KNX S1R-B4-UP DES

Actuator for 1 drive with 3 end switches

Item number 70536

elsner elektronik

Installation and Adjustment

1. Description ... 3
1.0.1. Scope of delivery ... 3
1.1. Technical data ... 3
2. Installation and commissioning ... 4
2.1. Installation notes ... 4
2.2. Safety notice for automatic functions ... 5
2.3. Connection ... 5
2.3.1. Device structure ... 6
2.4. Connection ... 6
2.4.1. Connection examples ... 7
2.5. Notes on mounting and commissioning ... 8
3. Addressing of the device at the bus ... 8
4. Disposal ... 8
5. Transfer protocol ... 9
5.1. List of all communication objects ... 9
6. Parameter setting ... 15
6.1. General settings ... 15
6.2. Output ... 15
6.2.1. Channel settings – drive ... 15
6.2.1.1. Control ... 16
6.2.1.2. Automation - external ... 22
6.2.1.3. Scenes ... 27
6.2.1.4. Button inputs ... 27
6.2.2. Output channel with drive ... 32
6.2.3. Connection option for zero position sensors ... 34

Installation, inspection, commissioning and troubleshooting of the device must only be carried out by a competent electrician.

This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual

Safety advice.

Safety advice for working on electrical connections, components, etc.

DANGER! ... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.

WARNING! ... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.

CAUTION! ... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.

ATTENTION! ... indicates a situation which may lead to damage to property if it is not avoided.

ETS In the ETS tables, the parameter default settings are marked by underlining.

1. Description

The **Actuator KNX S1R-B4-UP DES** is an electronic control device for controlling a motor with 3 end switches. A 230 V AC power supply is needed for the motor.

Functions:

- **1 drive output** for a **drive with 3 end switches** (Venetian blinds with working position)
- **4 binary input** for use as manual or bus button
- **Position feedback** of the movement position
- **Position storage** (movement position) via 1-bit object (storage and call-up, e.g. by button)
- Controls by **internal or external automatics**
- Integrated **shading control**
- **Scene control** for movement position with 16 scenes
- Blocking objects and alarm messages have different **priorities** so that safety functions always have priority (e.g. wind blocking)
- **Manual or automatic control configuration** per time or communication object

Configuration is made using the KNX software ETS 5. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu.

1.0.1. Scope of delivery

- Actuator

1.1. Technical data

Casing	Plastic
Colour	White
Installation	Flush-mounted (in connector socket, diameter 60 mm, 60 mm deep)
Protection category	IP 20
Size	approx. 50 x 50 x 54 (W × H × D, mm)
Weight	approx. 100 g
Ambient temperature	Operation -20…+45°C, storage -30…+85°C
Ambient humidity	5...80% RH, non-condensing
Operating voltage	KNX bus voltage
Current at the bus	20 mA

Output	1 x drive with 2 lower end switches (UP/AB1/AB2/N/PE). Fuse: Fine wire fuse T4.0 A. Output load capacity: A total of max. 4 A for resistive load, Inrush current total max. 4 A at ≤ 20ms.
Maximum load	Each terminal contact may be loaded with a maximum of 10 A.
Inputs	4× binary inputs
Max. wire length Binary inputs	10 m
Data output	KNX +/- Bus plug terminal
BCU type	Own microcontroller
PEI type	0
Group addresses	max. 1024
Allocations	max. 1024
Communication objects	111

The product is compliant with the provisions of EU Directives.

2. Installation and commissioning

2.1. Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.

- National legal regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for the intended purpose described in this manual. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Safety notice for automatic functions

WARNING!
Risk of injury from automatically moving components!
Parts of the system can be started by the automatic controls and be a danger to persons.

- No persons may remain in the travelling range of parts driven by an electric motor.
- Adhere to the relevant building regulations.
- Ensure that the return path/access to the building is not blocked if spending time outside the building (danger of being locked out).
- Correctly decommission the system for maintenance and cleaning work.

If there is a power outage, the system does not work. Therefore, shadings should be moved to a save position if there are anticipated weather conditions, for example, if this has not already been done by the automatic function (product protection).

If the power supply is removed, the connected drive switches off. When the power is restored, the consumer remains switched off until a new movement command is received by the actuator.

2.3. Connection

The device is suitable for operating in dry interiors. Connection according to the connection diagram. For maintenance purposes, accessibility to the device must be guaranteed.

The applicable provisions and standards for SELV circuits must be complied with for installation and cabling at the KNX connection and the inputs!
The connections for the binary inputs, including the auxiliary voltage output, meet the requirements for SELV circuits. Mixed installation with non-SELV circuits or the mixing of different auxiliary voltages is not permitted.

2.3.1. Device structure

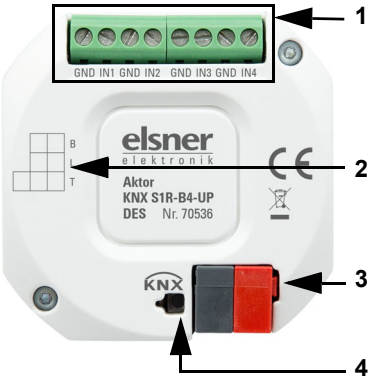


Fig. 1: Bus side
1 Connection terminal digital inputs
2 Label field
3 KNX plug terminal +/-
4 Programming LED and programming button (countersunk)

Allocation of the connection terminal analogue/digital inputs
1: GND | 2: IN1 | 3: GND | 4: IN2 | 5: GND | 6: IN3 | 7: GND | 8: IN4
All GND terminals are internally bridged.

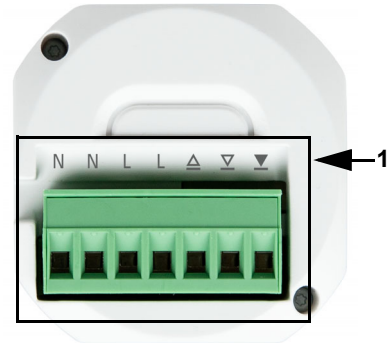


Fig. 2: Output side
1 Connection terminal for drive

2.4. Connection

The **Actuator KNX S1R-B4-UP DES** is installed in a flush-mounted box. The connection is made using a KNX connector on the KNX data bus.

The applicable provisions and standards for SELV circuits must be complied with for installation and cabling at the KNX connection and the inputs!

STOP

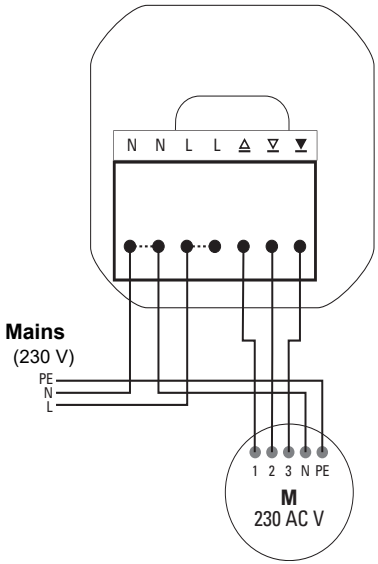
ATTENTION!
When first switched on. relays may be live!
The bistable relays used in this product can switch themselves on when subjected to strong vibration, e.g. during transport.

- First of all connect the bus voltage; this will switch off the relays. Then switch on the power supply to the drive.

The physical address is assigned by the KNX software. There is a button with a control LED for this on the actuator.

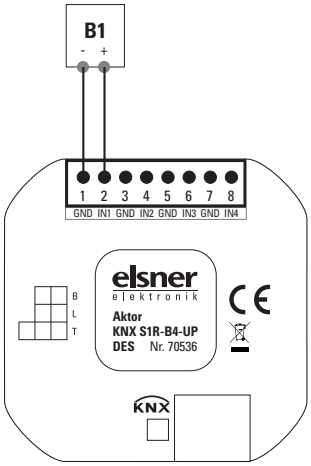
2.4.1. Connection examples

230V drive at the output:



Each terminal contact may be loaded with a maximum of 10 A.

Inputs:



Example: Binary contact on input 1

2.5. Notes on mounting and commissioning

Device must not be exposed to water (rain). This could result in the electronic being damaged. A relative air humidity of 95% must not be exceeded. Avoid bedewing.

After the operating voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.

For KNX devices with safety functions (e.g. wind or rain blocking), a cyclical monitoring of the safety objects must be set up. The ideal ratio is 1:3 (example: if the weather station sends a value every 5 minutes, the actuator must be configured for a monitoring period of 15 minutes).

3. Addressing of the device at the bus

The device is supplied with the bus address 15.15.255. You can program another address into the ETS by overwriting the 15.15.255 address or by teaching via the programming button.

4. Disposal

After use, the device must be disposed of or recycled in accordance with the legal regulations. Do not dispose of it with the household waste!

5. Transfer protocol

5.1. List of all communication objects

Abbreviations:
R Read
W Write
C Communication
T Transmit
DPT Data Point Type

No.	Text	Function	Flags	DPT type	Size
1	Software version	Readable	R-C-	[217.1] DPT_Version	2 Bytes
100	Channel A - Automatic or manual status	Output	R-CT	[1.2] DPT_Bool	1 Bit
101	Channel A - Manual long-term extended position	Input	RWC-	[1.8] DPT_UpDown	1 Bit
102	Channel A - Manual long-term closed position	Input	RWC-	[1.8] DPT_UpDown	1 Bit
103	Channel A - Manual short time	Input	RWC-	[1.8] DPT_UpDown	1 Bit
104	Channel A - Manual movement position	Input	RWC-	[5.1] DPT_Scaling	1 Byte
105	Channel A - Manual blind position	Input	RWC-	[5.1] DPT_Scaling	1 Byte
106	Channel A - Manually move to shading position	Input	RWC-	[1.1] DPT_Switch	1 Bit
107	Channel A - Manually move to closed position	Input	RWC-	[1.1] DPT_Switch	1 Bit
108	Channel A - Automatic long-term extended position	Input	RWC-	[1.8] DPT_UpDown	1 Bit
109	Channel A - Automatic long-term closed position	Input	RWC-	[1.8] DPT_UpDown	1 Bit
110	Channel A - Automatic short time	Input	RWC-	[1.8] DPT_UpDown	1 Bit
111	Channel A - Automatic movement position	Input	RWC-	[5.1] DPT_Scaling	1 Byte
112	Channel A - Automatic blind position	Input	RWC-	[5.1] DPT_Scaling	1 Byte
113	Channel A - Automatically move to shading position	Input	RWC-	[1.1] DPT_Switch	1 Bit
114	Channel A - Automatically move to closed position	Input	RWC-	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	DPT type	Size
115	Channel A - Automatically move to position memory	Input	RWC-	[1.1] DPT_Switch	1 Bit
116	Channel A - Learn object position memory automatically	Input	RWC-	[1.1] DPT_Switch	1 Bit
117	Channel A - Switch from manual to automatic	Input	RWC-	[1.2] DPT_Bool	1 Bit
118	Channel A - Automatic blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
119	Channel A - Current movement position	Output	R-CT	[5.1] DPT_Scaling	1 Byte
120	Channel A - Current blind position	Output	R-CT	[5.1] DPT_Scaling	1 Byte
121	Channel A - Status object	Output	R-CT	[1.2] DPT_Bool	1 Bit
122	Channel A - Call up / saving scenes	Input	RWC-	[18.1] DPT_SceneControl	1 Byte
123	Channel A - Outdoor temperature blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
124	Channel A - Outdoor temperature block measurement	Input	RWC-	[9.1] DPT_Value_Temp	2 Bytes
125	Channel A - Outdoor temperature blocking status	Output	R-CT	[1.1] DPT_Switch	1 Bit
126	Channel A - Twilight object	Input	RWC-	[1.1] DPT_Switch	1 Bit
127	Channel A - Twilight measurement	Input	RWC-	[9.4] DPT_Value_Lux	2 Bytes
128	Channel A - Twilight status	Output	R-CT	[1.1] DPT_Switch	1 Bit
129	Channel A - Time control	Input	RWC-	[1.1] DPT_Switch	1 Bit
130	Channel A - Inside temperature release object	Input	RWC-	[1.1] DPT_Switch	1 Bit
131	Channel A - Inside temperature release measurement	Input	RWC-	[9.1] DPT_Value_Temp	2 Bytes
132	Channel A - Inside temperature release setpoint	Input	RWC-	[9.1] DPT_Value_Temp	2 Bytes
133	Channel A - Inside temperature release status	Output	R-CT	[1.1] DPT_Switch	1 Bit
134	Channel A - Shading object	Input	RWC-	[1.1] DPT_Switch	1 Bit
135	Channel A - Shading brightness measurement 1	Input	RWC-	[9.4] DPT_Value_Lux	2 Bytes
136	Channel A - Shading brightness measurement 2	Input	RWC-	[9.4] DPT_Value_Lux	2 Bytes

No.	Text	Function	Flags	DPT type	Size
137	Channel A - Shading brightness measurement 3	Input	RWC-	[9.4] DPT_Value_Lux	2 Bytes
138	Channel A - Shading threshold value	Input / Output	RWCT	[9.4] DPT_Value_Lux	2 Bytes
139	Channel A - Shading threshold value 1 = + | 0 = -	Input	RWC-	[1.1] DPT_Switch	1 Bit
140	Channel A - Shading threshold value +	Input	RWC-	[1.1] DPT_Switch	1 Bit
141	Channel A - Shading threshold value -	Input	RWC-	[1.1] DPT_Switch	1 Bit
142	Channel A - Shading status	Output	R-CT	[1.1] DPT_Switch	1 Bit
143	Channel A - Shading position learning object	Input	RWC-	[1.1] DPT_Switch	1 Bit
144	Channel A - Azimuth	Input	RWC-	[9.7] DPT_Value_Humidity	2 Bytes
145	Channel A - Elevation	Input	RWC-	[9.7] DPT_Value_Humidity	2 Bytes
161	Channel A - Zero position reached	Input	RWC-	[1.1] DPT_Switch	1 Bit
162	Channel A - Zero position sensor disrupted	Output	R-CT	[1.1] DPT_Switch	1 Bit
163	Channel A - Master zero position status	Output	R-CT	[1.1] DPT_Switch	1 Bit
164	Channel A - Master zero position command	Output	R-CT	[1.1] DPT_Switch	1 Bit
165	Channel A - Slave zero position status	Input	RWC-	[1.1] DPT_Switch	1 Bit
166	Channel A - Master zero position status	Input	RWC-	[1.1] DPT_Switch	1 Bit
167	Channel A - Master zero position command	Input	RWC-	[1.1] DPT_Switch	1 Bit
168	Channel A - Slave zero position status	Output	R-CT	[1.1] DPT_Switch	1 Bit
171	Channel A - Blocking 1 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
172	Channel A - Blocking 1 - Wind blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
173	Channel A - Blocking 1 - Wind blocking measurement	Input	RWC-	[9.5] DPT_Value_Wsp	2 Bytes
174	Channel A - Blocking 1 - Wind blocking status	Output	R-CT	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	DPT type	Size
175	Channel A - Blocking 1 - Rain blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
176	Channel A - Blocking 2 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
177	Channel A - Blocking 2 - Wind blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
178	Channel A - Blocking 2 - Wind blocking measurement	Input	RWC-	[9.5] DPT_Value_Wsp	2 Bytes
179	Channel A - Blocking 2 - Wind blocking status	Output	R-CT	[1.1] DPT_Switch	1 Bit
180	Channel A - Blocking 2 - Rain blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
181	Channel A - Blocking 3 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
182	Channel A - Blocking 3 - Wind blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
183	Channel A - Blocking 3 - Wind blocking measurement	Input	RWC-	[9.5] DPT_Value_Wsp	2 Bytes
184	Channel A - Blocking 3 - Wind blocking status	Output	R-CT	[1.1] DPT_Switch	1 Bit
185	Channel A - Blocking 3 - Rain blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
186	Channel A - Blocking 4 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
187	Channel A - Blocking 4 - Wind blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
188	Channel A - Blocking 4 - Wind blocking measurement	Input	RWC-	[9.5] DPT_Value_Wsp	2 Bytes
189	Channel A - Blocking 4 - Wind blocking status	Output	R-CT	[1.1] DPT_Switch	1 Bit
190	Channel A - Blocking 4 - Rain blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
191	Channel A - Blocking 5 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
192	Channel A - Blocking 5 - Wind blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
193	Channel A - Blocking 5 - Wind blocking measurement	Input	RWC-	[9.5] DPT_Value_Wsp	2 Bytes
194	Channel A - Blocking 5 - Wind blocking status	Output	R-CT	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	DPT type	Size
195	Channel A - Blocking 5 - Rain blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
196	Channel A - Short time restriction	Input	RWC-	[1.1] DPT_Switch	1 Bit
250	Input 5 - Extended	Input / Output	RWCT	[1.8] DPT_UpDown	1 Bit
251	Input 5 - Short	Output	R-CT	[1.8] DPT_UpDown	1 Bit
252	Input 5 - Switch	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit
253	Input 5 - Relative dimming	Input / Output	RWCT	[3.7] DPT_Control_Dimming	4 Bit
254	Input 5 - Encoder 8 Bit	Output	R-CT	[5.4] DPT_Percent_U8	1 Byte
255	Input 5 - Temperature encoder	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
256	Input 5 - Brightness encoder	Output	R-CT	[9.4] DPT_Value_Lux	2 Bytes
257	Input 5 - Scene	Output	R-CT	[18.1] DPT_SceneControl	1 Byte
258	Input 5 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
260	Input 6 - Extended	Input / Output	RWCT	[1.8] DPT_UpDown	1 Bit
261	Input 6 - Short	Output	R-CT	[1.8] DPT_UpDown	1 Bit
262	Input 6 - Switch	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit
263	Input 6 - Relative dimming	Input / Output	RWCT	[3.7] DPT_Control_Dimming	4 Bit
264	Input 6 - Encoder 8 Bit	Output	R-CT	[5.4] DPT_Percent_U8	1 Byte
265	Input 6 - Temperature encoder	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
266	Input 6 - Brightness encoder	Output	R-CT	[9.4] DPT_Value_Lux	2 Bytes
267	Input 6 - Scene	Output	R-CT	[18.1] DPT_SceneControl	1 Byte
268	Input 6 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
450	Input 7 - Extended	Input / Output	RWCT	[1.8] DPT_UpDown	1 Bit
451	Input 7 - Short	Output	R-CT	[1.8] DPT_UpDown	1 Bit
452	Input 7 - Switch	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit

No.	Text	Function	Flags	DPT type	Size
453	Input 7 - Relative dimming	Input / Output	RWCT	[3.7] DPT_Control_Dimming	4 Bit
454	Input 7 - Encoder 8 Bit	Output	R-CT	[5.4] DPT_Percent_U8	1 Byte
455	Input 7 - Temperature encoder	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
456	Input 7 - Brightness encoder	Output	R-CT	[9.4] DPT_Value_Lux	2 Bytes
457	Input 7 - Scene	Output	R-CT	[18.1] DPT_SceneControl	1 Byte
458	Input 7 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit
460	Input 8 - Extended	Input / Output	RWCT	[1.8] DPT_UpDown	1 Bit
461	Input 8 - Short	Output	R-CT	[1.8] DPT_UpDown	1 Bit
462	Input 8 - Switch	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit
463	Input 8 - Relative dimming	Input / Output	RWCT	[3.7] DPT_Control_Dimming	4 Bit
464	Input 8 - Encoder 8 Bit	Output	R-CT	[5.4] DPT_Percent_U8	1 Byte
465	Input 8 - Temperature encoder	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
466	Input 8 - Brightness encoder	Output	R-CT	[9.4] DPT_Value_Lux	2 Bytes
467	Input 8 - Scene	Output	R-CT	[18.1] DPT_SceneControl	1 Byte
468	Input 8 - Blocking object	Input	RWC-	[1.1] DPT_Switch	1 Bit

6. Parameter setting

The default settings of the parameter are labelled by an underscore.

6.1. General settings

First set the general parameters for the bus communication (telegram rate, transmission delay). Additionally, you can indicate if for the programming of scenes all, or only the changed settings are applied to the bus.

Maximum telegram rate	1 • 2 • 5 • 10 • 20 telegrams per second
Send delay of threshold values after voltage returns	5 s ... 2 h
Send delay of switching and status outputs after voltage returns	5 s ... 2 h
For the use of scenes:	
Application when programming	all parameters • only changed parameters

6.2. Output

- General specifications for the connected drive (see *Channel settings – drive*, page 15)
- Control functions: Movement range limit, blocking, type of automatic (see *Control*, page 16)
- Automatic functions: Automatic can be specified externally or internally (see *Automatic - internal for shading:*, page 22)
- Scenes: Movement positions (see *Scenes*, page 27)
- Button inputs: Configuration as actuator button, bust button or for zero position sensor (see *Button inputs*, page 27)

6.2.1. Channel settings – drive

Set the general specifications for the drive.

Runtime:
The runtime between the end positions is the basis for moving into intermediate positions (e.g. for movement range limits and scenes). You can enter the runtime numerically here (in seconds).

Use an automatic runtime measurement	no • yes

Runtime UP in sec	1 ... 320; 65
Runtime DOWN in sec	1 ... 320; 60

Step setting of slats:
Step time x step number determines the turning time of the slats.

Step time in 10 ms	1 ... 100; 20
Step number slats	1 ... 255; 2

If the short time command for shutters (step command) is used only for slat adjustment, but not for positioning the curtain, the following parameter is set to "Yes".

Allow step commands only for slat adjustment	no • yes

Break time:
The required break times during a change of direction of the drive should be adjusted according to the specifications of the motor manufacturer.

Break time for a change of direction in 0.1 sec	5 ... 100; 10

Status object and drive position:
The status and current position can be sent to the bus. By sending of 1, the status object indicates that the retracted or closed position has been exited and it is suitable for example for monitoring windows.
The exact drive position can be sent on the bus if required. The variable delay ensures that the bus is not blocked by too many data packets during a longer movement. The position can also be transmitted cyclically.

Use status object	no • yes
Use drive position feedback	no • yes
Position transmit delay after change in 0.1 s *(only for feedback)*	0...50; 10
Transmit drive position cyclically *(only for feedback)*	no • 5 s • 10 s • ... • 2 h

6.2.1.1. Control

Set the behaviour of the drive here.

Movement range limit:

The operating range limit is used in order to avoid that two units collide with each other (e.g. an awning and a window which is about to open).

One of two drive mechanisms is prioritised and is parameterised as master and the other one as slave. By means of zero position sensors, both actuators know the own current status and the current status of the other one. This one is either “in a safe position“ or “not in a safe position“. The safe position is reached as soon as the drive mechanism is in a sector where a collision is not possible (for an awning, for example, this might be an extension of 0 to 30%). In order to report the safe position of the drive mechanism, either a zero position sensor (e.g. final position switch or light barrier) may be connected at an input of the actuator (this must be set in the example, if the

awning is used as slave 30% may be open, at position 31% it should be mounted), or the actuator receives the message of its zero position sensor by the bus (see graphic in chapter *Connection options for zero position sensors* in the general part).

Before the drive mechanism of the master actuator is moved, the slave actuator receives the command to move its drive mechanism to the safe position. As a consequence, the slave remains in safe position or it moves back if it is not within the safe range.

The master actuator knows from the communication object „Slave zero position status" whether the drive mechanism connected to the slave actuator is already in a safe position (then the master moves immediately) or not (then the master waits). Only if the master actuator is informed that the slave drive mechanism is in a safe position, it moves its drive mechanism beyond its own safe position.

Example:

The ventilation with the window shall take priority over the shading with the awning. Therefore, the window is parameterised as master, the awning as slave. Both are provided with a zero position sensor which reports whether the drive mechanism is in a safe position or not.

The awning is now extended and the window shall be opened. The window knows the status of the awning ("not safe position") and therefore submits a master command to the awning. This is the signal for the awning, to retract a little bit. As soon as the awning has reached a safe position, there is an according feedback signal of the zero position sensor of the awning. Only now the window opens.

Master and slave regularly exchange their positions ("safe" or "not safe"). By means of the monitoring period, you may adjust the frequency of information retrieval. The selected period should be shorter than the period which the monitored drive mechanism needs to travel from the limit of the safe range (last reported safe position) to a position where there is risk of collision.

If the drive mechanism does not receive a master/slave or zero position object, it moves to the safe position. The same holds true for a bus voltage breakdown or for a malfunction message from the zero position sensor (is valid for the parameterisation as master and as slave).

Without movement range limitation:

Use movement range limit	**no**
Behaviour following a failure of the bus power supply	• Stop
Behaviour on bus voltage restoration and after programming	• no action • Up command • Down1 command • Down2 command

With movement range limit:
Set if the zero position sensor of the drive is directly connected to the actuator (input channel) or if the zero position is received via the bus (communication object).

Use movement range limit	**yes**
Zero position sensor connected as	• communication object • input channel
Actuator is	master • slave

Actuator as master:

Actuator is	**master**
Send repetition for master command in sec	1 ... 255; 10
Monitoring period for slave status (and zero position) object in sec	1 ... 255; 10

Actuator as slave:

Actuator is	**slave**
Monitoring period for master status (and zero position) object in sec	1 ... 255; 10
Movement position for slave in % if input "Master zero position command" = 1	0 ... 100

Reference travel direction:

If the travel range is limited, the direction of the reference travel is fixed (safe position).

Direction of reference travel	in safe position

Blocking objects:
The output channel can be blocked in case of rain, wind or other events. The manual operation is then not possible. Blocking and monitoring are configured here first. For setting the individual blocks, separate menu items "Blocking X" will appear (see chapter *Block – blocking objects*, page 20, *Block – wind blocking*, page 20 and *Block – rain blocking*, page 21).
The priorities of the blocking objects correspond to the sequence listed (Block 1 has the highest priority, Block 5 the lowest).

Use Block 1 (high priority)	• no • yes, with blocking object • yes, as wind blocking • yes, as rain blocking
Use block 2	• no • yes, with blocking object • yes, as wind blocking • yes, as rain blocking
Use block 3	• no • yes, with blocking object • yes, as wind blocking • yes, as rain blocking

Use block 4	• no • yes, with blocking object • yes, as wind blocking • yes, as rain blocking
Use Block 5 (low priority)	• no • yes, with blocking object • yes, as wind blocking • yes, as rain blocking
Use monitoring of blocking objects	No • Yes
Monitoring period for blocking objects *(only if using monitoring of the blocking objects)*	5s... • 2 h; 5 min
Behaviour if a blocking object is not received *(only if blocking object monitoring is used)*	• Stop • Up command • Down command

Short time restriction:

If short time restriction is active, only short time movement commands are still possible manually. If the function "Allow step commands only for blind adjustment" is activated simultaneously, (see *Channel settings – drive*, page 15) only the slats can still be adjusted by hand but no longer the movement position of the shutter.
Restriction is active for object value 1.

Use short time limit	no • yes
Value of the object in front of 1. communication and bus voltage restoration *(if short time restriction is used)*	0 • 1

Automatic reset:

With the manual operation the automatic of the drive is deactivated. Here it is set when the automatic is reactivated.

Manual switches to automatic after	• expiry of a waiting period • reception of an object • expiration of a waiting period or receipt of an object
Waiting period in min *(if "Expiration of a waiting period" was chosen)*	1...255; 20
Switch to automatic for an object value *(if "Receipt of an object" was chosen)*	0 • 1 • 0 or 1

Automatic blocking object:
With the automatic blocking object, the automatic can be deactivated for a short term (e.g. if present or during speeches in conference rooms).
Here it is also specified in which mode the channel is found when the voltage returns, i.e. after a power failure. The mode (manual or automatic) is send as a status object to the bus.

Use automatic blocking object	no • yes
Operating mode after power returns	• Automatic • Manual
Send status object	• 1 for automatic | 0 for manual • 0 for automatic | 1 for manual
Send delay of the status output Automatic or Manual in 0.1 sec	0...50

Block – blocking objects

The menu item only appears if a block with blocking object was configured for "control". Here it is specified was happens for object value 1 and 0. Via the free blocking object, a fire alarm scenario may be configured for example (create escape routes by retracting the shading, smoke extraction via windows). This can prevent being locked out on the patio (opened window contact of the patio door blocks the shutter in front of the door).

Designation	Block 1 ... 5 [free text]
If blocking object has value =1	• no action • stop • up command • down1 command • down2 command • approach intermediate position • approach slat position
Position in % (only if by using a block, a specific position is achieved)	0...100
Slat position in % (only if by using a block, a specific shutter position is achieved)	0...100
If blocking object has value =0	
For manual operation before and after blocking	• no action • move into last position
For automatic operation after blocking	follow automatic
Value of the object before the 1st communication and bus voltage return	0...1

Block – wind blocking

The menu item only appears if a wind blocking was configured for "control". The input object "wind blocking" is linked with the output object of a wind sensor. The input can

be a 1bit object (smaller or larger than a threshold value), as well as a 16bit object (measurement value).

Designation	[Wind blocking] Enter a designation here!
Type of input object	1 bit • 16 bit

1 bit input object:

Type of input object	**1 bit**
If blocking object has value =1	• no action • stop • up command • down command • approach intermediate position • approach slat position
Position in % (only if by using a block, a specific position is achieved)	0...100
Slat position in % (only if by using a block, a specific shutter position is achieved)	0...100
Waiting period in secure position in min after blocking	0...255; 5
Behaviour after waiting period	
For manual operation before and after blocking	• no action • move into last position
For automatic operation after blocking	follow automatic

16 bit input object:

Type of input object	**16 bit**
As of wind speed in m/s blocking	2...30; 5
If blocking is active	• no action • stop • up command • down command • approach intermediate position • approach slat position
Waiting period in secure position in min after blocking	0...255; 5
Behaviour after waiting period	
For manual operation before and after blocking	• no action • move into last position
For automatic operation after blocking	follow automatic
Send current blocking status	no • yes

Block – rain blocking

The menu item only appears if a rain blocking was configured for "control". The input object "rain blocking" is linked with the output object of a rain sensor.

Designation	[rain blocking] Enter a designation here!
If blocking object has value =1	• no action • stop • up command • down command • approach intermediate position • approach slat position
Position in % (only if by using a block, a specific position is achieved)	0...100
Slat position in % (only if by using a block, a specific shutter position is achieved)	0...100
Waiting period in secure position in min after blocking	0...255; 5
Behaviour after waiting period	
For manual operation before and after blocking	• no action • move into last position
For automatic operation after blocking	follow automatic

6.2.1.2. Automation - external

Type of automatic:
The automatic for the connected drive can be specified externally, however all the settings can also be configured internally.

Type of automatic	external automatic • internal automatic

Automatic - internal for shading:

The menu item "Automatic internal" appears if internal automatic is selected for "automatic". The internal automatic functions take into account the brightness/position of the sun, outdoor and indoor temperature and allow a time and dimming control. A shading position can be specified or taught.

To be able to fully utilize the internal shading automatic, information about brightness/ twilight, outdoor and indoor temperature, time and position of the sun must be present in the bus system.

Outdoor temperature block:

The input object "outdoor temperature block" is linked with the output object of a temperature sensor. The input object can be a 1bit object (smaller or larger than a threshold value), as well as a 16bit object (measurement value).

Use automatic blocking object	no • yes

Use automatic blocking object	**yes**
Type of temperature input object	1 bit • 16 bit

1 bit input object:

Type of temperature input object	**1 bit**

Shading is allowed if the bit is 0 and blocked if the bit is 1.

16 bit input object:

Type of temperature input object	**16 bit**
Threshold value in 0.1°C	-300 ... 800; 50
Hysteresis in 0.1°C	1 ... 100; 20
Send current blocking status	no • yes

Shading is allowed
if the measurement value is larger than the threshold value+hysteresis
and blocked
if the measurement value is smaller than or equal to the threshold value.

Twilight/time control:

The time control is provided via a communication object. The input object "twilight control" is linked with the output object of a brightness sensor. A 1bit object (smaller or larger than a threshold value), as well as a 16bit object (measurement value) can be used for the twilight control.

Use twilight/time control	• no • only twilight control • only time control • both (OR linking)

Use twilight/time control	**only twilight control / both**
Type of twilight object	1 bit • 16 bit

16 bit input object:

Type of twilight object	**16 bit**
Twilight threshold value in lux	1 ... 1000; 10
Switching delay	1 minute
Send current twilight status	no • yes

Indoor temperature release:

The input object "indoor temperature release" is linked with the output object of a temperature sensor. The input object can be a 1bit object (smaller or larger than a threshold value), as well as a 16bit object (measurement value or target and actual value).

Use inside temperature release	no • yes

Type of input object	1 bit • 16 bit • 16 bit target/actual temperature

16 bit input object:

Type of input object	**16 bit**
Threshold value in 0.1°C	-300 ... 800; 200
Hysteresis in 0.1°C	0 ... 100; 20
Send current blocking status	no • yes

16 bit input object (target/actual temperature):
For this function the target value and actual value (measurement values) are imported from the 16bit object and evaluated.

Type of input object	**16 bit target/actual temperature**
Target value (SW) – actual value (MW) Difference in 0.1°C	1 ... 100; 20
Hysteresis in 0.1°C	0 ... 100; 20
Send current blocking status	no • yes

Shading is allowed if the measurement value is greater than or equal to the target value+difference
and blocked if the measurement value is smaller than the target value+hysteresis difference.

Automatic shading:

The automatic shading evaluates the input objects "brightness" and "position of the sun" of a weather station. The moving position for the automatic shading is specified here as well.

Use automatic shading	no • yes

Brightness:

For controlling brightness, a 1bit object (smaller or larger than a threshold value), as well as two or three 16bit objects (measurement values, e.g. East, South and West sun) can be used.

Type of shading input	1 x 1 bit • 1 x 16 bit • 2 x 16 bit • 3 x 16 bit

1 x 1 bit input object:
Set the delay times for shading (prevents constant opening and closing when light conditions change quickly).

Type of shading input	**1 x 1 bit**
Drive up delay in min	0 ... 255; 12
Departure delay in min	0 ... 30; 1

1 x 16 bit, 2 x 16 bit or 3 x 16 bit as an input object:
The brightness threshold value can be specified per parameter or communication object. For several brightness measurement values (2 x 16 bit or 3 x 16 bit) only the maximum brightness value is compared to the threshold value.

Type of shading input	**1 x 16 bit • 2 x 16 bit • 3 x 16 bit**
Shading threshold specification per	parameter • communication object

Threshold value per parameter:
Set the threshold value and delay times for shading (prevents constant opening and closing when light conditions change quickly).

Shading threshold specification per	**Parameter**
Shading threshold value in klux	1 ... 100; 30
Drive up delay in min	0 ... 255; 12
Drive down delay in min	0 ... 30; 1
Send current shading status	No • Yes

Threshold value per communication object:
The threshold value is received via the communication object and can be changed additionally (e.g. button for "more sensitive" and "less sensitive"). Set the delay times for shading here (prevents constant opening and closing when light conditions change quickly).

Shading threshold specification per	**communication object**
The value communicated last shall be retained	• not • after voltage returns • after voltage returns and programming
Start threshold value in klux valid until 1st communication	0 ... 100; 30
Type of limit value change	• Absolute value with a 16bit comm. object • Lifting/lowering with a comm. object • Lifting/lowering with two comm. objects
Increments in klux *(only when "lifting/lowering with comm. object")*	1 ... 5; 2
Drive up delay in min	0 ... 255; 12
Drive down delay in min	0 ... 30; 1
Send current shading status	no • yes

Position of the sun:

Assess position of the sun	no • yes

Assess position of the sun	**yes**
Position of the sun is defined via	• Discreet value of azimuth and elevation • Directions (regarding azimuth and elevation)

Defining position of sun via values:
Enter the range (direction and height) in which the sun must be located for the shading to be active.

Position of the sun is defined via	**discreet value of azimuth and elevation**
Azimuth from	0 ... 360
Azimuth to	0 ... 360
Elevation from	0 ... 90
Elevation to	0 ... 90

Defining position of the sun via directions:
Enter the direction in which the sun must be positioned so that the shading is active.

Position of the sun is defined via	**directions (regarding azimuth and elevation)**
Directions	• East (azimuth: 0° ... 180°) • South east (azimuth: 45° ... 225°) • South (azimuth: 90° ... 270°) • South west (azimuth: 135° ... 315°) • West (azimuth: 180° ... 360°)

Position memory for the manual movement can be activated here. The position set here can be overwritten via a learning object at any time. The memorised position can be retrieved again at a later time.

Use position memory	no • yes

Position specification	• shading position • closed position • intermediate position • slat position
Position in %	0...100; 75
Use learning object for new shading position	no • yes
Transfer when programming (when learning object is used)	• all parameters • changed parameters only

Use teaching object for new shading position: The curtain position it can be specified numerically or taught manually. For teaching set "use teaching object: Yes" and the "channel X shading position teaching object" is used for saving the position reached. Saving occurs for value = 1 and can for example be realized via a button linked to the teaching object. Numerical specifications already set are overwritten by the teaching object.

6.2.1.3. Scenes

A group address for scenes must be filed in the KNX system to control the scenes. The input object 'Channel X: call/save scenes' of the actuator is linked to this group address.

A scene is **called**, then the **scene number** is communicated to the actuator. The movement position saved for this scene number in the actuator is then taken.
If the scene **saving** function is used, then the current movement position is saved for this scene number in the actuator.

Every drive can **have up to 16 scene save points** for movement positions.

Use scenes	no • yes

Activate a scene save point.

Use scene X	no • **yes**

Assign a scene number to the scene save point. Use this scene number to call/save the movement position stored in the actuator. Make sure that every scene number is used only once per drive channel.

Scene number	0...127

Set the movement position. If it is allowed to save scenes via the bus, this position only applies after the ETS download until the first manual saving. Afterwards, the new movement position saved in the actuator is used.

Position specification	• shading position • closed position • intermediate position • slat position
Position in %	0...100; 50

6.2.1.4. Button inputs

There are four inputs.

The inputs can be used as actuator button or bus button.

For connected drives the input 1 can be used *alternatively* for a zero position sensor.

Operating mode	
Use input 1	• no • as a bus button • as an actuator switch • as a zero position sensor
Use input 2 / 3 / 4	• no • as a bus button • as an actuator switch

Input as bus button

If an input is used as a free bus button, it will send a previously set value to the bus when activated. In the program file of the actuator different parameters are integrated for frequently needed bus functions. Thus, the inputs can easily be configured as a switch, drive control, dimmer for sending values and for the scene calls.

Bus function	• Switch • Selector switch • Shutter • Blind • Awning • Window • Dimmer • 8 bit encoder • Temperature encoder • Brightness encoder • Scenes

Input as switch:

If a button with switch function is assigned to the input, select the bus function "Switch" and specify which value is sent when pressing/releasing the button and when it will be sent.

Function	**Switch**
Command when pressing the button	• send 0 • send 1 • do not send telegram
Command when releasing the button	• send 0 • send 1 • do not send telegram
Send value	• no change • for change to 1 • for change to 0 • for change and cyclical • for change to 1 and cyclical • for change to 0 and cyclical
Cycle *(if sent cyclical)*	5 s • 10 s • 30 s • 1 min • 2 min • 5 min • 10 min • 20 min • 30 min • 1 h • 2 h

The input can be blocked using a blocking object. Set what is transmitted to the bus when (de)activating blocking.
For active blocking there is *no* cyclical transmission.

Use blocking object	No • **Yes**

Once when activating the blocking	• send 0 • send 1 • do not send telegram
Once when deactivating the blocking	• send 0 • send 1 • do not send telegram • send current state

Input as changeover switch:

If a button with switch function is assigned to the input, select the bus function "Changeover Switch" and specify if the button should switch when pressed/released.

Function	**Changeover Switch**
Command when pressing the button	• Switching • do not send telegram
Command when releasing the button	• Switching • do not send telegram

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input to shutter, blinds, awning or window control:

If the input to the drive control is used via the bus, select the bus function "shutter", "awning", "blinds" or "window" and specify the button function and control mode.

Function	**Shutter / blinds / awning / window**	
Button function	Up • Down Up • Down • Up/ Down Retract • Extend • Retract/Extend Open • Closed • Open/Closed	(shutter) (blinds) (awning) (window)
Control mode*	• Standard • Standard inverted • Comfort mode • Dead man's switch	

*A detailed description of the setting options for the individual control modi can be found in the general part of chapter *Control modi for drive control*, page 32.

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input as dimmer:

If the input is used as a dimmer, select the bus function "Dimmer" and specify the button function, time interval (switching/dimming) and if requested, the repeat interval for a long button press.

Function	**Dimmer**
Button function	brighter • darker • brighter/darker
Time between switching and dimming (in 0.1 s)	1...50; 5
Repeat the dimm command	no • yes
Repeat the dimm command for a long button press *(if dimm command is repeated)*	every 0.1 s • every 2 sec; every 1 sec
Dim by *(if dimm command is repeated)*	1,50% • 3% • 6 % • 12,50% • 25% • 50%

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input 8 bit encoder:

If the input is to be used as an 8bit encoder, select the "8 bit encoder" bus function and specify which value will be sent.

Function	**8 bit encoder**
Value	0...255

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input as temperature encoder:

If the input is used as a temperature encoder, then choose the bus function "Temperature encoder" and specify which value between -30°C and +80°C will be sent. By sending a temperature value, the target value of the temperature control may be changed for example.

Function	**Temperature encoder**
Temperature in 0.1°C	-300...800; 200

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input as brightness encoder:

If the input is assigned and shall be used as a brightness encoder (e.g. threshold value of a sun sensor), select "brightness encoder" and specify which value will be sent.

Function	**Brightness encoder**
Brightness in klux	0...100; 20

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input for scene control:

If scenes are called and saved with the input, then choose the "Scenes" bus function and specify the saving, time difference (call/save) and scene number.

Function	**Scenes**
Button operation	• without saving • with saving
Time between calling and saving in 0.1 seconds *(only if selected "with saving")*	1...50; 20
Scene No.	0...127

The input can be blocked using a blocking object. For active blocking there is *no bus communication*.

Use blocking object	No • Yes

Input as actuator button

If this channel is used for the input to the control of the drive, then specify the button function and the control mode.

Button function	Up • Down
Control mode*	• Standard • Standard inverted • Comfort mode • Dead man's switch

*A detailed description of the setting options for the individual control modi can be found in the chapter *Control modi for drive control*, page 32.

The input can be blocked using a blocking object. No operation is possible for an active block.

Use blocking object	No • Yes

If monitoring periods or movement range limits are used, no operation via the local button is possible in case of a bus voltage failure.

Input as zero position sensor

The zero position sensor is used for the movement range limit of the respective drive (see *Channel settings – drive*, page 15). In case of a defect zero position sensor a malfunctioning message can be sent to the bus.

Send malfunction message when zero position sensor is defective	No • Yes

6.2.2. Output channel with drive

Control modi for drive control

If inputs are used as buttons for operating shading or windows, then different control modi can be set.

Control mode	• Standard • Standard inverted • Comfort mode • Dead man's switch

Standard:

If briefly operated, the drive will move incrementally or stops. If operated longer, the drive will move up to the end position. The time difference between "short" and "long" is set individually.

Control mode	**Standard**
Behavior during button operation: short = stop/increment long = Up or Down	
Time between short and long in 0.1 seconds	1...50; 10

Standard inverted:

When pushed shortly, the drive moves up to the end position. When pushed for longer, the drive moves incrementally or stops. The time difference between "short" and "long" and the repeat interval is set individually.

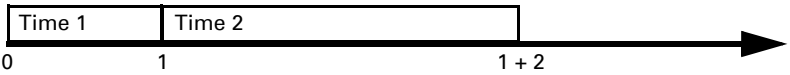
Control mode	**Standard inverted**
Behavior during button operation: short = Up or Down long = Stop/Step	
Time between short and long in 0.1 seconds	1...50; 10
Repeat the step command for a long button press	every 0.1 s • every 2 sec; every 0.5 sec

Comfort mode:

In the **comfort mode** actuating the button briefly, a bit longer and long will trigger different responses of the drive. The time intervals are set individually.

Short actuation (shorter than Time 1): The drive is positioned step-wise and stopped.
Holding it slightly longer (longer than Time 1, but shorter than Time 1+2): Drive running. Drive stops when the button is released.
Long holding (release after Time 1+2 runs out): Drive moves independently to the end position. The movement can be interrupted by a short tap.

Fig. 3
Time interval comfort mode diagram



Point in time 0:	*Actuate of button, start of time 1*
Release before time 1 expired:	*step (or stop if drive is moving)*
Point in time 1:	*End of time 1, start of time 2* *Moving command*
Release after time 1 expired *but before time 2 expires:*	*Stop*
Release after time 1 + 2 expired:	*Move into end position*

Control mode	**Comfort mode**
Behavior during button operation: Button is pushed and released before time 1 expired = stop/step held longer than time 1 = Up or Down released between time 1 and 1-2= stop released after time 1 +2 = no more stop	
Time 1	0.0s ... • 2 s; 0.4 s
Time 2	0 s • 2 s; 2 s

Dead man's switch:

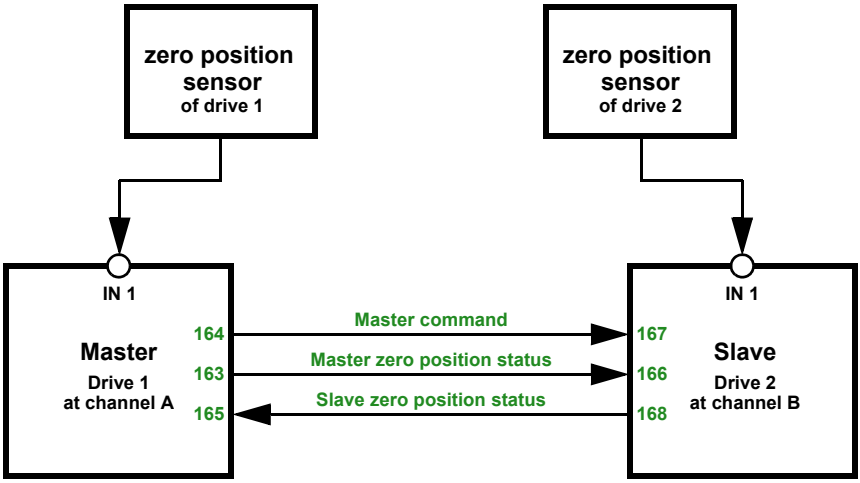
The drive moves as soon as the button is actuated and stops as soon as the button is released.

Control mode	**Dead man's switch**
Behavior during button operation: Push button = Up or Down command Release button = Stop command	

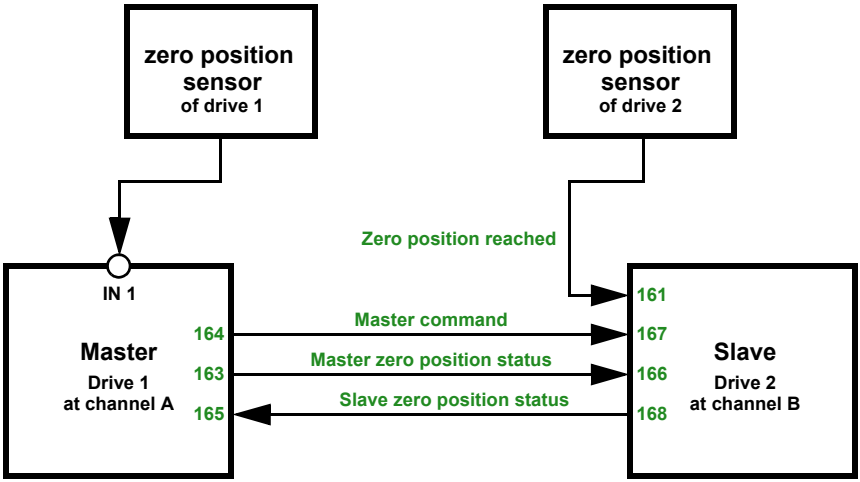
6.2.3. Connection option for zero position sensors

See also section *Movement Range Limit* in chapter *Control*, page 16. The examples and the communication object numbers refer to the mutual master-slave coupling of drives at the output channel A and channel B.

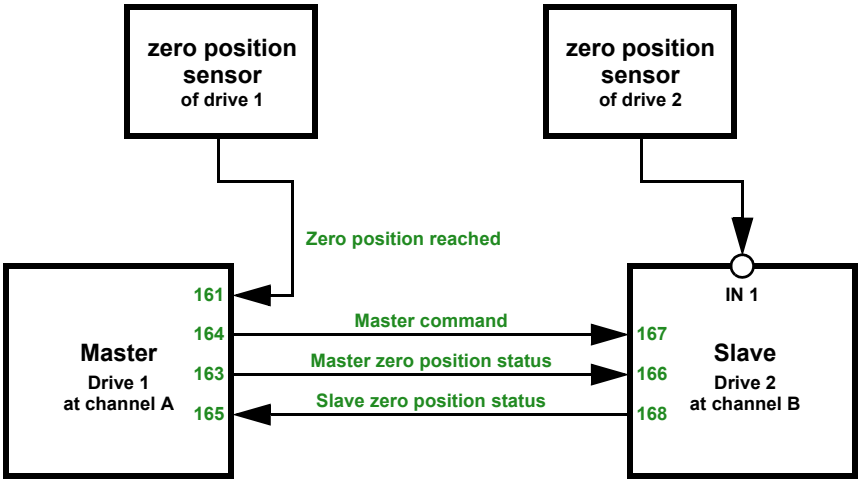
Actuator A is Master, zero position sensor at input 1 of the actuator, Actuator B is Slave, zero position sensor at input 1 of the actuator:



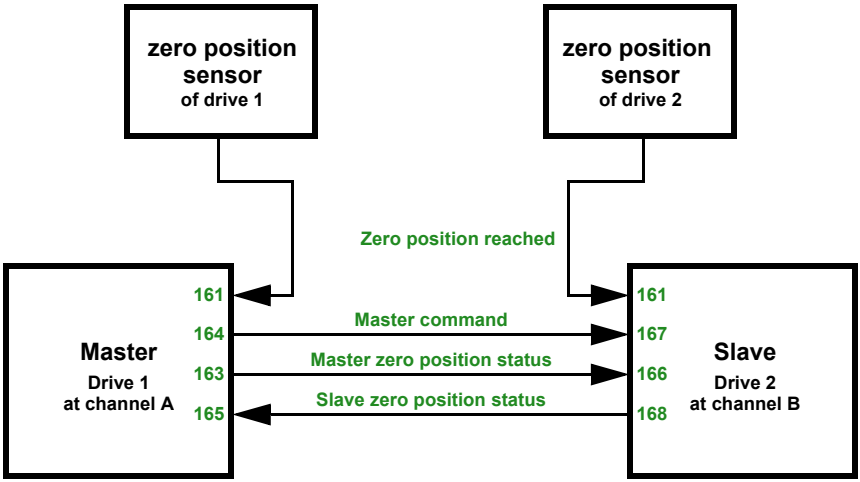
Actuator A is Master, zero position sensor at input 1 of the actuator, Actuator B is Slave, zero position sensor via bus:



Actuator A is Master, zero position sensor via bus, Actuator B is Slave, zero position sensor at input 1 of the actuator:



Drive channel A is Master, zero position sensor via bus, drive channel B is Slave, zero position sensor via bus:



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