



M/US05.1

KNX Mini Ultrasonic Sensor

User Manual

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Published on Dec. 4th, 2020

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Update History

The form below contains the information of every update. The latest version contains all the updates of all former versions.

No.	Version	Update Information	Date
1	V1.0.0	Initial release	Dec 4th, 2020

1 Introduction

KNX Mini Ultrasonic Sensor (See Figure 1) contains four independent logic blocks and one combined logic block. The logic inputs include ultrasonic sensor status, brightness value, temperature and external telegrams. Depending on the user's needs, the sensor can be set to either master-slave mode or single mode, etc.

This manual offers the information on installation steps, connection and configuration of KNX Mini Ultrasonic Sensor on ETS5.

Note: the pictures in the manual are for reference, the actual pictures should prevail.



Figure 1. Mini Ultrasonic Sensor

1.1 Features

KNX Mini Ultrasonic Sensor main features include:

- (1) With 2CH lighting control, 4 sections of brightness and delay time can be set in dimming output. With gradually dimming effect, the sensor supports automatic or semi-automatic mode. Telegram locking/unlocking and delay time can be set.
- (2) With 2CH constant brightness control, dimming values and forced operation can be set.
- (3) The sensor has 5 logic blocks and each block contains 10 object outputs. Telegram locking/unlocking and delay time can be set.
- (4) Control types: Switch control, Absolute dimming control, Shutter control, Alarm control, Percentage control, Sequence control, Scene control, String (14 bytes) control, Threshold control, Logic combination control.
- (5) Logic inputs: Ultrasonic sensing status, brightness value, temperature and external telegrams.
- (6) 2 logical relations: AND, OR.
- (7) 2 working modes: Single mode and master / slave mode.
- (8) The logic validity can be set by external telegram so as to ensure that end users can reset

the logics.

1.2 Important Notes

- (1) Installation - This device should be mounted at the ceiling at a recommended height of 2-3m from the floor.
- (2) Programming - The device is compliant with the KNX standard and the parameters are set by the Engineering Tool Software (ETS).
- (3) The KNX bus voltage is 21-30V DC.

1.3 Product Information

(1) Dimensions - See Figure 2 – 4

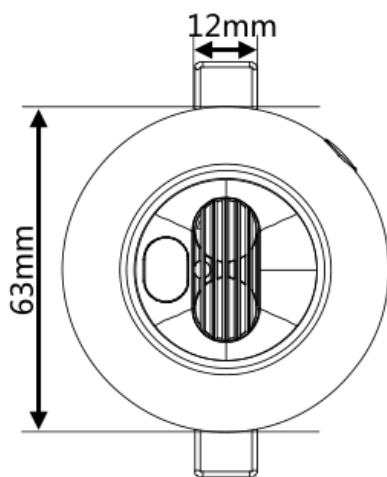


Figure 2. Dimensions - Front View

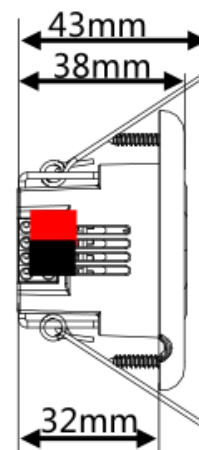


Figure 3. Dimensions - Side View

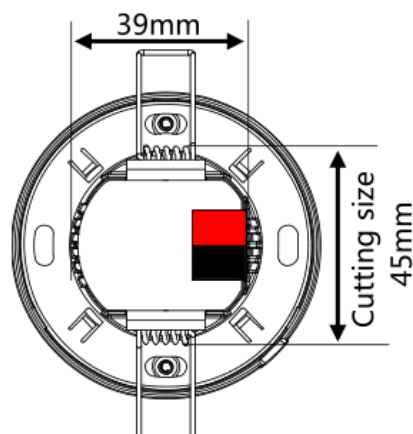


Figure 4. Dimensions - Back View

(2) Components – See Figure 5 – 6

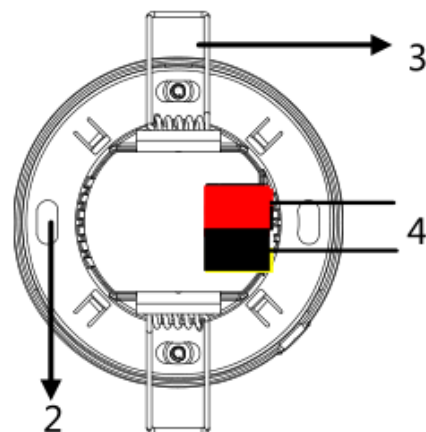
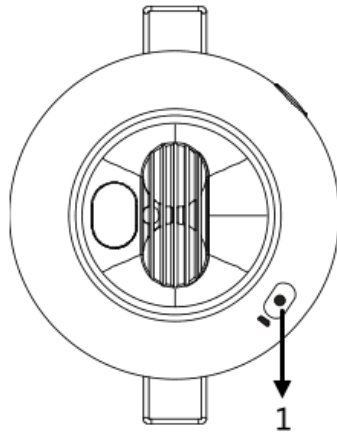
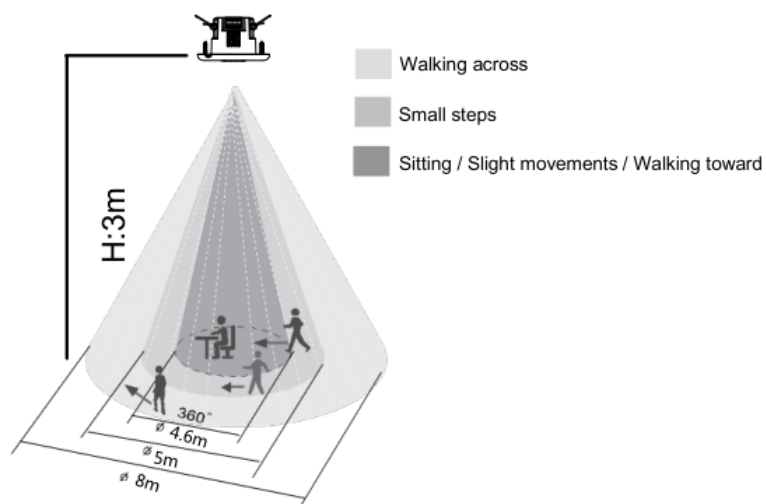


Figure 5. Components - Interior View Figure 6. Components - Back View

1. Programming button & programming LED
2. Screw hole
3. Spring clips
4. KNX/EIB bus connector

(3) Detection Range - - See Figure 7



Detection Range (At 25°C)

Mounting height	Sitting / Slight movements / Walking towards	Small steps	Walking across
3m	4.6m	5m	8m

Figure 7. Detection Range

(4) Ceiling – mounted - See Figure 8 – 10

Step 1. When installing the sensor in the thin ceiling, produce an opening of diameter 45mm in the ceiling.

Step 2. Fix the sensor into position with the assistance of the spring clips after wiring.

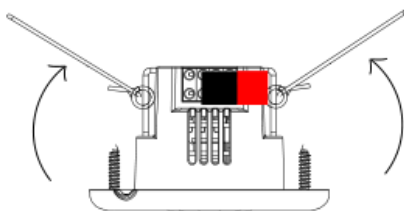


Figure 8

⇓ 1

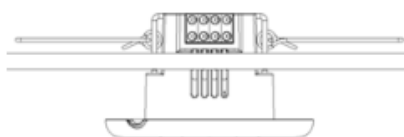


Figure 9

⇓ 2

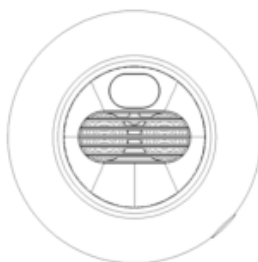


Figure 10

(5) Flush - mounted - See Figure 11 – 14

Step 1. When installing the sensor in the thick wall, produce an opening of diameter 45mm and depth of 35mm in the wall.

Step 2. Remove the spring clips and pry apart the cover and the sensor.

Step 3. Fix the sensor in the wall with screws.

Step 4. Attach the cover to the sensor.

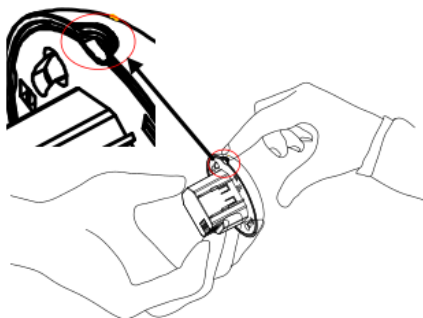


Figure 11

⇓1

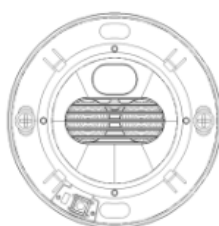


Figure 12

⇓2

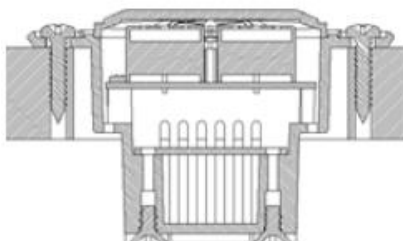


Figure 13

⇓3

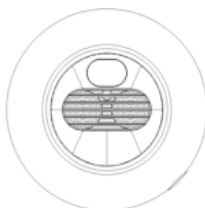


Figure 14

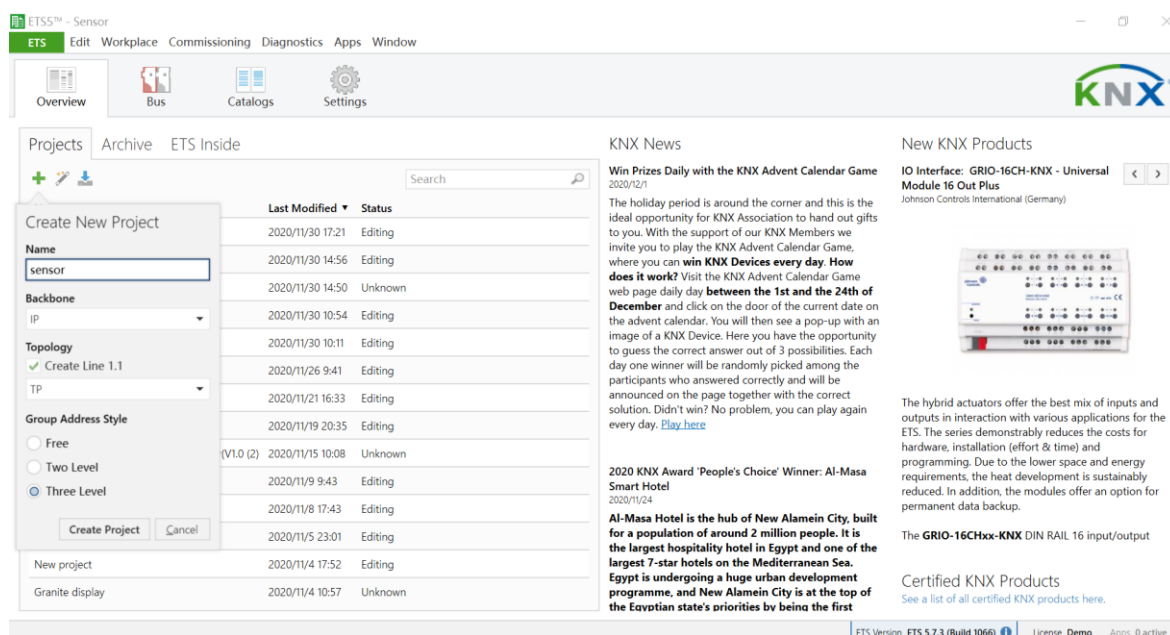
Figure 11 - 14. Installation – Flush-mounted

2 Configuration on ETS5

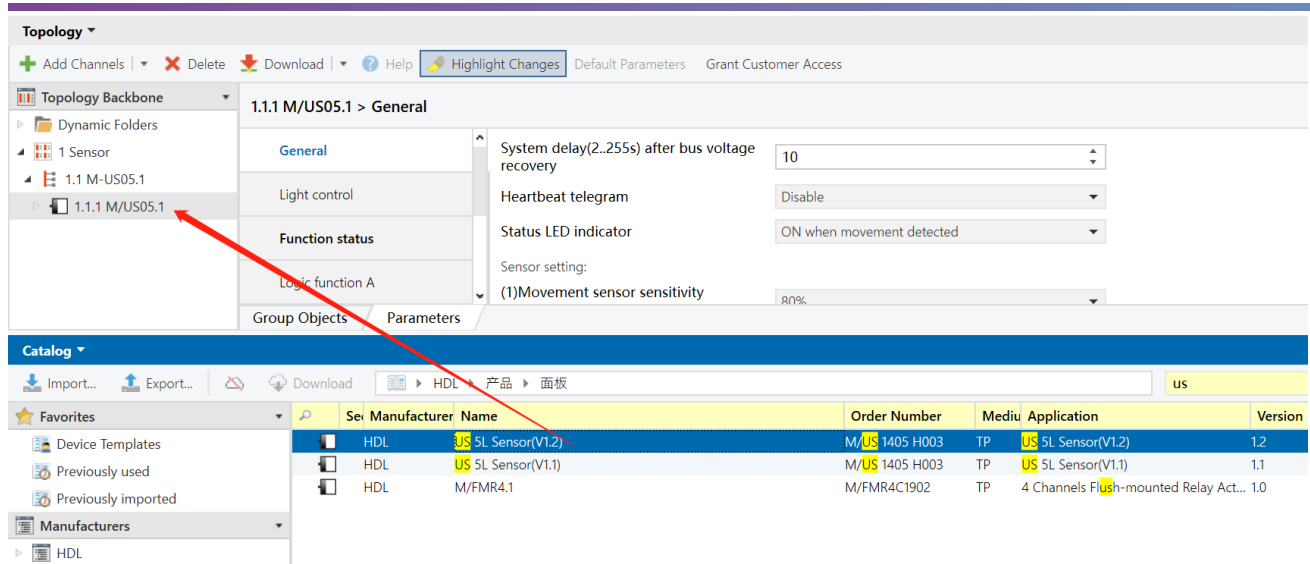
2.1 Import Devices

Add device/database before program it.

1. Create project in ETS5, if you have project, ignore it. Select three level group address style when create project.



2. Refer to the device version from the label, select Catalog, drag the database to current Line. According to the label of sensor, you can ask HDL technical support for corresponding database.



2.2 General

This document mainly describes 1.2 version M/US05.1 KNX Mini Ultrasonic sensor.

- (1) System delay (2...255s) after bus voltage recovery: time-delay function, namely a delay time between powering on the device and activating the system, which ranges from 2 to 255 s. The default value is 10 s.
- (2) Heartbeat telegram: It is used to check whether the communication between device and system is normal.
 - Disable: disable heartbeat telegram function.
 - Send value "0" cyclically: devices will send "0" on the KNX bus at a set time interval.
 - Send value "1" cyclically: devices will send "1" on the KNX bus at a set time interval.
 - Send value "1/0" inverted cyclically: devices will send "0" and "1" alternately on the KNX bus at a set time interval.

- (3) Status LED indicator:

Set the LED indicator's status, for normal use ON when movement detected.

1.1.1 M/US05.1 > General

General	System delay(2...255s) after bus voltage recovery	10
Light control	Heartbeat telegram	Disable
Function status	Status LED indicator	ON when movement detected
Logic function A	Sensor setting:	Always is OFF
Logic function B	(1) Movement sensor sensitivity (1%-100%)	ON when movement detected ✓
Logic function C	-> Movement sensor sensitivity via object	ON when received '1', else OFF
Logic function D	(2) Brightness quiver (5...30%)	ON when received '0', else OFF
Logic function E	-> Lux compensation	ON when logic A is lock, else OFF
	(3) Temperature hysteresis (0.1°C)	ON when logic A is unlock, else OFF
	-> Temperature compensation (0.1°C)	ON when logic B is lock, else OFF
	Constant brightness:	ON when logic B is unlock, else OFF
	Constant brightness function A	ON when logic C is lock, else OFF
		ON when logic C is unlock, else OFF
		ON when logic D is lock, else OFF
		ON when logic D is unlock, else OFF
		=====
		<input checked="" type="radio"/> Disable <input type="radio"/> Enable

If select anyone except 'Always is OFF', there has 'Led indicator (Enable/Disable)' function.

We can use this Group Address to enable or disable the Led indicator.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 external input	External telegram			1 bit	C	-	W	T	-	switch	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low
15	General	Led indicator status			1 bit	C	R	W	T	-	switch	Low

'ON when received '1', else OFF', means if received 'Led indicator (Enable/Disable),1', then turn ON the Led indicator.

'ON when received '0', else OFF', means if received 'Led indicator (Enable/Disable),0', then turn ON the Led indicator.

2.1.1 Sensor Settings

(1) Movement sensor sensitivity (1%-100%): use 80% by default.

(2) Movement sensor sensitivity via object:

If enable, we can modify sensor sensitivity via Group Address.

Sensor setting:

(1) Movement sensor sensitivity
(1%-100%)

80%

-> Movement sensor sensitivity via object ☐ Disable ☒ Enable

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
9	General	Movement sensor sensitivity			1 byte	C	-	W	T	-	percentage (0..100%)	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 external input	External telegram			1 bit	C	-	W	T	-	switch	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low

(3) Brightness quiver (5...30%)

This threshold affects the actual effective range. Take an example as below.

The Brightness quiver is used for brightness in logic.

If $n = 5\%$, $\text{Threshold}_1 \leq \text{Threshold}_2$, $\text{Threshold}_1 = 100 \text{ Lux}$ and $\text{Threshold}_2 = 300 \text{ Lux}$, actual effective range will be 95~315 Lux.

$$\text{Threshold}_1 * (1 - 5\%) = 100 * (1 - 5\%) = 95 \text{ Lux}$$

$$\text{Threshold}_2 * (1 + 5\%) = 300 * (1 + 5\%) = 315 \text{ Lux}$$

Logic function A

Block A

A1: Switching

Logic function B

(2) Enable brightness(Lux) sensor

☐ Disable ☒ Enable

Enable brightness(Lux) threshold A

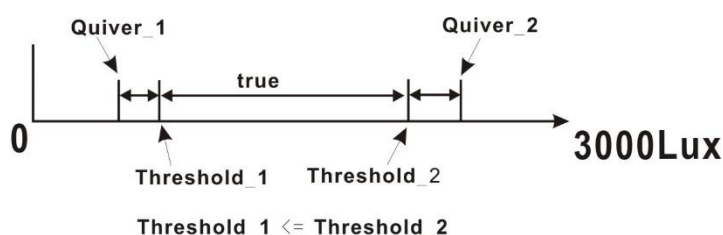
☐ Disable ☒ Enable

-> Lux >= Threshold lower(0 ~ 1200 lux)

100

-> Lux <= Threshold upper(0 ~ 1200 lux)

300



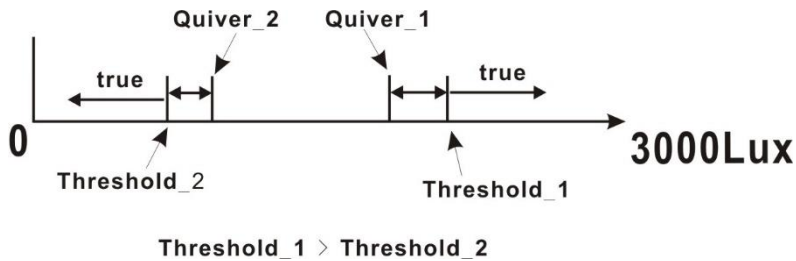
If $n = 5\%$, $\text{Threshold}_1 > \text{Threshold}_2$, $\text{Threshold}_1 = 300 \text{ Lux}$ and $\text{Threshold}_2 = 100 \text{ Lux}$, actual effective range will be 105 ~ 285 Lux.

$$\text{Quiver}_1 = \text{Threshold}_1 * (1 - 5\%) = 300 * (1 - 5\%) = 285 \text{ Lux}$$

$$\text{Quiver}_2 = \text{Threshold}_2 * (1 + 5\%) = 100 * (1 + 5\%) = 105 \text{ Lux}$$

Logic function A

Block A	(2)Enable brightness(Lux) sensor	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
A1: Switching	Enable brightness(Lux) threshold A	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Logic function B	->Lux >= Threshold lower(0 ~ 1200 lux)	300
	->Lux <= Threshold upper(0 ~ 1200 lux)	100



(4) Lux compensation: If actual Lux value is not correct, you can use this to adjust the Lux value.

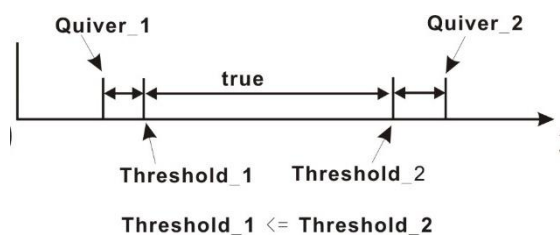
(5) Temperature hysteresis (0.1°C): The hysteresis for Logic Temperature input.

1.1.1 M/US05.1 > General		
General	System delay(2..255s) after bus voltage recovery	10
Light control	Heartbeat telegram	Disable
Function status	Status LED indicator	ON when movement detected
Logic function A	Sensor setting:	
Block A	(1)Movement sensor sensitivity (1%-100%)	80%
A1: Switching	->Movement sensor sensitivity via object	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function B	(2)Brightness quiver (5..30%)	5%
Logic function C	->Lux compensation	0
Logic function D	(3)Temperature hysteresis (0.1°C)	10
Logic function E	->Temperature compensation (0.1°C)	0
	Constant brightness:	=====
	Constant brightness function A	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

If hysteresis is 10, $\text{Threshold}_1 \leq \text{Threshold}_2$, $\text{Threshold}_1 = 20^\circ\text{C}$ and $\text{Threshold}_2 = 30^\circ\text{C}$. Then effective value is 19~31°C.

$\text{Threshold}_1 - 1^\circ\text{C} = 19^\circ\text{C}$

$\text{Threshold}_2 + 1^\circ\text{C} = 31^\circ\text{C}$



1.1.1 M/US05.1 > Logic function A

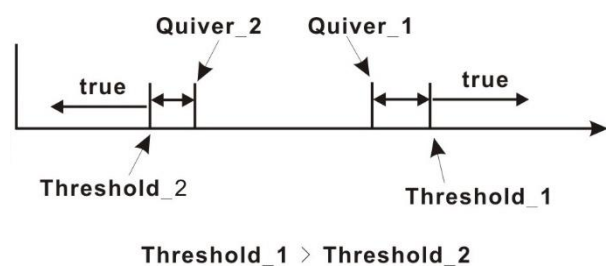
General	Use logical block A <input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	
Function status	(1)Enable Movement sensor Single mode(independent sensor)
	->Movement sensor status <input type="radio"/> Movement sensor detected is False,else is... <input checked="" type="radio"/> Movement sensor detected is True,else is F...
Logic function A	(2)Enable brightness(Lux) sensor <input checked="" type="radio"/> Disable <input type="radio"/> Enable
Block A	(3)Enable temperature sensor <input type="radio"/> Disable <input checked="" type="radio"/> Enable
A1: Switching	->Temperature >= Threshold lower (0.1°C) 20
Logic function B	->Temperature <= Threshold upper (0.1°C) 30

If hysteresis is 10, Threshold_1 > Threshold_2, Threshold_1 = 30°C and Threshold_2 = 20°C.

Then effective value is <21°C or <29°C.

Threshold_1 – 1C= 29°C

Threshold_2 + 1C= 21°C



(3)Enable temperature sensor	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
->Temperature >= Threshold lower (0.1°C)	30
->Temperature <= Threshold upper (0.1°C)	20

-> Temperature compensation (0.1°C): If temperature value is not correct, you can use this to adjust the temperature value.

2.1.2 Constant Brightness

(1) Constant brightness: Keep the range detected by the sensor at a constant value.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 external input	External telegram			1 bit	C	-	W	T	-	switch	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low
242	Constant brightness A	Dimming output value(0%..100%)			1 byte	C	R	-	T	-	percentage (0..100%)	Low

Trigger condition: Detection and Brightness are as logic input condition. When sensor detects movement and brightness lower than the preset value, then turn on the light (100%), and then the light will be dimming to preset value by auto. If no movement after delay time, the Constant Brightness function will stop.

You can enable the Constant Brightness function A/B in General setting.

1.1.1 M/US05.1 > Constant brightness A

General	Lux value from <input checked="" type="radio"/> Local lux sensor <input type="radio"/> External lux telegram -> Constant brightness value(0~1200 lux) <input type="text" value="100"/> Change constant brightness value via bus <input checked="" type="radio"/> Disable <input type="radio"/> Enable Lux quiver(n%): constant brightness lux* ((1-n%) and (1+n%)) <input type="text" value="10%"/> Output setting: Minimum dimming time interval limit (0.1~5.0 s) <input type="text" value="1.0 s"/> Minimum dimming step value limit (1~10%) <input type="text" value="1%"/> Maximum dimming step value limit (1~10%) <input type="text" value="5%"/> Minimum dimming value limit <input type="text" value="0%"/> Maximum dimming value limit <input type="text" value="100%"/> First dimming value of constant brightness after power on <input type="text" value="80%"/> Operational setting: Constant brightness control after power on <input type="text" value="Start"/>
Light control	
Function status	
Constant brightness A	
Logic function A	
Logic function B	
Logic function C	
Logic function D	
Logic function E	

Group Objects / Parameters

- Lux value can get from local lux sensor or external lux sensor.

+ Add Channels - Delete Download Info Reset Unload Print												
Search												
Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Priority
Dynamic Folders	0	General	Heartbeat telegram			1 bit	C	-	-	T	-	Low
1 Sensor	30	Object output A1	Switching			1 bit	C	R	-	T	-	Low
1.1 M-US05.1	211	Constant brightness A	Dimming output value(0%..100%)			1 byte	C	R	-	T	-	Low
1.1.1 M/US05.1	212	Constant brightness A	External Lux telegram(0~2000)			2 bytes	C	R	W	T	U	Low

- Constant brightness value range is 0~1200 lux and it use 100 lux by default. It can be changed by Bus if change constant brightness value via bus option is enabled.

Change constant brightness value via bus ☐ Disable ☒ Enable

0	General	Heartbeat telegram	1 bit	C	-	-	T	-	enable	Low
30	Object output A1	Switching	1 bit	C	R	-	T	-	switch	Low
211	Constant brightness A	Dimming output value(0%..100%)	1 byte	C	R	-	T	-	percentage (0..100%)	Low
213	Constant brightness A	Constant bri.. Lux (0~2000)	2 bytes	C	R	W	T	U	lux (Lux)	Low

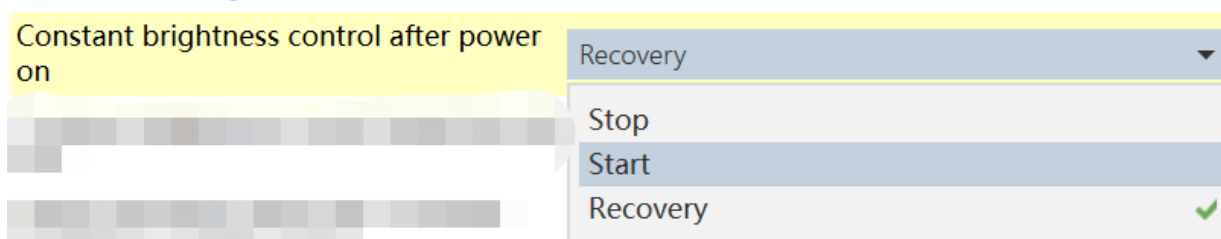
(2) Output setting

- Minimum dimming time interval limit range is from 0.1s to 5.0s.
- Minimum dimming step value limit range is from 1 to 10%.
- Maximum dimming step value limit range is from 1 to 10%.
- Minimum dimming value limit range is from 0% to 100%.
- Maximum dimming value limit range is from 0% to 100%.
- First dimming value of constant brightness after power on: After the power recovery, sensor will restore to the selected dimming value. Dimming value can be 0% ~ 100% and last dimming value. It uses 80% dimming value by default.

(3) Operational setting

- Constant brightness control after power on: After the power recovery, whether the constant brightness control function is enabled or disabled. Recovery means restore to the status before power failure after re-power on.

Operational setting:



- Constant brightness control start/stop via bus: Enable or disable the constant brightness control from the bus.

Constant brightness control start/stop via bus



Disable

Disable

Enable('1'-Start/'0'-Stop)

Enable('1'-Stop/'0'-Start)

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
30	Object output A1	Switching			1 bit	C	R	-	T	-	switch	Low
211	Constant brightness A	Dimming output value(0%..100%)			1 byte	C	R	-	T	-	percentage (0..100%)	Low
213	Constant brightness A	Constant bri.. Lux (0~2000)			2 bytes	C	R	W	T	U	lux (Lux)	Low
210	Constant brightness A	'1'-Start/'0'-Stop			1 bit	C	R	W	T	U	start/stop	Low

(4) Output dimming value after constant brightness control stopped: Whether directly output a specific dimming value after stop constant brightness control.

(5) Forced operation

Activate an operation after the power recovery. Usually it is used to output a different dimming value than constant brightness. When the force is stopped, return to constant brightness output.

Forced operation



Disable



Enable

1.1.1 M/US05.1 > A: Forced operation

General

The forced operation status after power on

To forced operation A1

Constant brightness A

Forced operation A1



Disable



Enable

A: Forced operation

->Forced operation start/stop(stop:back to constant brightness output)

'1'-Start,'0'-Stop

Function status

->Forced operation dimming value

0%

Logic function A

->Change forced dimming value via bus



Disable



Enable

Block A

Forced operation A2



Disable



Enable

(6) Trigger

Trigger



Disable



Enable

1.1.1 M/US05.1 > A: Trigger

General	Constant brightness object trigger 1 <input type="radio"/> Disable <input checked="" type="radio"/> Enable
Constant brightness A	Object value '0' trigger <input type="radio"/> Disable <input checked="" type="radio"/> Enable
A: Trigger	->Constant brightness value <input checked="" type="radio"/> To new lux <input type="radio"/> To the lux before triggered
Function status	->>New lux(0~2000 lux) <input type="text" value="0"/>
Logic function A	Object value '1' trigger <input type="radio"/> Disable <input checked="" type="radio"/> Enable
Block A	->Constant brightness value <input checked="" type="radio"/> To new lux <input type="radio"/> To the lux before triggered
A1: Switching	->>New lux(0~2000 lux) <input type="text" value="40"/>
Logic function B	Constant brightness object trigger 2 <input checked="" type="radio"/> Disable <input type="radio"/> Enable
	Constant brightness object trigger 3 <input checked="" type="radio"/> Disable <input type="radio"/> Enable

- To new lux: if to change current constant brightness value to new one, enable trigger function, send value "0" or "1" to number 222 group address.
- To the lux before triggered: if to switch back to current constant brightness value, select this option.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
30	Object output A1	Switching			1 bit	C	R	-	T	-	switch	Low
211	Constant brightness A	Dimming output value(0%..100%)			1 byte	C	R	-	T	-	percentage (0..100%)	Low
222	Constant brightness A Trigger 1	'1'/'0'-trigger			1 bit	C	R	W	T	-		Low

2.1.3 $PI:u(k)=K_p(\text{Proportional coefficient})[e(k)-e(k-1)]+K_i(\text{integration time})e(k)$

Dimming speed (for PI): Select the suitable dimming speed for constant brightness function.

$PI:u(k)=K_p(\text{Proportional coefficient})[e(k)-e(k-1)]$
 Dimming speed (for PI)

Defined
 Lowest(Ki=1%,Kp=1%)
 Lower(Ki=5%,Kp=5%)
 Low(Ki=10%,Kp=10%)
 Middle(Ki=15%,Kp=15%) ✓
 Fast(Ki=30%,Kp=30%)
 Faster(Ki=60%,Kp=60%)
 Fastest(Ki=100%,Kp=100%)

Middle(Ki=15%,Kp=15%) ▼

2.3 Light Control

Lighting control function. If just use PIR or PIR + brightness to control the light, you can set the parameter in Light Control1 or Light Control2. Take Light Control1 as example.

Enable the Light Control1 in General.

1.1.1 M/US05.1 > Light control

General	Use light channel 1?	<input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	Operation mode	<input checked="" type="radio"/> Normal <input type="radio"/> semi-automatic
Function status	-Follow-up time seconds	0
Constant brightness A	-Follow-up time minutes	1
Logic function A	-Follow-up time hours	0
Logic function B	-Follow-up time change via object?	<input checked="" type="radio"/> No <input type="radio"/> Yes
Logic function C	Threshold value brightness	500
Logic function D	-Threshold value brightness via object?	<input checked="" type="radio"/> No <input type="radio"/> Yes
Logic function E	Use brightness shutdown?	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Output	=====
	-Object type	<input checked="" type="radio"/> 1bit <input type="radio"/> 1byte
	-Value when detection	<input type="radio"/> OFF-"0" <input checked="" type="radio"/> ON-"1"
	-Value when non-detection time out	<input checked="" type="radio"/> OFF-"0" <input type="radio"/> ON-"1"
	Safety time(seconds)	0

Group Objects Parameters

■ Operation mode:

Normal: The logic can start by automation.

Semi-automatic: The logic needs to start when it receives External switching telegram '1'.

No matter which mode you select, create and link group address to Number 27.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 external input	External telegram			1 bit	C	-	W	T	-	switch	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low
242	Constant brightness A	Dimming output value(0%..100%)			1 byte	C	R	-	T	-	percentage (0..100%)	Low

- Follow-up time: If there is no detection after this time, it will trigger the output for non-detection.
- Follow-up time change via object: If Yes, then can use group address to change the follow-up time from BUS.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 external input	External telegram			1 bit	C	-	W	T	-	switch	Low
28	Light channel 1 time input	follow-up time(minutes)			2 bytes	C	-	W	T	-	time (min)	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low
242	Constant brightness A	Dimming output value(0%..100%)			1 byte	C	R	-	T	-	percentage (0..100%)	Low

■ Threshold value brightness:

In light control parameters, all the conditions use “AND” logical relationship by default. If only use PIR sensor and brightness is less than 1200, set threshold to 1200.

For example: If the brightness is less then Threshold value and it detects movement, will turn on the light. If the brightness is over then Threshold value and it detects movement, will not turn on the light.

- Threshold value brightness via object: If yes, then can use group address to change the threshold value from BUS.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
12	Real-time humidity	External Humidity			2 bytes	C	-	W	T	-	humidity (...)	Low
13	Real time input	The bus time			3 bytes	C	-	W	T	-	time of day	Low
15	General	Led indicator(Enable/Disable)			1 bit	C	R	W	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 input	External switching telegram			1 bit	C	-	W	T	-	switch	Low
29	Light channel 1 lux input	Brightness(Lux) threshold			2 bytes	C	-	W	T	-	lux (Lux)	Low
30	Light channel 1 lock input	1'-lock, 0'-unlock			1 bit	C	-	W	T	-	enable	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low

■ Use brightness shutdown:

If Yes, it will trigger the output for non-detection when value is in Threshold value brightness during delay time.

Use brightness shutdown?

☐ No ☒ Yes

-Calculate delay time(1..50minutes)

1

-Threshold value brightness

1000

When the brightness is 1000 lux during 1 minute, will turn off the light directly.

■ Output mode:

Individual: It can send out one output, you can select the output type (1bit or 1byte) and the value for detection/non-detection.

■ Safety time (seconds):

Only after this safety time will newer output be activated.

Safety time(seconds)

0

■ Lock:

'1'-lock, '0'-unlock; '0'-lock, '1'-unlock: Used 1bit group address to lock/unlock the logic for Light Control1.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 external input	External telegram			1 bit	C	-	W	T	-	switch	Low
30	Light channel 1 lock input	'1'-lock,'0'-unlock			1 bit	C	-	W	T	-	enable	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low

Topology												
Topology Backbone												
Numb	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
12	Real-time humidity	External Humidity			2 bytes	C	-	W	T	-	humidity (...)	Low
13	Real time input	The bus time			3 bytes	C	-	W	T	-	time of day	Low
15	General	Led indicator(Enable/Disable)			1 bit	C	R	W	T	-	enable	Low
26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
27	Light channel 1 input	External switching telegram			1 bit	C	-	W	T	-	switch	Low
30	Light channel 1 lock input	Scene telegram			1 byte	C	-	W	T	-	scene num...	Low
31	Light channel 1 output	Switching			1 bit	C	R	-	T	-	switch	Low

-- Only lock/unlock: Just lock/unlock the logic for Light Control1.

-- Lock/Unlock and transmit value: Lock/Unlock the logic for Light Control1 and send out a value to output group address. For example: Lock the logic and turn on the light when you

press button.

-- Automatic unlock after lock delay: It will automatically unlock after the delay time.

2.4 Function Status

1.1.1 M/US05.1 > Function status

General	Slave ultrasonic sensor status report	<input type="radio"/> No <input checked="" type="radio"/> Yes
Function status	-> Transmit telegram value when ultrasonic sensor detected	<input type="radio"/> Slave value-'0' <input checked="" type="radio"/> Slave value-'1'
Logic function A	Lux value report	<input type="radio"/> No <input checked="" type="radio"/> Yes
Block A	-> Lux report mode	<input checked="" type="radio"/> Report when changed <input type="radio"/> Report cyclic
A1: Switching	-> Differential value for report (1..200lux)	20
	-> Minimum time interval(1..255s)	1

■ Slave ultrasonic sensor status report: send value "0" or "1" to bus.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
30	Object output A1	Switching			1 bit	C	R	-	T	-	switch	Low
3	Function status	Slave sensor status to bus			1 bit	C	-	W	T	-	switch	Low

■ Lux report mode: feedback current lux value to bus.

1.1.1 M/US05.1 > Function status

General	Slave ultrasonic sensor status report	<input checked="" type="radio"/> No <input type="radio"/> Yes
Function status	Lux value report	<input type="radio"/> No <input checked="" type="radio"/> Yes
Logic function A	-> Lux report mode	<input checked="" type="radio"/> Report when changed <input type="radio"/> Report cyclic
Block A	-> Differential value for report (1..200lux)	20
	-> Minimum time interval(1..255s)	1

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
30	Object output A1	Switching			1 bit	C	R	-	T	-	switch	Low
5	Function status	Brightness(Lux) value			2 bytes	C	R	-	T	-	lux (Lux)	Low

2.5 Logic Function A/B/C/D

There are four independent logic, you can select movement /brightness /temperature /humidity /external telegram as logic input conditions, and you can use 1bit group address to

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enable/disable the logic function.

Take Logic Function A as example:

1.1.1 M/US05.1 > Logic function A		
General	Use logical block A <input type="radio"/> No <input checked="" type="radio"/> Yes	
Light control		
Function status		
Logic function A		
Block A	(1)Enable Movement sensor	Single mode(independent sensor) ▼
A1: Switching	->Movement sensor status	<input type="radio"/> Movement sensor detected is False,else is... <input checked="" type="radio"/> Movement sensor detected is True,else is F...
Logic function B	(2)Enable brightness(Lux) sensor	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function C	(3)Enable temperature sensor	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function D	(4)Enable external telegram 1	Disable ▼
Logic function E	(5)Enable external telegram 2	Disable ▼
	Logical relation of block A	<input checked="" type="radio"/> AND <input type="radio"/> OR
	Result of logic A inverted	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Status(True/False) of logic A to bus	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
	<1>Use logical A function lock?	<input checked="" type="radio"/> No <input type="radio"/> Yes
Group Objects	Parameters	

(1): Enable movement sensor: If enable, the movement sensor as logic input condition.

-- Disable: The ultrasonic sensor is not used in this logic.

-- Single mode (independent sensor): This ultrasonic sensor works as logic input condition, and you can select the sensor status. Suggest select ultrasonic sensor detected is True, else is False.

-- Master/Slave mode (Master sensor): More sensors work as logic input condition, but this sensor as master. It can use 1bit group address to link to slave sensor, when receive slave value, then the master set to True.

General	Use logical block A <input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	
Function status	(1)Enable Movement sensor <input type="radio"/> Master/Slave mode(Master sensor)
Logic function A	->Local Movement sensor status <input type="radio"/> Movement sensor detected is False,else is... <input checked="" type="radio"/> Movement sensor detected is True,else is F... ->Master is set to TRUE when received <input type="radio"/> Slave value-'0' <input checked="" type="radio"/> Slave value-'1'

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
41	Object input A	Movement status from bus			1 bit	C	-	W	T	U	switch	Low
61	Object output A1	Switching			1 bit	C	R	-	T	-	switch	Low

(2): Enable Brightness (Lux) Sensor: It supports up to 3 brightness thresholds. You can select the brightness value.

(2)Enable brightness(Lux) sensor	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Enable brightness(Lux) threshold A	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
->Lux >= Threshold lower(0 ~ 1200 lux)	100
->Lux <= Threshold upper(0 ~ 1200 lux)	300
->Changed Lux threshold value via bus	<input checked="" type="radio"/> No <input type="radio"/> Yes
->Brightness(Lux) status	In range is True,else False
->Independent control <object output 8>	<input checked="" type="radio"/> No <input type="radio"/> Yes(Separated from logic and output)
Enable brightness(Lux) threshold B	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

-- Change Lux threshold value via bus: If enable, can modify the value via group address.

-- Brightness (Lux) status: Select the Ture/False status for logic.

-- Independent control < object output 8: It can independently control the object output8 when brightness is in the range. This is separated from Logic A.

->Independent control <object output 8>	<input type="radio"/> No <input checked="" type="radio"/> Yes(Separated from logic and output)
-->>Enable/disable independent control via bus	<input type="radio"/> No <input checked="" type="radio"/> Yes
-->>Operation mode	'1'-Enable,'0'-Disable
-->><Object output 8 > status when independent control disabled	False and immediately output

(3): Enable temperature sensor: If enable, the local temperature works as logic input condition, you can select the temperature range and the temperature status.

And it supports modify the temperature threshold value from Bus.

(3)Enable temperature sensor ☐ Disable ☒ Enable

->Temperature >= Threshold lower (0.1°C)

->Temperature <= Threshold upper (0.1°C)

->Changed temperature threshold value via bus ☒ No ☐ Yes

->Temperature status

(5) Enable external telegram 1

(6) Enable external telegram 2

-- There are two external telegram which from Bus can work as logic input condition.

■ Logic relation of block A:

AND: Only when all input conditions are met can the target be executed

OR: If one of the input conditions is met, the target can be executed

■ Result of logic A inverted: Inverted the logic A result or not.

■ Status (True/False) of logic A to bus: If enable, it will send out the logic A status to Bus via group address.

■ Use logical A function lock?

-- Use telegram via bus: If yes, then can use Big telegram or Scene telegram to lock/unlock the Logical A.

	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
	1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
	61	Object output A1	Switching			1 bit	C	R	-	T	-	switch	Low
	78	<1>Logic A function	Lock logic function			1 bit	C	-	W	T	-	enable	Low

-- Logic A output status when logic function lock: Set the output status when logic lock.

-- Logic A automation unlock after logic function lock: It will auto unlock after delay time.

- **Logic A output status when logic function unlocks:** Set the output status when logic unlock.
- **Feedback logic A function lock status:** If enable, it can use 1bit group address to feedback the lock status to Bus.

2.1.4 Block A

Enable the output object for logic, take Logic function A as example. Logic function B/C/D are same.

For example: Logic function A has two outputs, one is control single light, second is control curtain.

1.1.1 M/US05.1 > Block A

General	Object output 1 (to bus)	Switch controller
Light control	Object output 2 (to bus)	Shutter controller
Function status	Object output 3 (to bus)	Invalid
Logic function A	Object output 4 (to bus)	Invalid
Block A	Object output 5 (to bus)	Invalid
A1: Switching	Object output 6 (to bus)	Invalid
A2: Shutter	Object output 7 (to bus)	Invalid
Logic function B	Object output 8 (to bus)	Invalid
Logic function C	Object output 9 (to bus)	Invalid
Logic function D	Object output 10 (to bus)	Invalid
Logic function E		
Parameters	Output repeat telegram on true	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

Output repeat telegram on true: Enable/disable the repeat telegram on true.

2.5 Logic Function E

Logic function E has combination function, it can combine logic A/B/C/D. For example, when logic A and logic B are both true, then turn on the light.

1.1.1 M/US05.1 > Logic function E

General	Use logical block E	<input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	Enable logic A	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Function status	Enable logic B	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function A	Enable logic C	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function B	Enable logic D	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function C	Result of logic E inverted	<input checked="" type="radio"/> No <input type="radio"/> Yes
Logic function D	NOTE: Logic E = A o B o C o D (o = AND/OR)	
	Status(True/False) of logic E to bus	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Logic function E		
Block E	<1> Use logical E function lock?	<input checked="" type="radio"/> No <input type="radio"/> Yes
E1: Switching	<2> Use logical E function lock?	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Logic E output status when logic function unlock	True
Parameters	Feedback logic E function lock status	<input checked="" type="radio"/> No <input type="radio"/> Yes
Group Objects		

- **Enable logic A/B/C/D:** Enable logic A/B/C/D as logic E input condition or not.
Result of logic A/B/C/D inverted: Inverted the result of logic A/B/C/D or not.
- **Result of logic E inverted:** Inverted the result of logic E or not.
- **Status (True/False) of logic E to bus:** If send out the logic E status to bus or not.
- **Use logical E function lock?**
 - Use telegram via bus: If yes, then can use Big telegram or Scene telegram to lock/unlock the Logical E.
 - Logic E output status when logic function lock: Set the output status when logic lock.
 - Logic E automation unlock after logic function lock: It will auto unlock after delay time.
- **Logic E output status when logic function unlocks:**
 - Set the output status when logic unlock.
- **Feedback logic E function lock status:** If enable, it can use 1bit group address to feedback the lock status to Bus.

2.6 Block E

Enable the output object for logic E.

For example: Logic function E has one output (Switch controller to control single light).

1.1.1 M/US05.1 > Block E

General	Object output 1 (to bus)	Switch controller
Light control	Object output 2 (to bus)	Invalid
Function status	Object output 3 (to bus)	Invalid
Logic function A	Object output 4 (to bus)	Invalid
Logic function B	Object output 5 (to bus)	Invalid
Logic function C	Object output 6 (to bus)	Invalid
Logic function D	Object output 7 (to bus)	Invalid
Logic function E	Object output 8 (to bus)	Invalid
	Object output 9 (to bus)	Invalid
	Object output 10 (to bus)	Invalid

Block E

Output repeat telegram on true ☒ Disable ☐ Enable

E1: Switching

Parameters Group Objects

Output repeat telegram on true: Enable/disable the repeat telegram on true.

2.7 Output of Logic Function E

After enable the output objects in Block E, then it will show the output setting for logic true/false.

The status after bus voltage recovery	Invalid ▼
Logical block output when TRUE	ON ▼
-> Delay time (0..17 Hours)	0 ▲▼
-> Delay time (0..59 Minutes)	0 ▲▼
-> Delay time (0..59 Seconds)	0 ▲▼
-> Change delay time via bus (0 s..17 h)	<input checked="" type="radio"/> No <input type="radio"/> Yes
Logical block output when FALSE	OFF ▼
-> Delay time (0..17 Hours)	0 ▲▼
-> Delay time (0..59 Minutes)	0 ▲▼
-> Delay time (0..59 Seconds)	10 ▲▼
-> Change delay time via bus (0 s..17 h)	<input checked="" type="radio"/> No <input type="radio"/> Yes

■ **The status after bus voltage recovery:** Set the status after bus voltage recovery.

■ **Logical block output when True:** Set the detail function when logic true.

Delay time: After delay time, will trigger the output.

Change delay time via bus (0s..17h): The delay time can be changed by bus.

■ **Logical block output when False:** Set the detail function when logic false.

Delay time: After delay time, will trigger the output.

■ **Change delay time via bus (0s..17h):** The delay time can be changed by bus.

3 Examples

3.1 Single movement control one light

(1) Enable Logic function A and select Single mode.

1.1.1 M/US05.1 > Logic function A

General	Use logical block A	<input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	(1)Enable Movement sensor	Single mode(independent sensor)
Function status	-> Movement sensor status	<input type="radio"/> Movement sensor detected is False,else is... <input checked="" type="radio"/> Movement sensor detected is True,else is F...
Logic function A	(2)Enable brightness(Lux) sensor	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Block A	(3)Enable temperature sensor	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
A1: Switching	(4)Enable external telegram 1	Disable
Logic function B	(5)Enable external telegram 2	Disable

- (2) Enable one output object, because control one light turns on/off, so we can use Switch controller type.

1.1.1 M/US05.1 > Block A

General	Object output 1 (to bus)	Switch controller
Light control	Object output 2 (to bus)	Invalid
Function status	Object output 3 (to bus)	Invalid
Logic function A	Object output 4 (to bus)	Invalid
Block A	Object output 5 (to bus)	Invalid
	Object output 6 (to bus)	Invalid

Enable one output object

- (3) Set the detailed function for output.

1.1.1 M/US05.1 > A1: Switching

General	The status after bus voltage recovery	Invalid
Light control	Logical block output when TRUE	ON
Function status	-> Delay time (0..17 Hours)	0
Logic function A	-> Delay time (0..59 Minutes)	0
Block A	-> Delay time (0..59 Seconds)	0
A1: Switching	-> Change delay time via bus (0 s..17 h)	<input checked="" type="radio"/> No <input type="radio"/> Yes
Logic function B	Logical block output when FALSE	OFF
Logic function C	-> Delay time (0..17 Hours)	0
Logic function D	-> Delay time (0..59 Minutes)	0
	-> Delay time (0..59 Seconds)	10
	-> Change delay time via bus (0 s..17 h)	<input checked="" type="radio"/> No <input type="radio"/> Yes

- (4) Link the group address to light. It means when it detects a movement, it will turn on relay1; when there is no detection in 10s, it will turn off relay1.

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
1 Sensor	61	Object output A1	Switching	relay 1	1/1/1	1 bit	C	R	-	T	-	switch	Low
1.1 M-US05.1													
1.1.1 M/US05.1													
1.1.2 M/R4.10.1													

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	10	Output A	Channel output	relay 1	1/1/1	1 bit	C	-	W	-	U	switch	Low
1 Sensor	30	Output B	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1 M-US05.1	50	Output C	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1.1 M/US05.1	70	Output D	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1.2 M/R4.10.1													

3.2 Master/Slave movement control one light

Some projects will use two sensors to control same light. One of sensors has detection, will turn on the light; If master sensor no detection for 10s and slave sensor not sent '1' in 10s, will turn off relay1.

- 1) Master sensor enable Logic function A and select Master/Slave mode (Master sensor).

Topology Backbone	1.1 M/US05.1 > Logic function A	
Dynamic Folders		
1 Sensor		
1.1 M-US05.1		
1.1.1 M/US05.1		
1.1.2 M/R4.10.1		
General	Use logical block A <input type="radio"/> No <input checked="" type="radio"/> Yes	
Light control	(1)Enable Movement sensor <input type="text" value="Master/Slave mode(Master sensor)"/>	
Function status	-> Local Movement sensor status <input type="radio"/> Movement sensor detected is False,else is... <input checked="" type="radio"/> Movement sensor detected is True,else is F...	
Logic function A	-> Master is set to TRUE when received <input type="radio"/> Slave value-'0' <input checked="" type="radio"/> Slave value-'1'	
Block A	(2)Enable brightness(Lux) sensor <input checked="" type="radio"/> Disable <input type="radio"/> Enable	
A1: Switching	(3)Enable temperature sensor <input checked="" type="radio"/> Disable <input type="radio"/> Enable	

Status from slave sensor

- 2) Master sensor enable one output object, because control one light turns on/off, so we can use Switch controller type.

1.1.1 M/US05.1 > Block A

Enable one output object

General	Object output 1 (to bus)	Switch controller
Light control	Object output 2 (to bus)	Invalid
Function status	Object output 3 (to bus)	Invalid
Logic function A	Object output 4 (to bus)	Invalid
	Object output 5 (to bus)	Invalid
Block A	Object output 6 (to bus)	Invalid

3) Set the detailed function for master sensor output.

1.1.1 M/US05.1 > A1: Switching

General	The status after bus voltage recovery	Invalid
Light control	Logical block output when TRUE	ON
Function status	-> Delay time (0..17 Hours)	0
	-> Delay time (0..59 Minutes)	0
Logic function A	-> Delay time (0..59 Seconds)	0
Block A	-> Change delay time via bus (0 s..17 h)	<input checked="" type="radio"/> No <input type="radio"/> Yes
A1: Switching	Logical block output when FALSE	OFF
Logic function B	-> Delay time (0..17 Hours)	0
Logic function C	-> Delay time (0..59 Minutes)	0
	-> Delay time (0..59 Seconds)	10
Logic function D	-> Change delay time via bus (0 s..17 h)	<input checked="" type="radio"/> No <input type="radio"/> Yes

4) Link the movement status from bus (other sensor's status), and link the address to light. That means current sensor or other sensor has detection, will turn on relay1; when master sensor no detection for 10s and slave sensor not sent '1' in 10s, will turn off relay1.

Add Channels Delete Download Info Reset Unload Print												Search		
Topology Backbone		Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders		1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
1 Sensor		16	Function status	Slave status to bus			1 bit	C	-	W	T	-	switch	Low
1.1 M-US05.1		20	Function status	Slave status to bus(Logic A)			1 bit	C	-	W	T	-	switch	Low
		23	Function status	Slave status to bus(Logic B)			1 bit	C	-	W	T	-	switch	Low
1.1.1 M/US05.1		24	Function status	Slave status to bus(Logic C)			1 bit	C	-	W	T	-	switch	Low
		25	Function status	Slave status to bus(Logic D)			1 bit	C	-	W	T	-	switch	Low
1.1.2 M/R4.10.1		41	Object input A	Movement status from bus	Slave sensor	0/0/2	1 bit	C	-	W	T	U	switch	Low
1.1.3 M/US05.1		61	Object output A1	Switching	relay 1	1/1/1	1 bit	C	R	-	T	-	switch	Low

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	10	Output A	Channel output	relay 1	1/1/1	1 bit	C	-	W	-	U	switch	Low
1 Sensor	30	Output B	Channel output	Light		1 bit	C	-	W	-	U	switch	Low
1.1 M-US05.1	50	Output C	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1.1 M/US05.1	70	Output D	Channel output			1 bit	C	-	W	-	U	switch	Low

5) Slave sensor reports the status to bus via group address.

Topology Backbone

Dynamic Folders

1 Sensor

1.1 M-US05.1

1.1.1 M/US05.1

1.1.2 M/R4.10.1

1.1.3 M/US05.1

1.1.3 M/US05.1 > Function status

General

Function status

Logic function A

(1)Slave Movement sensor status report ☐ No ☒ Yes

-> Transmit telegram value when Movement sensor detected ☐ Slave value-'0' ☒ Slave value-'1'

(2)Brightness report ☒ No ☐ Yes

(3)Temperature report ☒ No ☐ Yes

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
1 Sensor	16	Function status	Slave status to bus	Slave sensor	0/0/2	1 bit	C	-	W	T	-	switch	Low
1.1 M-US05.1	20	Function status	Slave status to bus(Logic A)			1 bit	C	-	W	T	-	switch	Low
1.1.1 M/US05.1	23	Function status	Slave status to bus(Logic B)			1 bit	C	-	W	T	-	switch	Low
1.1.2 M/R4.10.1	24	Function status	Slave status to bus(Logic C)			1 bit	C	-	W	T	-	switch	Low
1.1.3 M/US05.1	25	Function status	Slave status to bus(Logic D)			1 bit	C	-	W	T	-	switch	Low
	41	Object input A	Movement status from bus			1 bit	C	-	W	T	U	switch	Low
	61	Object output A1	Switching			1 bit	C	R	-	-	-	switch	Low

3.3 Light Control 1 (Fully-automatic/Normal)

Use movement and brightness as logic input. When the brightness is under preset value and has detection, then turn on light. If there is no detection after delay time, turn off the light.

1) Enable normal mode, set the delay time and object type.

1.1.1 M/US05.1 > Light control

General	Use light channel 1? <input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	Operation mode <input checked="" type="radio"/> Normal <input type="radio"/> semi-automatic
Function status	-Follow-up time seconds 0
Logic function A	-Follow-up time minutes 1
Logic function B	-Follow-up time hours 0
Logic function C	-Follow-up time change via object? <input checked="" type="radio"/> No <input type="radio"/> Yes
Logic function D	Threshold value brightness 500
Logic function E	-Threshold value brightness via object? <input checked="" type="radio"/> No <input type="radio"/> Yes
	Use brightness shutdown? <input checked="" type="radio"/> No <input type="radio"/> Yes
	Output =====
	-Object type <input checked="" type="radio"/> 1bit <input type="radio"/> 1byte
	-Value when detection OFF-"0" <input checked="" type="radio"/> ON-"1"
	-Value when non-detection time out <input checked="" type="radio"/> OFF-"0" <input type="radio"/> ON-"1"
	Safety time(seconds) 0

Group Objects Parameters

If no detection after 1 minutes,
turn off the light

Output 1 bit object

2) Link the output of light channel 1.

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
1 Sensor	26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
1.1 M-US05.1	27	Light channel 1 external input	External telegram	External telegram	0/0/3	1 bit	C	-	W	T	-	switch	Low
1.1.1 M/US05.1	31	Light channel 1 output	Switching	relay 1	1/1/1	1 bit	C	R	-	T	-	switch	Low
1.1.2 M/R4.10.1													

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	10	Output A	Channel output	relay 1	1/1/1	1 bit	C	-	W	-	U	switch	Low
1 Sensor	30	Output B	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1 M-US05.1	50	Output C	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1.1 M/US05.1	70	Output D	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1.2 M/R4.10.1													

Light

Result:

- a) Now is in normal mode, no matter it has external telegram or not, the logic will start by automation. If has group address for external telegram:

When receive External telegram '1', will turn on the light directly.

When receive External telegram '0', will turn off the light directly.

- b) When the brightness is less than 50 lux and has movement, then turn on the light.

- c) When there is no movement after 1 minute, turn off the light.

3.4 Light Control 1 (Semi-automatic)

Use movement and button as logic input. When press the button, sensor will turn on the light,

If there is no detection for preset time or the brightness are in preset value for a time, will turn off the light.

- 1) Enable semi-automatic mode, set the delay time and object type.

1.1.1 M/US05.1 > Light control

General	Use light channel 1?	<input type="radio"/> No <input checked="" type="radio"/> Yes
Light control	Operation mode	<input type="radio"/> Normal <input checked="" type="radio"/> semi-automatic
Function status	-Follow-up time seconds	0
Logic function A	-Follow-up time minutes	1
Logic function B	-Follow-up time hours	0
Logic function C	-Follow-up time change via object?	<input checked="" type="radio"/> No <input type="radio"/> Yes
Logic function D	Threshold value brightness	500
Logic function E	-Threshold value brightness via object?	<input type="radio"/> No <input checked="" type="radio"/> Yes
	Use brightness shutdown?	<input type="radio"/> No <input checked="" type="radio"/> Yes
	-Calculate delay time(1..50minutes)	1
	-Threshold value brightness	400
	Output	=====
	-Object type	<input checked="" type="radio"/> 1bit <input type="radio"/> 1byte
	-Value when detection	<input type="radio"/> OFF-"0" <input checked="" type="radio"/> ON-"1"

Group Objects Parameters

If there is no detection during this time, it will turn off the light

- 2) Link the group address for sensor/relay/button.

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	1	General	Heartbeat telegram			1 bit	C	-	-	T	-	enable	Low
1 Sensor	26	Light channel 1 slave input	Movement status from bus			1 bit	C	-	W	T	-	switch	Low
1.1 M-US05.1	27	Light channel 1 external input	External telegram	External telegram	0/0/3	1 bit	C	-	W	T	-	switch	Low
1.1.1 M/US05.1	31	Light channel 1 output	Switching	relay 1	1/1/1	1 bit	C	R	-	T	-	switch	Low

Sensor

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	10	Output A	Channel output	relay 1	1/1/1	1 bit	C	-	W	-	U	switch	Low
1 Sensor	30	Output B	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1 M-US05.1	50	Output C	Channel output			1 bit	C	-	W	-	U	switch	Low
1.1.1 M/US05.1	70	Output D	Channel output			1 bit	C	-	W	-	U	switch	Low

Light

Topology Backbone	Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
Dynamic Folders	40	Rocker A short	Switching	External telegram	0/0/3	1 bit	C	-	W	T	U	switch	Low
1 Sensor	41	Rocker A long	Switching			1 bit	C	-	W	T	U	switch	Low
1.1 M-US05.1	50	Rocker B short	Switching			1 bit	C	-	W	T	U	switch	Low
1.1.1 M/US05.1	51	Rocker B long	Switching			1 bit	C	-	W	T	U	switch	Low
1.1.2 M/R4.10.1	60	Rocker C short	Switching			1 bit	C	-	W	T	U	switch	Low
1.1.3 M/DLP04.1	61	Rocker C long	Switching			1 bit	C	-	W	T	U	switch	Low
	70	Rocker D short	Switching			1 bit	C	-	W	T	U	switch	Low
	71	Rocker D long	Switching			1 bit	C	-	W	T	U	switch	Low

Button

Result:

- 1: When press the button, the light will turn on.
- 2: If there is no detection for 1 minute, sensor will turn off the light. Or the brightness from dark to 400lux and over 400lux for 1minute, will turn off the light.