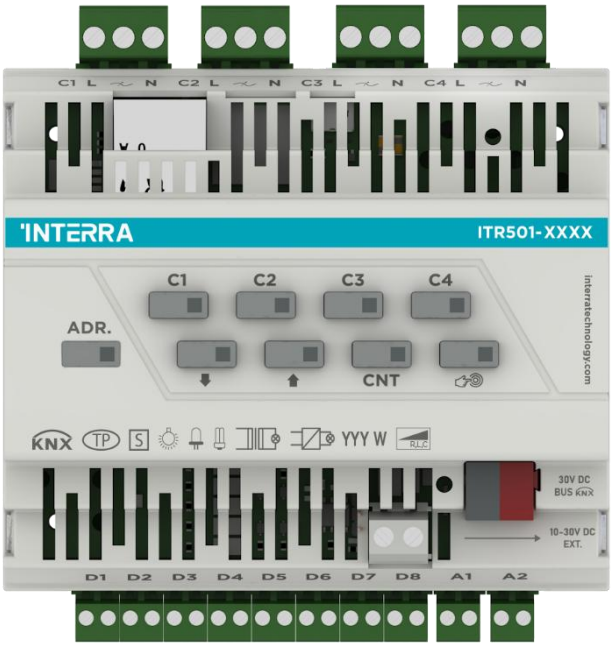
INTERRA

Developer of Uniqueness

Universal Dimming Actuator

Product Manual



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1. Content of The Document

This document contains Interra ITR501-XXX2/XXX4 coded Universal Dimming Actuator devices' electronic and all essential feature information for programming the products. In each subtitle is explained the characteristics of the device are. Modifications of the product and special change requests are only allowed in coordination with product management.

This manual provides detailed technical information concerning the ITR501-XXX2 - 2 Channel Universal Dimming Actuator and ITR501-XXX4 - 4 Channel Universal Dimming Actuator. All of the models have the same software functionality so, the features described in this document apply to all versions.

This user manual is intended for use by KNX installers and describes the functions and parameters of the Interra Universal Dimming Actuator family devices and how it is possible to change the settings and configurations using the ETS software tool. This document also describes the installation, programming, commissioning, and use of the devices with detailed information.

2. Product Description

Interra Universal Dimming Actuators can be used with Dimmable LED, incandescent lamps, LV, HV halogen lamps, and energy-saving lamps.

In Universal Dimming Actuator devices, there is an RGB LED status indicator for each channel and manual control can be made on the device. Scenarios, forced operation, block, staircase, operating hours, logic operation modules and converter modules are available.

Depending on the ETS configurations, automatic load recognition can be made and Dim curve determination, Dim operation is divided into 3 zones. The dimming speed of each zone can be adjusted separately.

Interra Universal Dimming Actuators can produce 250 W of output power per channel and drive R, L, and C loads. Temperature protection, short circuit protection, error notification via channel LEDs, and load presence detection features are available.

Ability to work with 3-phase systems, dry contact inputs (can be used externally or through channels), parallel operation and separate phase and neutral connection to each isolated channel.

2.1. Technical Information

The following table shows the technical information of the Universal Dimming Actuator 2 Ch & 4 Ch.

Product Code	ITR501-XXX2	ITR501-XXX4
KNX Medium	TP1	TP1
Configuration Mode	S-Mode	S-Mode
KNX Power Supply	21-32 V DC	21-32 V DC
KNX Operating Voltage	230 V AC ±10%	230 V AC ±10%
KNX Operating Frequency	50 Hz	50 Hz
Cable Cross-section	**Single Cable:** 0.5 mm^2 - 2.5 mm^2 or 2 x 1.5 mm **Ferrule cable:** 0.5…2.5 mm^2 **Without Ferrule:** 0.5… 2.5 mm^2	**Single Cable:** 1.5 mm^2 - 4 mm^2 or 2 x 1.5mm^2 **Ferrule cable:** 0.5…2.5 mm^2 **Without Ferrule:** 0.5… 2.5 mm^2
Max. Cable Length	100 m	100 m
Mounting Type	DIN Rail – 6 modules	DIN Rail – 6 modules
Bus Connection	1 x KNX, 1 x Ethernet	1 x KNX, 1 x Ethernet
Incandescent & Halogen HV	300 W (200 W in inductive mode)	250 W (200 W in inductive mode)
Switching Capacity Min.	5 W	5 W
Halogen LV (Ferromagnetic Transformer)	300 VA (Capacitive mode not supported)	250 VA (Capacitive mode not supported)
Halogen LV (Electronic transformer)	300 VA (Inductive mode not recommended)	250 VA (Inductive mode not recommended)
Dimmable LED (Retrofit) & CFL	300 VA (30 VA in inductive mode, the automatic mode is not recommended)	250 VA (25 VA in inductive mode, the automatic mode is not recommended)
Type of Protection	IP 20	IP 20
Temperature Range	Operation (-5℃...45℃) Storage (-25℃...55℃)	Operation (-5℃...45℃) Storage (-25℃...55℃)
Maximum Air Humidity	< 90 RH	< 90 RH
Colour	Light Grey	Light Grey
Dimensions	105 x 90 x 64 mm (W x H x D)	105 x 90 x 64 mm (W x H x D)
Certification	KNX Certified	KNX Certified
Configuration	Configuration with ETS	Configuration with ETS

* The recommended load per channel according to the “Load type” parameter are shown in the table below.

Load Type	Nominal Voltage	Ambient temperature	Leading edge (L mode) trailing edge (RC mode)	2 Channel Possible max. load	4 Channel Possible max. load
Incandescent lamps	230 V / 50 Hz	45 °C	RC-Mode	300 W	250 W
Ferromagnetic Transformer (Inductive)	230 V / 50 Hz	35 °C	L-Mode	240 W	200 W
	230 V / 50 Hz	45 °C	L-Mode	225 W	187.5 W
Electronic Transformer (Capacitive)	230 V / 50 Hz	45 °C	RC-Mode	300 W	250 W
LED (Retrofit)	230 V / 50 Hz	45 °C	RC-Mode	300 W	250 W
	230 V / 50 Hz	45 °C	L-Mode	30 W	27.5 W
CFL	230 V / 50 Hz	45 °C	RC-Mode	300 W	250 W
	230 V / 50 Hz	45 °C	L-Mode	45 W	40 W

*** The output with LED and compact fluorescent lamps in the leading edge is largely depending on the lamp type. Therefore, the dimmer might dim down because of an excess temperature. In this case, select the trailing edge operating mode! The device will thus not be damaged.**

Therefore, dimming of the dimmer can occur due to high temperatures. The device can so not be damaged.

ITR501-$X_1X_2X_3X_4$		
X_1	Reserved	
X_2	**0:** No Ethernet	**1:** Ethernet
X_3	**0:** No Inputs	**1:** Inputs
X_4	**2:** 2 Channels	**4:** 4 Channels

Table of Universal Dimming Actuator Code List

2.1.1. Load Types

The device works on the principle of phase cut-off or phase-on dimming and allows switching and dimming of HV incandescent lamps, HV halogen lamps, and conventional transformers as well as LV halogen lamps, dimmable CFL, and dimmable LED Driver loads. The recommended load types according to the “Load type” parameter are shown in the table below.

ETS Parameter \ Load	Halogen, Incandescent Lamps	Ferromagnetic Transformer (Inductive)*	Electronic Transformer (Capacitive)*	LED (Retrofit), CFL
Automatic	✓	✓	✓	⊖
Capacitive (phase cut-off)	✓	✗	✓	✓
Inductive (phase cut on)	✓	✓	⊖	✓

✓	Usage possible
⊖	Usage is not recommended
✗	Not possible to use

Caution!

If the LED load needs to be driven with the "Phase cut off" technique, set the load type to "LED/Capacitive", if the LED load needs to be driven with the "Phase cut off" technique, set the load type to "LED/Inductive".

2.1.2. Automatic Load Recognition

The automatic load recognition feature is an auxiliary function for unknown load types, load type selection is recommended for known load types. If the load type is set automatically on the ETS, the channel performs the calibration routine before each opening and activates the output as calibrated.

Load Types	Lamp Types
Resistive / Capacitive Loads	Incandescent lamps, HV halogen lamps, Electronic transformers, Dimmable energy-saving lamps and LED Retrofit
Inductive Loads	LV halogen lamps (Ferromagnetic transformers)

2.1.3. LED Notifications

- Each channel has one bi-colour notification LED. Green indicates that the channel is open, and red indicates that it is in an error state.
- If the manual mode LED flashes when trying to set the output with the buttons on the device, it means that the manual mode is turned off with the ETS parameter. You need to activate manual mode via ETS.
- If the programming LED is blinking at 3-second intervals, it means that the device cannot communicate with the BUS. In this case, the outputs can be controlled with the buttons on the device.
- There are also objects for each of the specified led errors. Every time the error status changes, status information is also sent from these objects.

LED Status	Description
Fast Flashing Red LED	The dim module has reached its temperature limit. In this case, the channel output is closed and does not open again until the temperature drops.
Flashing Red LED	The channel is not communicated with Universal Dimming Actuator. The channel may be faulty or not powered.
Constant Red LED	Short circuit at the channel output. The Universal Dimming Actuator repeats the short circuit check every 3 seconds and if the short circuit is corrected, the channel status returns to its former state, but the channel output remains closed.
Flashing Yellow LED	Load type mismatch for inductive load detected load type is inductive but selected load type is capacitive. If the parallel operation is active, it indicates that the calibrations of the parallel channels are different from each other. Loads must be dismantled and connected correctly.
Constant Yellow LED	No load is detected at the Universal Dimming Actuator output. The channel does not accept commands until the output load is detected.
Fast Flashing Green LED	Overload protection is active. In case of this error, the device will not try again, the energy should be cut off and the load amount should be brought to the declared level and energized again.
Constant Green LED	The channel output is active

2.1.4. Button Functions

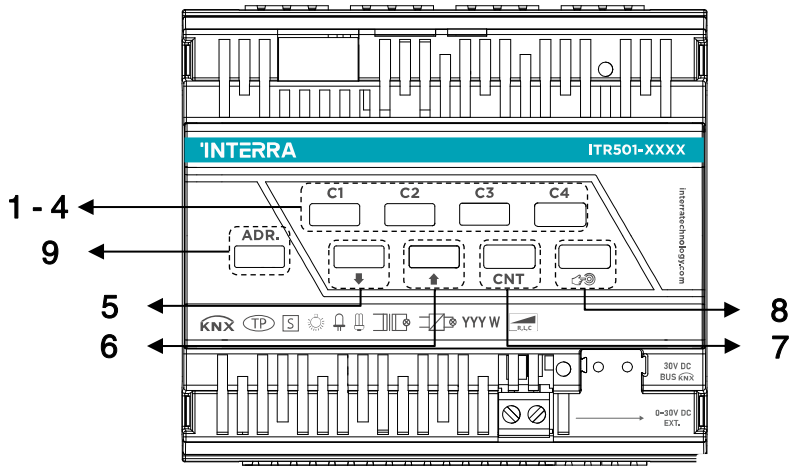


Fig. 1: Button Functions of Universal Dimming Actuator

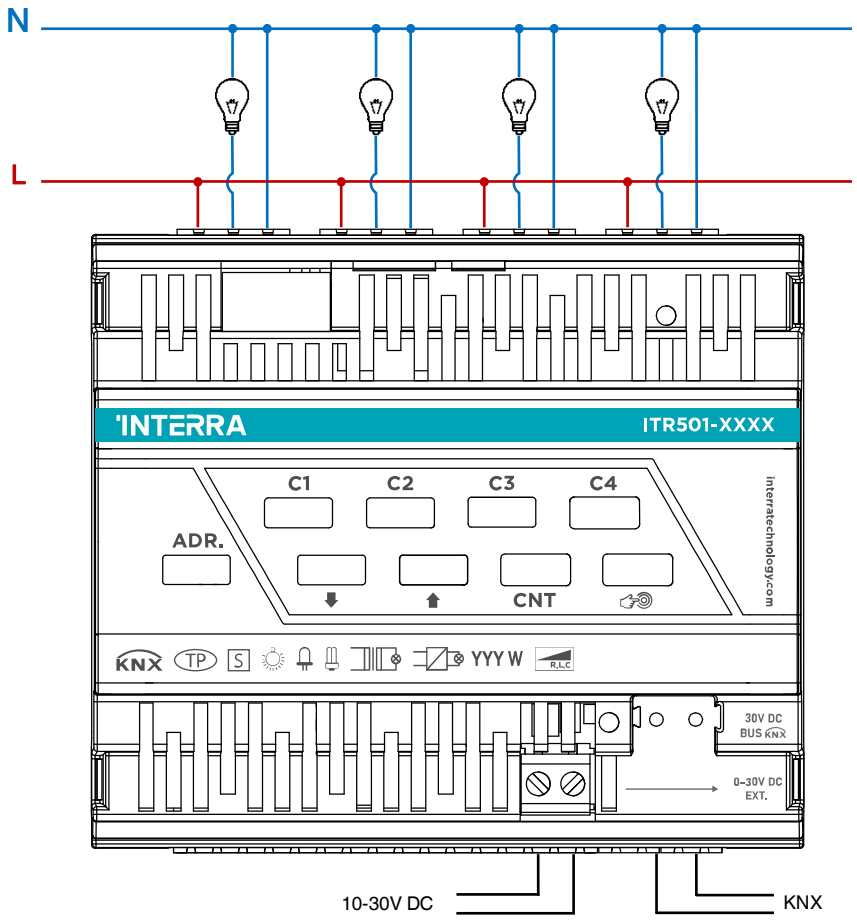
No	Button Name	Description
1-4	Switch On/Off C1...C4	The channel buttons with the notification led in the first row apply “Switch on/off” commands with only a short press, they have no function in long pressing. Channel numbers continue from left to right as 1-4.
5	Dim Down ⬇	It does not have any function in short press. Which channel the dim command goes to also depends on which channel's Switch on/off button was pressed last. Dim buttons are associated with the channel that was pressed last among the buttons in the first row.
6	Dim Up ⬆	It does not have any function in short press. Which channel the dim command goes to also depends on which channel's Switch on/off button was pressed last. Dim buttons are associated with the channel that was pressed last among the buttons in the first row.
7	Central Switch CNT	When the device is energized for the first time, the first command of this button always works as Switch off and continues in sequence as On/Off each time it is pressed. There is a red LED under this button. This led to checks if the USB cable is plugged in.
8	Manual Control ☞	When this button is pressed, the red manual control LED below becomes active and the device does not react to the commands from the KNX bus. This mode can be exited by pressing the button again or waiting for the time defined in the ETS.
9	KNX Button ADR.	The KNX programming button

2.1.5. Important Information

- Do not connect channels in series.
- For parallel connection, choose parallel connection over ETS.
- The automatic load identification feature is not recommended for known load types. For better dimming performance, select the appropriate parameter for known load types.

2.2. Connection Diagram

Each output (C1, C2, C3, C4) can be used individually for dimming control. The connection method is as follows.



: Load

Fig. 2: Connection Diagram of Universal Dimming Actuator

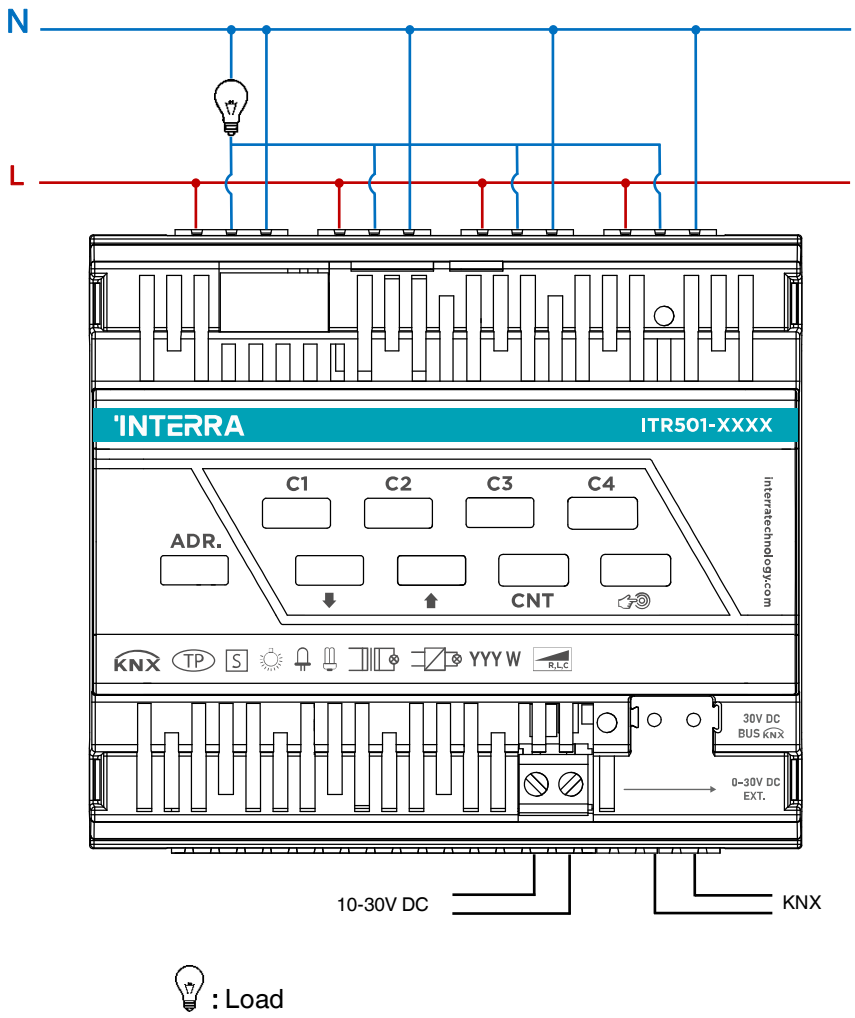


Fig. 3: All Channels Parallel Connection Diagram of Universal Dimming Actuator

Caution!

For parallel switching of channels, these must be connected to the same phase. In the case of different phases, the dimmer will be destroyed during parallel switching.

2.3. Dimensions

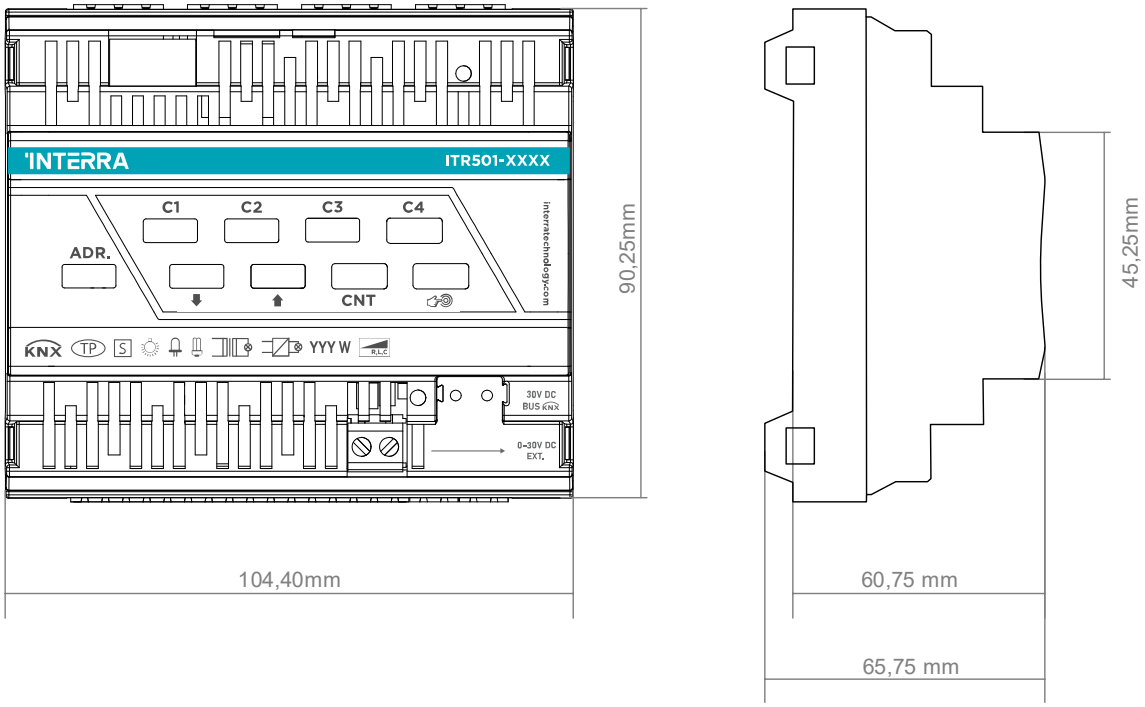


Fig. 4: Dimensions of Universal Dimming Actuator

2.3.1. Device Behaviour After ETS Installation

After ETS installation, the corresponding channel will be closed. The status light will also be off. If manual control is enabled from the ETS parameter, it can be controlled with the control buttons on the device.

2.3.2. Device Behaviour in the Case of Bus Failure

It can be set separately for all channels via ETS.

2.3.3. Device Behaviour in the Case of Bus Recovery

It can be set separately for all channels via ETS.

3. ETS Parameters & Descriptions

In this chapter, the ETS parameters of ITR501-XXX2 and ITR501-XXX4 Universal Dimming Actuator are described using the parameter pages and options. The parameter page features are dynamic structures which means further parameters and parameter pages are enabled depending on the configuration.

The words sensor and detector are used interchangeably in this document to mean 'device'. Therefore, both have the same meaning.

In the ETS parameter configuration pages, each of the parameters has got a default parameter value. These default values are written in bold.

- E.g.: Enable in operation •**no** yes

3.1. General Page

When the ITR501-002 and ITR501-004 Universal Dimming Actuators ETS configuration file is attached to the project from the ETS software, a configuration setting must be made primarily before loading. When entering the “GENERAL” in the parameter page, the configuration screen will appear as shown below. General settings for the devices are made in this window.

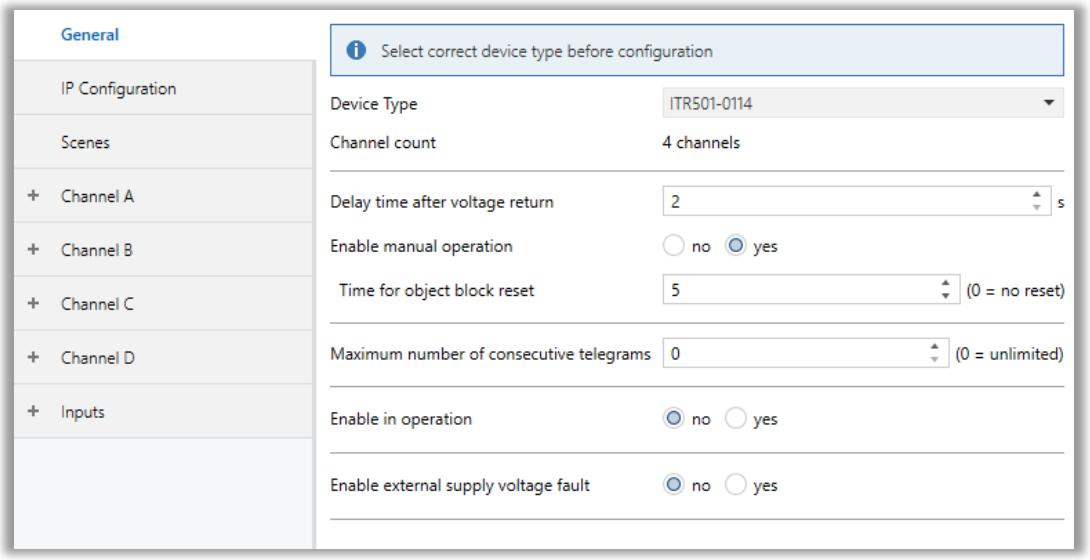


Fig. 5: General Page Configuratio

3.1.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Device type	This parameter is used to determine the type of Universal Dimming Actuator. If the device to be configured is ITR501-XXX2 Universal Dimming Actuator 2 Channels, please select the channels". If the device to be configured is ITR501-XXX4 4 Channel, please select "4 Channels".	ITR501-0002 ITR501-0012 ITR501-0102 ITR501-0112 ITR501-0004 ITR501-0014 ITR501-0104 **ITR501-0114**
Delay time after voltage return	This parameter is used to determine the delay time after voltage return in seconds. When in a delayed state, the Universal Dimming Actuator does not send any KNX telegrams. Incoming telegrams are received and updated in the background. The updated values are only executed when the wait state ends and then sent according to the parametrization.	**2**...60
Enable manual operation	This parameter is used to enable or disable the manual push button on the Universal Dimming Actuator. If manual operation is enabled, it can be disabled by Disable manual operation/Status group object. **Yes:** Manual operation is enabled. **No:** The push button is disabled. No manual action is allowed on the device.	**No** Yes
Time for Auto Reset	This parameter is used to reset the manual operation mode automatically. The time value entered is in minutes.	2…**5**…255
-> Maximum number of consecutive telegrams	This parameter is used to set the maximum number of sent telegrams by the device.	**0**...255
Enable In Operation	This parameter is used to determine the existence of the Universal Dimming Actuator on the KNX bus line. The cyclic telegram can be monitored by an external KNX device. If a telegram is not received, the device may be defective or the KNX cable to the transmitting device may be interrupted. **Yes:** The group object is enabled. **No:** The group object is not enabled.	**no** yes

-> In operation send	This parameter is used to determine the send value of the “General - In operation” group object on the KNX bus line.	value ‘0’ **value ‘1’**
-> In operation send interval (min)	This parameter is used to set the cyclically sending time interval value of the “General - In operation” group object.	1...**5**...255
Enable supply voltage fault	This parameter is used to enable or disable the supply voltage fault. **Yes:** As soon as the device supply voltage is interrupted, the Universal Dimming Actuator supply voltage fault group object sends a telegram with the value 1 on the KNX. The time at which a telegram is sent can be adjusted using the parameter below. **No:** The Universal Dimming Actuator voltage failure is not signalled to the KNX bus line.	**no** yes
-> Send object value	This parameter is used to set the sending object value method. **On request:** The status is sent when a request occurs. **Change or request:** The status is sent when either a change or request occurs.	On request **Change or request**

3.2. IP Configuration

This function is used to make the IP Configuration. Hostname, HTTP port, IP address assignment, Subnet mask assignment, Default gateway assignment, DNS Server assignment and user authentication configurations can be made on this parameter page.

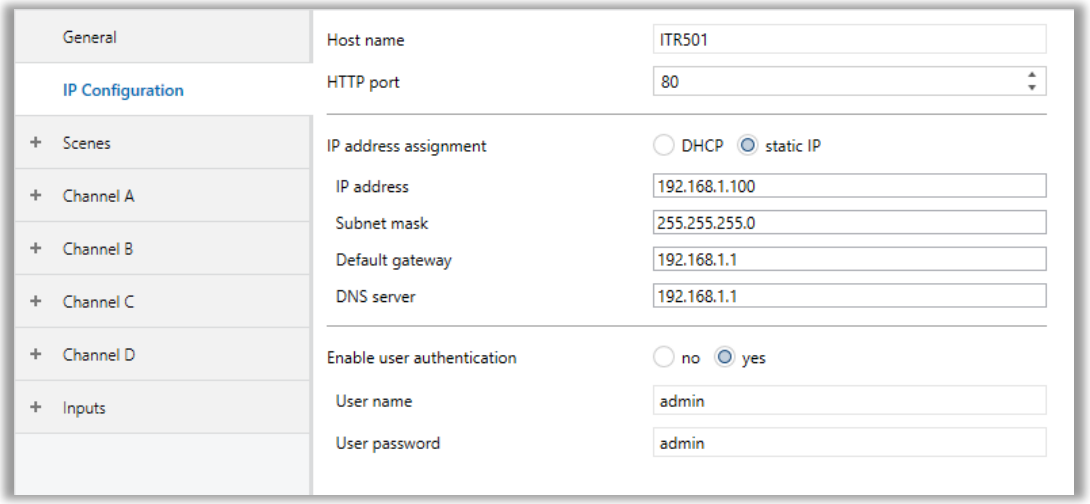


Fig. 6: IP Configuration Parameter Page

3.2.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Host Name	This parameter is used to determine a user-friendly Hostname for the Universal Dimming Actuator. Up to 15 bytes are allowed for the Hostname.	**ITR501**
HTTP port	This parameter is used to configure the HTTP port number.	0...**80**...65535
IP address assignment	This parameter is used to assign a static IP address or a dynamic address by a DHCP server. The parameters for the static IP address are only visible if you select “Static IP”.	**DHCP** Static IP
-> IP address	This parameter is used to set the static IP address of the Universal Dimming Actuator if you do not select the DHCP.	**192.168.1.100**
-> Subnet mask	This parameter is used to set the subnet mask of the Universal Dimming Actuator if you do not select DHCP.	**255.255.255.0**
-> Default gateway	This parameter is used to set the address of a standard gateway for direct access via the Internet. The setting is only possible if you do not select the DHCP.	**192.168.1.1**
-> DNS server	This parameter is used to set the DNS server address of the Universal Dimming Actuator if you do not select the DHCP.	**192.168.1.1**
Enable user authentication	This parameter allows login to the web server via a user name and password.	**No** Yes
-> User name	This parameter is used to configure a user-friendly name for the user area of the web server. User names consist of up to 15 bytes.	**admin**
-> User password	This parameter is used to configure a password for the user area of the web server. Passwords consist of up to 15 bytes.	**admin**

3.3. Scenes

The Interra Universal Dimming Actuators have 16 scenes per channel Each scene can be assigned to channels to control the brightness of the related channel. In addition, a scene member can be a member of several scenes. Any KNX scenes (1 to 64) can be selected to control each channel separately. If desired, channels can be used for environments with more complex user demands. With KNX scenarios, solutions can be produced for complex requirements.

3.3.1. Scenes General

On this parameter subpage, 16 scenarios can be set individually. For each scenario, a scenario number can be given by the KNX standard between 1 and 64 numbers.

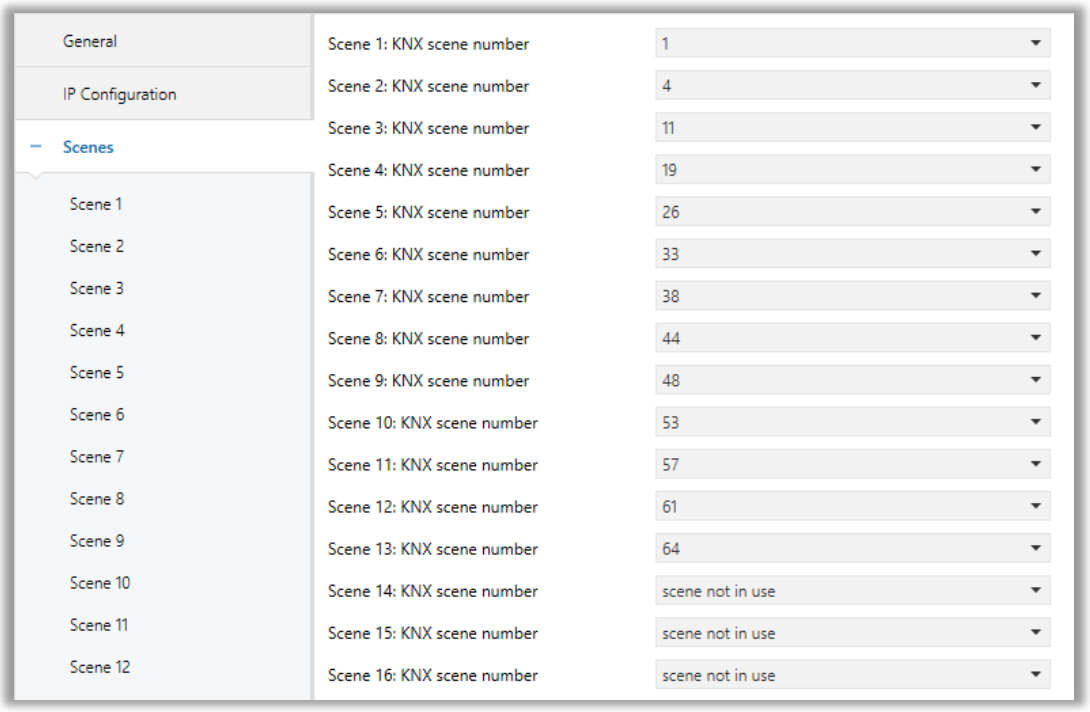


Fig. 7: Scenes - Main Page Configuration

3.3.1.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Scene 1: KNX scene number ... **Scene 16: KNX scene number**	This parameter is used to link a scene to a KNX scene. All of the possible KNX scenes (64 possible scenes) can be linked to different scenes for controlling the Universal Dimming Actuator channels. **Scene not in use:** The related scene x is not in use. **1...64:** The selected KNX scene (1 to 64) is assigned to selected KNX scene number x. This selection enables the related KNX scene parameter window.	**Scene not in use** 1...64

3.3.2. Scenes X

On this parameter subpage, the scenes properties and their members are parameterized in this parameter page. The scene x parameter page is only visible if KNX scene x is linked to a KNX scene(1 to 64 different KNX Scenes) in the X scenes parameter page.

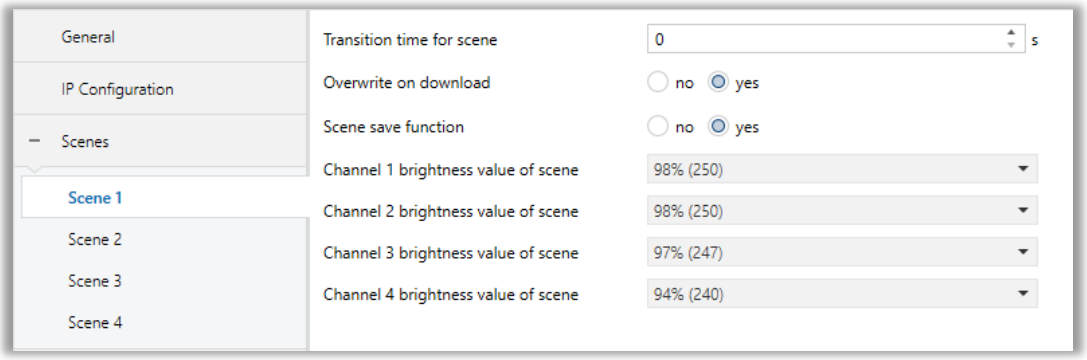


Fig. 8: Scenes – Scene X Page Configuration

3.3.2.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Transition time for scene	This parameter is used to determine the processing time for scene members to reach their scene value after a scene is called. When the dimming process is finished, the scene members have reached the set brightness for the scene. When a scene is recalled, all the lighting scene members are dimmed from their current brightness value to the set brightness value within this time.	**0**…255
Overwrite on download	This parameter is used to prevent manually set scene values from being overwritten by ETS download or KNX bus voltage recovery. Generally, the configured scene values are downloaded to the Interra Universal Dimming Actuator by ETS. But with this option, the saved scene configuration values via KNX are retained. **Yes:** The scene values for the scene members can be overwritten with the values configured in ETS by an application download or KNX bus voltage recovery. **No:** The scene values for the scene members cannot be overwritten with the values configured in ETS by an application download or KNX bus voltage recovery.	No **yes**
Scene Save Function	This parameter is used to save the scene for later usage.	No **Yes**

Channel X brightness value of scene	This parameter is used the determine the brightness value of the related channel X when a scene is recalled. **No change (not a member in this scene):** The related channel X is not a member of the selected scene and is not affected by a scene recall. The current brightness of value remains unchanged and even when the scene is stored via the KNX, the brightness value is not stored in the related channel X. **100% (255)…0% (OFF):** The related channel X is a member of the selected scene. During a scene recall, the scene member is set to the brightness value parameterized here. If the set brightness value is above or below the upper or lower dimming value defined for the scene member in question, the corresponding dimming value is stored in the scene.	**No change (not a member in this scene)** 0% (OFF)...%100 (255)

3.4. Channel X (A-B, A-D)

This section describes how to configure the related channel of Interra Universal Dimming Actuator devices. Channel configuration and parameters with similar features are explained separately in different sub-titles. Channel counts differ according to Universal Dimming Actuator Model (2-channel or 4-channel)

The physical outputs to the logical KNX channels are allocated with the aid of channel allocation. This, allows the outputs to be bundled and connected in parallel for increasing the connectable load.

3.4.1. Channel X – General

On this parameter page, the configuration of the general parameters for the relevant channel is described. Since the channels are the same, only the parameters related to Channel A are explained. When other channels are used, this section can be referenced for the relevant channel.

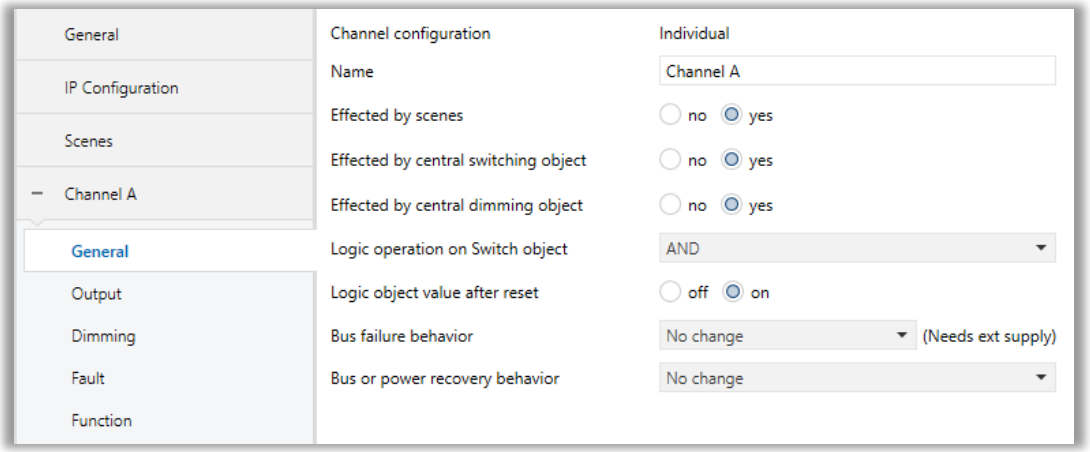


Fig. 9: Channel X - General Page Configuration

3.4.1.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Channel Configuration ->>> Individual		
Name	This parameter is used to determine the channel name. Up to 40 characters can be typed in this parameter.	**40 bytes allowed**
Effected by scenes	This parameter is used to determine whether channel X will be affected by scenes.	no **yes**
Effected by central switching object	This parameter is used to determine whether the corresponding channel is affected when a value is received from the bus to the central switching object. **No:** Will not be affected. **Yes:** Will be affected.	no **yes**
Effected by central dimming object	This parameter is used to determine whether the corresponding channel is affected when a value is received from the bus to the central dimming object. **No:** Will not be affected. **Yes:** Will be affected.	no **yes**
Logic operation on Switch object	This parameter is used to define the logic operation gate type. 'AND', 'OR' or 'XOR' operations can be made with logic objects.	**NONE** AND OR XOR
->> Logic object value after reset	This parameter is used to determine the logic object value after reset. Typically, 'on' for TRUE, 'off' for FALSE.	**off** on
Bus failure behaviour	This parameter is used to define the behaviour of the dimming channel after bus or mains voltage failure. **Min brightness value:** The channel x brightness will be at a minimum (switch-off value). **Brightness value %25:** The channel x brightness will be at %25. **Brightness value %50:** The channel x brightness will be at %50.	**No change** Off Min brightness value Brightness value %25 Brightness value %50 Brightness value %75 Max brightness value Last value before failure

	Brightness value %75: The channel x brightness will be at %75. **Max brightness value:** The channel x brightness will be at maximum (switch on value). **Last value before failure:** The channel x brightness will be the last value before failure.	
Bus recovery behaviour	This parameter is used to define the behaviour of the dimming channel after the bus or mains voltage recovers. **Min brightness value:** The channel x brightness will be at a minimum (switch-off value). **Brightness value %25:** The channel x brightness will be at %25. **Brightness value %50:** The channel x brightness will be at %50. **Brightness value %75:** The channel x brightness will be at %75. **Max brightness value:** The channel x brightness will be at maximum (switch on value). **Last value before failure:** The channel x brightness will be the last value before failure.	**No change** Off Min brightness value Brightness value %25 Brightness value %50 Brightness value %75 Max brightness value Last value before failure

3.4.2. Channel X – Output

On this parameter subpage, the configuration of the output parameters for the relevant channel is described. Since the channels are the same, only the parameters related to Channel A are explained. When other channels are used, this section can be referenced for the relevant channel.

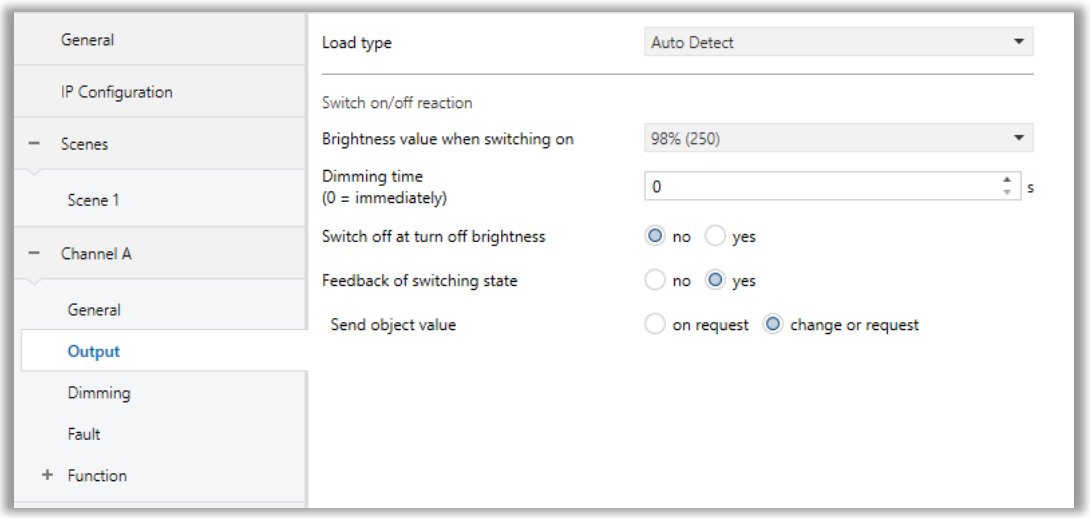


Fig. 10: Channel X - Output Page Configuration

3.4.2.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Load Type	This parameter is used to select the load type connected to the channel. If the load type is unknown, the **"Auto-Detect"** option should be selected.	Auto-detect Inductive – L (FPC) Capacitive – RC (RPC)
Switch on/off reaction		
Brightness value when switching on	This parameter is used to determine the brightness value when the related channel X switches on after receiving an ON telegram. The dimming thresholds (upper and lower dimming values) are calibrated automatically to the maximum or minimum dimming values. **Previous value:** The channel x switches on at the brightness value it was switched off at by the Switch group object. The brightness value of each channel is saved when they are switched off and restored when they are switched back on. If a channel is OFF when switched off, the previous brightness value is saved as 0% (OFF) and is switched back on in the same state. This means that the related channel will be switched off unless it has a brightness value other than 0 when switched back on. **0%...100%:** When the channel switches on, the selected % brightness value will be set for each channel.	0%...**100%** Previous value
Dimming time (0=immediately)	This parameter can be used to set a start by defining how long the output takes to dim up or down from the previous brightness value to the desired brightness when it receives a telegram. **0:** The related output is to get the desired brightness value immediately. **1...255:** During this time, the related output is dimmed from the previous brightness to the desired brightness.	**0**...255
Switch off at the turn off brightness	This parameter is used to enable or disable the switch off at the turn off brightness. If an OFF telegram is a receipt, whether the related lighting will be turned off or it will first reach a turn off brightness is determined.	**no** yes

	Yes: The turn off brightness is a parametrizable brightness value. **No:** The lighting switches off completely (the brightness value will be %0).	
-> Turn off the brightness	This parameter is used to determine the brightness value for the switch-off at the turn off brightness. For example, the brightness at which the channel switches off when receiving an OFF telegram. If the turn off brightness is set outer of the maximum and minimum limits, the turn off brightness will be automatically calibrated to maximum or minimum.	1%...**30%**...100%
Feedback of switching state	This parameter is used to enable or disable the channel x status object to send information via this object to the KNX bus line. **Yes:** The output x status group object is enabled. The information is given by a 1-bit group object. **No:** The group object is not enabled.	**no** yes
-> send object value	This parameter is used to determine the sending object value according to action type. **Change or request:** The status is sent when a change occurs or a request demanding from the KNX bus line. **On request:** The status is sent when a request occurs from the KNX bus line.	**Change or request** On request

3.4.3. Channel X – Dimming

On this parameter subpage, the parameters for controlling the Universal Dimming Actuator by dimming are described.

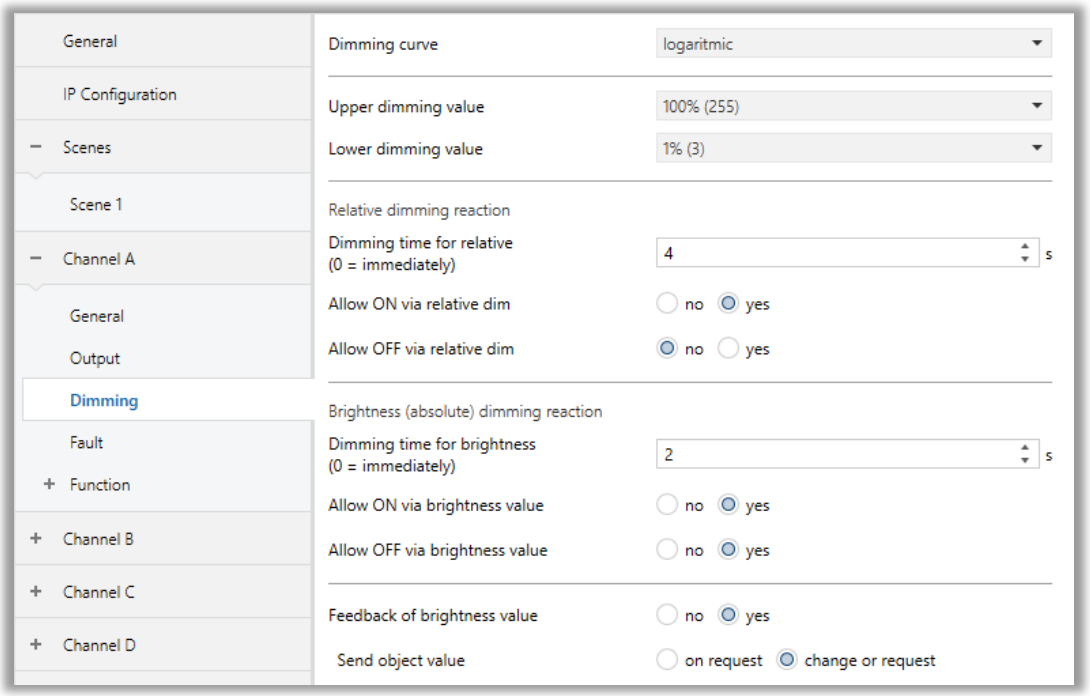


Fig. 11: Channel X - Dimming Page Configuration

3.4.3.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Selected dimming curve	This parameter is used to determine the Universal Dimming Actuator characteristic. You can also specify the dimmer characteristic manually. **Logarithmic:** The dimmer characteristic will be used as logarithmic **Linear:** The dimmer characteristic will be linear. KNX value refers to the luminous flux.	Logarithmic **Linear** User-defined
Dimming curve (User Defined)		
->> Dimming curve areas	This parameter is used to determine the dimming curve areas. Dimming Time and Dimming Value must be determined separately for each selected area.	**2 area** 3 area 4 area 5 area
->> Dimming Time for X.area (0 = immediately, X = 1…5)	This parameter is used to specify the dimming time for X.area to reach the desired ambient brightness value. If you specify 0, the brightness value will be sent immediately.	0…**2**…255
->> Dimming value for X.area (X = 1…5)	This parameter is used to specify the dimming value for X.area. The value range is %0 and %100.	1%...**20%...**100%
Upper dimming value	This parameter defines the upper dimming value that will be applied to the Universal Dimming Actuator's related channel X. If the defined upper dimming value exceeds the maximum brightness value, the Universal Dimming Actuator equalize them.	1%...**100%**
Lower dimming value	This parameter defines the lower dimming value that will be applied to the Universal Dimming Actuator's related channel. If the defined lower dimming value exceeds the maximum brightness value, the Universal Dimming Actuator equalize them. The lower dimming value also applies to dimming and scenes.	**1%**...100%
Dimming time for relative **(0 = immediately)**	This parameter can be used to set a start by defining how long the output takes to dim up or down from the previous brightness value to the desired brightness when it receives a telegram.	**0**...255

	0: The related output is to get the desired brightness value immediately. **1...255:** During this time, the related output is dimmed from the previous brightness to the desired brightness.	
Allow ON via relative dim	This parameter defines the related channel X behaviour when switching on with a dimming value. For example, the lighting is OFF and you send a %3 dimming telegram. If this object is selected as yes, the lighting will be switched on and its brightness is %3. Relative dim telegram can be sent via 4-bit value. **Yes:** Switching on using the relative dim telegram is allowed. **No:** Switching on using the relative dim telegram is not allowed.	No **yes**
Allow OFF via relative dim	This parameter defines the related channel X behaviour when switching off with a dimming value. For example, the lighting is ON and its dimming value is % 45 and when you send a dimming telegram for lowering %45. If this object is selected as yes, the lighting will be switched OFF. Relative dim telegram can be sent via 4-bit value. **Yes:** Switching OFF using the brightness telegram is allowed. **No:** Switching OFF using the brightness telegram is not allowed.	**No** yes
Dimming time for brightness (0 = immediately)	This parameter can be used to set a start by defining how long the output takes to dim up or down from the previous brightness value to the desired brightness when it receives a telegram. **0:** The related output is to get the desired brightness value immediately. **1...65535:** During this time, the related output is dimmed from the previous brightness to the desired brightness.	**0**...65535

Allow ON via brightness value	This parameter defines the related channel X behaviour when switching on with brightness value. For example, the lighting is OFF and you send a %67 brightness telegram. If this object is selected as yes, the lighting will be switched on and its brightness is %67. Brightness telegram can be sent via 1-byte value. **Yes:** Switching on using the brightness telegram is allowed. **No:** Switching on using the brightness telegram is not allowed.	No **yes**
Allow OFF via brightness value	This parameter defines the related channel X behaviour when switching off with a dimming value. For example, the lighting is ON and its dimming value is % 45 and when you send a dimming telegram for lowering %45. If this object is selected as yes, the lighting will be switched OFF. Brightness(absolute) dim telegram can be sent via a 1-byte value. **Yes:** Switching OFF using the brightness telegram is allowed. **No:** Switching OFF using the brightness telegram is not allowed.	No **yes**
Feedback of brightness value	This parameter is used to enable or disable the channel X – Status brightness value objects to send brightness value on the KNX bus line via related objects. **Yes:** The channel X – Status brightness value object is enabled. The information is given by a 1-byte group object. **No:** The channel X – Status brightness value object is not enabled hence the status brightness value is not sent on the KNX bus line.	**No** yes
-> send object value	This parameter is used to determine the sending object value according to action type. **Change or request:** The status is sent when a change occurs or a request demanding from the KNX bus line. **On request:** The status is sent when a request occurs from the KNX bus line.	On request **Change or request**

3.4.4. Channel X – Fault

On this parameter subpage, the fault parameters of the Universal Dimming Actuator are described.

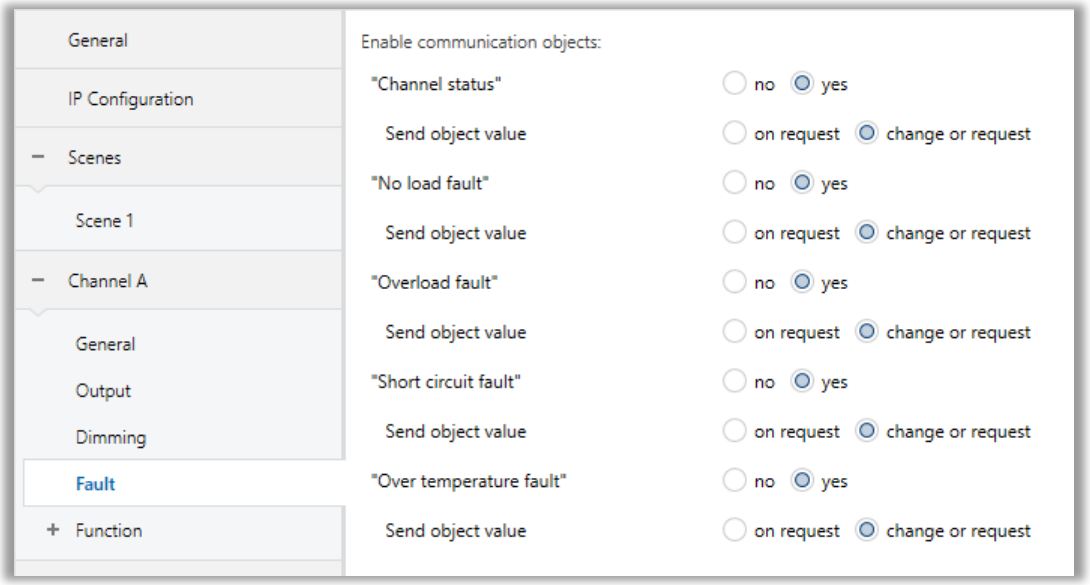


Fig. 12: Channel X - Fault Page Configuration

3.4.4.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
"Channel Status"	This parameter is used to define whether the availability status of the dimming channel will be sent or not.	**No** Yes
-> send object value	This parameter is used to object value information to the KNX bus according to the following options: **On request:** The object value status is sent when a request occurs from the KNX bus line. **Change or request:** The object value status is sent when a change or a request occurs from the KNX bus line.	On request **Change or request**
"No Load Fault"	This parameter is used to define whether the no-load status of the dimming channel will be sent or not.	**No** Yes
-> send object value	This parameter is used to object value information to the KNX bus according to the following options: **On request:** The object value status is sent when a request occurs from the KNX bus line. **Change or request:** The object value status is sent when a change or a request occurs from the KNX bus line.	On request **Change or request**
"Overload Fault"	This parameter is used to define whether the overload status of the dimming channel will be sent or not. If the device detects an overload, the channel does not switch on the state. If the channel is already an on the state the channel is switched off automatically after an overload error. After switching off, the actuator transmits a message telegram to the bus.	**No** Yes
-> send object value	This parameter is used to object value information to the KNX bus according to the following options: **On request:** The object value status is sent when a request occurs from the KNX bus line. **Change or request:** The object value status is sent when a change or a request occurs from the KNX bus line.	On request **Change or request**
"Short Circuit Fault"	This parameter is used to define whether the short circuit status of the dimming channel will be sent or not. Short-circuit protection is integrated with	**No** Yes

	the device for each channel. If the device detects short-circuit, the load is switched off automatically. After switching off, the actuator transmits a message telegram to the bus.	
-> send object value	This parameter is used to object value information to the KNX bus according to the following options: **On request:** The object value status is sent when a request occurs from the KNX bus line. **Change or request:** The object value status is sent when a change or a request occurs from the KNX bus line.	On request **Change or request**
“Over Temperature Fault”	This parameter is used to define whether the excess temperature status of the dimming channel will be sent or not. If there is an overtemperature in the device, the load is switched off by the temperature control of the device. The actuator, after switching off, transmits a message telegram to the bus.	**No** Yes
-> send object value	This parameter is used to object value information to the KNX bus according to the following options: **On request:** The object value status is sent when a request occurs from the KNX bus line. **Change or request:** The object value status is sent when a change or a request occurs from the KNX bus line.	On request **Change or request**

3.4.5. Channel X – Function

On this parameter subpage, the function parameters of the Universal Dimming Actuator are described.

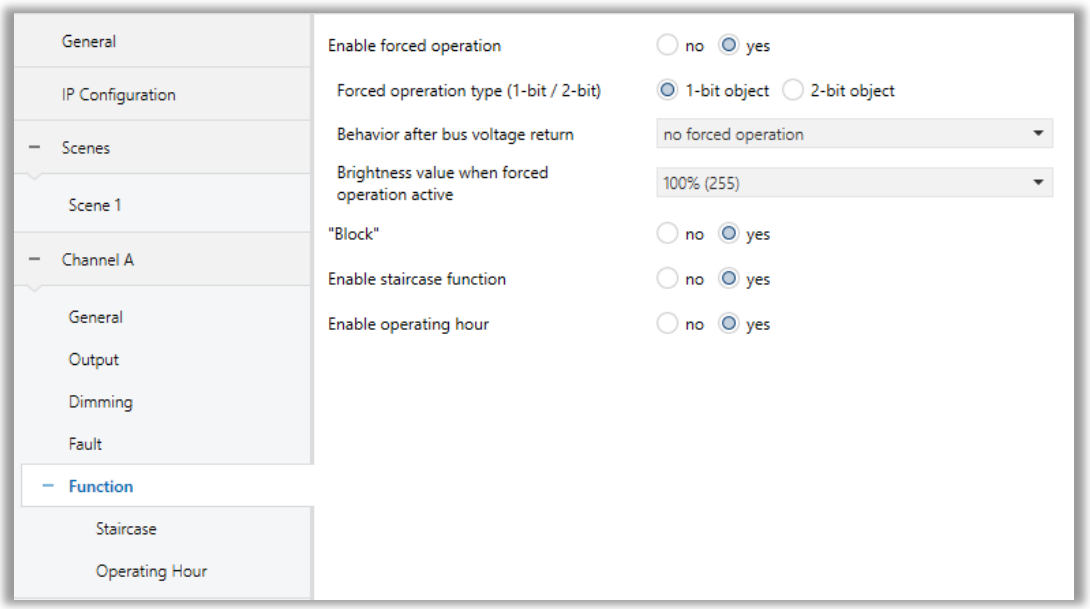


Fig. 13: Channel X - Function Page Configuration

3.4.5.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Enable Forced Operation	This parameter is used to enable or disable the forced operation.	**No** Yes
->> Forced operation type (1-bit / 2-bit)	This parameter is used to determine the forced operation object type. **Forced operation 1 bit:** The Forced operation 1-bit group object is enabled. If the gateway receives a telegram with the value 1 via this group object, channel X is forcibly operated. When it receives a telegram with the value 0 the forced operation is lifted and channel X is re-enabled. **Forced operation 2-bit:** The Forced operation 2-bit group object is enabled. If the gateway receives a telegram with the value 2 or 3 via this group object, channel X is forcibly operated.	**1-bit object** 2-bit object
->> Behaviour after bus voltage return	This parameter is used to define the Forced operation state after KNX bus voltage recovery. **No Forced Operation:** The related channel X is enabled after bus voltage recovery and is no longer subject to Forced operation. Any parametrized Staircase lighting functions will be active on standby if they were activated before Forced operation. **Forced On:** The related channel X is forcibly operated and switched on at the brightness parameterized in Brightness value when switched on by force. **Forced Off:** The related channel X is forcibly operated and switched off. This option is available only with Forced operation, 2-bit. **Position Before Failure:** The related channel X is reset to the state it was in before the KNX voltage failure.	**No forced operation** Forced on Forced off Position before failure
->> Brightness value when forced operation active	This parameter is used to define the brightness value used to switch on channel X during activated forced operation.	**100% (255)**…0% (OFF)

“Block”	This parameter is used to enable or disable the block function for the related channel X. The Block function is activated by a telegram with the value 1 and deactivated with the value 0. The related channel X can be blocked using this group object so that it cannot be changed via the bus. Incoming telegrams are processed in the background. Dimming processes are not simulated in the background; with time sequences the end brightness value is immediately memorized. When the block is removed, the value updated in the background is set.	**No** yes
Enable Staircase function	This parameter is used to enable or disable the Staircase function.	**No** yes
Enable operating hour	This parameter is used to enable or disable the operating hour function.	**No** yes

3.4.6. Channel X – Function Staircase

On this parameter page, Staircase lighting functionality parameters are described.

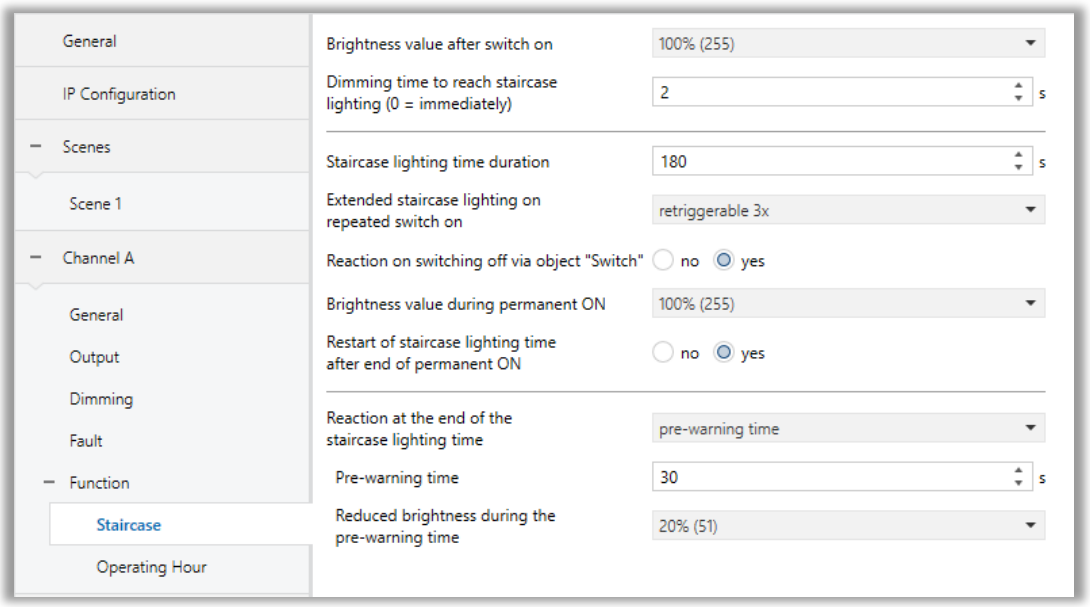


Fig. 14: Channel X - Function Staircase Page Configuration

3.4.6.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Brightness Value After Switch On	This parameter is used to define the brightness when the Staircase lighting function is running. This is the brightness value that is set after a switch on.	**100% (255)**…0% (OFF)
Dimming time to reach staircase lighting (0 = immediately)	This parameter is used to define the transition to the staircase lighting brightness value via a dimming phase. When the value is selected as '0', the related channel X immediately switches on the staircase lighting brightness. The other values are the staircase lighting dimming time to its brightness value.	0…**2**…255
Staircase lighting time duration	This parameter is used to set the staircase lighting time. The dimming up and dimming downtimes are not included.	0…**180**…65535
Extended staircase lighting on repeated switch on	This parameter is used to extend the staircase lighting duration time. If the Switch group object receives a further ON telegram during the staircase lighting sequence (including dimming down/ warning), the remaining staircase lighting time can be extended. The maximum time can be set to 2, 3, 4 or 5 times the staircase lighting time. **Not re-triggerable:** The receipt of an ON telegram is ignored. The staircase lighting time continues unmodified to completion. **Yes re-triggerable:** Restarts staircase lighting time. The staircase light time is reset with each new ON telegram and starts to count again. This option allows the process to be repeated as often as desired. **Retriggerable 2/3/4/5x:** Extend staircase lighting time up to max 2/3/4/5x times, New ON telegrams extend the staircase lighting time by 2/3/4/5 times.	**Not retriggerable** Yes retriggerable Retriggerable 2x Retriggerable 3x Retriggerable 4x Retriggerable 5x
Reaction on switching off via object “Switch”	This parameter is used to determine whether the "switch off" value from the "switch" object is taken into account.	**No** Yes
Brightness Value During Permanent ON	This parameter is used to determine the brightness value in the permanent ON state.	**100% (255)**…0% (OFF)

A restart of staircase lighting time after the end of permanent ON	This parameter is used to ensure that the staircase lighting period is restarted when the permanent ON state is ended.	**No** Yes
Reaction at the end of the staircase lighting time	This parameter is used to determine the behaviour of the related channel X when the staircase lighting ends. **Switch Off:** The related channel X will be switched off. **Pre-Warning Time:** A pre-warning time duration starts when the end of staircase lighting time. **Reduced Continuous:** A reduced continuous dimming downtime starts when the end of staircase lighting time.	**Switch off** Pre-warning time Reduced continuous
Pre-Warning Time		
->> Pre-warning time	This parameter is used to set the value of the pre-warning time that will be started after the stair lighting ends. The parameter value to be entered is in seconds.	0…**30**…65535
->> Reduced brightness during the pre-warning time	This parameter is used to determine the ambient brightness value during the pre-warning time.	**100% (255)**…0% (OFF)
Reduced Continuous		
Dimming Down Time	This parameter is used to set the value of the dimming downtime that will be started after the stair lighting ends. The parameter value to be entered is in seconds.	0…**30**…65535
->> Reduced brightness for continuous lighting	This parameter is used to determine the ambient brightness value when the dimming process ends.	**100% (255)**…0% (OFF)

3.4.7. Channel X – Function Operating Hour

On this parameter page, the operating hours counter functionality is described. Operating hours counter counts the ON-time of a related dimming channel X. For the operating hours counter an output must be actively switched on, i.e. when current is flowing to the load. The operating hours counter sums up the determined ON-time for a dimming channel. The accumulated operating hours are tracked in a 2-byte counter. The count value can be also transmitted cyclically to the KNX bus.

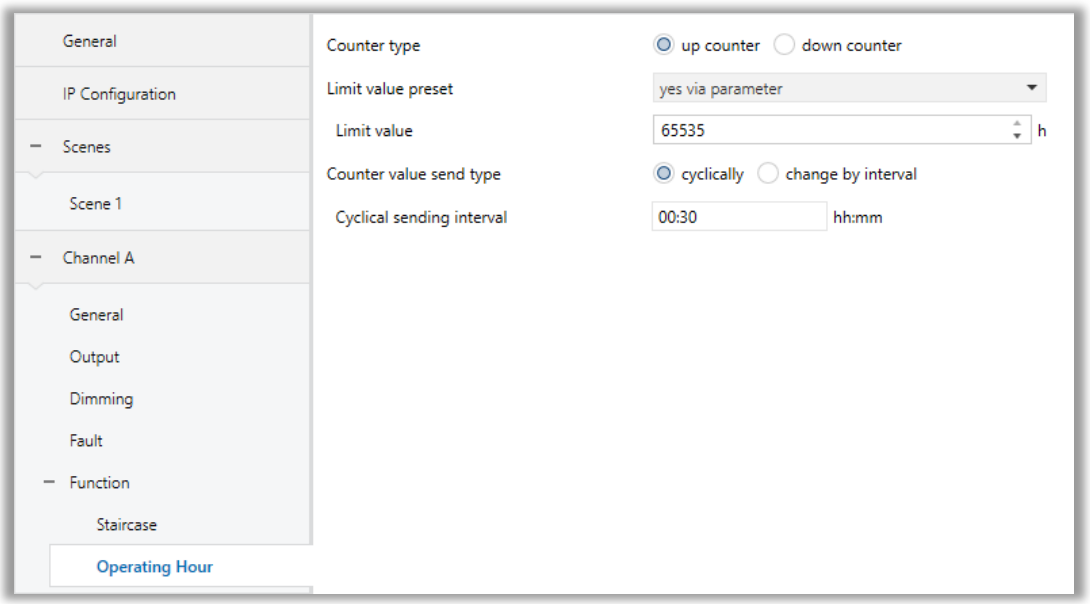


Fig. 15: Channel X - Function Operating Hour Page Configuration

3.4.7.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Counter Type	This parameter is used to determine the type of operating hours counter.	**Up counter** Down counter
Limit value present	This parameter is used to determine the limit value present of the operating hours counter. **No limit:** There will be no limit for the operating hours counter. **Yes, via parameter:** Limit value can be specified in the parameter. **Yes, via object:** The limit value can be specified by the KNX communication object.	**No limit** Yes, via parameter Yes, via object
->> Limit value	This parameter is used to determine the operating hours counter-limit value. It is visible if the limit value present parameter is selected as 'Yes via parameter'.	0…**65535**
Counter value send type	This parameter is used to determine the operating hours counter's value send type.	**Cyclically** Change by interval
->> Cyclical sending interval	This parameter is used to specify cyclical sending interval time for the related channel X hours counter value that will be sent cyclically.	00:00…**00:30**…23:59
->> Sending interval	This parameter sets the cycle time for sending the counted hours value.	**1**…65535

3.5. Inputs

Interra Universal Dimming Actuator has 8 digital inputs and 2 analogue inputs. By connecting buttons to digital inputs, you can choose the lighting, curtains/blinds, RGB LEDs, dim devices etc. you want to control. You can control the devices by making the necessary configurations via the Universal Dimming Actuator. However, by connecting an NTC temperature sensor or LDR resistance to the analogue input, you can obtain temperature/brightness information from further distances from the Universal Dimming Actuator.

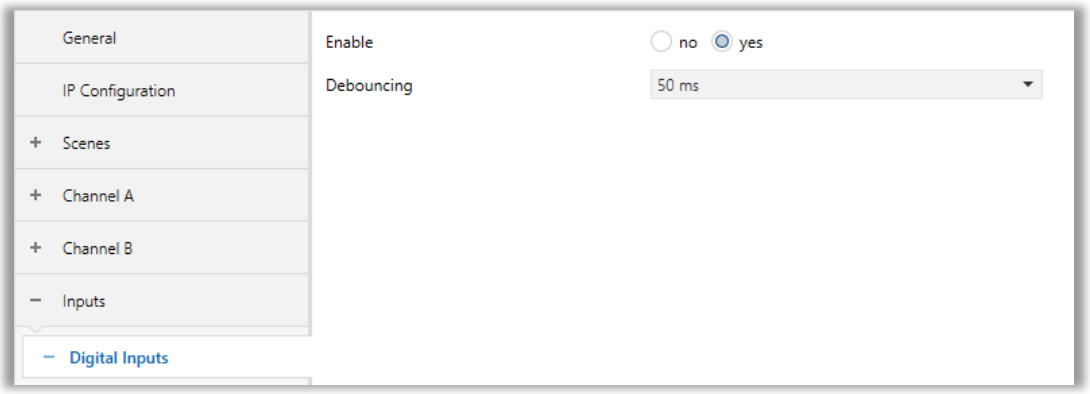


Fig. 16: Digital Inputs - General Page Configuration

PARAMETERS	DESCRIPTION	VALUES
Enable	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Dimming' function are described.	No **yes**
Debounce time	This parameter is used to determine the debounce time. Debouncing prevents unwanted multiple operations of the input, e.g. due to bouncing of the contact.	Off **50 ms** 100 ms 150 ms 200 ms 250 ms

3.5.1. Digital Input X – Switching

In this section, it is explained how to control the related automation unit via Universal Dimming Actuator by switching via buttons connected to digital inputs. Detailed information on the relevant parameter configurations is described in the table below.

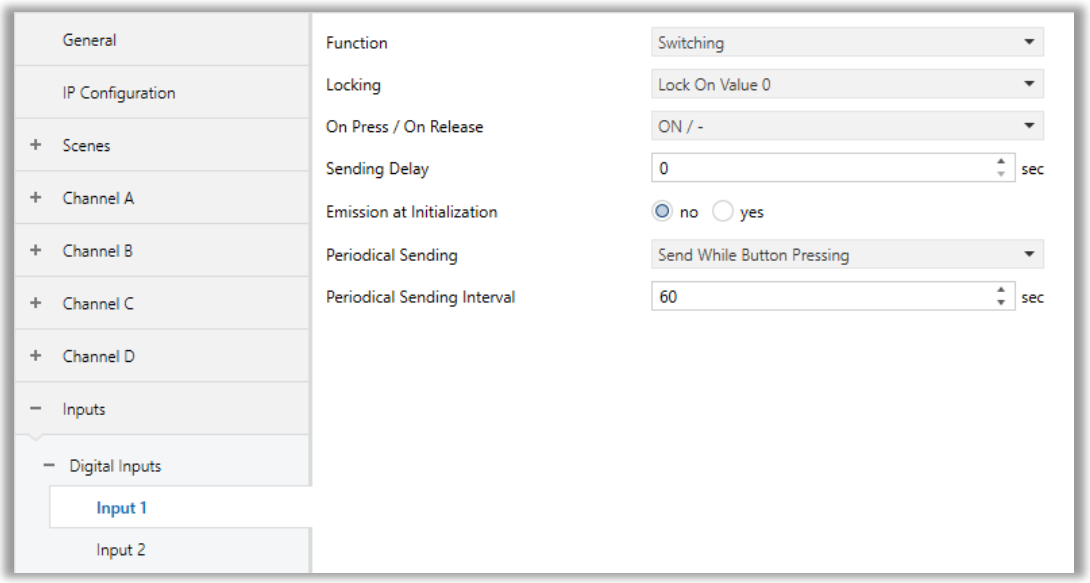


Fig. 17: Digital Inputs – Input X - Switching Page Configuration

3.5.1.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Switching' function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
On Press / On Release	This parameter is used to determine the digital input button x event type. **ON / - :** The ON value will be sent when a press event occurs on the digital input x. No value will be sent at release events. **OFF / - :** The OFF value will be sent when a press event occurs on the digital input x. No value will be sent at release events. **- / ON:** The ON value will be sent when a release event occurs on the digital input x. No value will be sent at press events. **- / OFF:** The OFF value will be sent when a press event occurs on the digital input x. No value will be sent at press events. **ON / OFF:** The ON value will be sent when a press event occurs and the OFF value will be sent when a release event occurs on the digital input x. **OFF / ON:** The OFF value will be sent when a press event occurs and the ON value will be sent when a release event occurs on the digital input x.	**ON / -** OFF / - ON / OFF OFF / ON - / ON - / OFF
Sending Delay	This parameter is used to specify the delay time of the sending value when a press or release event occurred.	**0**…255

Emission at Initialization	This parameter is used to enable or disable the value emitting at initialization.	**No** Yes
Periodical Sending	This parameter is used to enable or disable the periodical sending functionality. If it is selected as 'Don't send periodically', periodical sending will be disabled. Otherwise, **Send While Button Pressing:** The periodical value sending can be made only while the button that is connected to the digital input x is pressing. **Send While Button Not Pressing:** The periodical value sending can be made only while the button that is connected to the digital input x is not pressing. **Send Always:** The periodical value will be sent always	**Don't Send Periodically** Send While Button Pressing Send While Button Not Pressing Send Always
->> Periodical Sending Interval	This parameter is used to specify the periodical sending delay time of the value according to the periodical sending configuration.	1…**60**…65535

3.5.2. Digital Input X – Toggle

In this section, it is explained how to control the unit of lighting unit through the Universal Dimming Actuator, both by switching and dimming, via the buttons connected to the digital inputs. Detailed information on the relevant parameter configurations is described in the table below. Make sure that the lighting unit to be controlled has a dimming feature.

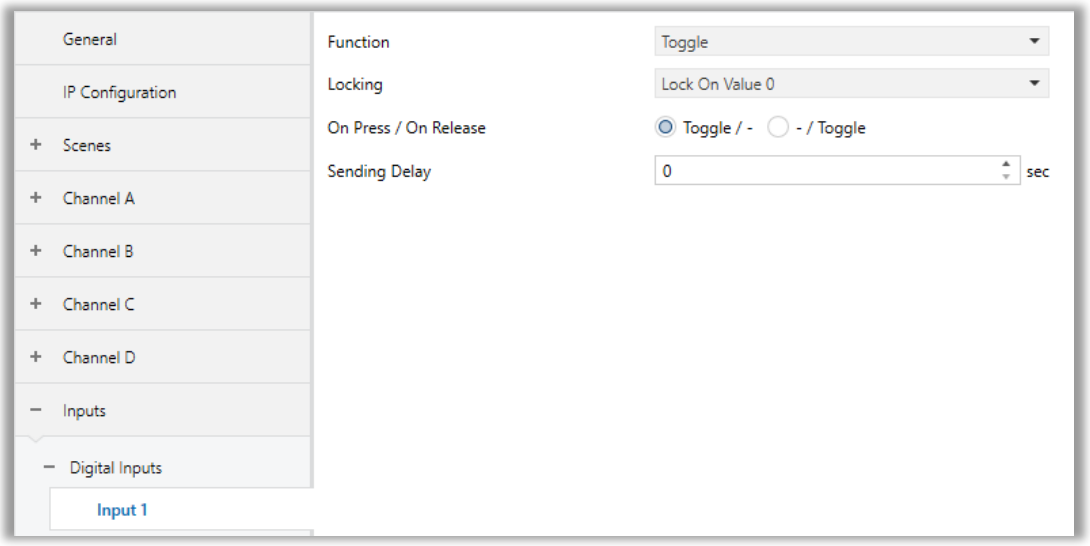


Fig. 18: Digital Inputs – Input X - Toggle Page Configuration

3.5.2.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Toggle function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
On Press / On Release	This parameter is used to determine the digital input button x event type. **Toggle / - :** The logically opposite value of the last sent value will be sent when a press event occurs on the digital input x. **- / Toggle:** The logically opposite value of the last sent value will be sent when a release event occurs on the digital input x.	**Toggle / -** - / Toggle
Sending Delay	This parameter is used to specify the delay time of the sending value when a press or release event occurred.	**0**…255

3.5.3. Digital Input X – Dimming

In this section, it is explained how to control a shutter/blind unit via the buttons connected to the digital inputs via the Universal Dimming Actuator. Detailed information on the relevant parameter configurations is described in the table below.

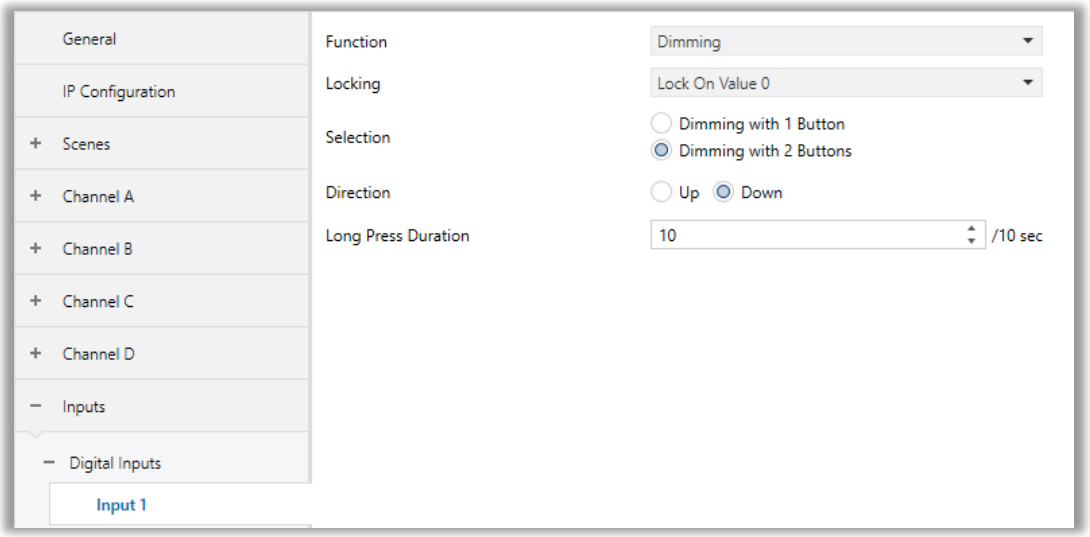


Fig. 19: Digital Inputs – Input X - Dimming Page Configuration

3.5.3.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Dimming' function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
Selection	This parameter is used to determine how many buttons the dimming control will be done with. **Dimming with 1 Button:** Only one button will be used for dimming control. **Dimming 2 Buttons:** Two different buttons connected to the digital input x will be used for dimming control. If this parameter is selected, direction configuration also must be made for dimming.	**Dimming with 1 Button** Dimming with 2 Buttons
-> Direction	This parameter is visible if the 'Selection' parameter is selected as "Dimming with 2 buttons". It is used to determine the dimming direction (to brighter or darker).	**Up** Down
Long Press Duration	This parameter is used to determine long operation detection after the button press operation. For making a long operation, the button should be pressed at least the configured time value.	1…**10**…255

3.5.4. Digital Input X – Shutter/Blinds

In this section, it is explained how to control an automation unit via Universal Dimming Actuator via a value/forced via buttons connected to digital inputs. Detailed information on the relevant parameter configurations is described in the table below.

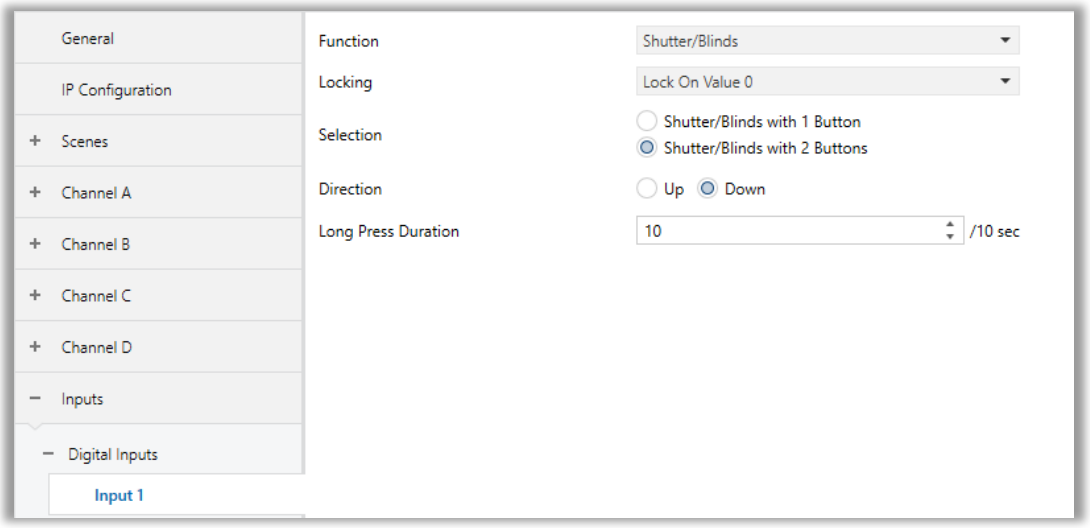


Fig. 20: Digital Inputs – Input X – Shutter/Blinds Page Configuration

3.5.4.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Shutter/Blinds' function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
Selection	This parameter is used to determine how many buttons the shutter/blind control will be done with. **Shutter/Blinds with 1 Button:** Only one button will be used for shutter/blind control. **Shutter/Blinds with 2 Buttons:** Two different buttons that are connected to the digital input x will be used for shutter/blinds control. If this parameter is selected, direction configuration also must be made for the shutter/blinds.	**Shutter/Blinds with 1 Button** Shutter/Blinds with 2 Buttons
-> Direction	This parameter is visible if the 'Selection' parameter is selected as "Shutter/Blinds with 2 buttons". It is used to determine the shutter/blinds movement direction (upwards or downwards).	**Up** Down
Long Press Duration	This parameter is used to determine long operation detection after the button press operation. For making a long operation, the button should be pressed at least the configured time value.	1…**10**…255

3.5.5. Digital Input X – Value

In this section, it is explained how to control the related automation unit via Universal Dimming Actuator by triggering a scenario via buttons connected to digital inputs. Detailed information on the relevant parameter configurations is described in the table below.

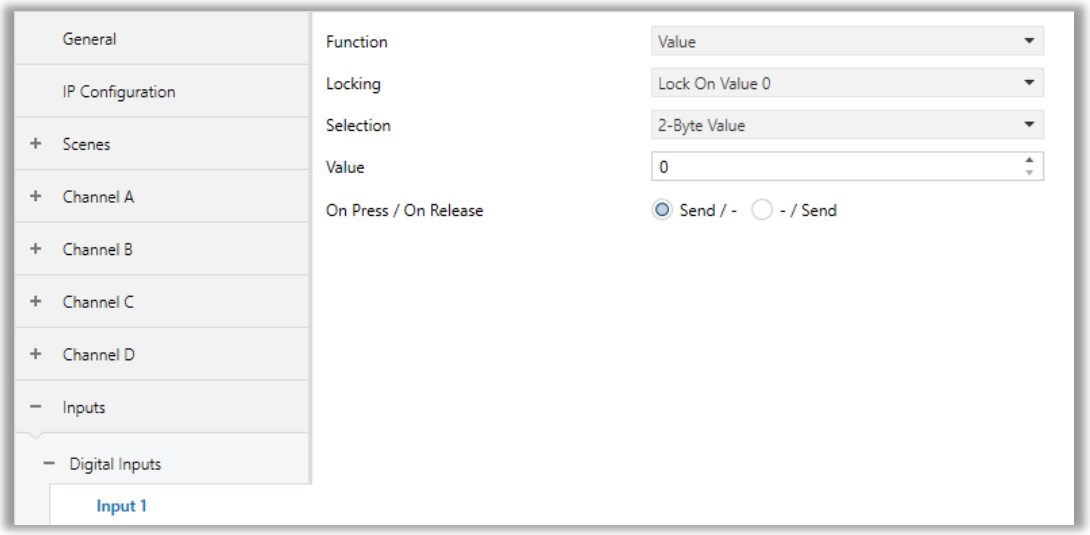


Fig. 21: Digital Inputs – Input X – Value Page Configuration

3.5.5.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Value' function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
Selection	This parameter is used to determine the function operation type when a press or release event occurs on the related digital input x.	**1-Byte Value** 2-Byte Value Percentage Temperature Luminosity
-> Value	This parameter is used to determine the sending value when a press or release event occurs. The value range depends on the selection at the 'Selection' parameter. **1-byte Value:** 1-byte value will be sent. The value range is 0…255 **2-byte Value:** 2-byte value will be sent. The value range is 0…65535 **Percentage:** The percentage value will be sent. Value range is 0% (OFF)...100% (25%) **Temperature:** The temperature value will be sent. The value range is 0°C… 50°C **Luminosity:** The luminosity value will be sent. Value range is 0 Lux…1200 Lux	**0**…255 **0**…65535 **0%(OFF)…**100%(255) 0°C…0.5°C….**20°C** 49.5°C…50°C 0 Lux…50 Lux…**300 Lux**…1150Lux…1200 Lux
On Press / On Release	This parameter is used to determine the digital input button x event type. **Send / - :** The configured value will be sent when a press event occurs on the digital input x. **- / Send:** The configured value will be sent when a release event occurs on the digital input x.	**Send / -** - / Send

3.5.6. Digital Input X – 2 Channel Mode

This section, it is explained how to control an RGB LED device through the buttons connected to the digital inputs via the Universal Dimming Actuator. Detailed information on the relevant parameter configurations is described in the table below.

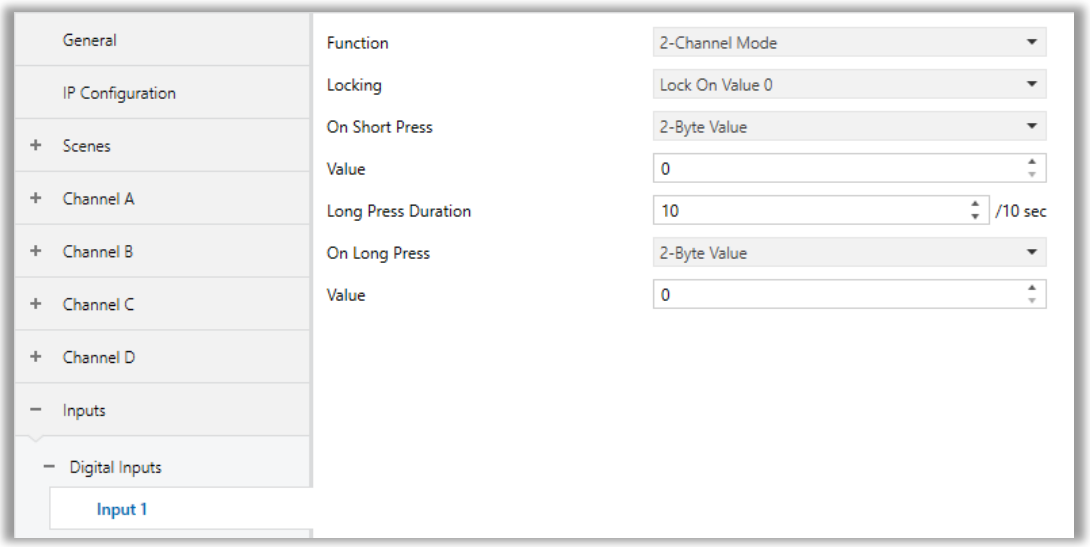


Fig. 22: Digital Inputs – Input X – 2 Channel Mode Page Configuration

3.5.6.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the '2-Channel Mode' function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
On Short Press	This parameter is used to determine the short press operation type when a short press event occurs on the related digital input x.	Not Used **ON** OFF Toggle 1-Byte Value 2-Byte Value Percentage Temperature Luminosity
-> Value	This parameter is used to determine the sending value when a short press event occurs. The value range depends on the selection at the 'On Short Press' parameter. **1-byte Value:** 1-byte value will be sent. The value range is 0…255 **2-byte Value:** 2-byte value will be sent. The value range is 0…65535 **Percentage:** The percentage value will be sent. Value range is 0% (OFF)...100% (25%) **Temperature:** The temperature value will be sent. The value range is 0°C… 50°C	**0**…255 **0**…65535 **0%(OFF)…**100%(255) 0°C…0.5°C….**20°C** 49.5°C…50°C 0 Lux…50 Lux…**300 Lux**…1150Lux…1200 Lux

	Luminosity: The luminosity value will be sent. Value range is 0 Lux…1200 Lux	
Long Press Duration	This parameter is used to determine long operation detection after the button press operation. For making a long operation, the button should be pressed at least the configured time value.	1…**10**…255
On Long Press	This parameter is used to determine the long-press operation type when a long-press event occurs on the related digital input x.	Not Used **ON** OFF Toggle 1-Byte Value 2-Byte Value Percentage Temperature Luminosity
-> Value	This parameter is used to determine the sending value when a long press event occurs. The value range depends on the selection at the 'On Long Press' parameter. **1-byte Value:** 1-byte value will be sent. The value range is 0…255 **2-byte Value:** 2-byte value will be sent. The value range is 0…65535 **Percentage:** The percentage value will be sent. Value range is 0% (OFF)...100% (25%) **Temperature:** The temperature value will be sent. The value range is 0°C… 50°C **Luminosity:** The luminosity value will be sent. Value range is 0 Lux…1200 Lux	**0**…255 **0**…65535 **0%(OFF)…**100%(255) 0°C…0.5°C….**20°C** 49.5°C…50°C 0 Lux…50 Lux…**300 Lux**…1150Lux…1200 Lux

3.5.7. Digital Input X – Channel Control

In this section, it is explained how to control the operating modes of an HVAC unit via the buttons connected to the digital inputs via the Universal Dimming Actuator. Detailed information on the relevant parameter configurations is described in the table below.

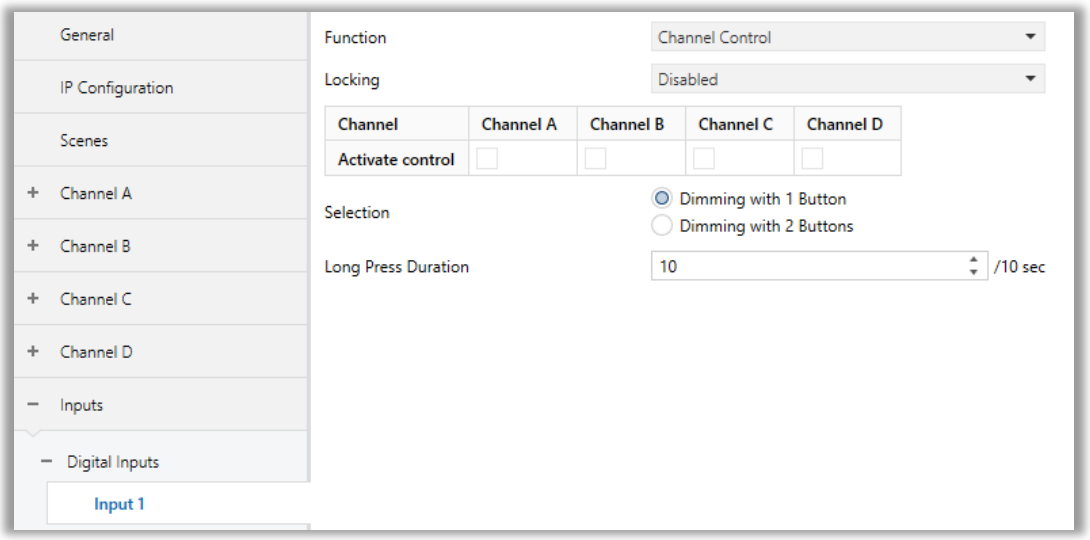


Fig. 23: Digital Inputs – Input X – Channel Control Page Configuration

3.5.7.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the digital input x functionality. Various functions can be selected such as switching, toggle, dimming etc. In this table, the parameters for the 'Channel Control' function are described.	**Not functional** Switching Toggle Dimming Shutter/Blinds Value 2-Channel Mode Channel Control
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
Dimmer Channel	This parameter is used to determine the related channel x (A-D) that will be controlled by digital input x.	**Channel A** Channel B Channel C Channel D
Selection	This parameter is used to determine how many buttons the selected channel X dimming will be done with. **Dimming with 1 Button:** Only one button will be used for dimming. **Dimming with 2 Buttons:** Two different buttons that are connected to the digital input x will be used for dimming. If this parameter is selected, direction configuration also must be made for dimming.	**Dimming with 1 Button** Dimming with 2 Buttons
-> Direction	This parameter is visible if the 'Selection' parameter is selected as "Dimming with 2 buttons". It is used to determine the dimming direction (to brighter or darker).	**Up** Down
Long Press Duration	This parameter is used to determine long operation detection after the button press operation. For making a long operation, the button should be pressed at least the configured time value.	1…**10**…255

3.5.8. Analog Input X – Temperature

This section describes how to configure a parameter for an NTC sensor that can be connected to the analog input of the Universal Dimming Actuator. After obtaining the necessary information about the NTC sensor to be connected from the relevant document, you should configure it.

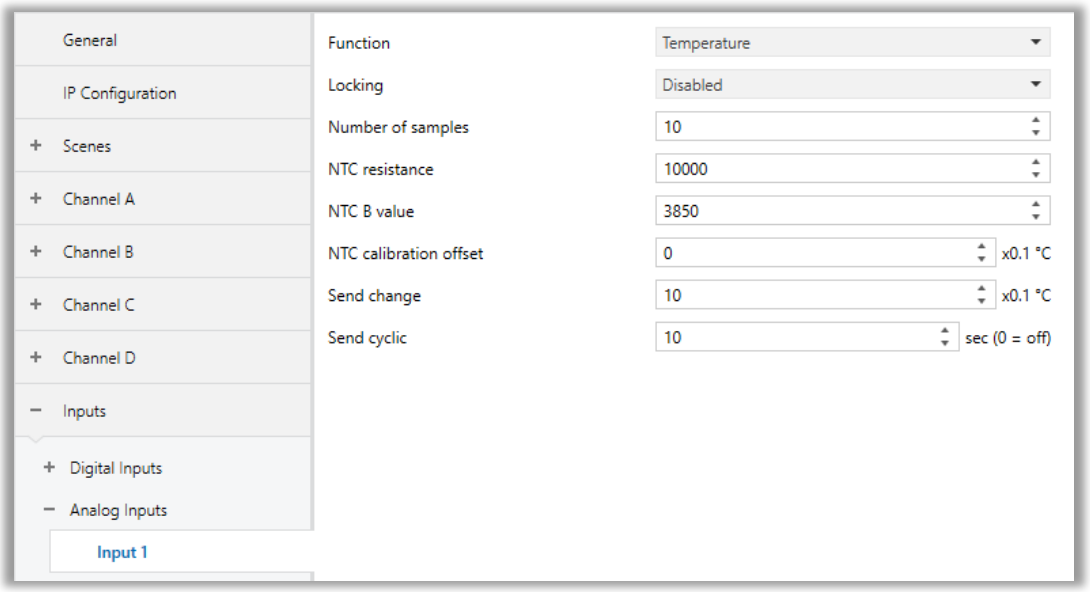


Fig. 24: Analog Inputs – Input X – Temperature Page Configuration

3.5.8.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the analog input x functionality. In this section temperature functionality is described. **Not Functional:** Analog input function will not be used. **Temperature:** The device connected to the analog input is an NTC temperature sensor. **Brightness:** The device connected to the analog input is a light-dependent resistor (LDR) sensor.	**Not Functional** Temperature Brightness
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
Number of samples	This parameter is used to determine the sample count to calculate the ambient temperature.	1…**10**…100
NTC resistance	This parameter is used to determine the resistance value of the NTC sensor to be used to measure the ambient temperature.	1…**10000**…65535
NTC B value	This parameter is used to determine the NTC B value of the NTC sensor to be used to measure the ambient temperature.	1…**3850**…65535
NTC calibration offset (x0.1°C)	This parameter is used to determine the calibration offset value of the NTC sensor to be used to measure the ambient temperature.	**-**128…**0…**127
Send Change (x0.1°C)	This parameter is used to determine the temperature-changing ratio for sending the current temperature value to the bus.	0…**10**…255
Send Cyclic (sec, 0 = off)	This parameter is used to determine the value sent to the bus cyclically or not. If the parameter value is selected as '0', the cyclic operation will be off. Other values are the period time for sending value.	0…**10**…255

3.5.9. Analog Input X – Brightness

This section describes how to configure a parameter for an LDR resistance that can be connected to the analog input of the Universal Dimming Actuator. After obtaining the necessary information about the LDR resistance to be connected from the relevant document, you should configure it.

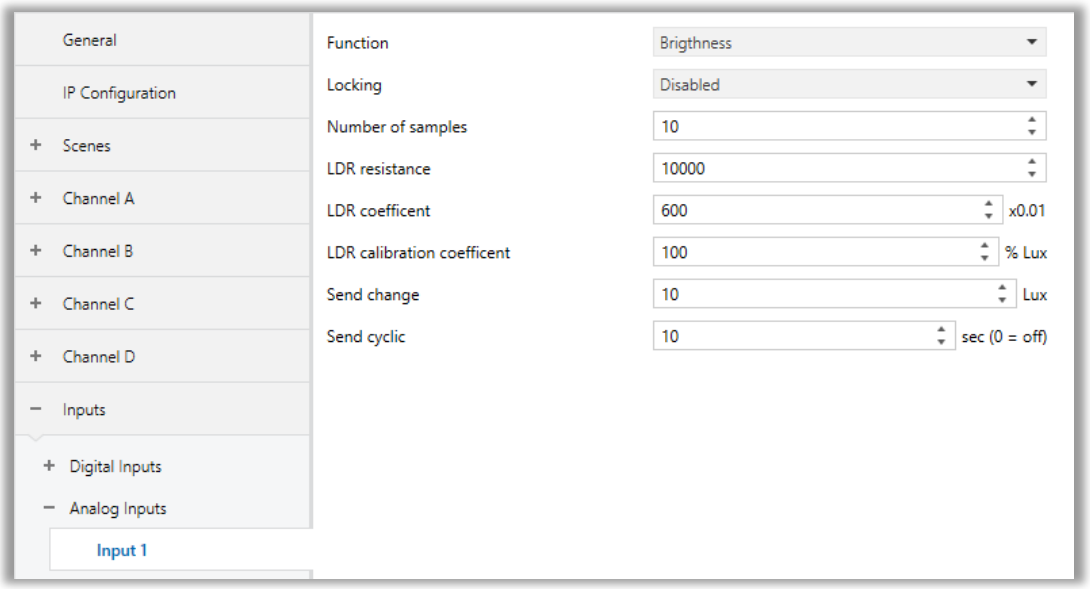


Fig. 25: Analog Inputs – Input X – Brightness Page Configuration

3.5.9.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function	This parameter is used to determine the analog input x functionality. In this section brightness functionality is described. **Not Functional:** Analog input function will not be used. **Temperature:** The device connected to the analog input is an NTC temperature sensor. **Brightness:** The device connected to the analog input is a light-dependent resistor (LDR) sensor.	**Not Functional** Temperature Brightness
Locking	This parameter is used to determine the telegram value to activate the lock. E.g. if it is selected as Lock On Value 1, a "1" value telegram will lock and a "0" value telegram will unlock. Vice versa also applies. If it is selected as "Disabled" there will be no locking functionality.	**Disabled** Lock On Value 0 Lock On Value 1
Number of samples	This parameter is used to determine the sample count to calculate the ambient brightness.	1…**10**…100
LDR resistance	This parameter is used to determine the resistance value of the LDR to be used to measure the ambient brightness.	1…**10000**…65535
LDR coefficient (x 0.01)	This parameter is used to determine the coefficient value of the LDR to be used to measure the ambient brightness.	1…**600**…65535
LDR calibration coefficient (% Lux)	This parameter is used to determine the coefficient calibration value of the LDR to be used to measure the ambient brightness.	**00:00**…23.59
Send Change (Lux)	This parameter is used to determine the brightness changing ratio for sending the current brightness value to the bus.	0…**10**…255
Send Cyclic (sec, 0 = off)	This parameter is used to determine the value sent to the bus cyclically or not. If the parameter value is selected as '0', the cyclic operation will be off. Other values are the period time for sending value.	0…**10**…255

4. ETS Objects List & Descriptions

The Interra Universal Dimming Actuators can communicate via the KNX bus line. In this section, the group objects of the Interra Universal Dimming Actuators are described. Which of these group objects are visible and capable of being linked with group addresses are explained in sub-sections.

No	Name	Function	DTP Type	Length	Flags				
					C	R	W	T	U
1	General	In operation	1.002	1 bit	X	X		X	
2	General	Disable manual operation/Status	1.003	1 bit	X	X	X	X	
3	General	External Supply Error	1.005	1 bit	X	X		X	
126	General	Central Switch	1.001	1 bit	X		X		
127	General	Central Dimming	5.001	1 byte	X		X		
128	General	Scene Input	18.001	1 byte	X		X		
6, 36, 66, 96	Channel X	Switch	1.001	1 bit	X		X		
7, 37, 67, 97	Channel X	Status Switch	1.001	1 bit	X	X		X	
8, 38, 68, 98	Channel X	Relative Dimming	3.007	4 bit	X		X		
9, 39, 69, 99	Channel X	Brightness value	5.001	1 byte	X		X		
10, 40, 70, 100	Channel X	Status Brightness value	5.001	1 byte	X		X		
11, 41, 71, 101	Channel X	Forced operation	1.001	1 bit / 2 bit	X	X	X		
12, 42, 72, 102	Channel X	Block	1.003	1 bit / 2 bit	X	X	X		
13, 42, 73, 103	Channel X	Logic	1.002	1 bit	X	X	X		
14, 44, 74, 104	Channel X	Staircase start	1.010	1 bit	X	X	X		
15, 45, 75, 105	Channel X	Staircase permanent on	1.010	1 bit	X		X		
16, 46, 76, 106	Channel X	OHC start/limiting value	7.007	2 byte	X		X		
17, 47, 77, 107	Channel X	OHC reset	1.015	1 bit	X		X		
18, 48, 78, 108	Channel X	OHC value	7.007	2 byte	X	X		X	
19, 49, 79, 109	Channel X	OHC elapsed	1.002	1 bit	X	X		X	
20, 50, 80, 110	Channel X	Channel Status	1.003	1 bit	X	X		X	
21, 51, 81, 111	Channel X	No Load	1.005	1 bit	X	X		X	
22, 52, 82, 112	Channel X	Short Circuit	1.005	1 bit	X	X		X	
23, 53, 83, 113	Channel X	Overload	1.005	1 bit	X	X		X	
24, 54, 84, 114	Channel X	Over Temperature	1.005	1 bit	X	X		X	
172, 177, 182, 187, 192, 197, 202, 207	Binary X	Lock	1.003	1 bit	X		X		
173, 178, 183, 188, 193, 198, 203, 208	Binary X	Status	1.001	1 bit	X		X		
			1.007	1 bit	X		X		
175, 180, 185, 190, 195, 200, 205, 210	Binary X	Switch	1.001	1 bit	X	X		X	
		Slat Angle/Stop	1.007	1 bit	X	X		X	
		Value	5.010	1 byte	X	X		X	
			7.001	2 byte	X	X		X	
		Percentage	5.001	1 byte	X	X		X	
		Temperature	9.001	2 bytes	X	X		X	
		Luminosity	9.004	2 bytes	X	X		X	
176, 181, 186, 191, 196, 201, 206, 211	Binary X	Switch	1.001	1 bit	X	X		X	
		Dim	3.007	4 bit	X	X		X	
		Up/Down	1.008	1 bit	X	X		X	
		Value	5.010	1 byte	X	X		X	

			7.001	2 byte	X	X		X	
		Percentage	5.001	1 byte	X	X		X	
		Temperature	9.001	2 bytes	X	X		X	
		Luminosity	9.004	2 bytes	X	X		X	
212, 217	Analog X	Lock	1.003	1 bit	X		X		
213, 218	Analog X	Temperature Out / Brightness Out	9.001	2 byte	X	X		X	
214, 219	Analog X	Temperature Calibration / Brightness Calibration	9.001 / 9.004	2 byte	X		X		

4.1. General Objects

This section describes the "general" group objects and their properties. General group objects, as the name suggests, indicate the general characteristics of the Universal Dimming Actuator.

Object Number	Object Name	Function	Type	Flags
1	General	In operation	1 bit	CRT

This object is used to monitor the presence of the device on the KNX bus line regularly. However, monitoring telegrams can be sent cyclically on the KNX bus line.

DPT: 1.002 (boolean)

2	General	Disable manual operation/Status	1 bit	CRWT

This object is used to disable manual operation. The devices that are connected to Universal Dimming Actuator can not be manually switched via Universal Dimming Actuator when the manual operation is disabled.

If a logic 1 value sends via this object, manual operation is disabled. On the contrary, when the logic 0 value sends, manual operation is enabled.

DPT: 1.003 (enable)

3	General	External Supply Error	1 bit	CRT

This object is used to detect the Universal Dimming Actuator's supply voltage fault. If the Universal Dimming Actuator supply voltage fails for a few seconds, a fault message telegram is sent immediately. The time depends on the load.

If a logic 1 value sends via this object, there is a dimmer actuator external supply voltage fault. On the contrary, when the logic 0 value sends, there is no fault.

DPT: 1.005 (alarm)

126	General	Central Switch	1 bit	CW

This object is used to switch the devices connected to the all-enabled channels for ON or OFF at the brightness values defined in the channel X parameter page. For example, if channel x is parameterized as vulnerable to central switching operation, central control is performed depending on the switch-on and switch-off values on the output parameter page of the relevant channel.

DPT: 1.001 (switch)

127	General	Central Dimming	1 byte	CW

This object is used to dim the devices connected to the all-enabled channels for the upper dimming value or lower dimming value at the brightness values defined in the channel X parameter page. For example, if channel x is parameterized as vulnerable to central dimming operation, central control is performed depending on the upper dimming value and lower dimming value on the output parameter page of the relevant channel.

DPT: 5.001 (percentage)

128	General	Scene Input	1 byte	CW

This object is used to monitor the presence of the device on the KNX bus line regularly. However, monitoring telegrams can be sent cyclically on the KNX bus line.

DPT: 18.001 (scene control)

4.2. Channel X Objects

In this section, channel X objects are described in the table below. x indicates the channel letter from A to B or A to D according to the device model. In the first column name of the object, in the second column function name, the third column data type and fourth column the objects flags, information is given. All channel objects are identical to channel A.

Object Number	Object Name	Function	Type	Flags
6, 36, 66, 96	Channel X	Switch	1 bit	CW

This object is used to switch the devices connected to channel X ON or OFF at the brightness values defined in the channel X parameter page.

If a logic 1 value sends via this object, the parameter settings define whether a predefined brightness value or the value before switch-off is set. On the contrary, when the logic 0 value sends, all connected lamps are switched on. If luminosity devices are already switched on and the Universal Dimming Actuator receives an ON telegram, all devices are set to the parametrized switch-on value.

DPT: 1.001 (switch)

7, 37, 67, 97	Channel X	Status Switch	1 bit	CRT

This object is used to gain information about the group object that indicates the current switch state of the related channel x.

If a logic 1 value sends via this object, the device will be switched on. On the contrary, when the logic 0 value sends, the device is switched off.

DPT: 1.001 (switch)

8, 38, 68, 98	Channel X	Relative Dimming	4 bit	CW

This object is used to receive dimming telegram for devices connected to channel X. When a start telegram is received, the brightness value is changed in the defined direction. If a stop telegram is received before the dimming process ends or the upper dimming or lower dimming value is reached, the dimming process is interrupted and the brightness value reached is retained.

The minimum and maximum dimming thresholds apply and cannot be exceeded.

DPT: 3.007 (dimming control)

9, 39, 69, 99	**Channel X**	**Brightness value**	**1 byte**	**CW**

This object is used to receive brightness value for devices connected to channel X. Dimming time to reach brightness value can be parameterized in the channel x parameter page.

Brightness values higher or lower than the configured max brightness or minimum brightness are matched to the threshold values.

1-byte data is from decimal 0 to decimal 255. So, sending 0 is mapped to 0%, 255 is mapped to 100%, and 128 is mapped to 50%...so, be aware of the values corresponding to brightness.

DPT: 5.001 (percentage)

10, 40, 70,100	**Channel X**	**Status Brightness value**	**1 byte**	**CW**

This object is used to gain the status of brightness value for devices connected to channel X. Status value can be sent on ‘request’ or ‘change or request’.

1-byte data is from decimal 0 to decimal 255. So, sending 0 is mapped to 0%, 255 is mapped to 100%, and 128 is mapped to 50%...so, be aware of the values corresponding to brightness.

After resetting, the channel sends a value if the previous value of the object is different from 0.

DPT: 5.001 (percentage)

11, 41, 71, 101	**Channel X**	**Forced operation**	**1 bit /2 bit**	**CRW**

This group object is enabled if enabled forced operation is set to the required option.

In the forced operation, a 1-bit group object forcibly operates channel x, e.g. by higher-level control. The value of the group object directly defines the forced position of the group:

Telegram value:

0 = The channel is not forcibly operated; existing forced operations are removed.

1 = The channel is forcibly operated and switched on at the parametrized brightness value. Forced operation is active.

In the forced operation, a 2-bit group object forcibly operates a channel, e.g. by higher-level control. The value of the group object directly defines the forced position of the group:

Telegram value: 0 or 1 = The channel x is not forcibly operated; existing forced operations are removed.

2 = The channel x is forcibly switched off. Forced operation is active.

3 = The channel x is forcibly operated and switched on at the parametrized brightness value. Forced operation is active.

DPT: 1.001 (switch), 2.001 (switch control)

12, 42, 72, 102	Channel X	Block	1 bit /2 bit	CRW

The Block group object is used to block a channel to prevent unwanted operations. Any further incoming telegrams are ignored but are updated in the background. When the group is released, the updated brightness values are set and incoming telegrams are immediately processed again.

Telegram value:

0 = Remove block

1 = Activate block

DPT: 1.003 (enable)

13, 43, 73, 103	Channel X	Logic	1 bit	CRW

This is a 1-bit object for the input of the logical link of a dimming channel. This object can act like AND, OR or XOR logic gates and it can directly affect output. And the switching objects are affected by this object too.

DPT: 1.002 (boolean)

14, 44, 74, 104	Channel X	Staircase start	1 bit	CRW

This group object is enabled if the additional function Staircase lighting has been enabled in the channel x parameter page.

This group object is used to activate/deactivate the Staircase lighting function. On deactivation, the channel acts like a "normal" actuator without a Staircase lighting function. The Staircase lighting function can be reactivated when the actuator receives a value 1 telegram via this group object.

Telegram value:

0 = Staircase lighting is deactivated

1 = Staircase lighting is activated

DPT: 1.010 (enable)

15, 45, 75, 105	Channel X	Staircase permanent on	1 bit	CW

This group object is used to activate the Staircase lighting function permanently.

DPT: 1.010 (switch)

16, 46, 76, 106	Channel X	OHC start/limiting value	2 byte	CW

This object is used to set the limit value of the runtime counter for the relevant channel. Counting is counted backwards or forwards from the specified value.

DPT: 7.007 (time(h))

17, 47, 77, 107	**Channel X**	**OHC reset**	**1 bit**	**CW**

This object is used to reinitialize the operating hours counter for the relevant channel so far. The operating hour counter is reset when the value 1 is sent from the KNX bus line.

DPT: 1.015 (reset)

18, 48, 78, 108	**Channel X**	**OHC value**	**2 byte**	**CRT**

This object is used to send the working hours that have passed so far for the relevant channel to the bus line.
DPT: 7.007 (reset)

19, 49, 79, 109	**Channel X**	**OHC elapsed**	**1 bit**	**CRT**

This object is used to send to the bus line that the threshold value for the working hours that have passed so far for the relevant channel has been exceeded.

DPT: 1.002 (Boolean)

20, 50, 80, 110	**Channel X**	**Channel Status**	**1 bit**	**CRT**

This object is a 1-bit object that is used for screening channel status.

0 = Channel is not usable

1 = Channel is usable

DPT: 1.003 (enable)

21, 51, 81, 111	**Channel X**	**No Load**	**1 bit**	**CRT**

This object is a 1-bit object that is used for screening any no load on a channel.

0 = There is a load on the channel

1 = There is no load on the channel

DPT: 1.005 (alarm)

22, 52, 82, 112	**Channel X**	**Short Circuit**	**1 bit**	**CRT**

This object is a 1-bit object that is used for screening any short circuit or very high load on the channel.

0 = There is no short circuit or very high load on the channel

1 = There is a short circuit or very high load on the channel

DPT: 1.005 (alarm)

23, 53, 83, 113	**Channel X**	**Overload**	**1 bit**	**CRT**

This object is a 1-bit object that is used for screening any overload status.

0 = There is no overload on the channel

1 = There is an overload on the channel

DPT: 1.005 (alarm)

24, 54, 84, 114	**Channel X**	**Over Temperature**	**1 bit**	**CRT**

This object is a 1-bit object that is used for screening any excess temperature status.

0 = There is no excess temperature on the channel

1 = There is the excess temperature on the channel

DPT: 1.005 (alarm)

4.3. Inputs

This section contains information about KNX objects and their properties related to the input channels. The types, flags and properties of the objects are explained in detail below. There are 8 digital input channels with the same functionality and 2 analog input channels. In this section, digital input objects are described only for one channel due to the identical.

Object Number	Object Name	Function	Type	Flags
172,177,182,187, 192, 197,202,207	Binary x	Lock	1 bit	CW

This object is used to lock the sensor channel. It becomes visible when the "Lock on Value 1" or "Lock on Value 0" parameter is selected. Depending on the parameter setting, when an ON or OFF telegram is sent to this object, the corresponding channel is locked.

For example, when "ON telegram" is selected in the parameter page for locking, it will be locked when an ON telegram is received from the KNX bus line, and when an OFF telegram is received, the related dimmer actuator channel will be unlocked. Depending on the parameter configuration, an output value can also be sent when the locking operation is performed.

DPT: 1.003 (enable)

173,178,183,188, 193,198,203,208	Binary X	Status	1 bit	CW

This object is used to specify what was the last value sent to the bus line. Typically, it can be used for toggle operation.

DPT: 1.001 (switch) & 1.007 (Switch)

175,180,185,190, 195,200,205,210	Binary X	Switch - Slat Angle/Stop - Value - Percentage - Temperature - Luminosity	1 bit / 1 byte / 2 byte	CRT

This communication object changes in functionality depending on the selected input function. Depending on the configuration, the data type of this object changes. Switching, dimming, lamella adjustment, temperature, luminosity, shutter/blind control, value determination, and percentage operations can be performed on this object.

DPT: According to parameter selection

176,181,186,191, 196,201,206,211	Binary X	Switch - Dim - Up/Down - Value - Percentage - Temperature - Luminosity	1 bit / 4 bit / 1 byte / 2 byte	CRT

This communication object changes in functionality depending on the selected input function. Depending on the configuration, the data type of this object changes. Switching, dimming, lamella adjustment, temperature, luminosity, shutter/blind control, value determination, and percentage operations can be performed on this object.

DPT: According to parameter selection

212, 217	Analog X	Lock	1 bit	CW

This object is used to lock the sensor channel. It becomes visible when the "Lock on Value 1" or "Lock on Value 0" parameter is selected. Depending on the parameter setting, when an ON or OFF telegram is sent to this object, the corresponding channel is locked.

For example, when "ON telegram" is selected in the parameter page for locking, it will be locked when an ON telegram is received from the KNX bus line, and when an OFF telegram is received, the related dimmer actuator channel will be unlocked. Depending on the parameter configuration, an output value can also be sent when the locking operation is performed.

DPT: 1.003 (enable)

213, 218	Analog X	Temperature Out / Brightness Out	2 byte	CRT

This object is used to send temperature value or Brightness value to the KNX bus line according to parameter configuration. The temperature or brightness value can be also sent to the KNX bus line periodically or according to the configured variation parameter.

Note: For more accurate results, the NTC sensor or LDR resistance parameter values should be configured correctly.

DPT: 9.001(temperature), 9.004(lux)

214, 219	Analog X	Temperature Calibration / Brightness Calibration	2 byte	CW

This object is used to receive temperature calibration or brightness calibration values from the KNX bus line according to parameter configuration.

Note: For more accurate results, the NTC sensor or LDR resistance parameter values should be configured correctly.

DPT: 9.001(temperature), 9.004(lux)

CONTACT INFORMATION

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