ASL100 Series of Two-in-one Sensor

Instructions V1.0

Acrel Electric Co., Ltd.

Catalog

1. Overview

ASL100-T2/BM two-in-one sensor (hereinafter referred to as sensor) is the illumination and human body movement two-in-one sensor based on Acrel-bus intelligent control system. The module is developed by Acrel and conforms to the rules of the enterprise standard Q31/0114000129C032-2017 *ASL100 Intelligent Lighting Control System*. European KNX communication bus is adopted and illumination is acquired in real time. When the illumination is more than and (or) less than the threshold of the parameter setting, the sensor will send the corresponding command according to the parameter setting. After the human body movement sensor detects the human activity, the sensor will send the corresponding control signal according to the parameter setting. In the intelligent control system, other control modules will match the sensor to achieve the intelligent control of illumination, fan and air conditioner. The module uses the latest single-chip microcomputer technology and is highly stable and reliable.

2. Specification and model

ASL100—T 2/BM

传感器类型：B代表光照度传感器
　　　　　　 M代表移动传感器
传感器种类数：2表示二合一传感器
模块类型：T代表传感器模块
企业代号：安科瑞电气股份有限公司
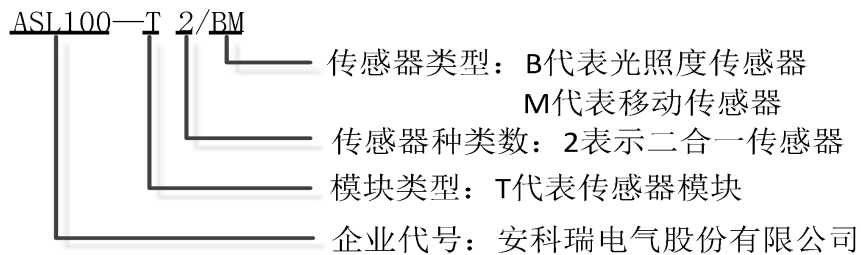
| 企业代号：安科瑞电气股份有限公司	Enterprise code: Acrel Electric Co., Ltd.
模块类型：T 代表传感器模块	Module type: T refers to sensor module
传感器种类数：2 代表二合一传感器	Sensor type number: 2 refers to two-in-one sensor
传感器类型	Sensor type
B 代表光照度传感器	B refers to illumination sensor
M 代表移动传感器	M refers to movement sensor

3. Technical parameters

Power supply feature	KNX bus feeder	DC21～30V
	Power supply current	<12mA
	Power consumption	<360mW
External connection	KNX-TP1	Use twisted-pair cable conforming to KNX standard
	Wiring terminal at load end	Terminating with 0.5nm～0.6nm torque
Operation and display interface	Programming key and relevant indicator	LED indicator is in red when waiting for programming and is in green during and after programming.
Temperature range	Operating temperature	-5℃～+45℃
	Storage temperature	-25℃～+55℃
	Transport temperature	-30℃～+70℃
Environmental requirements	Maximum air humidity	95%
Mechanical parameters	Dimension (mm)	36x90x62
Installation	Embedded installation	

4. Configuration
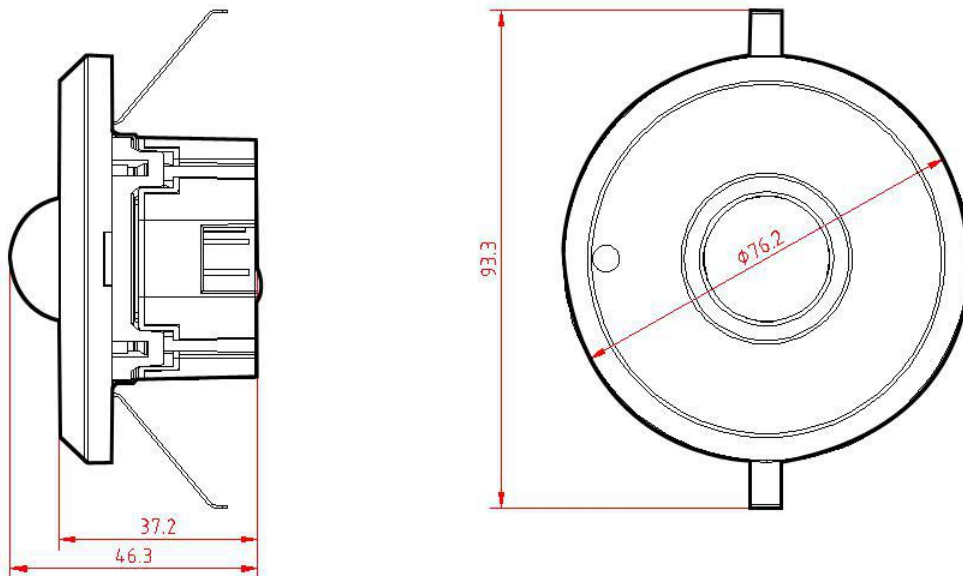
Installation notes: the product is easy to install and is embedded. The installation hole size of the sensor is ψ58mm. During installation, the product is fixed by the leaf springs on both sides. KNX bus is connected by the bus terminal and other modules.

5.Electric wiring diagram
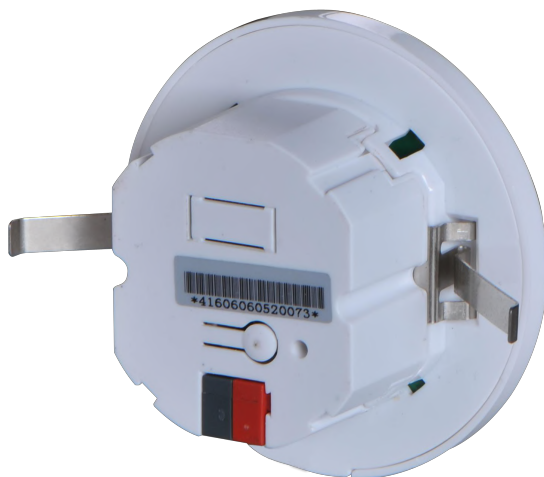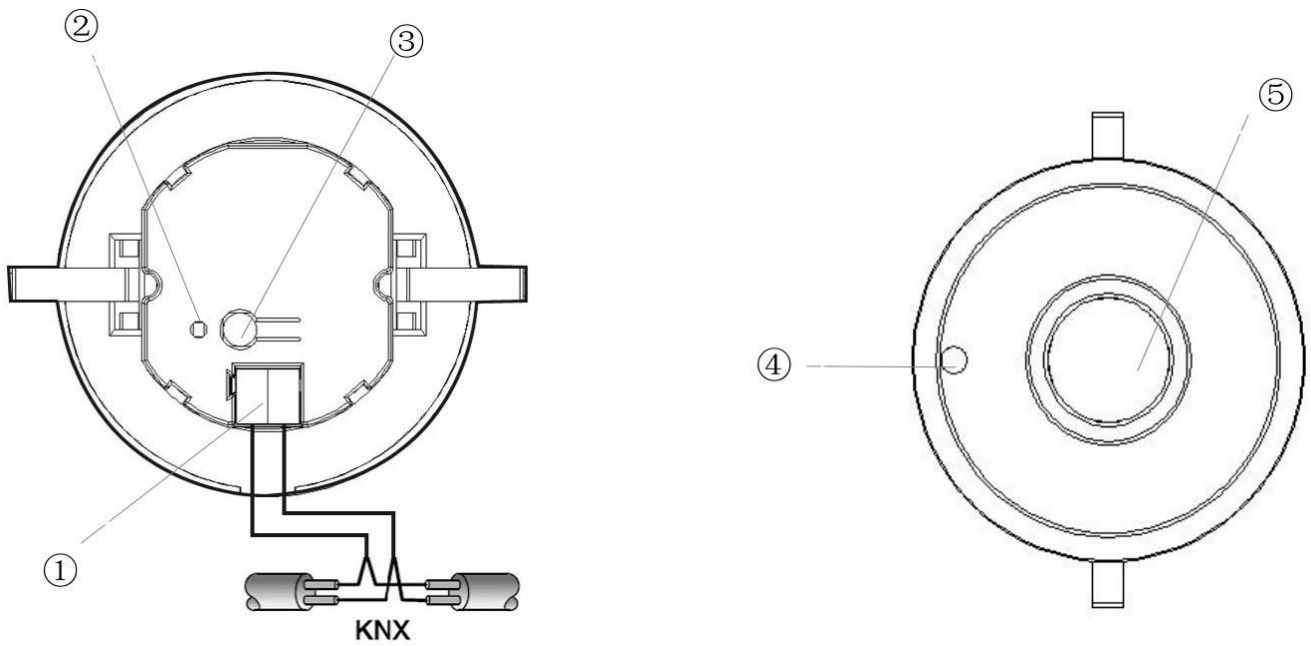
① KNX bus terminal

② Running and programming indicator

③ Programming key

④ Illumination sensor

⑤ Human body movement sensor

6. Application guide

     Two--in-one sensor includes illumination and human body movement. The sensor is connected into the system by KNX bus terminal without additional power supply. VD3.VD4 file is imported into ETS for sensor functional setting. The corresponding threshold and control command are set in the parameter window according to the actual need.

The functions of two-in-one sensor are shown below:

➢ Human body movement detection

➢ Illumination detection

➢ Three types of data output

➢ Illumination threshold setting

➢ Logic calculating function under conditions of illumination, movement and input, etc.

➢ Human body movement detection with 10 (1~10) levels of sensitivity

The illumination and human body movement two-in-one sensor module is generally used for entrances of aisle, garage and public place. When a human body moves, the light on the aisle is turned on, the relevant area light in the garage is turned on and the area lights in the public places are turned on. After the human body leaves, the lights in the relevant areas are turned off. The light is automatically controlled and lights in some areas are not turned on for a long time to avoid electrical energy waste. With the illumination and logic use, when the illumination is high in some areas and if there is the human movement, the light is not turned on to achieve energy saving and automation.

6.1 Product features

When detecting the human movement and (or) illumination is more or less than the threshold, the illumination and human movement two-in-one sensor has three formats of message control commands. The illumination and human body movement two-in-one sensor can control the on and off of the light, shutter and diming light with different settings. The sensor has 10 (1-10) levels of sensitivity for human body movement. There are different detection modes for different places. The logic function is to conduct the logic processing for the operation commands of illumination and human body movement to decide the driver action under two conditions.

6.2 Operating guide

6.2 Operating guide

1. Connect the module with the engineering network and connect the communication network with the computer attached with ETS by USB or IP gateway. Check whether the communication between the computer and network is normal.

2. Import VD3 file into ETS database and establish the relevant project. Add the dry contact module in the topological structure and set its physical address (the physical address cannot be repeated); later, open the parameter configuration page of the dry contact module and configure the corresponding parameters; finally, set the corresponding group address according to the actual needs.

3. Click the download options in ETS, press the programming button of the dry contact module, and then download the parameter configuration information to the module. Finally, finish the application programming.

6.3 Parameter description

The module parameter is to set all parameters related to human body movement and illumination. The intelligent control of other driving modules is realized by illumination threshold, human body movement and logic setting.

6.3.1   General

The parameters include the initialization time, sensor working mode, illumination, and human body movement and enabled functions of logic function. The specific parameters are shown below:
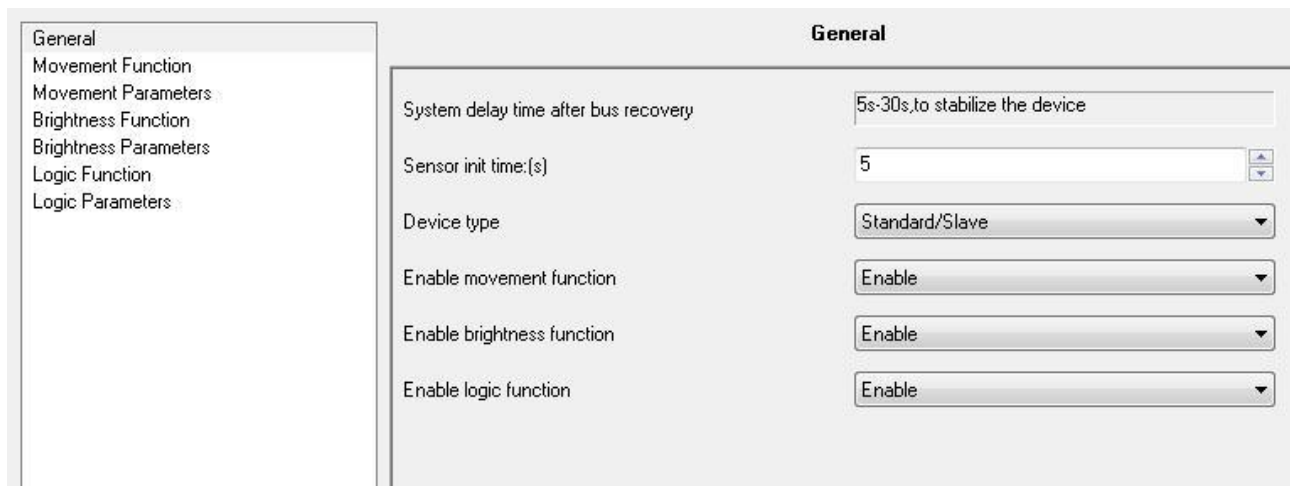
System delay time after bus recovery

Options: 5s~30s to stabilize the device

Sensor init time:[s]

Options: 5...30

Device type

Options: Standard/Slave

Master

Enable movement function

Options: Enable

Disable

Enable illumination function

Options: Enable

Disable

Enable logic function

Options: Enable

Disable

6.3.2 Movement Function

The movement detection function is set by the parameter, including trigger mode, sensitivity and delay time and so on. The specific parameters are shown below:

Movement delay retrigger

Options: Enable

Disable

Movement sensitivity

Options: 1...10

Movement sensitivity change via bus

Options: Enable

Disable

The parameter refers to the sensitivity changing the movement by the group object. If the parameter is selected as Enable, the corresponding group object is displayed in the group object. The sensitivity can be changed with ETS software. If Disable is selected, the sensitivity is the value set by the above parameter.

Movement delay time:[s]

Options: 1...65535

The parameter sets the time of keeping current state after detecting the human body movement. For example, the parameter is set as 20 and after the human movement is detected, the light is turned on and then turned off after 20s (the parameter retrigger is selected as Enable, if the human body moves; it is turned on all the time). If the human body still moves, the light is turned on immediately.

Movement tel. cyclically send time:[s]

Options: 1...65535

The parameter matches the first parameter in the movement function parameters. If the first parameter is set as Cyclically send, the parameter is the cycle time for sending message.

6.3.3Movement Parameters

The parameter block sets all parameters of movement detection, including value sending for all message types. The specific parameter window is shown below:
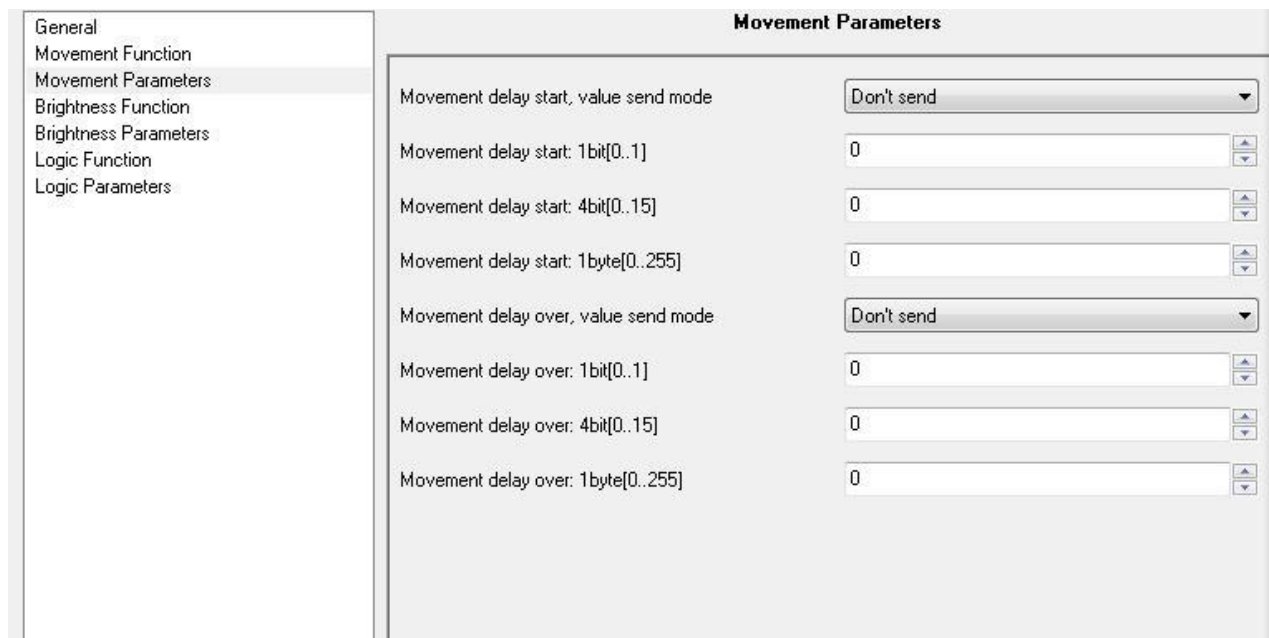
Movement delay start, value send mode

Options: Don't send

          Send only once

Cyclically send

The parameter sets the mode of sending message after human body movement. The cycle sending time is set in the previous parameter window. However, the time of cycle sending message shall be within the delay time. Thus, the time of cycle sending message shall be controlled within the delay time.

Movement delay start 1bit [0…1]

Options: 0…1

Movement delay start 4bit [0…15]

Options: 0…15

Movement delay start 1byte [0…255]

Options: 0…255

Movement delay over, value send mode

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode after the human body movement is finished. The cycle sending time is set in the previous parameter window. However, the time of cycle sending message shall be within the delay time. Thus, the time of cycle sending message shall be controlled within the delay time.

Movement delay over 1bit [0…1]

Options: 0…1

Movement delay over 4bit [0…15]

Options: 0…15

Movement delay over 1byte [0…255]

Options: 0…255

6.3.4 Illumination Function

The parameter sets the functions of illumination detection function, including illumination threshold, changing threshold by the group object, mode of acquiring current illumination. The specific parameters are shown below:

Brightness   threshold 1(low)

Options: 0…65535

Brightness   threshold 1(high)

Options: 0…65535

Brightness   threshold change via bus

Options: Enable

　　　　　Disable

Illumination   threshold   hysteresis

Options: Without hysteresis

　　　　　With hysteresis

Brightness   update mode

Options: Don't update

　　　　　Update only after read

　　　　　Update cyclically

Brightness   update time:[s]

Options: 1…65535　　　　　　　　　　　Cycle time set of illumination value (if Brightness   update

　　　　　　　　　　　　　　　　　　mode is selected as Update cyclically)

Brightness   tel. cyclically send time:[s]

Options: 1...65535   Cycle time set of illumination value (match Brightness Parameters

Page   value and mode selected as Cyclically send)

Threshold 1 value must bigger than hysteresis value

Options: < ---Attention

Threshold 2 value must bigger than threshold 1 value

Options: < ---Attention

Lux= "current illumination value"

Options: < ---Attention

Lower= "illumination threshold 1"

Options: < ---Attention

Upper= "illumination threshold 2"

Options: < ---Attention

The five above parameter splines are used to remind all threshold setting and related auxiliary notes and tips.

6.3.5 Brightness   Parameters

There are two options for the parameter block setting, including no delay and delay. All parameters of brightness detection are set in the page, including sending values for all message types. The specific parameters window without delay is shown below:
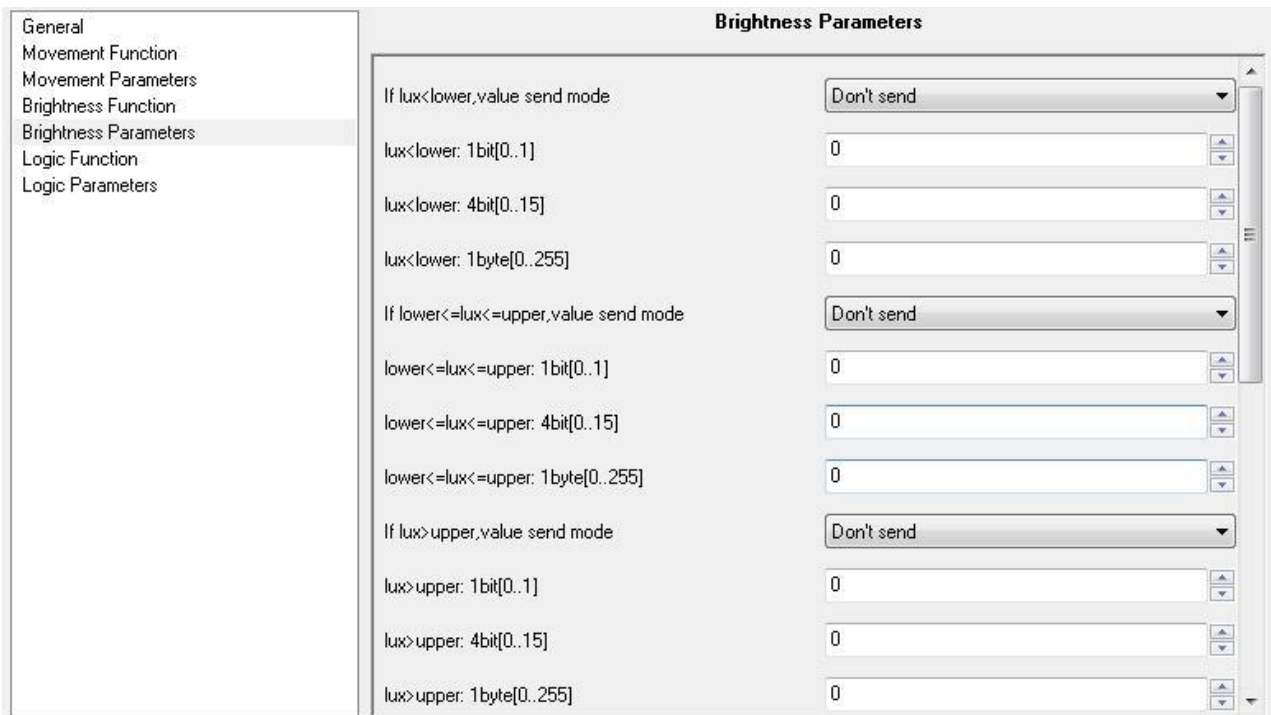
If lux<lower, value send mode

Options: Don't send

      Send only once

      Cyclically send

    The parameter sets the message sending mode after the brightness is detected to be less than the minimum threshold. The cycle sending time is set in the previous parameter window.

lux<lower：1bit [0…1]

Options: 0…1

lux<lower：4bit [0…15]

Options: 0…15

lux<lower：1byte [0…255]

Options: 0…255

If lower<=lux<=upper, value send mode

Options: Don't send

      Send only once

      Cyclically send

    The parameter sets the message sending mode after the brightness is detected to be within the set threshold. The cycle sending time is set in the previous parameter window.

lower<=lux<=upper：1bit [0…1]

Options: 0…1

lower<=lux<=upper：4bit [0…15]

Options: 0…15

lower<=lux<=upper：1byte [0…255]

Options: 0…255

If lux>upper, value send mode

Options: Don't send

      Send only once

      Cyclically send

    The parameter sets the message sending mode after the brightness is detected to be more than the maximum threshold. The cycle sending time is set in the previous parameter window.

lux>upper：1bit [0…1]

Options: 0…1

lux>upper：4bit [0…15]

Options: 0…15

lux>upper：1byte [0…255]

Options: 0…255

The following window is the parameter setting window with delay:

If lux<lower, value send mode

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode after the brightness is less than the minimum threshold. The cycle sending time is set in the previous parameter window.

lux<lower：1bit [0…1]

Options: 0…1

lux<lower：4bit [0…15]

Options: 0…15

lux<lower：1byte [0…255]

Options: 0…255

If lux>upper, value send mode

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode after the brightness is more than the maximum threshold. The cycle sending time is set in the previous parameter window.

lux>upper：1bit [0…1]

Options: 0…1

lux>upper：4bit [0…15]

Options: 0…15

lux>upper：1byte [0…255]

Options: 0…255

6.3.6Logic Function

The parameter block sets all parameters of logic function, including logic input enabled/disabled, logic function selection and time setting. The specific parameter window is shown below:
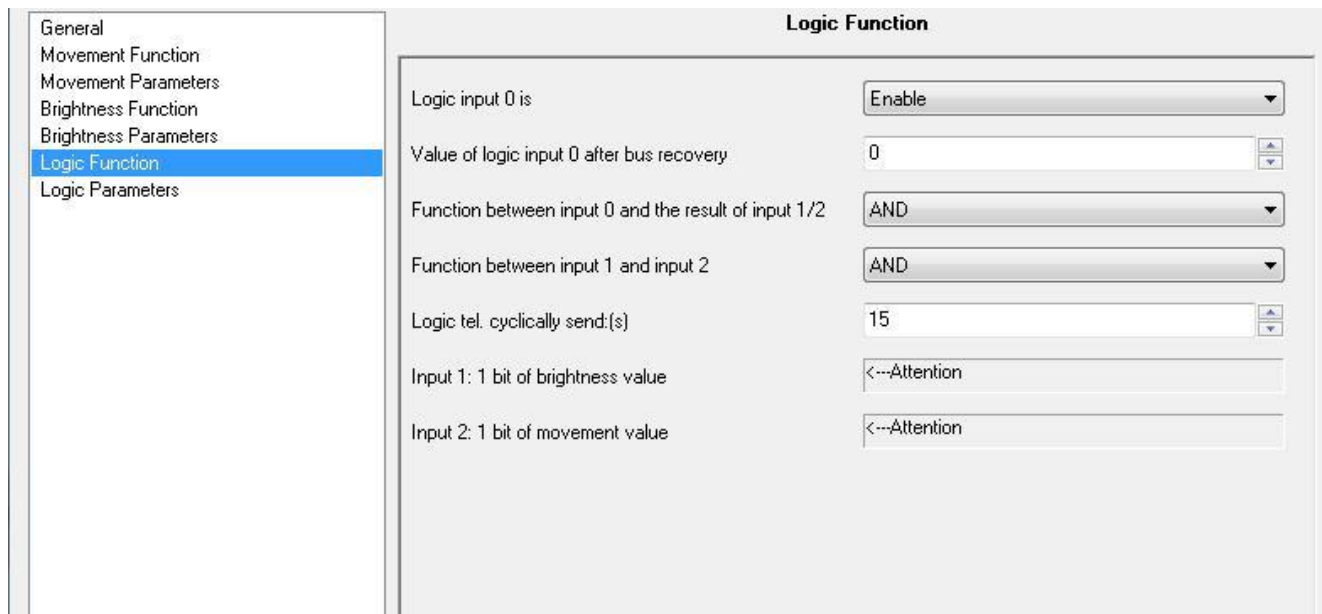
Logic input 0 is

Options: Enable

         Disable

Value of logic input 0 after bus recovery

Options: 0…1

Function between input 0 and the result of input 1/2

Options: AND

         OR

         XOR

Function between input 1 and input 2

Options: AND

OR

XOR

Logic tel. cyclically send：[s]

Options: 0…65535

Input 1：:1 bit of illumination value

Options: < --Attention

Input 2：:1 bit of movement value

Options: < --Attention

The parameter belongs to indicative parameter setting to prompt the functions of logics 1 and 2.

6.3.7   Logic Parameters

The parameter block sets all parameters of logic functions, including all sending value of all types of messages. The specific parameter window is shown below:
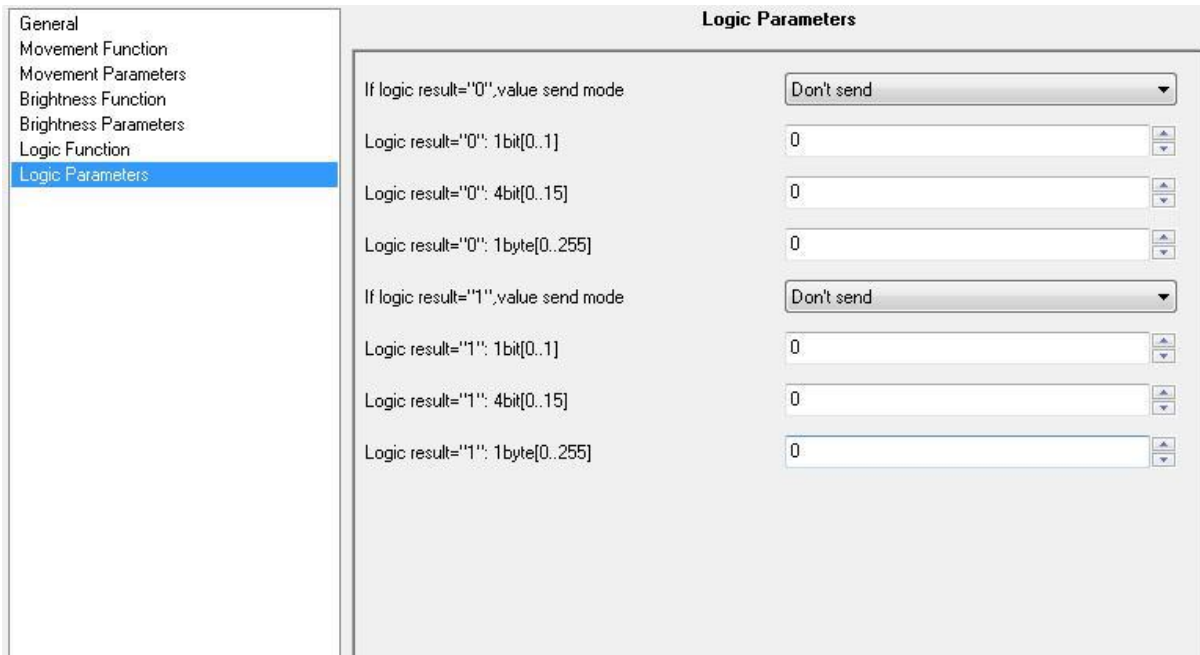
If logic result='0', value send mode

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode with 0 logic output. The cycle sending time is set in the previous parameter window.

Logic result='0', 1bit [0…1]

Options: 0…1

Logic result='0', 4bit [0…15]

Options: 0…15

Logic result='0', 1byte [0…255]

Options: 0…255

If logic result='1', value send mode

Options: Don't send

Send only once

Cyclically send

The parameter sets the message sending mode with 1 logic value. The cycle sending time is set in the previous parameter window.

Logic result='0', 1bit [0…1]

Options: 0…1

Logic result='0', 4bit [0…15]

Options: 0…15

Logic result='0', 1byte [0…255]

Options: 0…255

6.4 Description of communication object

The communication object is the communication medium between the module on the bus and other control modules. The operation is realized by the address setting of the communication object. The sensor is the illumination and human body movement two-in-one sensor. All communication objects include the illumination and movement functions. The details are shown below:

| | | 1 | Enable movement function | Enable movement function | 1比特 C - W - - 低级 |

No.	Function
1	Enable the movement detection function. The communication object is used to enable or disable the movement detection function.

■2 Enable brightness function　　Enable Brightness function　　1 比特　C - W - -　1 bit DPT_En... 低级

No.	Function
2	Enable brightness detection function. The communication object can enable or disable the brightness detection function.

■3 Enable logic function　　Enable logic function　　1 比特　C - W - -　低级

No.	Function
3	Enable logic function. The communication object can enable or disable the logic function.

■4 Slave value　　Slave value　　1 比特　C - W - -　低级

No.	Function
4	The group object is used to receive the value sent from the sensor. If the value is the value designed by parameter "Master delay start when", the main sensor sends the value and begins the delay. If it is not the designed value, the main sensor ignores it.

■5 Master send 1 bit[0..1]　　Master send 1 bit　　1 比特　C - - T -　1 bit DPT_Sw... 低级

No.	Function
5	When the main sensor receives the designed value or delay completion from the sensor, the main sensor sends 1bit message.

■6 Master send 4 bit[0..15]　　Master send 4 bit　　4 比特　C - - T -　3 bit controll... 低级

No.	Function
6	When the main sensor receives the designed value or delay completion from the sensor, the main sensor sends 4bit message.

■7 Master send 1 byte[0..255]　　Master send 1 byte　　1 字节　C - - T -　8 bit unsign... 低级

No.	Function
7	When the main sensor receives the designed value or delay completion from the sensor, the main sensor sends 1byte message.

■8 Movement send 1 bit[0..1]　　Movement send 1 bit　　1 比特　C - - T -　1 bit DPT_Sw... 低级

No.	Function
8	The sensor detects the object movement sending 1bit message.

■9 Movement send 4 bit[0..15]　　Movement send 4 bit　　4 比特　C - - T -　3 bit controll... 低级

No.	Function
9	The sensor detects the object movement sending 4bit message.

☐☑10 Movement send 1 byte[0..255]   Movement send 1 byte   1 字节   C － － T －   8 bit unsign...   低级

No.	Function
10	The sensor detects the object movement sending 1byte message.

☐☑11 Brightness send 1 bit[0..1]   Brightness send 1 bit   1 比特   C － － T －   1 bit DPT_Sw...   低级

No.	Function
11	The sensor detects the brightness sending 1bit message.

☐☑12 Brightness send 4 bit[0..15]   Brightness send 4 bit   4 比特   C － － T －   3 bit controll...   低级

No.	Function
12	The sensor detects the brightness sending 4bit message.

☐☑13 Brightness send 1 byte[0..255]   Brightness send 1 byte   1 字节   C － － T －   8 bit unsign...   低级

No.	Function
13	The sensor detects the brightness sending 1byte message.

☐☑14 Change brightness threshold 1   Change lower threshold   2 字节   C － W － －   低级

No.	Function
14	The group object is to change the brightness threshold 1.

☐☑15 Change brightness threshold 2   Change upper threshold   2 字节   C － W － －   低级

No.	Function
15	The group object is to change the brightness threshold 2.

☐☑16 Read lux value   Read lux value   2 字节   C R － T －   低级

No.	Function
16	The group object is used to read the current brightness.

☐☑17 Cyclically send lux value   Cyclically send lux value   2 字节   C － － T －   低级

17	The group object is used to cyclically send current brightness value.

☐☑18 Logic input 0 value   Logic input 0 value   1 比特   C － W － －   低级

No.	Function
18	The group object is used for logic input.

☐☑19 Logic send 1 bit[0..1]   Logic send 1 bit   1 比特   C － － T －   1 bit DPT_Sw...   低级

No.	Function

No.	Function
19	The group object is used to logically output 1bit data.

☐☑20 Logic send 4 bit[0..15]	Logic send 4 bit	4 比特 C - - T - 3 bit controll... 低级

No.	Function
20	The group object is used to logically output 4bit data.

☐☑21 Logic send 1 byte[0..255]	Logic send 1 byte	1 字节 C - - T - 8 bit unsign... 低级

No.	Function
21	The group object is used to logically output 1byte data.

☐☑22 Movement sensitivity change	Movement sensitivity change	1 字节 C - W - - 低级

No.	Function
22	The group object is used to change the sensitivity of movement detection.

7. **Notes**

1．**Check whether its appearance is damaged before using the module. In case of damage, please ask the retailer to replace it to prevent electric leakage during use and avoid personal injury.**

2．**Install the module with the power failure. If the module cannot be replaced with the power failure, please ask the professional personnel to conduct the operation according to the situation.**

3．**Connect the module with the bus before debugging. Check whether its running indicator is normal. Operate the programming button and check whether the programming indicator works normally. If the indicator works abnormally, please contact the relevant staffs. Operate the programming button and observe whether the programming indicator works normally.**

4．**Confirm whether the bus and computer are connected correctly before downloading the parameter.**

5．Select the standard EIB twisted-pair cable as the communication cable and use the standard KNX wiring terminal.