Description

Description

General settings: KNX IP Multi IO 580
Universal binary interface with 48 channels

Channel

Logic / Timer

+ Channel 1

Wiring scheme

Please consult device data sheet and manual for further information.

Contact:
Weinzierl Engineering GmbH
Achats 3
84508 Burgkirchen / Alz
Germany
www.weinzierl.de
info@weinzierl.de

B. General:

2.1.1 Multi IO > General settings

Description: Send delay after supply power return: 5 s

Manual operation on device: Enabled with time limit 10 min

Telegram rate limitation (telegrams in 10 seconds): No limitation

Heartbeat: Disabled Enabled

Display synchronization: Disabled Enabled

Device reset via menu: Disabled Enabled

Long button press after: 1.2 s

Send delay after supply power return

A send delay of telegrams after the return of the supply 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 supply power return. Other functions such as receiving telegrams of switching operations of the actuator are not affected 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 last state of the outputs remains, until a new switching telegram is received again.

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

Telegram rate limitation

Here the telegram rate limitation of the device can be configured. The maximum number of telegrams that can be sent within a time span of 10 seconds can be specified. The following options are selectable:

- No limitation
- 200 telegrams
- 100 telegrams
- 50 telegrams

Heartbeat

Cyclic sending of values to KNX IP, 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

Furthermore, in channel function binary input the parameters *Heartbeat* and *Cycle time* are used as configuration for cyclic sending, in case that switching is configured as state query. For a more detailed description regarding state query please take a look at "Input 1: Switching – State query".

Display synchronization (Enabled / Disabled)

If enabled, a communication object 'Display synchronization – Trigger' appears. Each Weinzierl device with a display of this product range provides this parameter. As soon as the device

wakes up, the associated group telegram will be sent to the KNX bus which wakes up every other device whose display synchronization group object is associated to the same group address.

Group Object	Type KNX	Size	Direction
GO 2 Display synchronization – Trigger	1.017	1 Bit	From / To KNX

Device reset via menu (Enabled / Disabled)

By disabling this option, the function for resetting the device by its local menu is deactivated.

Long button press after

The time for detection of a long button press can be set here, this time is valid for all input channels.

C. Channel

For each of the 48 available channels, a function can be selected.

The following options are selectable:

- Channel disabled
- Switching Actuator
- Shutter Actuator
- Binary Input

Detailed information on the respective channel functions can be found in the following chapters.

Channel function: “Switching 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 ...”. In the following, the first channel is described, the functionality of the remaining channels is analog.

Function

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

- Disabled
- Universal output
- On/Off delay
- Staircase function
- Valve actuator (PWM for thermal servo)

A more detailed description of the functions can be found in the individual function descriptions under Function (...).

If the actuator is not “Disabled”, the following parameters are displayed:

Behavior after supply power return

Here the behavior of the output after supply power return can be configured. This behavior will be set after every device restart (e.g. also on restart after ETS download).

The following options are selectable:

- Switch on
- Switch off
- State like before supply power failure

Send state

This parameter defines the behavior of the state objects:

- Disabled
State objects are deactivated and not displayed
- Only on read
State objects send only on request
- On change
State objects send on value change
- Cyclic and on change
State objects send cyclically and on value change

Group Object	Type KNX	Size	Direction
GO 18 Actuator 1: Output - State	1.001	1 Bit	To KNX
GO 19 Actuator 1: Valve actuator (PWM) – State*	5.001	1 Byte	To KNX

* if valve actuator was selected

Time for cyclic state

Is selected state object "Cyclic and on change", in this parameter the cycle time can be set.

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 "Lock function" are displayed for further configuration. If the lock has been activated via the group object "Lock", the received switching telegrams are not executed.

In addition to the lock object, there is also a priority object, which can be switched independently of the lock. Thus, it is possible to set an output state without affecting other functions.

Group Object	Type KNX	Size	Direction
GO 15 Actuator 1: Lock - Activate	1.001	1 Bit	From KNX
GO 16 Actuator 1: Prior. output - Switch	1.001	1 Bit	From KNX

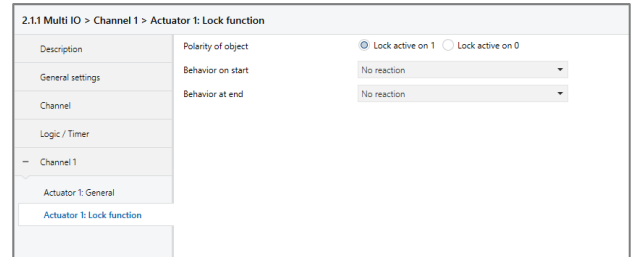
Example of the priority object:

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 during the lecture or concert, switches that are accessible to unauthorized persons, in order to prevent unmeant switching.

Nevertheless, the individual lamps can controlled by use of the priority object without canceling the lock.

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 on start

This parameter configures, which state the output should set, if the lock activates.

The following options are selectable:

- No reaction
- Switch on
- Switch off

This output state can still be changed by the priority object.

Behavior at end

This parameter defines, which state the output should set, if the lock deactivates.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- State before lock
- State without lock

State before lock:

This restores the original state before the lock was activated. Switching telegrams received during the lock are ignored.

State without lock:

Here the state of the last received switching telegram is restored. This takes into account the received switching telegrams during the lock. Thus, when the lock is deactivated, the last received switching telegram is set.

Function (Universal output)

If the universal output is selected on the parameter page "General", the actuator can be used as a switching output. A parameter for the scene function is also displayed.

Group Object	Type KNX	Size	Direction
GO 11 Actuator 1: Output - Switch	1.001	1 Bit	From KNX

Scene function

With this parameter the scene function can be enabled or disabled. If this functionality is enabled, the respective group object as well as the parameter page "Scene function" are displayed for further configuration of scenes 1-16.

Group Object	Type KNX	Size	Direction
GO 12 Actuator 1: Scene – Activ./Lrn.	18.001	1 Bit	From KNX

B. Scene function:

Description	Scene 1	No reaction
General settings	Scene 2	Switch on
Channel	Number	2
Logic / Timer	Scene 3	Switch off
Channel 1	Number	3
Actuator 1: General	Scene 4	Learnable
Actuator 1: Scene function	Number	4
	Scene 5	No reaction
	Scene 6	No reaction
	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

Scene 1-16

These parameters can be used to configure the state, which is set at the output when the respective scene is executed.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- Learnable

Learnable:

By using a scene control telegram, the current state at the output can be saved for the respective scene. This allows the user to customize the scene without ETS download.

Number

This parameter sets any scene number between 1 and 64 to the scene. There must not be configured any scene numbers twice.

Function (On/Off delay)

If the ON/OFF delay is selected on the parameter page "General", delayed switching times can be configured. The "On/Off Delay" parameter page is displayed for this purpose.

Group Object	Type KNX	Size	Direction
GO 11 Actuator 1 Output - Switch	1.001	1 Bit	From KNX

C. On/Off delay:

Description	On delay time	2 s
General settings	Retriggerable	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Channel	Off delay time	30 s
Logic / Timer	Retriggerable	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Channel 1		
Actuator 1: General		
Actuator 1: On/Off delay		

On delay time

The duration of the switch-on delay is configured in this parameter.

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

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

Off delay time

The duration of the switch-off delay is configured in this parameter.

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

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

Retriggerable

If these parameters are activated, the respective delay time is restarted upon receipt of the corresponding switching signal.

Function (Staircase function)

If the staircase function is selected on the parameter page "General", a group object for the staircase function appears in addition to the normal switching object. Via the additional parameter page "Staircase function" this function can be configured.

Group Object	Type KNX	Size	Direction
GO 11 Actuator 1: Output – Switch	1.001	1 Bit	From KNX
GO 13 Actuator 1: Staircase function - Trigger	1.010	1 Bit	From KNX

D. Staircase function:

Switch off time

The time for which the output is activated after an ON telegram (object of the staircase function) has been received, can set in this parameter.

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

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

Retriggerable

This parameter can be used to set whether the follow-up time is to be restarted when an ON telegram is received on the object of the staircase function.

Reaction on 'OFF' telegram

This parameter can be used to set whether an OFF telegram on the object of the staircase function should be processed or ignored.

Time for warning before switch off

The time between pre-warning and deactivation is configured, or the pre-warning is deactivated with this parameter. If the pre-warning time is longer than the actual follow-up time, no pre-warning is carried out.

Time off interrupt

The pre-warning is indicated by a brief interruption (switch off -> switch on). The duration of this interrupt is configured in this parameter.

Note: LED lamps often have a long follow-up time, in which the lamp still lights even though it is already switched off. With such lamps longer interrupt times must be set to generate a "visible" interruption.

Function (Valve actuator)

The function valve actuator is foreseen to control thermoelectric valve drives which are used for floor heating but also for radiators. It maps the continuous position (0% - 100%) to an ongoing On/Off sequence called PWM (pulse width modulation) signal.

If the valve actuator is selected on the parameter page "General", a group object for the valve actuator appears instead of the normal switching object. This allows the current PWM at the output to be set via KNX (0% - 100%). An additional parameter page "Valve actuator" appears for the configuration of the valve actuator.

The received control value is saved automatically by the device, to continue faultless after a possible bus power loss.

Group Object	Type KNX	Size	Direction
GO 14 Actuator 1: Valve actuator (PWM) – Control value	5.001	1 Byte	From KNX

E. Valve actuator:

Cyclic time (PWM)

The cyclic time of the PWM, which is used to control a servo drive, is configured with this parameter. One cycle involves a time range in which the output is switched on and one in which the output is switched off. The cyclic time corresponds to the period between two rising edges (state change at the output from OFF to ON). The longer the flow of the heating circuit (tube / pipe length), the higher the cyclic time should be set.

Note: Typical thermal servo require several minutes for a 100% valve change.

Maximum control value (PWM)

This parameter can be used to limit the maximum control value. The control value is expressed in percent and de-fines the period during which the output is switched on in one cycle.

Example:

Cyclic time = 10 min

Maximum control value (PWM) = 80 %

Maximal output state = ON - 8 min / OFF - 2 min

Stuck protection

With the stuck protection, it is intended to prevent the valve from being damaged by corrosion or calcification, that it can no longer be moved. In case stuck protection is enabled, this is only triggered if the value is permanently 0 % or 100 %. On every other control value the servo already moves, so there is no need for a stuck protection.

Control value 0% → Open servo for the set time
Control value 100% → Close servo for the set time

In case the valve is not allowed to open, the stuck protection must be disabled.

Execution time

If the stuck protection is activated, this parameter is used to set the duration of the state change.

Monitoring interval

If the stuck protection is activated, this parameter sets the monitoring interval. If the state of the output remains unchanged for this time, the lock protection is triggered.

Protection on missing control value

This parameter enables the protection function on missing control value telegrams. This is necessary in order to prevent unwanted and uncontrolled overheating or cooling down of the room, when the control value is missing.

Protection takes effect, as soon as no telegrams are received from the controller over a longer period of time. As soon as this extended telegram pause has occurred, it can be assumed that the corresponding controller has failed or the connection between the controller and the valve actuator has been interrupted.

Protection control value (PWM)

If the protection on missing control value is enabled, this parameter sets a protection control value. This configured PWM value will set the output, if the protection is active.

As soon as telegrams from the controller are received again, the protection control value (PWM) is overwritten by the received value. The protection does not react again, until the waiting time in the set monitoring interval is exceeded between individual telegrams.

Monitoring interval

If the protection on missing control value is enabled, this parameter sets the monitoring interval. If no further telegram is received by the device during this time, the protection function takes effect.

Lock function (with valve actuator)

With this parameter the lock function can be disabled or enabled. If this functionality is activated, the associated group objects as well as the parameter page "Lock function" are displayed for further configuration. If the lock has been activated via the group object "Lock", the received switching telegrams are not executed.

In addition to the lock object, there is also a priority object, which can be used to set a control value independently of the lock. Thus, it is possible to set an output PWM without affecting other functions.

When the lock is ended, the last received value (not priority object) is represented as PWM at the output.

Group Object	Type KNX	Size	Direction
GO 15 Actuator 1: Lock - Activate	1.001	1 Bit	From KNX
GO 17 Actuator 1: Prior. valve actuator (PWM) – Control value	5.001	1 Byte	From KNX

F. Lock function:

2.1.1 Multi IO > Channel 1 > Actuator 1: Lock function

Description: Polarity of object Lock active on 1 Lock active on 0

General settings: Behavior on start No reaction Value

Channel: Control value (PWM) 50 %

Logic / Timer

Channel 1

Actuator 1: General

Actuator 1: Valve actuator

Actuator 1: 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 on start

This parameter defines, which behavior the output should represent, if the lock activates.

The following options are selectable:

- No reaction
- Value

No reaction:

The PWM value remains as to begin of the lock function.

Value:

When the lock is activated, a defined PWM value is represented on the output.

Control value (PWM)

If a defined PWM value should be set to the output when the lock is activated, this value can be set with this parameter.

Channel function: “Blinds actuator”

A. General:

2.1.1 Multi IO > Channel 1 > Jalousie 1: General

Description	Name	Jalousie 1
General settings	Position	Without calculation
Channel	Behavior after supply power return	No reaction
Logic / Timer	Emergency stop function	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Channel 1	Scene function	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
Jalousie 1: General	Alarm / Lock function	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
	Delay between direction changes	0.5 s
	Stepping	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Stepping time [ms]	500

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 ...”. In the following, the first channel is described, the functionality of the remaining channels is analog.

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.



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 1: Blind position - State	5.001	1 Byte	To KNX
GO 16 Actuator 1: Slats position*- State	5.001	1 Byte	To KNX

* Only for blind drives

Behavior after supply power return

Defines which action should be performed after the supply 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 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 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 a new drive command is received by any of the other group objects.

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

B. 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

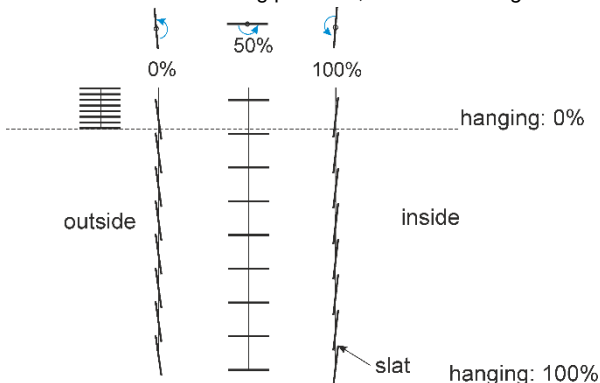
The movement speed upward and downward is for some drives not equal. So this parameter allows adjusting for differences.

Time for full turn of slats [s]

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

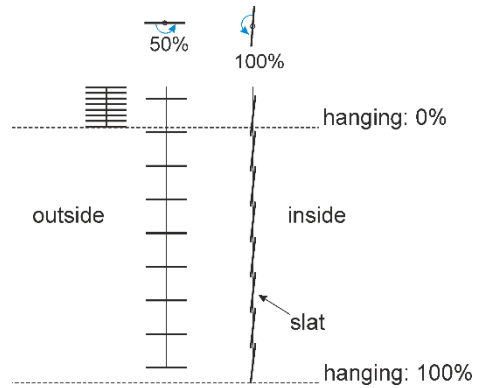
Max. slats rotation angle

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



Positions of blind and slats 180°

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 1: Up / Dn - Drive start	1.008	1 Bit	From KNX
GO 12 Actuator 1: Step / Stop - Drive stop	1.007	1 Bit	From KNX
GO 13 Actuator 1: Blind position - Set position	5.001	1 Byte	From KNX
GO 14 Actuator 1: Slats position - Set position	5.001	1 Byte	From KNX

C. Shutter settings:

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 1: Up / Dn - Drive start	1.008	1 Bit	From KNX
GO 12 Actuator 1 Step / Stop - Drive stop	1.007	1 Bit	From KNX
GO 13 Actuator 1: Blind position - Set position	5.001	1 Byte	From KNX

D. Scene function:

Position strategy

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

- *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 1: Scene – Activ./Lrn.	18.001	1 Byte	From KNX

E. Alarm / Lock function:

This page provides options to enable or disable the alarm 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

Am Ende des Alarms kann eine dieser Reaktionen eingestellt werden.

- *No Reaction*
- *Up*
- *Down*
- *State before function*
At the beginning of the alarm the current position will be stored and restored if the alarm ends.
- *State without function*
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 1: 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 but-tons, 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 1: Lock - Activate	1.001	1Bit	From KNX
GO 20 Actuator 1: Prior. drive start -Up / Dn	1.008	1 Bit	From KNX
GO 21 Actuator 1: Prior. drive stop - Step / Stop	1.007	1 Bit	From KNX
GO 22 Actuator 1: Prior. blind position – Set position	5.001	1 Byte	From KNX
GO 23 Actuator 1: Prior. slats position – Set position*	5.001	1 Byte	From KNX

* Only for blind drives

Channel function: "Binary input"

A. General

The screenshot shows the configuration interface for 'Input 1: General'. The 'Name' field is set to 'Input 1'. The 'Function' dropdown is set to 'Switching'. The 'Type' section has two radio buttons: 'Normally open contact' (selected) and 'Normally closed contact'. The 'Lock function' section has two radio buttons: 'Disabled' (selected) and 'Enabled'.

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 ...". In the following, the first channel is described, the functionality of the remaining channels is analog.

Function

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

- Disabled
- Switching
- Dimming
- Shutter
- Send value
- Scene
- Impulse counter

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

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. You can choose between normally open or normally closed.

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 "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 16 Input 1: Lock - Activate	1.001	1 Bit	From KNX

B. 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.

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.

C. 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 11 Input 1: Output a – Switch	1.001	1 Bit	To KNX
GO 22 Input 1: 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.

The following options are selectable:

- No reaction
- Switch on
- Switch off
- Toggle

On toggle, the last value received from the bus is evaluated if the write flag is activated on the object 11.

Output b

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

D. Input 1: Switching – State query

The state query function is used, for example, to monitor window contacts.

The state query mode is recognized automatically by the firmware, if the following parameter setting is configured:

User control: Press / Release

Function of (...) on press: Switch on

Function of (...) on release: Switch off

or inverted:

User control: Press / Release

Function of (...) on press: Switch off

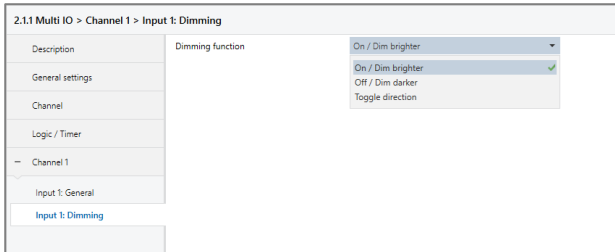
Function of (...) on release: Switch on

If a state query is configured, the value on the object is kept up to date. The value corresponding to the current state is read. If

the lock is active, the object value corresponds to the last state before the lock or to the configured value on lock.

Cyclic sending of this actual value is possible. Via activating the parameter *Heartbeat* on page *General settings* the object value of the state query is sent cyclically on the KNX bus (see *Heartbeat*), but not if the lock is activated. The cycle time is also used from the corresponding parameter of the heartbeat.

E. Dimming



On selection of function Dimming following objects are visible:

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Dimming on/off	1.001	1 Bit	To KNX
GO 12 Input 1: 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:

The following options are selectable:

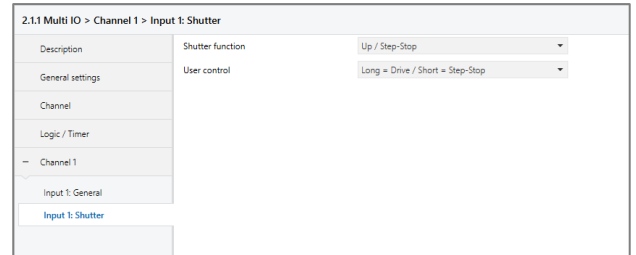
- On / Dim brighter
- Off / Dim darker
- Toggle direction

On toggle direction, the last value received from the bus is evaluated if the write flag is activated on the object 11.

If the input detects a short button press, a switching telegram is sent via object 11. On long button press, a relative dimming is sent over the entire dimming range to object 12. When releasing after long button press, a dimming-stop telegram is sent via object 12.

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

F. Shutter



On selection of Shutter function following objects are visible:

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Drive start – Up/Down	1.001	1 Bit	To KNX
GO 12 Input 1: Drive stop – Step/Stop	1.001	1 Bit	To KNX

Shutter function

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

The following options are selectable:

- 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 11.
Short button press: Stop/step command via object 12

- Short = Drive / Short = Step/Stop

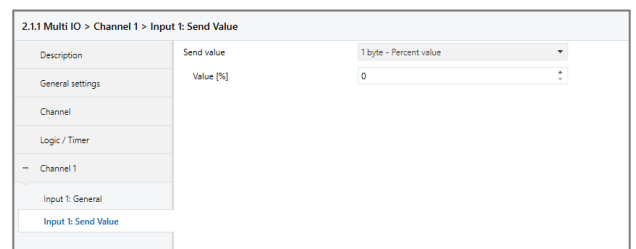
Alternately drive command via object 11 and stop/step command via object 12 on short button press, long button press is not evaluated

- Pressed = Drive / Release = Stop

On button press drive command via object 11, on releasing the button stop/step command via object 12

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

G. 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 11 Input 1: Send percent value (1 byte) – Set value	5.001	1 Byte	To KNX

- 1 byte - Integer value

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Send integer value (1 byte) – Set value	5.010	1 Byte	To KNX

- 2 byte - Integer value

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Send integer value (2 byte) – Set value	7.001	2 Byte	To KNX

- 2 byte - Float value

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Send float value (2 byte) – Set value	9.001	2 Byte	To KNX

- 3 byte - RGB value

Group Object	Type KNX	Size	Direction
GO 11 Input 1: 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 11 Input 1: Send ASCII string (14 byte) – Set value	16.000	14 Byte	To KNX

- Shutter

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Send blind position – Set position	5.001	1 Byte	To KNX
GO 12 Input 1: 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.

H. Scene

On selection of Scene function the following object is visible:

Group Object	Type KNX	Size	Direction
GO 11 Input 1: 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.

I. Scaled counter

2.1.1 Multi IO > Channel 1 > Input 1: Scaled counter

Description	Scaling factor (Value per pulse)	1
General settings	Datapoint type	Integer (32 bit) - DPT 13
Channel	Send condition	On read
Logic / Timer	Monitoring limit value	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
Channel 1	Limit value	1
Input 1: General	Behavior on reaching limit value	<input type="radio"/> Send 0 <input checked="" type="radio"/> Send 1
Input 1: Scaled counter	Behavior on reaching limit value	Counter continue
Input 1: Rate of change	Send on device restart	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
	Reset via object	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
	Reset on ETS download	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled
	Lock function	<input checked="" type="radio"/> Disabled <input type="radio"/> Enabled

Example:
Electricity meter with 1000 impulses per kWh
-> Scaling factor = 0.001 for kWh

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 11 Input 1: Counter – Value	13.013	4 Byte	To KNX

- Float (16 Bit) – DPT 9

Group Object	Type KNX	Size	Direction
GO 11 Input 1: Counter – Value	9.024	2 Byte	To KNX

- Float (32 Bit) - DPT 14

Group Object	Type KNX	Size	Direction
GO 11 Input 1: 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

- 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 12 Input 1: 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 15 Input 1: 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 16 Input 1: 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.

J. Lock function

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

K. Rate of change

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 13 Input 1: Rate of change – Value	9.024	2 Byte	To KNX

- Floating point (32 Bit) – DPT 14

Group Object	Type KNX	Size	Direction
GO 13 Input 1: 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

- 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 14 Input 1: 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

Logic / Timer

2.1.1 Multi IO > Logic / Timer		
Description	Function 1	Timer
General settings	Function 2	Logic
Channel	Function 3	Disabled
Logic / Timer	Function 4	Timer
+ Function 1	Function 5	Disabled
+ Function 2	Function 6	Timer
+ Function 4	Function 7	Disabled
+ Function 6	Function 8	Logic
+ Function 8	Function 9	Disabled
+ Function 16	Function 10	Disabled
	Function 11	Disabled
	Function 12	Disabled
	Function 13	Disabled
	Function 14	Disabled
	Function 15	Disabled
	Function 16	Timer

A. 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.

B. Function 1 – 16 (Timer)

2.1.1 Multi IO > Function 1 > Fcn 1: Timer		
Description	Function name	Fcn 1
General settings	Timer type	Switch-on delay
Channel	Delay time [s]	60
Logic / Timer	Output	<input checked="" type="radio"/> Not inverted <input type="radio"/> Inverted
- Function 1		
Fcn 1: 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.

C. Function 1 – 16 (Logic)

2.1.1 Multi IO > Function 1 > Fcn 1: Logic

Description	Function name	Fcn 1
General settings	Gate type	AND gate
Channel		
Logic / Timer		
- Function 1		
Fcn 1: 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)

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

Gate type (OR)

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

Gate type (XOR)

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

Gate type (NAND)

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

Gate type (NOR)

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

Gate type (XNOR)

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.



ETS4/5 Database

www.weinzierl.de/en/products/580/ets4

Datasheet

www.weinzierl.de/en/products/580/datasheet

CE Declaration

www.weinzierl.de/en/products/580/ce-declaration

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