Dimmers

DM470X2X y DM460X00

Programming manual

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1   General description

The Bes devices Ref. DM470X2X y DM460X00 are dimmers which allow to regulate any kind of lightning.

These devices are designed to obtain a precise digital regulation receiving orders through the bus or from a pushbutton connected to its low voltage input by using long/short pulsations.

The regulating ramp speed (the progressive on/off lighting) can be configured by programming.

1.1   About this manual

This manual is applicable to the following dimmers:

- ✓ DM470120
- ✓ DM470220
- ✓ DM470323
- ✓ DM460300
- ✓ DM460200

2 Technical information

Voltage Supply	230 Vac		
Max. Power consumption	0,5W @ 230 Vac		
KNX Supply	29 Vdc from KNX BUS		
BUS current consumption	DM470XX0: 15 mA from BUS KNX		
	DM460X00: 35 mA from BUS KNX		
Mounting	DM470120: Integrated on luminaire to false ceiling/ 77x35x17 mm		
	DM470220: DIN rail / 4 modules		
	DM470322: DIN rail / 4 modules		
	DM460200: Integrated on luminaire to false ceiling/ 77x35x17 mm		
	DM460300: DIN rail / 4 modules		
Connections	Connection to KNX BUS Screw terminal blocks for power , inputs and outputs		
Outputs	DM470120: 1 dimmer channel		
	DM470220: 2 dimmer channels		
	DM470322: 3 dimmer channels		
	DM460200: 2 dimmer channels with 1-10V output		
	DM460300: 3 dimmer channels with 1-10V output		
Output power	DM470120: 200 W		
	DM470250: 200 W per channel		
	DM470330: 200 W per channel		
	DM460300	230V incandescent or halogen charges	10 A como max.
		Low voltage charges with conventional or electronic transformer	
Inputs	DM470120: Without inputs		
	DM470220: 2 low voltage inputs (SELV)		
	DM470322: 3 low voltage inputs (SELV)		
	DM460X00: Without inputs		
Drive current inputs	Min. 15 mA		
Cable distance to the inputs	Max 30 meters (from the input mechanism)		
Temperature range	Running: -10 ºC/ 55 ºC		
	Storage: -30 ºC / 60 ºC		
	Transport: -30 ºC / 60 ºC		
Regulation	According to the directives of electromagnetic compatibility and low voltage: EN 50090-2-2 / UNE-EN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010-1.EN 50090-2-2 / UNE-EN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010-1		

3 Programming

3.1 Application program information

Application program: Ingenium / Dimmers (manufacturer / program name).

Catalogue version: v 1.0

Maximum number of communication objects: 24.

Maximum number of assignments: 25.

3.2   Individual address assignment

These dimmers have a programming button for the KNX individual address assignment which is located on the front of the device.

A red led near the programming button lights up when it is pressed manually or if the device is set remotely to programming mode state.

The LED is automatically turned off if the ETS has assigned an individual address correctly or if the programming button is pressed again manually.

3.3   Communication objects

In the following table the communication objects of the first cannel are shown. The rest of the channels have the same communication objects.

Objeto	Nombre / Función	Longitud	DPT	Flags				
				C	R	W	T	U
0	CH1 - On/Off	1 bit	1.001	●		●		●
1	CH1 - Dimmer	4 bit	3.007	●		●		●
2	CH1 - Value	1 byte	5.001	●		●		●
3	CH1 - On/Off status	1 bit	1.001	●	●		●	
4	CH1 – Value status	1 byte	5.001	●	●		●	
21	DMDM490120- Enable	1 bit	1.001	●	●	●		
22	Scene	1 byte	5.001	●		●		●

3.4   Objects description

Then, the first cannel communication objects are described. The same description can be applied to the rest of channels.

Name	Object 0: CH1 - On/Off
Function	1 bit communication object to switch on and off the regulation channel 1.
Description	When a "1" is received through this object the dimmer is switched on and the brightness level goes up to the last regulation value (non-zero). When a "0" is received the dimmer is switched off. By default, the behavior of light when it is turned on through this subject is to take the value it had before switching off.
Name	Object 1: CH1 - Dimmer
Function	4 bits communication object for dimming control with pushbuttons.

Description	Depending on the dimming steps set in the pushbutton, telegrams will make the brightness level goes up or down according to the ramp speed configured.
	Breaks telegrams to this object will stop the brightness at the current level.
	By default, the behavior when receiving a telegram to increase the brightness when the light is turned off is turned on and start to regulate. Conversely, if the light is on you cannot turn it off by telegrams decrease brightness.
Name	**Object 2: CH1 – Value**
Function	1 byte communication object for precise control by setting a new brightness level directly.
Description	The brightness level will go up or down slowly according to the ramp speed configured.
	By default, the behavior when receiving a telegram with non-zero brightness value, when the light is turned off is turned on and regulate the level received. Also, if the light is on you can turn it off by a telegram with the value 0.
Name	**Object 3: CH1 - On/Off status**
Function	1bit communication object for feedback signaling of the on / off state of the dimmer.
Description	When the dimmer is off and receives a switch on telegram or a brightness value, a "1" is sent through this object.
	When the dimmer is on and it receives a switch off telegram or a brightness value of 0% a "0" is sent through this object.
Name	**Object 4: CH1 - Value status**
Function	1byte communication object for feedback signaling of the current brightness level of the dimmer.
Description	When it receives a new brightness value or an increase/decrease telegram the final brightness value is sent through this object.
Name	**Object 21: General- Device lock/unlock ('1'/'0')**
Function	1 bit communication object to enable or disable the device control through the KNX BUS.
Description	When a "0" is received through this object the device cannot be controlled by BUS telegrams (input is not disabled). When a "1" is received the device is enabled.
	By default, this feature is enabled. No need to use this object to enable normal device function.
Name	**Object 22: Scenes – Active / learn**
Function	1byte communication object for internal scenes execution.
Description	Scenes can be programmed in the parameters window of the device. There are up to 8 scenes available.

3.5   Parameters

There are several tabs to configure different parameters depending on the type of the device selected, which is selected by "Number of channels" parameter, in the "General" tab, depending on the reference of the product. Depending on this selection, different tabs will be activated.

Some parameters can be hidden depending on the device selected or the previous configuration. The description of every parameter is shown next.

3.5.1   General

Name	Number of channels
Values	1 channel, 2 channels, 3 channels
Description	Allows to select the corresponding device that will be programmed by the application. The ETS will show or hide communications objects and parameters according to this parameter.

Name	Lower dimming limit (% Brightness)
Values	From 0 to 100
Description	It is the minimum regulation value (in percentage %) that the dimmer can reach.. The brightness level of the dimmer will stop at the lower limit when receiving decrements by precise control telegrams (by object 2) or dimming telegrams (by object 1) and it can only be switched off with a "0" through the on/off or value objects (objects 0 and 2). This parameter is only a hardware limitation. The user can adjust any value from 0 to 100% but the current brightness level will be internally adjusted according to the maximum and minimum values.
Name	Upper dimming limit (% Brightness)
Values	From 0 to 100
Description	It is the maximum regulation value (in percentage %) that the dimmer can reach. The brightness level of the dimmer will stop at the upper limit when receiving increments by precise control telegrams (by object 2) or dimming telegrams (by object 1). This parameter is only a hardware limitation. The user can adjust any value from 0 to 100% but the current brightness level will be internally adjusted according to the maximum and minimum values.

⚠️ *The maximum and minimum limits are parameters which depend on the lamp model and technology. In order to adjust them correctly, firstly select a 0% value for the lower limit and 100% for the upper limit. Then check the operation of the lamp in order CHx << - Value >>. Finally choose the values which best fit the behavior of the lamp.*

3.5.2   Channel 1/2/3

Name	Dimming time (sec)
Values	From 0 min 0 sec to 4 min 13 sec
Description	It is the brightness change rate measured in seconds. The brightness changes gradually when using channel 1 value or dimming communication objects. Typical value = 10 seconds. With too low values, it will be difficult for the user to get the desired value while regulating the light.
Name	Switch on time (sec)

Name		
Values	From 0 min 0 sec to 4 min 13 sec	
Description	It is time which dimmer spend to switch on the channel after receiving the correspondent order.	
Name	**Switch off time (sec)**	
Values	From 0 min 0 sec to 4 min 13 sec	
Description	It is time which dimmer spend to switch off the channel after receiving the correspondent order.	
Name	**Allow switch on with new value**	
Values	Yes, no	
Description	If Yes option is selected, channel can be switched on by Channel X – Value communication object.	
Name	**Behaviour when switching on**	
Values	Last value … 100%	
Description	Dimmer will switch on to this value when switching on the channel	

3.5.3   Staircase timer

Name	**Stairlight timer**	
Values	From Disabled to 790 min	
Description	Time dimmer spends to switch off the channel after receiving a switch on order	
Name	**Allow timer retrigger**	
Values	No / yes	
Description	If Yes option is selected, dimmer will start to count again the stairslight timer with each switch on order.	

3.5.4   Scenes

Dimmers allow to configure scenes that can be executed from bus commands with the corresponding communication object (number 22). The presets of the three channels when calling a scene are configured in the following parameters tab:

Name	Scene X Value (% Brightness)
Values	From 0 to 100.
Description	It is the value memorized in the scene for the brightness level of the channel. The brightness level will go up or down slowly according to the ramp speed configured when the scene is called.

3.6 Inputs

3.6.1 Connection

The dimmers have low voltage inputs (SELV) which allow to control the regulation channels through pushbuttons.

The inputs are activated when it is connected to "reference" as shown in the next picture:

⚠️
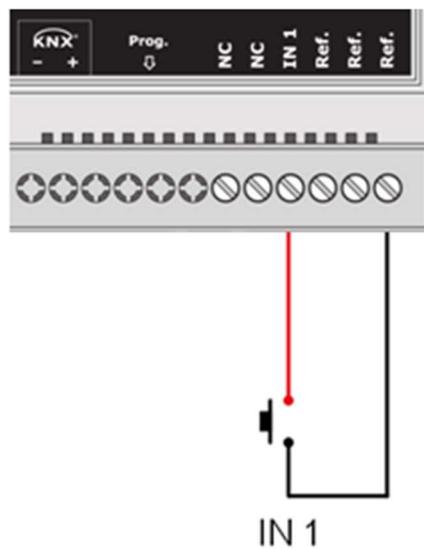
Feed low voltage lines (BUS and inputs) in separate ducting to that of power (230V) and outputs to ensure there is enough insulation and avoid interferences.

Do not connect the main voltages (230 V) or any other external voltages to any point of the BUS or inputs.

3.6.2 Working mode

The input is internally associated to its corresponding output: the input IN1 controls the output L1 (it cannot be programmed with the ETS or associated to any other function).

The working mode for the dimmer control is the classic long/short press:

- A **short press** in the input switches on and off the light completely and instantly. The switch on brightness level will be the last one and the switch off brightness level is always 0%.

- On the other side, a **long press** in the input increases or decreases the brightness slowly according to the ramp configured (if the ramp speed is very fast it will be difficult for the customer to set the brightness level desired).

4   Application example

4.1   Light control with scenes

4.1.1   Devices

Ref. DMDM470120: One channel proportional actuator.

KNX 1 gang pushbutton

KNX 1 gang switch.

4.1.2   Description

The DM470120 dimmer regulates a light circuit of the room that should be controlled from a pushbuttons and also from another switch to recall two scenes directly for 30% and 70% of brightness.

The lights can be controlled from an universal pushbutton connected to the input of the DMDM470120 and at the same time from any KNX 1xgang pushbutton connected to the EIB/KNX BUS anywhere.

4.1.3   Objects links

Ref. DM490120 –	Object 0	->	Object X Short press – KNX pushbutton
Ref. DM490120 –	Object 1	->	Object Y Long press – KNX pushbutton
Ref. DM490120 –	Object 22	->	Object X Rising edge – KNX switch
Ref. DM490120 –	Object 22	->	Object Y Falling edge – KNX switch
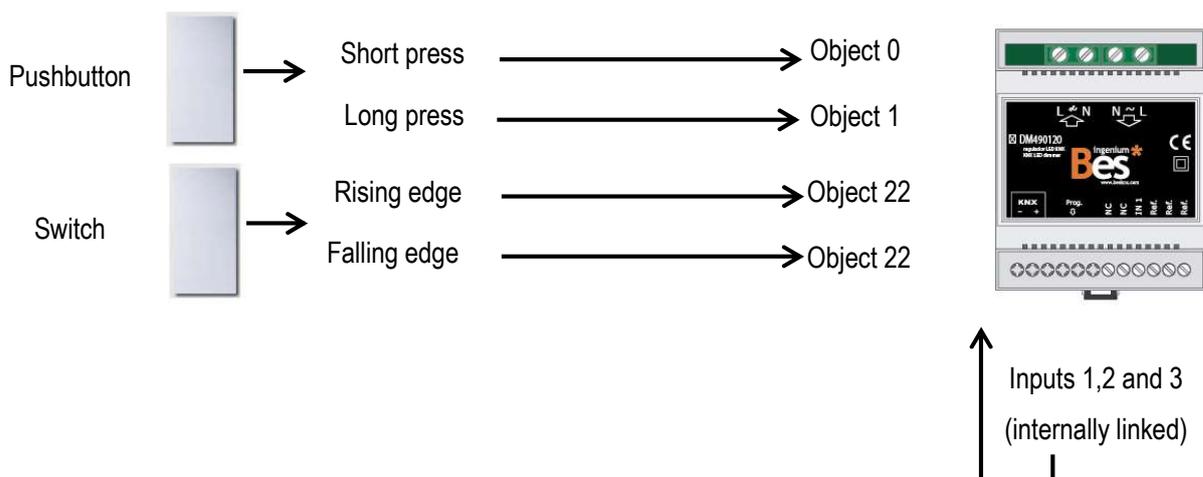
4.1.4 Parameter settings

The following parameter setting is generally recommended for this example. The ideal parameters may change depending on the application or installation.

	Parameter name	Configuration
General	Number of channels	1 channel
	Lower limit	0%
	Upper limit	100%
Channel 1	Times/behaviour	10 seconds
Scenes	Scene 1	30
	Scene 2	70
KNX Pushbutton	Short press	Switch 0/1
	Long press	Increases/decreases - 100%
KNX Switch	Rising edge	Sent value = 0
	Falling edge	Sent value= 1

The KNX pushbutton behavior is the typical short-press/long-press working principle: a short press switches on and off the light at the last dimming level meanwhile long press makes the brightness go up or down according to the ramp speed configured until the button is released (increases or decreases orders). Take into account that the ramp speed must be a high value, if not; it will be difficult to stop the dimming at the color desired.

The KNX switch will work sending bytes values to recall the scenes memorized in the dimmer in order to change to a brightness value directly and instantly.

Remember that the input of the dimmer is non-programmable and internally associated to the output. It can be controlled by any universal pushbutton (also with short-press/long-press principle).

5   Installation

5.1   DM470120

⚠️

Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference.

Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.

5.2 DM470220
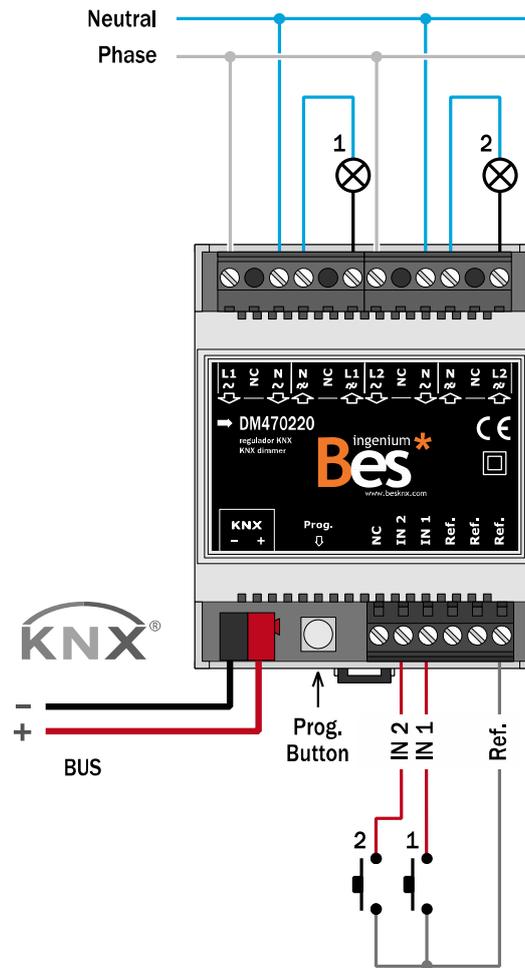
⚠️

Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference.

Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.

5.3   DM470322
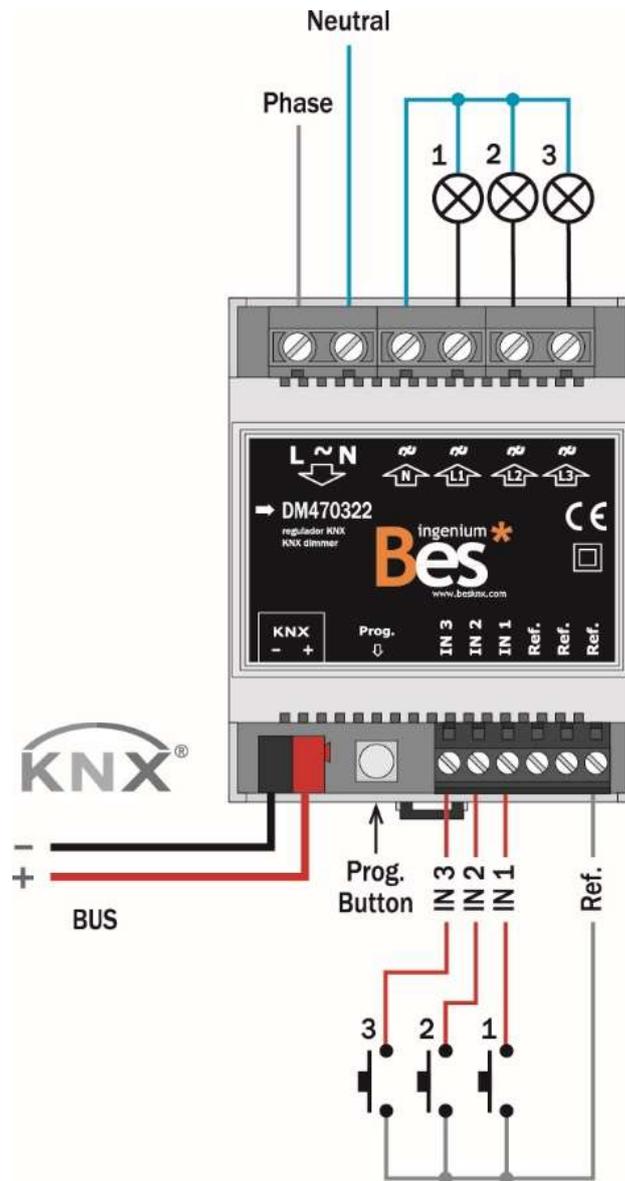
⚠️

Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference.

Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.

5.4   DM460200
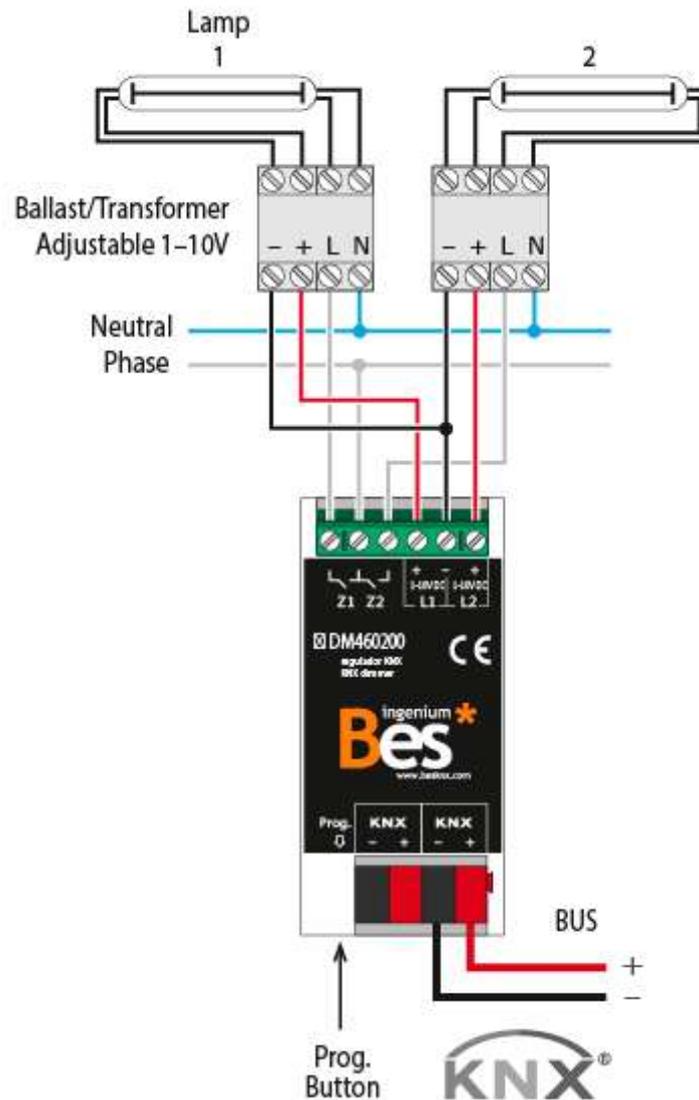
⚠️

Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference.

Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.

5.5   DM460300
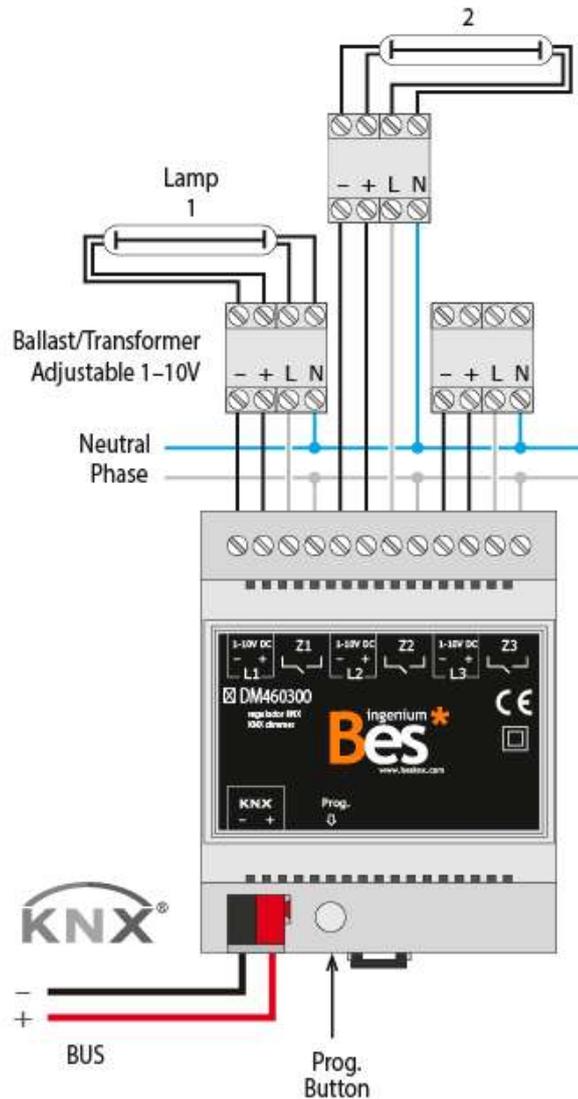
⚠️

Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference.

Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.
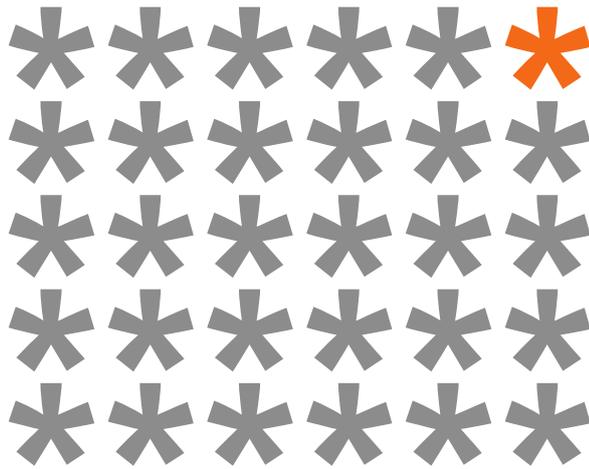
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