Dry Contact 4CH Sensor

M/S04.1

Program version: V1.1

Guangzhou Hedong Electronic CO., Ltd(HDL)
HDL KNX / EIB-BUS
(Intelligent Installation Systems)

Product Manual

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1- General

HDL KNX / EIB dry contact 4CH sensor is developed by HDL. Using KNX/EIB BUS communication with other KNX devices. Database need to be downloaded to the switch actuator by using ETS, The document descripts how to use the products. Our products use standard according to EMC, electrical safety, environmental conditions.

The dry contact is used to control switched loads, such as:

- switch control
- dimming control
- Shutter control
- Flexible control
- Scene control
- Sequence control
- Percentage control
- Threshold control
- String control
- Forced control
- PWM output
- 5 logic control
- Counting control
- 5 logic control
- Combination control
- LED status indicator
- Alarm control
- Heating control
- 0-10V dimming
- Other Equipments

The rights and the copyright to this manual are exclusively the property of HDL.
1.1-Product Function

Dry contact 4CH sensor is one of the products in HDL KNX/EIB serials. It includes 4 channel signal input and 4 channel signal output. The signal input channel can receive signal from the temperature sensor and from the dry contact sensor, it offers 4 channels output DC0-10V dimming signal or 4 channels drive for the LED status. This module including the functions of temperature collection, dry contact input, 5 logic output, 0-10V dimming, sensor, LED driver function, etc. control way including relay control, dimming control, curtain control, scene control, etc. in a logic control process each logic combines with 4 signal input channels.

The M/S04.1 there is 3 work modes,

1- Sensors controller.
2- Logic controller
3- Dimming controller

➢ **Sensors controller**
  Switch controller
  Switch/Dimming controller
  Shutter controller
  Flexible controller
  Scene controller
  Sequence switch
  Percentage controller
  Threshold controller
  String (14bytes) controller
  Forced position controller
  Counter controller
  Combination controller

➢ **Logical controller**
  Dry contact sensor
  Temperature sensor
  Black A
  Object output 1……Object 10

  A1: Switching
  A2: Alarm
  A3: Shutter
  A4: Scene
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Dry Contact 4CH Sensor

A5: Sequence
A6: Percentage
A7: Threshold
A8: Threshold
A9: String (14bytes)
A10: String (14bytes)

- Dimming controller
  - Input A function
  - Dry contact sensor
  - Temperature sensor
  - 0-10 ballast dimming
  - Staircase lighting
  - Flashing
  - Scene
  - Threshold
  - Heating
# 2-Hardware

The technical properties of HDL KNX/EIB M/S04.1 is as the following sections.

## 2.1 Technical data

### Power supply
- **Operating voltage (supply by the bus)**: 21...30 V DC,
- **Current consumption EIB / KNX**: < 15 mA

### Input sensors
- **Switch/Temperature sensor**

### Temperature sensor choice
- **TTS/APR 1.0**

**NOTE:** You have to choice the special temperature sensor supplied by HDL. The type is TTS/APR 1.0.

### Output/Input nominal values
- **Type of Device**: M/S04.1
- **Number of input pins**: 4
- **Number of output pins**: 4

### Connections
- **EIB / KNX**: Bus Connection Terminal
  - 0.8 mm Ø, single core
- **Load circuits**: Screw terminal with Slotted head
  - 0.2...4 mm² multi-core
  - 0.4...6 mm² single-core
- **cable shoe**: 12 mm
- **Tightening torque**: Max. 0.8 Nm

### Operating and display
- **Red LED and push button**: Indicate enter programming mode

### Temperature range
- **Operation**: – 5 °C ~ + 45 °C
- **Storage**: – 25 °C ~ + 55 °C
- **Transport**: – 25 °C ~ + 70 °C

### Environment conditions
- **humidity**: max. 95 % Non-condensing
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Dry Contact 4CH Sensor

Appearance design

* Dimensions (H x W x D) 50 x 50 x 13

Weight (unit kg) 0.06

Installation screw fixation

Mounting position

Material and Colour Plastic, black

Standard and Safety Certificated

* LVD Standard EN60669-2-1, EN60669-1
* EMC Standard EN50090-2-2

CE mark

* In accordance with the EMC guideline and low voltage guideline

Pollutant Comply with RoHS

loads

* Dimmable Ballast 0-10V

Application table

<table>
<thead>
<tr>
<th>Dry contact functions</th>
<th>Sensors controller</th>
<th>logical controller</th>
<th>dimming controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of communication objects</td>
<td>130</td>
<td>150</td>
<td>122</td>
</tr>
<tr>
<td>Max. number of group addresses</td>
<td>254</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>Max. number of associations</td>
<td>254</td>
<td>254</td>
<td>254</td>
</tr>
</tbody>
</table>

Note: The programming requires the KNX/EIB Software Tools ETS.

2.2 Dimension drawings
2.3 Wiring diagram

1 Input pin, from left to right is A,B,C,D,COM,
2 Programming button & Programming LED
3 KNX/EIB
4 Output pin, contact to dimmable ballast or Led driver.

Note:  
a) Dimensions of the space to be provided for each dry contacts.
b) Dimensions and position of the means for supporting and fixing the switch within this space
c) Minimum clearance between the various parts of the switch and the surrounding parts where fitted
d) Minimum dimensions of ventilating opening, if needed, and their correct arrangement.

2.4 Maintenance and Cautions

*Please read this user manual carefully before any operation.
*Don’t close to the interfering devices.
*The site should be ventilated with good cooling environment.
*Pay attention to damp proof, quakeproof and dustproof.
*Avoid rain, other liquids or caustic gas.
*Please contact professional maintenance staff or HDL service center for repair or fix.
*Remove the dust regularly and do not wipe the unit with the volatile liquids like alcohol, gasoline, etc.
*If damaged by damp or liquid, turn off it immediately.
*Regularly check the circuitry and other related circuit or cables and replace the disqualified circuitry on time.
*Installation location should be well-ventilated, pay attention to moisture, shock, dust proof.
3-Software

HDL KNX/EIB 4 Dry sensor type is M/S04.1, and the database name is “Dry Contact 4CH Sensor”. It’s Interface and the functions apply parameters please overview the following description of the paragraph.

The device contact to temperature sensor and dry contact, with the function of sending the variety data points at the same time that can simultaneously control many different types of KNX equipment.

The following paragraph will description of output and input's setting in detail.

3.1 Database functions Overview

The following table provides an overview of the functions and some parameters with the switch actuators:

<table>
<thead>
<tr>
<th>function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensors controller</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Heartbeat telegram</td>
</tr>
<tr>
<td>Switch controller</td>
<td>Y</td>
</tr>
<tr>
<td>Switch/Dimming controller</td>
<td>Y</td>
</tr>
<tr>
<td>Shutter controller</td>
<td>Y</td>
</tr>
<tr>
<td>Flexible controller</td>
<td>Y</td>
</tr>
<tr>
<td>Scene controller</td>
<td>Y</td>
</tr>
<tr>
<td>Sequence controller</td>
<td>Y</td>
</tr>
<tr>
<td>Percentage controller</td>
<td>Y</td>
</tr>
<tr>
<td>Threshold controller</td>
<td>Y</td>
</tr>
<tr>
<td>String(14 bytes)controller</td>
<td>Y</td>
</tr>
<tr>
<td>Forced position controller</td>
<td>Y</td>
</tr>
<tr>
<td>Counter controller</td>
<td>Y</td>
</tr>
<tr>
<td>Combination controller</td>
<td>Y</td>
</tr>
<tr>
<td>Logical controller</td>
<td></td>
</tr>
<tr>
<td>Switching</td>
<td>Y</td>
</tr>
<tr>
<td>Alarm</td>
<td>Y</td>
</tr>
<tr>
<td>Shutter</td>
<td>Y</td>
</tr>
<tr>
<td>Scene</td>
<td>Y</td>
</tr>
<tr>
<td>Sequence</td>
<td>Y</td>
</tr>
<tr>
<td>Percentage</td>
<td>Y</td>
</tr>
<tr>
<td>Threshold</td>
<td>Y</td>
</tr>
<tr>
<td>String (14 bytes)</td>
<td>Y</td>
</tr>
<tr>
<td>Dimming controller</td>
<td></td>
</tr>
</tbody>
</table>
### Table 1: Database application overview.

<table>
<thead>
<tr>
<th>Function</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scene NO.1-64</td>
<td></td>
</tr>
<tr>
<td>Sequence</td>
<td>Y</td>
</tr>
<tr>
<td>Staircase light</td>
<td></td>
</tr>
<tr>
<td>Flashing</td>
<td>Y</td>
</tr>
<tr>
<td>Scene</td>
<td></td>
</tr>
<tr>
<td>Threshold</td>
<td>Y</td>
</tr>
<tr>
<td>Heating</td>
<td></td>
</tr>
<tr>
<td>1bit/1byte PWM control</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Note:** For each function and mode, can only be used alone.
3.2 Function parameter “General”

In the parameter of the general windows can set the work mode of the module.

---Work mode

Options: **Sensors controller**

**Logical controller**

**Dimming controller**

The dry contact 4ch sensor there is 3 work modes. The following will detail these three modes.
3.2.1 Work mode “Sensors controller”

---System delay (2…255s) after bus voltage recovery

The device will be delayed for 2..255s after the power on. The default value is 2 seconds. The Min. value is 2 seconds, and the max. value is 255 seconds.
Options: 2…255s

When power on and after the delay time out, the device begin working.

---Heatbeat telegram (1…65535s, 0-invalid)

The range of the parameter is 0 to 65535s. 0 is that the function is invalid, other of parameter enable this function
Options: 0…65535s

The parameter set to nonzero, Device will send a telegram cyclically after time out. Send the value alternately between 0 and 1. This function use or not decided by user.

-> Temperature Quiver: < (threshold – n) or >(threshold + n) on out range

Temperature within the effective range, when changes in the set range, the status does not change.
When the temperature changes greater than n, the status will
change. The quiver range between threshold – n and threshold or between threshold and threshold +n.

Options: 0…10C

---Channel A: LED output

The module has 4 output channels, channel A, channel B, channel C and channel D.

Options: NO

YES

If you selection YES, there will be appearing the setting page of the “LED output A”. This page show you that how to set the led state parameter. Channel B, C, D outputs are as same as A.

![Fig2.1: “LED output A” parameter windows](image)
3.2.1.1 The parameter window of “LED output A”

---LED functionality

Options: Switch state ON/OFF

Switch state ON/OFF: This function show how to operation the LED’s state.

Flashing: LED’s state is flashing.

➢ Selection “Switch state ON/OFF”
Fig4: “Switch state ON/OFF” parameter window

---Maximum drive voltage of LED(100%)
Set the drive voltage of LED. The range is 1V to 10V.
**Options:** 1V-10V

---Default ON brightness of LED
Set the default brightness of LED. The range is 10% to 100%.
**Options:** 10%---100%(255)

---LED control mode
Set the control mode of LED.
**Options:**
- Local status
- Via bus(1 bit-operation and 1 byte-Brightness)
  - Local status: The LED controlled by local status.
  - Via bus: the LED controlled by the telegram via bus.

---Change ON brightness via bus
Set the enable of change on brightness via bus.
**Options:** NO
- YES
  - NO: you can’t change brightness via bus.
  - YES: you can change brightness via bus.

--LED status(1 bit) response
Set the response of LED status.
**Options:**
- Invalid
  - 1 bit always response
  - 1 bit only changed
  - 1 bit always response: it’s always response.
  - 1 bit only changed: it’s response when status changed.
--LED status(1 byte ) response
Options: Invalid
    1 byte always response
    1 byte only changed
1 byte always response: it’s always response.
1 byte only changed: it’s response only when status changed.

--- LED indication
Options: ON if value>="1", else OFF
    ON if value is "0", else OFF
    Always ON
    Always OFF
ON if value>="1", else OFF: the value>="1", LED state is ON, else
LED state is OFF.
ON if value is "0", else OFF: the value is 0, LED state is ON, else
LED state is OFF.
Always ON: LED state is always ON.
Always OFF: LED state is always OFF.

---LED automatically darker delay time: base
    Set the delay time’s base.
Options: 100ms, 1sec, 1min 1hour

---Factor(1…255)->time = base* factor
Options: 1…255
    Set the delay time, this time is options value* base. After this time,
LED automatically darken the set value.

--- LED States after bus voltage recovery
Options: OFF
    ON
    Set to LED state after bus voltage recovery.

➤ Selection “Flashing”
**Fig5:** “Flashing” parameter window

LED State is flashing. Flashing parameter’s setting as follows.

--- **Maximum drive voltage of LED(100%)**
Set the drive voltage of LED. The range is 1V to 10V.
**Options:** 1V-10V

--- **Default ON brightness of LED**
Set the default brightness of LED. The range is 10% to 100%.
**Options:** 10%---100%(255)

--- **LED control mode**
Set the control mode of LED.
**Options:** Local status
Via bus(1 bit-operation and 1 byte-Brightness)
Local status: The LED controlled by local status.
Via bus: The LED controlled by the telegram via bus.

--- **Change ON brightness via bus**
Set the enable of change on brightness via bus.
**Options:** NO
**YES**

NO: you can’t change brightness via bus.
YES: you can change brightness via bus.

--- **LED status(1 bit ) response**
Set the response of LED status.
**Options:** Invalid
1 bit always response
1 bit only changed
1 bit always response: it’s always response.
1 bit only changed: it’s response when status changed.

--LED status(1 byte) response
Options: Invalid
1 byte always response
1 byte only changed
1 byte always response: it’s always response.
1 byte only changed: it’s response only when status changed.

--- LED indication
Options: Flashing if value>"1", else stop
    Flashing if value is "0", else stop
    Always flashing
Flashling if value>="1", else OFF: the value>="1", LED state is flashing, else LED state is no flashing.
flashing if value is "0", else OFF: the value is 0, LED state is flashing, else LED state is OFF.
Always flashing: LED state is always flashing.

--- Duration time for brightness: base
    Set the delay time’s base.
Options: 100ms, 1sec, 1min 1hour

--- Factor(1…255)->time = base* factor
Options: 1…255
    Set the delay time, this time is options value* base. After this time, LED automatically reaches the setting brightness value.

--- Duration time for darkness: base
    Set the delay time’s base.
Options: 100ms, 1sec, 1min 1hour

--- Factor(1…255)->time = base* factor
Options: 1…255
    Set the delay time, this time is options value* base. After this time, LED automatically darkens the setting value.

--- Flasing time limit
    Set the time of flashing, after this time the LED will stop flashing
--- LED States after bus voltage recovery
   Options: OFF
   ON
   Set to LED state after bus voltage recovery.

3.2.1.2 The parameter window of “Channel A”

Channel N as an input pin there are 2 kinds of input methods:
Dry contact sensor and Temperature sensor.

3.2.1.2.1 The parameter window of “Dry contact sensor”
**Fig 6:** “Dry contract sensor” parameter window

**Input A as a dry contact sensor, you have to do the following settings.**

---Enable/Disable via bus

Set the enable of input A,

**Options:**

**Enable:** input A enable. Select this one, input A has some functions.

**Disable:** input A disable.

---Function selection==>

**Options:**

Switch controller

Switch / Dimming controller
Shutter controller
Flexible controller
Scene controller
Sequence controller
Percentage controller
Threshold controller
String (14bytes) controller
Forced position controller
Counter controller
Combination controller

Select the different functions the parameters settings are also different.

➢ **Selection “Switch controller”**
Fig7: “Switch controller” parameter window

Dry contact has 2 types.
Input A as a dry contact, the function is switch controller.

---Dry contact type
Options: Mechanical switch
Electronic switch

The follow setting is that the dry sensor’s type is mechanical switch.

Fig7.1: “Mechanical switch” parameter window

---Reaction when closing the contact
Options: Unchanged
  ON
  OFF
  Toggle
  Stop cyclic telegram

When closing the dry contact it will send a target variable. 1 is ON, 0 is OFF.

Unchanged: It will send the value is same to the last time.

ON: it will send the value is 1.

OFF: it will send the value is 0.

Toggle: the dry contact is closed, send the value negated with the last time.

Stop cyclic telegram: This is mainly used for the following cycle settings

---Reaction when opening the contact
Options: Unchanged
  ON
  OFF
  Toggle
  Stop cyclic telegram

When opening the dry contact it will send a target variable. 1 is ON, 0 is OFF.

The setting is same to the closing.

---Delay for ON of switch (0…255s)
---Delay for OFF of switch (0…255s)

Options: (0…255s)
Set the delay time for ON and OFF of switch.
The range is 0…255s.

---Object value inverted when receiving from bus
Options: NO
  YES

NO: when receiving the value from bus is not negated.
YES: when receiving the value from bus is negated.

---Cyclic telegram of object
Options: NO
  If switch is ON
  If switch is OFF
  Always transmission

NO: there is not cyclic function.
If switch is ON:
If switch is OFF
Always transmission:

---Transmit object value after bus voltage recovery
Options: NO
YES
Whether transmit object value after bus voltage recovery.

---The operation time interval: base
Options: 10ms, 100ms, 1sec, 1min, 1hour
Factor (1…255) -> time = base * factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base * factor.

The follow setting is that the dry sensor's type is electronic switch.

Fig7.2: "Electronic switch" parameter window
---The normally contact status is
Options: Close
Open
Set the dry contact status when have no operation.
Close: the contact status is close.
Open: the contact status is open

---Reaction when short button operation
---Reaction when long button operation
Options: invalid
    Unchanged
    ON
    OFF
    Toggle
These 2 parameters are about reaction when button operation.

---Delay for ON of switch (0…255s)
---Delay for OFF of switch (0…255s)
Options: 0..255s
Set the delay time for ON and OFF of switch.
The range is 0…255s.

---Object value inverted when receiving from bus
Options: NO
    YES
    NO: when receiving the value from bus is not negated.
    YES: when receiving the value from bus is negated.

---The operation time interval: base
Options: 10ms, 100ms, 1sec, 1min, 1hour
Factor (1…255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.
Selection “Switch/Dimming controller”

**Function selection**: Switch/Dimming controller

---

**Dry contact type**

**Options**: Mechanical switch

---

**Mechanical switch**

---
Fig 8.1: “Mechanical switch” parameter window

---Reaction when closing the contact:
Set function when closing the dry contact.

**Options:**
- Invalid
- Dim->Brighter
- Dim->Darker
- Dim-> Brighter/Darker
- Dim-> Stop

Invalid: the dry contact is invalid.
**Dim->Brighter:** when closing the dry contact will increase brightness.
**Dim->Darker:** when closing the dry contact will decrease brightness.
**Dim-> Brighter/Darker:** when closing the dry contact will increase/decrease brightness.
**Dim->Stop:** when closing the dry contact will stop.

---Reaction when opening the contact:
Set function when opening the dry contact, setting is same to closing the contact.

---Dimming steps (Brightness changed on every sent telegram):

**Options:**
- Step1 (100%)
- Step2 (50%)
- Step3 (25%)
- ....
- Step7 (1.56%)

Set the brightness values of each change.

---Dimming telegram repeat enabled (valid only when dimming up/down):

**Options:**
- Disable
- Enable

Whether repeated receiving telegram.
**Disable:** do not repeated receiving telegram.
**Enable:** when dimming up/down will repeat receiving telegram.

When select enable, there are some parameters as follow.

---Dimming telegram repeated time
**Options:** 0.2s---60s

---Dimming telegram repeated number (1…255,0-unlimited)
**Options:** 0---255
---Transmit object value after bus voltage recovery
Options: NO
YES
Whether transmit object value after bus voltage recovery.

--The operation time interval: base
Options: 10ms
100ms
1sec
1min
1hour

Factor (1…255) ->time=base*factor
Options: 1—255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

Electronic switch

![Electronic switch parameter window](image)

---The normally contact status is
Options: Close
        Open
    Set the dry contact status when have no operation.
Close: the contact status is close.
Open: the contact status is open.

---Reaction when short button operation
---Reaction when long button operation
Options: invalid
        Unchanged
        ON
        OFF
        Toggle

---Reaction when long button operation
Options: invalid

---Delay for ON of switch (0…255s)
---Delay for OFF of switch (0…255s)
Options: 0..255s
    Set the delay time for ON and OFF of switch.
The range is 0…255s.

---Object value inverted when receiving from bus
Options: NO
        YES
    NO: when receiving the value from bus is not negated.
    YES: when receiving the value from bus is negated.

---The operation time interval: base
Options: 10ms, 100ms, 1sec, 1min, 1hour
    Factor (1…255)->time=base*factor
    These two parameters are setting the time interval of repeat
    operation dry contact, the time is base*factor.
Selection “Shutter controller”

Input A as a dry contact, the function is shutter controller.

---Dry contact type

Options: Mechanical switch
        Electronic switch

Dry contact has two types, the details setting as follow.

Mechanical switch

Fig9.1: “Mechanical switch” parameter window
---Reaction when closing the contact:
---Reaction when opening the contact:
Set function when closing/opening the dry contact.

Options:
Invalid
Stepping->Increase
Stepping->Decrease
Stepping->Toggle
Stepping->Repeat telegram stopped
Moving->UP
Moving->DOWN
Moving->Toggle

Invalid: when closing/opening dry contact is invalid.
Stepping->Increase: when closing dry contact to increase.
Stepping->Decrease: when closing dry contact to Decrease.
Stepping->Toggle: when closing dry contact to toggle.
Stepping->Repeat telegram stopped: when closing dry contact to repeat telegram stopped.
Moving->UP: when closing dry contact to up.
Moving->Down: when closing dry contact to down.
Moving->Toggle: when closing dry contact to toggle.

When opening the dry contact, setting is same to closing the contact.

---Delay for stepping of shutter (0…255s)
---Delay for Moving of shutter (0…255s)

Options: 0…255s
Set the delay time for stepping/Moving of shutter.

---Stepping telegram repeated number (1…255, 0-unlimited)

Options:
Disable
Enable
Whether repeated receive stepping telegram.
Disable: do not repeated receive stepping telegram.
Enable: repeat receiving stepping telegram.
When select enable, there are some parameters as follow.

---Stepping telegram repeated time
Options: 0.2s---60s
Set the time of stepping telegram repeated.
---Stepping telegram repeated number (1…255,0-unlimited)
   Options: 0---255

---Moving stopped telegram enabled (Adjust telegram used for stop)
   Options: Disable
   Enable

---Moving stopped telegram enabled (Adjust telegram used for stop)
   Options: 100ms, 1sec, 1min, 1hour

---Factor (1..255)->time=base*factor

---Transmit object value after bus voltage recovery
   Options: NO
   YES
   Whether transmit object value after bus voltage recovery.
   NO: do not transmit object value after bus voltage recovery.
   YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
   Options: 10ms
      100ms
      1sec
      1min
      1hour

--Factor (1…255) ->time=base*factor
   Options: 1---255
   These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.
- **Electronic switch**

![Electronic switch parameter window](image)

**Fig 9.2:** “Electronic switch” parameter window

---The normally contact status is

**Options:**
- Close
- Open

Set the dry contact status when have no operation.
- Close: the contact status is close.
- Open: the contact status is open.

---Reaction when short button operation

Set the function of short operation the dry contact.

**Options:**
- Invalid
- Stepping->Increase/STOP
- Stepping->Decrease/STOP
- Stepping->Toggle/STOP
- Moving->UP
- Moving->DOWN
- Moving->Toggle

**Invalid:** short operation dry contact is invalid.

**Stepping->Increase/Stop:** when short operation dry contact to increase/stop.

**Stepping->Decrease/Stop:** when short operation dry contact to Decrease/Stop.

**Stepping->Toggle/Stop:** when short operation dry contact to toggle/stop.

**Moving->UP:** when short operation dry contact to up.
Moving-> Down: when short operation dry contact to down.
Moving-> Toggle: when short operation dry contact to toggle.

---Reaction when long button operation
Set the function of long operation the dry contact.
Options:
Invalid
Stepping->Increase/STOP
Stepping->Decrease/STOP
Stepping->Toggle/STOP
Moving->UP
Moving->DOWN
Moving->Toggle
Press: Moving->UP, Release: Call short button
Press: Moving->DOWN, Release: Call short button
Press: Moving->Toggle, Release: Call short button

Invalid: when long operation dry contact is invalid.
Stepping->Increase/Stop: when long operation dry contact to increase/stop.
Stepping-> Decrease/Stop: when long operation dry contact to Decrease/Stop.
Stepping-> Toggle/Stop: when long operation dry contact to toggle/stop.
Moving-> UP: when long operation dry contact to up.
Moving-> Down: when long operation dry contact to down.
Moving-> Toggle: when long operation dry contact to down.
Press: Moving->UP, Release: Call short button: Pressing the dry contact to up, release the dry contact to send the value of short button.
Press: Moving->DOWN, Release: Call short button: Pressing the dry contact to down, release the dry contact to send the value of short button.
Press: Moving->Toggle, Release: Call short button: Pressing the dry contact to toggle, release the dry contact to send the value of short button.

---Long button time after
Options: 0.2s…..60s
Set the time of the long button. The range is 0.2s to 60S.

---Delay for Stepping of shutter (0…255s)
---Delay for Moving of shutter (0…255s)
Options: 0..255s
Set the delay time for Stepping/Moving of shutter.
The range is 0…255s.

---Object value inverted when receiving from bus
Options: NO
        YES
NO: when receiving the value from bus is not negated.
YES: when receiving the value from bus is negated.

---The operation time interval: base
Options: 10ms, 100ms, 1sec, 1min, 1hour
Factor (1…255) -> time = base * factor

---Delay for ON of switch (0…255s)
---Delay for OFF of switch (0…255s)
Options: 0..255s
Set the delay time for ON and OFF of switch.
The range is 0…255s.

---Stepping telegram repeated enabled
Options: Disable
        Enable
Set the enable of stepping telegram repeated.
Disable: do not repeated stepping telegram.
Enable: will repeated stepping telegram.

---Stepping telegram repeated time
Options: 0.2s—60s
Set the time of stepping telegram repeated.

---Stepping telegram repeated number (1…255, 0—unlimited)
Options: 0---255

---Moving stopped telegram enabled (Adjust telegram used for stop)
Options: Disable
        Enable
Set the enable of moving stopped telegram.
Disable: do not use moving stopped telegram.
Enable: use moving stopped telegram.

---Moving stopped telegram delay time base
Options: 1sec

---Factor (1…255) -> time = base * factor
---Moving stopped telegram enabled (Adjust telegram used for stop)
Options: 100ms, 1sec, 1min, 1hour

---Factor (1..255)->time=base*factor

---The operation time interval: base
Options: 10ms, 100ms, 1sec, 1min, 1hour

---Factor (1..255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

Selection “Flexible controller”

Fig10: “Flexible controller” parameter window
Input A as a dry contact, the function is flexible controller.

---Dry contact type
Options: Mechanical switch
Electronic switch

Dry contact has two types, the details setting as follow.
Mechanical switch

---Flexible button operation:
Set function when operation the dry contact.
Options: Invalid
  Close="toggle"
  Open="toggle"
  Close="ON"
  Open="ON"
  Close="ON", Open="ON"
  Close="OFF"
  Open="OFF"
  Close="OFF", Open="OFF"
  Close="OFF", Open="OFF"
  Close="OFF", Open="ON"

Invalid: the dry contact is invalid.
Toggle: the dry contact is toggle.
Press="ON": Press dry contact is ON.
Press="ON", Release="ON": Press and release dry contact are all on.
Press="OFF": Press dry contact is OFF.
Release="OFF": release dry contact is off.
Press="OFF", Release="OFF": Press and release dry contact are all off.
Press="ON", Release="OFF": Press dry contact is on, release is off.
Press="OFF", Release="ON": Press and release dry contact are all off.
---Transmit object value after bus voltage recovery
Options: NO  YES
Whether transmit object value after bus voltage recovery.
NO: do not transmit object value after bus voltage recovery.
YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
Options: 10ms  100ms  1sec  1min  1hour
--Factor (1…255) ->time=base*factor
Options: 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

● Electronic switch

Fig10.2: “Electronic switch” parameter window

---The normally contact status is
Options: Close  Open
Set the dry contact status when have no operation.
Close: the contact status is close.
Open: the contact status is open.
---Flexible button operation
Set the function of short operation the dry contact.

**Options:** Invalid
- Press="toggle"
- Release="toggle"
- Press ="ON"
- Release ="ON"
- Press ="ON", Release ="ON"
- Press ="OFF"
- Release ="OFF"
- Press ="OFF", Release ="OFF"
- Press ="ON", Release ="OFF"
- Press ="OFF", Release ="ON"

**Invalid:** the dry contact is invalid.

**Press=Toggle:** press the dry contact is toggle.
**Release="toggle":** release the dry contact is toggle.
**Press="ON":** Press dry contact is ON.
**Press="ON", Release="ON":** Press and release dry contact are all on.
**Press="OFF":** Press dry contact is OFF.
**Release="OFF":** release dry contact is off.
**Press=" OFF", Release=" OFF":** Press and release dry contact are all off.
**Press=" ON", Release=" OFF":** Press dry contact is on, release is off.
**Press=" OFF", Release=" ON":** Press and release dry contact are all off.

--The operation time interval: base
**Options:** 10ms
- 100ms
- 1sec
- 1min
- 1hour

--Factor (1…255) ->time=base*factor
**Options:** 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.
Selection “Scene controller”

Input A as a dry contact, the function is scene controller.

---Dry contact type

Options: Mechanical switch
Electronic switch

Dry contact has two types, the details setting as follow.

Mechanical switch

---Call scene number when closing the contact:
---Call scene number when opening the contact:
   Options: Scene NO.01
            Scene NO.02
            ......
            Scene NO.64
   Call the scene number of opening/closing the dry contact. The range is scene 1 to 64.

---Delay for call the scene when closed (0…255s):
   Options: 0…255s
   Set the delay time after closed dry contact then call scene. The range is 0…255s.

---Delay for call the scene when opened (0…255s):
   Options: 0…255s
   Set the delay time after opened dry contact then call scene. The range is 0…255s.

---Transmit object value after bus voltage recovery
   Options: NO
            YES
   Whether transmit object value after bus voltage recovery.
   NO: do not transmit object value after bus voltage recovery.
   YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
   Options: 10ms
            100ms
            1sec
            1min
            1hour

--Factor (1…255) ->time=base*factor
   Options: 1---255
   These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.
Electronic switch

---The normally contact status is

**Options**: Close
- Open
Set the dry contact status when have no operation.

**Close**: the contact status is close.

**Open**: the contact status is open.

---Call scene when short button operation

**Options**: Scene NO.01
- Scene NO.02
- ..........
- Scene NO.64
Call the scene number when short button operation the dry contact. The range is scene 1 to 64.

---Reaction when long button operation

Set the dry contact’s functions when long button operation.

**Options**: Scene dimming
- Scene saving
- Dimming and saving

---Scene dimming

**Options**: Dim-> Brighter
- Dim-> Darker
- Dim-> Brighter/Darker

**Dim->Brighter**: long button operation to increase light brightness.

**Dim->Darker**: long button operation to decrease light brightness

**Dim-> Brighter/Darker**: long button operation to increase/decrease light brightness.
✧ ---Scene saving
   Saving the scene, and the scene number is 1..64

✧ ---Dimming and Saving
   Dimming and saving together.

---Long button time after
   Options: 0.2s…..60s
   Set the time of the long button. The range is 0.2s to 60S.

---Short button operation toggled
   Options: NO
            YES

---Toggled scene of the short operation
   Options: Scene NO.01
            Scene NO.02
            ........
            Scene NO.64

---Delay for call the scene when opened (0…255s):
   Options: 0…255s
   Set the delay time after opened dry contact then call scene. Theange is 0…255s.

--The operation time interval: base
   Options: 10ms
            100ms
            1sec
            1min
            1hour

--Factor (1…255) ->time=base*factor
   Options: 1---255
   These two parameters are setting the time interval of repeat
operation dry contact, the time is base*factor.
**Selection “Sequence controller”**

---Dry contact type

**Options:** Mechanical switch
Electronic switch

Dry contact has two types, the details setting as follow.

### Mechanical switch

---Reaction when closing the contact
---Reaction when opening the contact
Set the function of the dry contact when opening/closing it.
**Options:**
- Invalid
- Toggle
  - Start with “1”
  - Stop with “0”
**Invalid:** the dry contact is invalid.
**Toggle:** when opening/closing the dry contact is a toggle.
**Start with”1”:** telegram value 1 is start.
**Stop with”0”:** telegram value 0 is stop.

---Delay for call the sequence when closed (0…255s):
**Options:** 0…255s
Set the delay time after closed dry contact then call the sequence.
The range is 0…255s.

---Delay for call the sequence when opened (0…255s):
**Options:** 0…255s
Set the delay time after opened dry contact then call the sequence.
The range is 0…255s.

---Transmit object value after bus voltage recovery
**Options:**
- NO
- YES
Whether transmit object value after bus voltage recovery.
**NO:** do not transmit object value after bus voltage recovery.
**YES:** will transmit object value after bus voltage recovery.

--The operation time interval: base
**Options:**
- 10ms
- 100ms
- 1sec
- 1min
- 1hour

--Factor (1…255) ->time=base*factor
**Options:** 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.
Fig12.2: “Electronic switch” parameter window

---The normally contact status is
- **Options**: Close
- **Open**

Set the dry contact status when have no operation.
- **Close**: the contact status is close.
- **Open**: the contact status is open.

---Reaction when short button operation
---Reaction when long button operation

Set the function of the dry contact when short/long button operation.
- **Options**: Invalid
- **Toggle**
- **Start with “1”**
- **Stop with “0”**

**Invalid**: the dry contact is invalid.
**Toggle**: when long/short operation the dry contact is a toggle.
**Start with”1”**: telegram value 1 is start.
**Stop with”0”**: telegram value 0 is stop.

---Long button time after
- **Options**: 0.2s….60s
Set the time of the long button. The range is 0.2s to 60S.

---Delay for short operation (0…255s):
---Delay for long operation (0…255s):
- **Options**: 0…255s
Set the delay time after operation dry contact. The range is 0…255s.

--The operation time interval: base
Options: 10ms
100ms
1sec
1min
1hour

--Factor (1…255) -> time = base * factor
Options: 1…255

These two parameters are setting the time interval of repeat operation dry contact, the time is base * factor.

Selection “percentage controller”

Fig13: “percentage controller” parameter window
Input A as a dry contact, the function is percentage controller.

Dry contact type
Options: Mechanical switch
Electronic switch

Dry contact has two types, the details setting as follow.
Mechanical switch

---Percentage control when closing the contact
---Percentage control when opening the contact
   Set the light level when closing/opening the dry contact.
   Options: invalid
           0%(0)—100%(255)
   Invalid: the dry contact is invalid.
   0%(0)—100%(255) : the light’s brightness.

---Delay for percentage control when closed (0…255s):
   Options: 0…255s
   Set the delay time after closed dry contact. The range is 0…255s.

---Delay for call the sequence when opened (0…255s):
   Options: 0…255s
   Set the delay time after opened dry contact. The range is 0…255s.

---Transmit object value after bus voltage recovery
   Options: NO
   YES
   Whether transmit object value after bus voltage recovery.
   NO: do not transmit object value after bus voltage recovery.
   YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
   Options: 10ms
100ms
1sec
1min
1hour

--Factor (1…255) ->time=base*factor
Options: 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

• Electronic switch

---The normally contact status is
Options: Close
   Open
Set the dry contact status when have no operation.
Close: the contact status is close.
Open: the contact status is open.

---Reaction when short button operation
---Reaction when long button operation
Options: invalid
0%(0)—100%(255)
Invalid: the dry contact is invalid.
0%(0)—100%(255) : the light's brightness.

---Long button time after
Options: 0.2s…..60s
Set the time of the long button. The range is 0.2s to 60S.
---Short button operation toggled:
  Options: NO
  YES
--Toggled brightness of the short operation
  Options: 0%(0)—100%(255)

---Long button operation toggled:
  Options: NO
  YES
--Toggled brightness of the long operation
  Options: 0%(0)—100%(255)

---Delay for short operation (0…255s):
---Delay for long operation (0…255s):
  Options: 0…255s
  Set the delay time after operation dry contact. The range is 0…255s.

--The operation time interval: base
  Options: 10ms, 100ms, 1sec, 1min, 1hour

--Factor (1…255) -> time=base*factor
  Options: 1—255
  These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

➤ Selection “Threshold controller”

![Threshold controller parameter window](image)

Fig14: “threshold controller” parameter window
Input A as a dry contact, the function is threshold controller.

--- Dry contact type
Options: Mechanical switch
Electronic switch
Dry contact has two types, the details setting as follow.

- Mechanical switch

![Parameter window](image)

--- Threshold control type when closing the contact
--- Threshold control type when opening the contact

Set the threshold control type when closing/opening the dry contact.
Options: invalid
1byte threshold
2bytes threshold
Invalid: the dry contact is invalid.
1 byte threshold: the threshold type is 1 byte. The threshold is 0...255.
2 bytes threshold: the threshold type is 2 bytes. The threshold is 0...65535.

--- Delay for threshold control when closed (0...255s):
Options: 0...255s
Set the delay time after closed dry contact. The range is 0...255s.

--- Delay for threshold control when opened (0...255s):
Options: 0...255s
Set the delay time after opened dry contact. The range is
0...255s.

---Transmit object value after bus voltage recovery
   Options: NO  YES
   Whether transmit object value after bus voltage recovery.
   NO: do not transmit object value after bus voltage recovery.
   YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
   Options: 10ms
            100ms
            1sec
            1min
            1hour
   --Factor (1...255) ->time=base*factor
   Options: 1---255
   These two parameters are setting the time interval of repeat
   operation dry contact, the time is base*factor.

● Electronic switch

---The normally contact status is
   Options: Close
            Open
   Set the dry contact status when have no operation.
   Close: the contact status is close.
   Open: the contact status is open.

Fig14.2: “Electronic switch” parameter window
---Reaction when short button operation
---Reaction when long button operation
Set the function of short operation the dry contact.
Options: invalid
1 byte threshold
2 bytes threshold
Invalid: the dry contact is invalid.
1 byte threshold: the threshold type is 1 byte. The threshold is 0…255.
2 bytes threshold: the threshold type is 2 bytes. The threshold is 0…65535.

---Long button time after
Options: 0.2s…..60s
Set the time of the long button. The range is 0.2s to 60S.

---Short button operation toggled:
Options: NO
YES
--Toggled threshold (0…65535) of the short operation
Options: 0—65535

---Long button operation toggled:
Options: NO
YES
--Toggled threshold (0…255) of the long operation
Options: 0…255

---Delay for short operation (0…255s):
---Delay for long operation (0…255s):
Options: 0…255s
Set the delay time after operation dry contact. The range is 0…255s.

--The operation time interval: base
Options: 10ms
100ms
1sec
1min
1hour

--Factor (1…255) ->time=base*factor
Options: 1---255
These two parameters are setting the time interval of repeat
operation dry contact, the time is base*factor.

**Selection “String(14bytes) controller”**

---Dry contact type

**Options:**
- Mechanical switch
- Electronic switch

Dry contact has two types, the details setting as follow.

- Mechanical switch

---Fig15: “String (14bytes) controller” parameter window
Input A as a dry contact, the function is string (14bytes) controller.

---Fig15.1: “Mechanical switch” parameter window
---String (max 14bytes) sended when closing the contact
--- String (max 14bytes) sended when opening the contact
Set the string sended when closing/opening the dry contact. The string Max. length is 14bytes

---Delay for send when closed (0…255s):
---Delay for send when opened (0…255s):
   Options: 0…255s
Set the delay time after closed/opened dry contact. The range is 0…255s.

---Transmit object value after bus voltage recovery
   Options: NO
           YES
Whether transmit object value after bus voltage recovery.
   NO: do not transmit object value after bus voltage recovery.
   YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
   Options: 10ms, 100ms, 1sec, 1min, 1hour

--Factor (1…255) ->time=base*factor
   Options: 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

● Electronic switch

Fig15.2: “Electronic switch” parameter window
--- The normally contact status is
   Options: Close
          Open
   Set the dry contact status when have no operation.
   Close: the contact status is close.
   Open: the contact status is open.

--- String (max 14 bytes) sended when short button operation
--- String (max 14 bytes) sended when long button operation
   Set the string sended when short/long button operation the dry contact. The string Max. length is 14 bytes

--- Long button time after
   Options: 0.2s…..60s
   Set the time of the long button. The range is 0.2s to 60s.

--- Delay for short operation (0…255s):
--- Delay for long operation (0…255s):
   Options: 0…255s
   Set the delay time after operation dry contact. The range is 0…255s.

-- The operation time interval: base
   Options: 10ms
            100ms
            1sec
            1min
            1hour
-- Factor (1…255) -> time = base * factor
   Options: 1---255
   These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.
### Selection “Forced position controller”

<table>
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<th>Value</th>
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<td>Dry contact sensor</td>
</tr>
<tr>
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<td>Enable</td>
</tr>
</tbody>
</table>

**Function selection:** Forced position controller

**Dry contact type:**
- Mechanical switch
- Electronic switch

**Options:**
- Value sent when closing the contact
- Value sent when opening the contact
- Transmitted value (ON/OFF)
- Delay to send when closed (0-255s)
- Delay to send when opened (0-255s)
- Transmit object value after bus voltage recovery
- The operation time interval base

**Dry contact type** (Mechanical switch)

**Value sent when closing the contact**

**Value sent when opening the contact**

---

**Fig16:** “Forced position controller” parameter window

**Input A as a dry contact, the function is forced position controller.**

**Dry contact type**
- Options: Mechanical switch
- Electronic switch

**Dry contact has two types, the details setting as follow.**

**Mechanical switch**

**Fig16.1:** "Mechanical switch" parameter window

---

**Value sent when closing the contact**

**Value sent when opening the contact**
Set the value sent when closing/opening the dry contact.

**Options:**
- Invalid
- 2 bits value
- 1 byte value (0…255)
- 2 bytes value (-32768…32767)
- 2 bytes value (0…65535)
- 2 bytes value (Float)
- 4 bytes value (0…2147483647)

**Invalid:** the dry contact is invalid.

**2 bits value:** 2 bits value sent when closing/opening the dry contact.

--- Transmitted value (ON/OFF)

**Options:**
- ON->control
- OFF->control
- NO control

**On-> control:**
- OFF->control:
- NO->control

**2 bytes value (-32768…32767):** -32768…32767 sent when closing/opening the dry contact.

**2 bytes value (0…65535):** 2 bytes value (0…65535) sent when closing/opening the dry contact.

**2 bytes value (Float):** -100…100 value sent when closing/opening the dry contact.

**4 bytes value (0…2147483647):** 0…2147483647 sent when closing/opening the dry contact.

--- Delay for send when closed (0…255s):
--- Delay for send when opened (0…255s):

**Options:** 0…255s
Set the delay time after closed/opened dry contact. The range is 0…255s.

--- Transmit object value after bus voltage recovery

**Options:**
- NO
- YES
Whether transmit object value after bus voltage recovery.

**NO:** do not transmit object value after bus voltage recovery.

**YES:** will transmit object value after bus voltage recovery.
--The operation time interval: base
   Options: 10ms
            100ms
            1sec
            1min
            1hour

--Factor (1...255) -> time = base * factor
   Options: 1---255
   These two parameters are setting the time interval of repeat operation dry contact, the time is base * factor.

- Electronic switch

---The normally contact status is
   Options: Close
            Open
   Set the dry contact status when have no operation.
   Close: the contact status is close.
   Open: the contact status is open.

---Value when short button operation
--- Value when long button operation
   Set the value sended when short/long button operation the dry contact.
   Options: Invalid
            2 bits value
            1byte value (0...255)
2bytes value(-32768…32767)
2bytes value(0…65535)
2bytes value(Float)
4bytes value(0…2147483647)

**Invalid:** the dry contact is invalid.

**2 bits value:** 2 bits value sent when closing/opening the dry contact.

--- Transmitted value(ON/OFF)
Options: ON->control
        OFF->control
        NO control

On-> control
OFF->control
NO->control

2bytes value(-32768…32767): -32768…32767 sednded when closing/opening the dry contact.

2bytes value(0…65535): 2bytes value(0…65535) sednded when closing/opening the dry contact.

2bytes value(Float): -100…100 value sednded when closing/opening the dry contact.

4bytes value(0…2147483647): 0…2147483647 sednded when closing/opening the dry contact.

---Long button time after
Options: 0.2s……60s
Set the time of the long button. The range is 0.2s to 60S.

---Delay for short operation (0…255s):
---Delay for long operation (0…255s):
Options: 0…255s
Set the delay time after operation dry contact. The range is 0…255s.

--The operation time interval: base
Options: 10ms
        100ms
        1sec
        1min
        1hour

--Factor (1…255) ->time=base*factor
**Options:** 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

- **Selection “Counter controller”**

![Counter controller parameter window](image)

**Fig17:** “Counter controller” parameter window
Input A as a dry contact, the function is counter controller.

--- **Pulse detection**
**Options:** Closing contact (falling edge)
Opening contact (rising edge)
Closing (falling edge) and Opening (rising edge)

**Closing contact (falling edge):** when the falling edge count.
**Opening contact (rising edge):** when the rising edge count.
**Closing (falling edge) and Opening (rising edge):** falling edge and rising edge all count.

--- **Divider set: number of pulse for one counter step (1…65535)**
**Options:** 1…65535
Set the number of pulses counted once, the range is 1…65535.

--- **Data width of counter**
**Options:** 1 byte (0…255)
2 bytes (0…65535)
4 bytes (0…2147483647)

Set the width of counter.
**1 byte (0…255):** the width of counter is 0…255.
**2 bytes (0…65535):** the width of counter is 0…65535.
**4 bytes (0…2147483647):** the width of counter is...
When the data width of counter is 1byte:

---Counter end of (0…255)
Set the end of count. The end counter is 0…255.
2bytes end counter is 0…65535.
4bytes end counter is 0…2147483647.

---Enable set counter end via bus
Whether set end counter via bus.
Options: Enable
    Disable
Enable: you can set end counter via bus.
Disable: you can’t set end counter via bus.

---Enable set counter value (<=end) via bus
Whether set start counter via bus.
Options: Enable
    Disable
Enable: you can set start counter via bus.
Disable: you can’t set start counter via bus.

--- Transmit counter to bus
Options: Don’t transmission
    Transmit every counter
    Transmit counter cyclically
Don’t transmission: every counter don’t transmission.
Transmit every counter: every counter do transmission.
Transmit counter cyclically:

---Counter value transmitted time : base
---Factor(1…255)->time=base* factor
These two parameters are setting the time counter value transmitted, the time is base*factor.
---Counter Transmited number (1…255,0-unlimited)
---Overflow set: Reset
  Reset and Alarm
  Stop
  Stop and Alarm
Reset: overflow set will reset counter.
Reset and Alarm: overflow set will reset counter and alarm.
Stop: overflow set will stop counter.
Stop and Alarm: overflow set will stop and alarm.

--Transmit object value after bus voltage recovery

--The operation time interval: base
Options: 10ms
  100ms
  1sec
  1min
  1hour

--Factor (1…255) -> time = base * factor
Options: 1---255
These two parameters are setting the time interval of repeat operation dry contact, the time is base * factor.

<table>
<thead>
<tr>
<th>Divider number</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td>+1</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

| 2              | +1     |
|                | +1     |
|                | +1     |
|                | +1     |
| 3              | +1     |
|                | +1     |
| 2              |
Selection “Combination controller”

**Mechanical switch**

---Delay for send when closed (0…255s):
---Delay for send when opened (0…255s):
   Options: 0…255s
   Set the delay time after closed/opened dry contact. The range is 0…255s.

---Transmit object value after bus voltage recovery
   Options: NO
          YES
   Whether transmit object value after bus voltage recovery.
   NO: do not transmit object value after bus voltage recovery.
   YES: will transmit object value after bus voltage recovery.

--The operation time interval: base
   Options: 10ms
         100ms
         1sec
         1min
         1hour
--Factor (1…255) ->time=base*factor
   Options: 1---255
   These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

Reaction when closing the contact: ON closing
   --Object type 1(closing operation)
   --Object type 1(closing operation)
   .......
   --Object type 10 (closing operation)
   ✷ Options: Invalid
      Switch controller
      Shutter controller
      Scene controller
      Sequence controller
      Percentage controller
      Threshold controller
      14byte value controller (string)
   This mode is that closing dry contact can control several objects. if set some these items, and when closing dry contact that can send several control telegram simultaneously.

   Opening dry contact’s setting is same as left button.
● Electronic switch

Fig18.2: “Electronic switch” parameter window

---The normally contact status is
Options: Close
Open
Set the dry contact status when have no operation.
Close: the contact status is close.
Open: the contact status is open.

---Long button time after
Options: 0.2s…..60s
Set the time of the long button. The range is 0.2s to 60S.

---Delay for short operation (0…255s):
---Delay for long operation (0…255s):
Options: 0…255s
Set the delay time after operation dry contact. The range is 0…255s.

--The operation time interval: base
Options: 10ms
100ms
1sec
1min
1hour

--Factor (1…255) ->time=base*factor
Options: 1---255
These two parameters are setting the time interval of repeat
operation dry contact, the time is base*factor.

Reaction when short button: ON short
--Object type 1(short operation)
--Object type 1(short operation)
......
--Object type 10 (short operation)
◇ Options: Invalid

Switch controller
Shutter controller
Scene controller
Sequence controller
Percentage controller
Threshold controller
14byte value controller (string)

This mode is that short button operation dry contact can control several objects. If set some these items, and when short button operation dry contact that can send several control telegram simultaneously.

Long button operation dry contact’s setting is same as left button.

3.2.2 Work mode "Logical controller"

![Fig19: "logical controller" parameter window](image)

--System delay (2…255s) after bus voltage recovery
The device will be delay for 2..255s after the power on. The default value is 2 seconds. The Min. value is 2 seconds, and the
max. value is 255 seconds.

**Options:** 2…255s

--Heartbeat telegram (1…65535s, 0-invalid)
The range of the parameter is 0 to 65535s. 0 is that the function is invalid, other of parameter enable this function

**Options:** 0…65535s

The parameter set to nonzero, Device will send a telegram data cyclically when time out. Send the value alternately between 0 and 1.
This function use or not decided by user.

-> Temperature Quiver: < (threshold – n) or >(threshold +n) on out range)
Temperature within the effective range, when changes in the set range, the status does not change.
When the temperature changes greater than n, the status will change. The quiver range beteen threshold – n and threshold or between threshold and threshold +n.

**Options:** 0…10C

--Channel A: LED output (0…2V)
LED output’s setting.

**Options:** NO

**YES**

**NO:** output A is invalid.

**YES:** select this one you can set to output A’s parameter.
The setting as follows.
Output A, B, C, D’s setting are the same.

Output A function: LED status indication

--LED functionality
Set output A’s function. There are 2 functions, switch status ON/OFF and flashing.

Options: Switch status ON/OFF
          Flashing

Switch status ON/OFF: the function is the status of input A.
Flashing: output A is flashing.

The detail settings are as follow.
Switch status ON/OFF:

Fig21: “Switch state ON/OFF” parameter window

---Maximum drive voltage of LED(100%)
Set the maximum drive voltage of LED. The range is 1V to 10V.
Options: 1V-10V

---Default ON brightness of LED
Set the default brightness of LED. The range is 10% to 100%.
Options: 10%---100%(255)

---LED control mode
Set the control mode of LED.
Options: Local status
Via bus(1 bit-operation and 1 byte-Brightness)
Local status: The LED controlled by local status.
Via bus: the LED controlled by the telegram via bus.

---Change ON brightness via bus
Set the enable of change on brightness via bus.
Options: NO
YES
NO: you can’t change brightness via bus.
YES: you can change brightness via bus.

--LED status(1 bit ) response
Set the response of LED status.
Options: Invalid
1 bit always response
1 bit only changed
1 bit always response: it’s always response.
1 bit only changed: it’s response when status changed.
--LED status(1 byte ) response
  Options: Invalid
  1 byte always response
  1 byte only changed
  1 byte always response: it’s always response.
  1 byte only changed: it’s response only when status changed.

--- LED indication
  Options: ON if value>="1", else OFF
  ON if value is "0", else OFF
  Always ON
  Always OFF
  ON if value>="1", else OFF: the value>="1", LED state is ON, else LED state is OFF.
  ON if value is "0", else OFF: the value is 0, LED state is ON, else LED state is OFF.
  Always ON: LED state is always on.
  Always OFF: LED state is always OFF.

--- LED automatically darker delay time: base
  Set the delay time’s base.
  Options: 100ms, 1sec, 1min 1hour

--- Factor(1…255)->time = base* factor
  Options: 1…255
  Set the delay time, this time is options value* base. After this time, LED automatically darkens the setting value.

--- LED States after bus voltage recovery
  Options: unchanged
  OFF
  ON
  Set to LED state after bus voltage recovery.
Selection “Flashing”

Fig22: “Flashing” parameter window
LED State is flashing. Flashing parameter’s setting as follows.

---Maximum drive voltage of LED (100%)
Set the maximum drive voltage of LED. The range is 1V to 10V.
Options: 1V-10V

---Default ON brightness of LED
Set the default brightness of LED. The range is 10% to 100%.
Options: 10%---100%(255)

---LED control mode
Set the control mode of LED.
Options: Local status
Via bus(1 bit-operation and 1 byte-Brightness)
Local status: The LED controlled by local status.
Via bus: the LED controlled by the telegram via bus.

---Change ON brightness via bus
Set the enable of change on brightness via bus.
Options: NO
YES
NO: you can’t change brightness via bus.
YES: you can change brightness via bus.

--LED status (1 bit) response
Set the response of LED status.
Options: Invalid
1 bit always response
1 bit only changed
1 bit always response: it's always response.
1 bit only changed: it's response when status changed.

--LED status(1 byte ) response
    Options: Invalid
    1 byte always response
    1 byte only changed
1 byte always response: it's always response.
1 byte only changed: it's response only when status changed.

--- LED indication
    Options: Flashing if value>"1", else stop
    Flashing if value is "0", else stop
    Always flashing
Flashimg if value>"1", else OFF: the value>"1", LED state is flashing, else LED state is no flashing.
flashing if value is "0", else OFF: the value is 0, LED state is flashing, else LED state is OFF.
Always flashing: LED state is always flashing.

---Duration time for brightness : base
Set the delay time's base.
    Options: 100ms, 1sec, 1min 1hour

---Factor(1…255)->time = base* factor
    Options: 1…255
Set the delay time, this time is options value* base. After this time, LED automatically reaches the setting brightness value.

---Duration time for darkness: base
Set the delay time’s base.
    Options: 100ms, 1sec, 1min 1hour

---Factor(1…255)->time = base* factor
    Options: 1…255
Set the delay time, this time is options value* base. After this time, LED automatically darkens the setting value.

---Flashing time limit
Set the time of flashing, after this time the LED will stop flashing
--- LED States after bus voltage recovery

**Options:** OFF

ON

Set to LED state after bus voltage recovery.

### 3.2.2.2 Logic function A

--- *Enable logical block A*

**Options:** Disable

Enable

Disable: the logical block A is invalid.

Enable: you can set logic block A’s function.

--- *Input detection*

“Input A” as a logical condition.

**Options:** Disable

Dry contact sensor

Temperature sensor

Disable: “input A” not as a logical condition.

**Dry contact sensor:** input A’s work mode is dry contact sensor.

**Temperature sensor:** input A’s work mode is temperature sensor.
Temperature compensation (-5C…+5C)

When input detection is dry contact sensor

- The normally contact status is
  - Options: Open, Close
  - Set the dry contact status when have no operation.
  - Close: the contact status is close.
  - Open: the contact status is open

>> Status when short button operation
>>Status when long button operation

Options: Invalid
   True
   False
   Toggle

These 2 parameters are about logic conclusion when button operation.

--Long button time after
Options: 0.2s…..60s
   Set the time of the long button. The range is 0.2s to 60S.

--The status after bus voltage recovery
Options: Invalid
   True
   False
   Toggle

Set the logic conclusion after bus voltage recovery.

>>Dry contact status report
Options: NO
   YES

Whether to report the status of dry contact.

The dry contact sensor is mechanical switch, you need set parameters as follow.

<table>
<thead>
<tr>
<th>Dry contact type</th>
<th>Mechanical switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;&gt;Status when closing the contact</td>
<td>True</td>
</tr>
<tr>
<td>&gt;&gt;Status when opening the contact</td>
<td>False</td>
</tr>
<tr>
<td>&gt;&gt;Dry contact status report</td>
<td>No</td>
</tr>
</tbody>
</table>

>>Status when closing the contact
>>Status when opening the contact

Options: Invalid
   True
   False
   Toggle

These 2 parameters are about logic conclusion when button operation.

>>Dry contact status report
Options: NO
YES

Whether to report the status of dry contact

---Enable external telegram<1>:
External telegram <1> as a logical condition.

Options: Disable
1 bit value (‘1’/’0’)
1 byte threshold (0…255)
2 bytes threshold (0…65535)
2 bytes float threshold (-50…50)
4 bytes threshold (0…2147483647)

Disable: External telegram <1> is invalid.

1 bit value (‘1’/’0’): when external telegram is 1 bit value, the logical is true or false.

->Default status after bus voltage recovery: set the status is true or false after voltage recovery.

2 bytes threshold (0…65535): external telegram is 2 bytes threshold, the setting as follows.

->1byte threshold (0…255): set the threshold, the range is 0…255.

->Extern telegram status:
Options: True if REV value >= threshold, else False
True if REV value <= threshold, else False

True if REV value >= threshold, else False: when extern telegram value >= threshold, the logical is true, else is false.

True if REV value <= threshold, else False: when extern telegram value <= threshold, the logical is true, else is false.

->Default status after bus voltage recovery: set the status is true or false after voltage recovery.

2 bytes threshold (0…65535)
2 bytes float threshold (-50…50)
4 bytes threshold (0…2147483647)

These 3 external telegram types’ settings are same as above settings.
---Enable external telegram<2>
---Enable external telegram<3>
---Enable external telegram<4>
---Enable external telegram<5>

The settings are same as “Enable external telegram<1>”.

---Logical relation of Block A
Options: AND
   OR

---Result of logic A inverted
Whether the results of the logic to be negated
Options: NO
   YES

3.2.2.3 Block A

Fig24: "Block A" parameter window

This parameter window is setting the targets type when logic A is true.

---Object output 1(to bus)
Options: Invalid
Switch controller
Alarm controller
Shutter controller
Scene controller
Sequence controller
Percentage controller
Threshold controller
String (14 bytes) controller

There are 9 kinds of the target type, the details setting as below.
The default is invalid

**Switch controller**

![Fig24.1: “A1:Switching” parameter window](image)

**The status after bus voltage recovery:**

- **Options:** Invalid
- ON
- OFF
- Recovery

When power on and the bus voltage recovery, this function will be executed. Four selection will be available as following:

**Recovery:** After bus voltage recovery, the channel switch position will be back to the state of the power-down previous.

- **ON:** The channel position will switch ON after bus voltage recovery.
- **OFF:** The channel position will switch OFF after bus voltage recovery.
- **Recovery:** The channel switch position recovery the status of before bus voltage recovery.

**Logical block output when true:**

- **Options:** Invalid
- ON
- OFF
- Toggle
**Alarm**

Fig 24.2: “A1: Alarm” parameter window

->The status after bus voltage recovery:
   Options: Invalid
   Alarm
   No alarm
   Recovery
   According to logical status

->Logical block output when TRUE:
   Options: Invalid
   Alarm
   No alarm
   Toggle

->Time delay for logical block when TRUE (0…65535):
   Options: 0…65535

->Logical block output when FALSE:
   Options: Invalid
   Alarm
   No alarm
   Toggle

->Time delay for logical block when FALSE (0…65535):
   Options: 0…65535
**Shutter controller**

**Fig24.3:** “A1: Shutter” parameter window

-> **The status after bus voltage recovery:**
   - Options: Invalid
     - UP
     - DOWN
     - Recovery
     - According to logical status

-> **Logical block output when TRUE:**
   - Options: Invalid
     - Toggle
     - UP
     - DOWN

-> **Time delay for logical block when TRUE(0…65535):**
   - Options: 0…65535

-> **Logical block output when FALSE:**
   - Options: Invalid
     - Toggle
     - UP
     - DOWN

-> **Time delay for logical block when FALSE (0…65535):**
   - Options: 0…65535
Scene

Fig24.4: “A1: Scene” parameter window

- The status after bus voltage recovery:
  Options: Invalid
  Defined scene
  Recovery
  According to logical status

- Logical block output when TRUE:
  Options: Invalid
  Scene NO.01
  ....
  Scene 64

- Time delay for logical block when TRUE (0…65535):
  Options: 0…65535

- Logical block output when FALSE:
  Options: Invalid
  Scene NO.01
  ....
  Scene 64

- Time delay for logical block when FALSE (0…65535):
  Options: 0…65535
Sequence

Fig24.5: “A1: Sequence” parameter window

- The status after bus voltage recovery:
  Options: Invalid
  Start
  Stop
  Recovery
  According to logical status

- Logical block output when TRUE:
  Options: Invalid
  Toggle
  Start
  Stop

- Time delay for logical block when TRUE (0…65535):
  Options: 0…65535

- Logical block output when FALSE:
  Options: Invalid
  Toggle
  Start
  Stop

- Time delay for logical block when FALSE (0…65535):
  Options: 0…65535
Fig24.6: “A1: Percentage” parameter window

- **The status after bus voltage recovery:**
  Options: Invalid
  Defined percentage
  Recovery
  According to logical status

- **Logical block output when TRUE:**
  Options: Invalid
  0%(0)…100%(255)

- **Time delay for logical block when TRUE (0…65535):**
  Options: 0…65535

- **Logical block output when FALSE:**
  Options: Invalid
  0%(0)…100%(255)

- **Time delay for logical block when FALSE (0…65535):**
  Options: 0…65535
Threshold

Fig24.7: “A1: Threshold” parameter window

- Threshold control type:
  Options: 1 byte threshold
            2 bytes threshold

- The status after bus voltage recovery:
  Options: Invalid
            Defined threshold
            Recovery
            According to logical status

- TRUE is valid?
  Options: NO
           YES

  block output when TRUE:
  Options: Invalid
           Toggle
           Start
           Stop

- Time delay for logical block when TRUE(0…65535):
  Options: 0…65535

- Logical block output when FALSE:
  Options: Invalid
           Toggle
           Start
           Stop
->Time delay for logical block when FALSE (0…65535):
   Options: 0…65535

Fig25: “Block E” parameter window

3.2.3 Work mode “Dimming controller”

Fig26: “Dimming controller” parameter windows

--System delay (2…255s) after bus voltage recovery
   The device will be delay for 2..255s after the power on. The
default value is 2 seconds. The Min. value is 2 seconds, and the
max. value is 255 seconds.
   Options: 2…255s

--Heartbeat telegram (1…65535s,0-invalid)
The range of the parameter is 0 to 65535s. 0 is that the function is invalid, other of parameter enable this function.

**Options: 0…65535s**

The parameter set to nonzero, Device will send a telegram data cyclically when time out. Send the value alternately between 0 and 1. This function use or not decided by user.

-> **Temperature Quiver: < (threshold – n) or >(threshold +n) on out range**

Temperature within the effective range, when changes in the set range, the status does not change. When the temperature changes greater than n, the status will change. The quiver range beteen threshold – n and threshold or between threshold and threshold +n.

**Options: 0…10C**

--**Enable sequence 1**

**Options: Disable**

Enable

Set the enable of wequence1, if you choose Enable, you’ll set some parameters as follow.
3.3.3.1 G: sequence 1

---Operation mode of the sequence 1
Set the operation mode.
Options: Start with “1”, Stop with “0”
Start with “0”, Stop with “1”
Start with “1/0”, can’t stop
Start with “1”, Stop with “0”: When receives “1”, then run sequence 1, When receives 0, then stop sequence 1.
Start with “0”, Stop with “1”: when receives 0, then run sequence 1, When receives 1, then stop sequence 1.
Start with “1/0”, can’t stop: Both receive 1 or 0, start the sequence 1.

---Control mode of the sequence 1
Set the control mode.
Options: FWD
REW
Random
FWD: Forward mode
REW: Back work mode
RANDOM: Random mode

---Running mode of the sequence 1
Set the running mode.
Options: Single
Cycle
Single: Run only ones.
Cycle: Cycle run.

---Running time (0…255 hours, 0h&0m-unlimited)
Set the sequence running time.
**Options:** 0-255

---Running time (0…59mins, 0h&0m-unlimited)
Set the sequence running time. The longest time is 59mins.
**Options:** 0-59

**Note:** Unlimited when the time set to 0h&0m.

---Position after time out
If the sequence running in Cycle mode, and is run time greater than zero, After time out, the sequence will back to this set position.

**Total 24steps, configuration as following:**

---Step 1 configuration
**Options:** invalid
Scene NO.01
...
Scene NO.64

---Time for step 1 (0…65535s)
Set the time for the step. The longest time is 65535s.

---Time for step 1 (0…999ms)
Set the time for the step. The longest time is 999ms.
Set of other steps is same as the step 1.

### 3.2.3.2 Channel A

![Fig28: “Channel A” parameter windows](image)
---Input A detection
Set the input A detection's type.

Options: No detection
Dry contact sensor
Temperature sensor

No detection: Input A is invalid.

Dry contact sensor: Input A is a dry contact sensor.
If you select this type, the settings below will appear.

---Dry contact type:
Options: Mechanical switch.
Electronic switch

Mechanical switch

---Reaction when closing the contact
---Reaction when opening the contact

Options: Unchanged
ON
OFF
Toggle
Dim-> Brighter
Dim-> Darker
Dim-> Brighter/Darker
Dim-> Stop

Invalid: the dry contact is invalid.

Dim->Brighter: when operation the dry contact will increase brightness.

Dim->Darker: when operation the dry contact will decrease brightness.

Dim-> Brighter/Darker: when operation the dry contact will increase/decrease brightness.

Dim->Stop: when closing the dry contact will stop.

---The operation time interval: base
Factor (1…255) -> time = base * factor

These two parameters are setting the time interval of
repeat operation dry contact, the time is base*factor.
**Options:** 10ms, 100ms, 1sec, 1min, 1hour
Factor (1…255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

- **Electric switch**

![Image of Electric switch configuration]

The dry contact type is electronic switch

--- The normally contact status is
**Options:** Close
Open
Set the dry contact status when have no operation.
Close: the contact status is close.
Open: the contact status is open

--- Reaction when short button operation
--- Reaction when long button operation
**Options:** invalid
Unchanged
ON
OFF
Toggle
These 2 parameters are about reaction when button operation.

--- Long button time after
**Options:** 0.2s…60s
Set the time of the long button. The range is 0.2s to 60S.

--- The operation time interval: base
**Options:** 10ms, 100ms, 1sec, 1min, 1hour
Factor (1…255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

--- The response of channel status (1 bit)
**Options:** Invalid
1 bit always response
1 bit only changed
1 bit always response: it always response,
If the channel is ON, then response 1
If the dimmer is OFF, response 0
1 bit only changed: it will be response when the dimmer state was changed

---The response of channel status (1 byte)
Options: Invalid
1 byte always response
1 byte only changed
1 byte always response: it always response of the light level value.
1 byte only changed: it will be response when the light value was changed.

---Synchronization control relay (Channel brightness>0 is ON, else OFF)
Options: NO
YES

---Statistics total ON time to allow (0..65535h =7.4years)
This function is used to calculate the total ON time for channel output, The maximum time is 65535h. This function is very useful, Because can know channel work status through this function.
Options: Disable
Enable
Disable: don’t timing.
Enable: Statistics time.

---Alarm when time out (1…65535h,0-invalid)
When the device's operating time arrive the setting value will alarm.
The value rang is 1…65535h, 0 is invalid.
---Transmit telegram interval when alarm
Set the alarm time interval.

---The status after bus voltage recovery
Set the status of restore mode after power on for each channel.
Options: OFF
- Defined brightness value
- Last brightness value
*Off*: After power on and the channel’s status is off.
*Defined brightness value*: After power on and the channel’s status is defined brightness value
*Last brightness value*: After power on and the channel’s status is last brightness value

---Brightness value
Set the brightness value.

---Maximum level
Set the maximum level.
*Options*: 0%(0)-100%(255)

---Upper threshold level
Set the upper threshold level.
*Options*: 0%(0)-100%(255)

---Lower threshold level
Set the lower threshold level.
*Options*: 0%(0)-100%(255)

---Dimming minimum level
Set the dimming minimum level.
*Options*: 0%(0)-100%(255)

---Show the function page== >>
Set the enable and show the function page.

*Options*: Disable
- Enable

*Disable*: Don’t show the function page about dimmer.
*Enable*: Show the function page, the page is set the function about dimmer.
3.2.3.3 Dimming config

---Switching ON fade time (0…255s)
Set the time for switch ON.

Note: brightness 0%...100%/0..255s

---Switching OFF fade time (0…255s)
Set the time for switch OFF.

Note: brightness 0%...100%/0..255s

---Enable relative dimming
Options: Disable
  Enable

Disable: No allow to relative dimming
Enable: Allow to relative dimming

Note: Relative dimming fade time (brightness 0%...100%/0..255s), the data length is 4bits

---Enable absolute dimming
Options: Disable
  Enable

Disable: No allow to absolute dimming
Enable: Allow to absolute dimming

Note: Absolute dimming fade time (brightness 0%...100%/0..255s), the data length is 1byte

Fig29: “Dimming config” parameter windows
A: function

---Enable function “staircase light”
---Enable function “flashing”
---Enable function “scene”
---Enable function “threshold”
---Enable function “heating”

A: function “staircase light”

For staircase application
---Staircase lighting operation
Options: Start with “1”, stop with “0”
        Start with “1”, invalid with “0”
        Start with “1/0”, can’t stop

Start with “1”, stop with “0”: When receive data 1 and the staircase light start run automatic, stop with time out or stop with 0.
Start with “1”, invalid with “0”: When receive data 1 and the staircase light start run automatic, 0 is invalid.
Start with “1/0”, can’t stop: When receive data 1/0 and the staircase light start run automatic, Can’t stop.

---Brightness value
Set the brightness value of staircase light.

---Fade time of brighter: (0...255s)
Fade seconds in the brighter state.

---Fade time of darker: (0...255s)
Fade seconds in the darker state.

---Duration time for brightness: base
Duration minutes in the brightness state.
Options: 1sec, 1min, 1hour
Factor(1..255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

---Change staircase lighting time via bus
Options: Disable
        Enable

Disable: Can’t modify staircase lighting delay off time via bus, only can be set by database.
Enable: allow modify staircase lighting delay off time via bus by user.

---Alarm staircase light via bus
Options: NO
        YES
NO: Prohibition Alarm.
YES: allow alarm via bus by user.

➢ A: function “flashing”

---Flashing operation
This function has three Control modes.

Options: Start with “1”, stop with “0”
Start with “1”, invalid with “0”
Start with “1/0”, can’t stop

Start with “1”, stop with “0”: Start flashing with 1 and stop flashing with 0.
Start with “1”, invalid with “0”: Start flashing with 1 and invalid with 0.
Start with “1/0”, can’t stop: Start flashing with 1 or 0, can’t stop.

---Brightness value: 0%...100%
Set the brightness value.

---Fade time of brighter: (0...255s)
Fade seconds in the brighter state.

---Fade time of darker: (0...255s)
Fade seconds in the darker state.

---Duration time for brightness: base
Duration minutes in the brightness state.

Fig30.2: “Flashing” parameter windows
Flashing between ON and OFF in this mode.
Options: 1sec, 1min, 1hour
-Factor(1..255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

---Duration time for darkness: base
Duration minutes in the darkness state.
Options: 1sec, 1min, 1hour
-Factor(1..255)->time=base*factor
These two parameters are setting the time interval of repeat operation dry contact, the time is base*factor.

---Duration time for darkness: (0...255 Min)
Duration minutes in the darkness state.

---Flashing number (0...255, 0-Unlimited)
The number of flashing, range between 0 and 255. 0 is unlimited.

---Brightness after achieves the flashing number
Set the brightness after achieves the flashing number, the range is 0%(0)...100% (255).

A: function “scene”

---Fade time of scene dimming: (0...255s)
Fade seconds in the brighter state.
Total 10 scenes, configuration as following, the setting like below.

Each scene is same as following:
---Output assigned to(scene 1..64)
Allocate the scene.

---Output brightness value
Set the output brightness value 0%..100%

---Fade time for brighter/darker (0…255s)
Set the time for brighter or darker.

A: function “threshold”

---Brightness value for switch ON of threshold
Config the brightness for the switch ON

---Fade time for switch ON of threshold (0…255s)
Config the time for switch ON

---Fade time for switch OFF of threshold (0…255s)
Config the time for switch OFF

---Threshold input type
Options: 1 byte threshold
2 bytes threshold
Set the type of threshold input.
---Threshold 1 value is (0…255)
Set threshold 1 value between 0 and 255. Default is 80.

---Threshold 2 value is (0…255)
Set threshold 2 value between 0 and 255. Default is 180.

---Input object value<Lower threshold
If the value of receiving telegram from bus lower than the minimum threshold value, the switch will action according to below option (ON or OFF or no Unchange)

Options: Unchange
  ON
  OFF

Unchange: The channel switch position no changed.
ON: The channel switch position set to ON.
OFF: The channel switch position set to OFF

---Lower threshold<=Input value<=Upper threshold
If the value of receiving telegram from bus between Lower threshold and Upper threshold, the switch will action according to below option (ON or OFF or no action)

Options: Unchange
  ON
  OFF

Unchange: The channel switch position no changed.
ON: The channel switch position set to ON.
OFF: The channel switch position set to OFF

---Input value>Upper threshold
If the value of receiving telegram from bus more than the upper threshold value, the switch will action according to below option (ON or OFF or no action)

Options: Unchange
  ON
  OFF

Unchange: The channel switch position no changed.
ON: The channel switch position set to ON.
OFF: The channel switch position set to OFF
---Change threshold 1 via bus
Options: Disable
Enable
Disable: No allow to change the threshold 1 value from bus.
Enable: Allow to change the threshold 1 value from bus.

---Change threshold 2 via bus
Options: Disable
Enable
Disable: No allow to change the threshold 2 value from bus.
Enable: Allow to change the threshold 2 value from bus.

A: function “heating”

![Image of parameter windows]

---Brightness value for switch ON of heating
Config the brightness for the switch ON

---Fade time for switch ON of heating (0…255s)
Config the time for switch ON

---Fade time for switch OFF of heating (0…255s)
Config the time for switch OFF

---PWM cycle time set: base
Options: 1sec, 1min, 1hour
-Factor(1..255)->time=base\*factor
These two parameters are setting the PWM cycle time of repeat operation dry contact, the time is base\*factor.

---Control telegram is received as
Type of control can be control as 1bit or 1byte.

Options: 1bit PWM(1-start/0-stop)
1byte(255-switch ON/0-switch OFF/ other valve)

1bit PWM(1-start/0-stop): The PWM start and switch ON by the value of receiving telegram “1”, and stop by “0”.

1byte(255-ON/0-OFF/other valve): the switch ON always by the value of receiving telegram “255”, the switch OFF by the value of receiving telegram “0”. The PWM runs and pulse width of PWM is set according to the value of receiving telegram (1 to 254 )

---The scale of ON
This parameter will set the valve of the PWM (pulse width).
Options: 0%(OFF)
10%(26)
20%(51)
30%(77)
40%(102)
50%(128)
60%(153)
70%(179)
80%(204)
90%(230)
100%(ON)

--- Running automatically after bus voltage recovery
The PWM runs automatic by the setting YES, The PWM runs by manual when set to NO.

Options: NO
YES

YES: PWM running automatic at power on.
NO: PWM running by manual.
--- Monitoring temperature

It will monitor temperature by the setting YES, it will not monitoring temperature when set to NO.

Options: NO

YES

--- Forced position of PWM

Options: NO

YES
4- Communication objects description

In this section will introduce the communication objects. The objects will show by setting the function enable.

4.1 Sensor controller

4.1.1 Objects “General” and Enable of “Input A”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>General</td>
<td>Heartbeat telegram</td>
<td>C T</td>
<td>DPT 1.003 1bit</td>
</tr>
</tbody>
</table>

This communication object is always active and valid. Invert the value send telegram to bus in next frame. e.g. last telegram value is “1”, the next telegram value is “0”

| 10  | Input A    | 1-Enable, 0-disable | C W   | DPT 1.003 1bit |

This communication object is set the enable of input A. when receive the telegram 1, the input function is enable, when received the telegram 0, the function is disable.

4.1.2 Dry contact sensor

NOTE: Input A has 12 kinds of functions and dry contact has 2 work types, this manual is take Electronic switch for example.

- Objects “Switch controller”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>switching</td>
<td>C W T U</td>
<td>DPT 1.001 1bit</td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>switching</td>
<td>C W T U</td>
<td>DPT 1.001 1bit</td>
</tr>
</tbody>
</table>

These communication objects are switch controller, when operation dry contact A will send value to BUS, then control switch.
● Objects “Switch/Dimming controller”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Switching</td>
<td>C W T U</td>
<td>DPT 1.001</td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>Dimming</td>
<td>C T</td>
<td>DPT 3.007</td>
</tr>
</tbody>
</table>

These communication objects used for switch control and relative dimming control, when operation dry contact A will send value to BUS, then control switch or relative dimming.

● Objects “shutter controller”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Adjust for shutter(Inc)</td>
<td>C W T U</td>
<td>DPT 1.007</td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>Move for shutter(Toggle)</td>
<td>C W T U</td>
<td>DPT 1.007</td>
</tr>
</tbody>
</table>

These communication objects used for shutter control, when close or opened the dry contact will send the value to BUS, then control shutter.

● Objects “Flexible controller”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Flexible</td>
<td>C W T U</td>
<td>DPT 1.001</td>
</tr>
</tbody>
</table>

This communication object used for flexible control, when control the dry contact will sends the value “1”or“0” to BUS, then can flexible control.

● Objects “scene controller”
**HDL KNX / EIB – BUS**

**Dry Contact 4CH Sensor**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Call scene</td>
<td>C W T U</td>
<td>DPT 18.001 1 byte</td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>Scene dimming</td>
<td>C T</td>
<td>DPT 3.007 4 bit</td>
</tr>
</tbody>
</table>

This communication object used for scene control, when short or long operation the dry contact will call scene or scene dimming.

**Objects “sequence controller”**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Sequence</td>
<td>C W T U</td>
<td>DPT 1.010 1 bit</td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>Sequence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This communication object used for sequence control, when short or long operation the dry contact will sends the value to BUS, then control sequence.

**Objects “Percentage controller”**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Percentage</td>
<td>C W T U</td>
<td>DPT 5.001 1 byte</td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>percentage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This communication object used for percentage control, when short or long operation the dry contact will sends the value to BUS, then percentage control.

**Objects “Threshold controller”**
### HDL KNX / EIB – BUS

#### Dry Contact 4CH Sensor

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Threshold</td>
<td>C W T U</td>
<td>DPT 5.004</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1byte)</td>
<td></td>
<td>1 byte</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>Threshold</td>
<td>C W T U</td>
<td>DPT 7.001</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1byte)</td>
<td></td>
<td>1 byte</td>
<td></td>
</tr>
</tbody>
</table>

This communication object used for threshold control, when short or long operation the dry contact will sends the value to BUS, then control threshold.

#### Objects “String(14bytes)controller”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>String(14</td>
<td>C T</td>
<td>DPT 16.000</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bytes)value</td>
<td></td>
<td>14 bytes</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>String(14</td>
<td>C T</td>
<td>DPT 16.000</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bytes)value</td>
<td></td>
<td>14 byte</td>
<td></td>
</tr>
</tbody>
</table>

This communication object used for string control, when short or long operation the dry contact will sends the value to BUS.

#### Objects “Forced position controller”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A(short)</td>
<td>Forced value</td>
<td>C W T U</td>
<td>DPT 5.004</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(temperature)</td>
<td></td>
<td>2 bytes</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Input A(long)</td>
<td>Forced value</td>
<td>C W T U</td>
<td>DPT 7.001</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0…255)</td>
<td></td>
<td>1 byte</td>
<td></td>
</tr>
</tbody>
</table>

This communication object used for forced value control, when short or long operation the dry contact will sends the value to BUS.
operation the dry contact will sends the value to BUS, then forced value control.

- **Objects “Counter controller”**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Counter (0…255)</td>
<td>C W T U</td>
<td>DPT 5.004 1 byte</td>
</tr>
<tr>
<td>12</td>
<td>Input A</td>
<td>Set counter end(0…255)</td>
<td>C W U</td>
<td>DPT 5.004 1 byte</td>
</tr>
<tr>
<td>13</td>
<td>Input A</td>
<td>Set counter (0…255)</td>
<td>C W U</td>
<td>DPT 5.004 1 byte</td>
</tr>
</tbody>
</table>

This communication object used for send the pulse counter.

- **Objects “Combination controller”**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A( short)</td>
<td>COMB OBJ1 switching</td>
<td>C T</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMB OBJ1 shutter</td>
<td>C T</td>
<td>DPT 1.008 1 bit</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 scene</td>
<td></td>
<td>DPT 18.001</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------</td>
<td>---</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 sequence</td>
<td></td>
<td>1 byte</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 percentage</td>
<td></td>
<td>1 byte</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 Threshold(0…255)</td>
<td></td>
<td>1 byte</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 Threshold(0…65535)</td>
<td></td>
<td>2 byte</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 String (14 bytes)</td>
<td></td>
<td>14 byte</td>
<td></td>
</tr>
</tbody>
</table>

These communication objects used for combination control, it contains switch, shutter, scene, sequence, percentage, threshold, string(14 bytes) controller, when short operation the dry contact, it will send the value to the BUS, then control other devices.

<table>
<thead>
<tr>
<th></th>
<th>COMB OBJ1 switching</th>
<th></th>
<th>DPT 1.001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COMB OBJ1 shutter</td>
<td></td>
<td>1 byte</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 scene</td>
<td></td>
<td>DPT 18.001</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 sequence</td>
<td></td>
<td>1 byte</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 percentage</td>
<td></td>
<td>1 byte</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 Threshold(0…255)</td>
<td></td>
<td>1 byte</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 Threshold(0…65535)</td>
<td></td>
<td>2 byte</td>
</tr>
<tr>
<td></td>
<td>COMB OBJ1 String (14 bytes)</td>
<td></td>
<td>14 byte</td>
</tr>
</tbody>
</table>

These communication objects used for combination control, it contains switch, shutter, scene, sequence, percentage, threshold, string(14 bytes) controller, when long operation the dry contact, it will send the value to the BUS, then control other devices.
4.1.3 Temperature sensor

- Objects “Switch controller”

<table>
<thead>
<tr>
<th>No.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Switching</td>
<td>C W T U</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td>12</td>
<td>Input A</td>
<td>Change</td>
<td>C W U</td>
<td>DPT 9.001 2 byte</td>
</tr>
<tr>
<td></td>
<td></td>
<td>temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>threshold 1/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Input A</td>
<td>Forced</td>
<td>C W U</td>
<td>DPT 9.001 1 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>switching</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These communication objects used for switch control, when operation the dry contact will switch control or change temperature threshold.

- Objects “Alarm controller”

<table>
<thead>
<tr>
<th>No.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Alarm</td>
<td>C W T U</td>
<td>DPT 1.005 1 bit</td>
</tr>
<tr>
<td>12</td>
<td>Input A</td>
<td>Change</td>
<td>C W U</td>
<td>DPT 9.001 2 byte</td>
</tr>
<tr>
<td></td>
<td></td>
<td>temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>threshold 1/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Input A</td>
<td>Forced</td>
<td>C W U</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>alarm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These communications object used for alarm control, when operation the dry contact will alarm or change temperature threshold.

- Objects “shutter controller”
These communication objects used for shutter control, when operation the dry contact will move for shutter or change temperature threshold.

**Objects “Scene controller”**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Move for shutter</td>
<td>C W T U</td>
<td>DPT 1.008</td>
</tr>
<tr>
<td>12</td>
<td>Input A</td>
<td>Change temperature threshold 1/2</td>
<td>C W U</td>
<td>DPT 9.001</td>
</tr>
<tr>
<td>13</td>
<td>Input A</td>
<td>Forced move</td>
<td>C W U</td>
<td>DPT 1.001</td>
</tr>
</tbody>
</table>

These communication objects used for scene control, when operation the dry contact will call scene or change temperature threshold.

**Objects “sequence controller”**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Call scene</td>
<td>C W T U</td>
<td>DPT 18.001</td>
</tr>
<tr>
<td>12</td>
<td>Input A</td>
<td>Change temperature threshold 1/2</td>
<td>C W U</td>
<td>DPT 9.001</td>
</tr>
<tr>
<td>13</td>
<td>Input A</td>
<td>Forced scene</td>
<td>C W U</td>
<td>DPT 1.001</td>
</tr>
</tbody>
</table>

**Guangzhou Hedong Electronic Co., Ltd (HDL)**

www.hdlchina.com
These communication objects used for sequence control, when operation the dry contact will sequence control or change temperature threshold.

- Objects “Percentage controller”

These communication objects used for percentage control, when operation the dry contact will control percentage or change temperature threshold.

- Objects “Threshold controller”

These communication objects used for threshold control, when operation the dry contact will control threshold or change temperature threshold.
**HDL KNX / EIB – BUS**

**Dry Contact 4CH Sensor**

<table>
<thead>
<tr>
<th>NO</th>
<th>Input A</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Threshold value(1 byte)</td>
<td>C W T U</td>
<td>DPT 5.001 1 byte</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Change temperature threshold 1/2</td>
<td>C W U</td>
<td>DPT 9.001 2 byte</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Forced threshold value</td>
<td>C W U</td>
<td>DPT 1.001 1 bit</td>
<td></td>
</tr>
</tbody>
</table>

These communication objects used for threshold value control, when operation the dry contact will threshold control or change temperature threshold.

- **Objects “String(14bytes)controller”**

<table>
<thead>
<tr>
<th>NO</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A (in range/TEMP THR1)</td>
<td>String(14bytes) value</td>
<td>C W T U</td>
<td>DPT 16.000 1 byte</td>
</tr>
<tr>
<td>12</td>
<td>Input A</td>
<td>Change temperature threshold 1/2</td>
<td>C W U</td>
<td>DPT 9.001 2 byte</td>
</tr>
<tr>
<td>13</td>
<td>Input A</td>
<td>Forced string</td>
<td>C W U</td>
<td>DPT 1.001 1 bit</td>
</tr>
</tbody>
</table>

These communication objects used for string control, when operation the dry contact will control string or change temperature threshold.

- **Objects “Forced position controller”**

<table>
<thead>
<tr>
<th>NO</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Forced value(2 bits)</td>
<td>C W U</td>
<td>DPT 2.001 2 bit</td>
</tr>
</tbody>
</table>

Guangzhou Hedong Electronic Co., Ltd (HDL)  
www.hdlchina.com
These communications object used for scene control, when operation the dry contact will call scene or change temperature threshold.

- Objects “Combination controller”

<table>
<thead>
<tr>
<th>No.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Input A</td>
<td>Change temperature thresh1/2</td>
<td>C W U</td>
<td>DPT 9.001 2byte</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Input A(in range/TEMP THR1)</td>
<td>COMB OBJ1 switching</td>
<td>C T</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMB OBJ1 alarm</td>
<td>C T</td>
<td>DPT 1.005 1 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMB OBJ1 shutter</td>
<td>C T</td>
<td>DPT 1.008 1 bit</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>COMB OBJ1 scene</td>
<td>C T</td>
<td>DPT 18.001 1 byte</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMB OBJ1 sequence</td>
<td>C T</td>
<td>DPT 1.010 1 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COMB OBJ1 percentage</td>
<td>C T</td>
<td>DPT 5.001 1 byte</td>
</tr>
</tbody>
</table>
These communication objects used for combination control, it contains switch, shutter, scene, sequence, percentage, threshold, string(14 bytes) controller, when operation the dry contact, it will send the value to the BUS, then control other devices.

<table>
<thead>
<tr>
<th>COMB OBJ1</th>
<th>C T</th>
<th>DPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold(0…255)</td>
<td></td>
<td>5.004</td>
</tr>
<tr>
<td>C T</td>
<td></td>
<td>1 byte</td>
</tr>
<tr>
<td>Threshold(0…65535)</td>
<td></td>
<td>7.001</td>
</tr>
<tr>
<td>C T</td>
<td></td>
<td>2 byte</td>
</tr>
<tr>
<td>String (14 bytes)</td>
<td></td>
<td>16.000</td>
</tr>
<tr>
<td>C T</td>
<td></td>
<td>14 byte</td>
</tr>
</tbody>
</table>

4.2 Logical controller

4.2.1 Logical function A and block A
This communication object used for dry contact status report, when operation the dry contact will send the status to the KNX/EIB Bus.

These communication objects are as conditions of logic, these conditions are from KNX/EIB bus by panels or other devices. There are 5 extern telegrams.
When the logic A is true will control these objects, logic A 1 to logic A 10, contains switching, alarm, shutter, scene, sequence, percentage, string (14 bytes). Logical B, logical C, logical D are same to logic A.

<table>
<thead>
<tr>
<th>Logic E:1</th>
<th>Switching</th>
<th>C W T U</th>
<th>DPT 1.001 1 bit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alarm</td>
<td>C W T U</td>
<td>DPT 1.005 1 bit</td>
</tr>
<tr>
<td></td>
<td>Shutter</td>
<td>C W T U</td>
<td>DPT 1.008 1 bit</td>
</tr>
<tr>
<td></td>
<td>Scene</td>
<td>C W T U</td>
<td>DPT 18.001 1 byte</td>
</tr>
<tr>
<td></td>
<td>Sequence</td>
<td>C W T U</td>
<td>DPT 1.010 1 bit</td>
</tr>
<tr>
<td>Percentag e(0%..100 %)</td>
<td>C W T U</td>
<td>DPT 5.001 1 byte</td>
<td></td>
</tr>
<tr>
<td>Threshold (0..255)</td>
<td>C W T U</td>
<td>DPT 5.004 1 byte</td>
<td></td>
</tr>
<tr>
<td>Threshold (0..65535)</td>
<td>C W T U</td>
<td>DPT 7.001 1 byte</td>
<td></td>
</tr>
<tr>
<td>String(14 bytes)</td>
<td>C W T U</td>
<td>DPT 16.000 14 byte</td>
<td></td>
</tr>
</tbody>
</table>

Logic E’s condition is controlled by logic A, logic B, logic C, logic D’s output.
### 4.3 Dimming controller

#### 4.3.1 Objects “General”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>General</td>
<td>Sequence 1</td>
<td>C W U</td>
<td>DPT 1.010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>…</td>
<td></td>
<td>1 bit</td>
</tr>
<tr>
<td>8</td>
<td>General</td>
<td>Sequence 4</td>
<td>C W U</td>
<td>DPT 1.010</td>
</tr>
</tbody>
</table>

These communication objects are implementation of sequence control. The sequence will be control when receive the value by other devices via KNX/EIB Bus.

#### 4.3.2 Objects “output A”

<table>
<thead>
<tr>
<th>NO.</th>
<th>Object name</th>
<th>Function</th>
<th>Flags</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Output A</td>
<td>Channel output</td>
<td>C W U</td>
<td>DPT 1.001</td>
</tr>
<tr>
<td>13</td>
<td>Output A</td>
<td>Response status(1 bit)</td>
<td>C R T</td>
<td>DPT 1.001</td>
</tr>
</tbody>
</table>

This communication object is implementation channel output A control. The output A will be control when receive the value by other devices via KNX/EIB Bus.
<table>
<thead>
<tr>
<th>27</th>
<th>Response status (1 byte)</th>
<th>C R T</th>
<th>DPT 5.001 1 byte</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SYNC control relay</td>
<td>C T</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td>Temperature report</td>
<td>CRT</td>
<td>DPT 9.001 2 byte</td>
</tr>
<tr>
<td></td>
<td>R/W total ON time</td>
<td>CRWTU</td>
<td>DPT 7.007 1 bit</td>
</tr>
<tr>
<td></td>
<td>Alarm when total ON time out</td>
<td>CRT</td>
<td>DPT 1.005 1 bit</td>
</tr>
<tr>
<td></td>
<td>Staircase light</td>
<td>CWU</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td>Change staircase light factor</td>
<td>CWU</td>
<td>DPT 5.004 1 byte</td>
</tr>
<tr>
<td></td>
<td>Alarm staircase light</td>
<td>CRT</td>
<td>DPT 1.005 1 bit</td>
</tr>
<tr>
<td></td>
<td>Flashing</td>
<td>C WU</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td>Scene (8 bit)</td>
<td>C WU</td>
<td>DPT 18.001 1 byte</td>
</tr>
<tr>
<td></td>
<td>Scene dimming (4 bit)</td>
<td>C WU</td>
<td>DPT 3.007 4 bit</td>
</tr>
<tr>
<td></td>
<td>Threshold input</td>
<td>C WU</td>
<td>DPT 5.004 1 byte</td>
</tr>
<tr>
<td></td>
<td>Change threshold 1</td>
<td>C WU</td>
<td>DPT 5.004 1 byte</td>
</tr>
<tr>
<td></td>
<td>Change threshold 1</td>
<td>C WU</td>
<td>DPT 5.004 1 byte</td>
</tr>
</tbody>
</table>

This communication object is implementation channel output A's functions control. The output A will be control when receive the value by other devices via KNX/EIB Bus.

<table>
<thead>
<tr>
<th>28</th>
<th>Output A (PWM)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Heat with 1 bit control</td>
<td>CWU</td>
<td>DPT 1.001 1 bit</td>
</tr>
<tr>
<td></td>
<td>TEMP threshold2 alarm</td>
<td>CRT</td>
<td>DPT 1.005 1 bit</td>
</tr>
<tr>
<td></td>
<td>Forced position</td>
<td>CWU</td>
<td>DPT 1.001 1 bit</td>
</tr>
</tbody>
</table>

These communication objects used for combination control,

Note: Output B, C, D 's setting are all same to output A.
5- Application

5.1 Sensor control

Flowchart:
- Program start
  - Sensors controller
  - Logic controller
  - Dimming controller

1. No detection
   - Sensor controller
   - Dry contact sensor
     - Switch controller
     - Switch/Dimming controller
     - Shutter controller
     - Flexible controller
     - Scene controller
     - Sequence controller
     - Percentage controller
     - Threshold controller
     - String(14bytes) controller
     - Forced position controller
     - Counter controller
     - Combination controller
     - Output

2. Temperature sensor
   - Switch controller
   - Alarm controller
   - Shutter controller
   - Scene controller
   - Sequence controller
   - Percentage controller
   - Threshold controller
   - String(14bytes) controller
   - Forced position controller
   - Combination controller
   - Output
5.2 Logic control

Disable/Dry contact sensor/Temperature sensor
- External telegram<1>
- External telegram<2>
- External telegram<3>
- External telegram<4>
- External telegram<5>

AND/OR Logic A

Disable/Dry contact sensor/Temperature sensor
- External telegram<1>
- External telegram<2>
- External telegram<3>
- External telegram<4>
- External telegram<5>

AND/OR Logic B

Output A
Output B
Output C
Output D
AND/OR Logic E

Output

5.3 Dimming control

Dimming control
- Sequence 1
- Sequence 2
- Sequence 3
- Sequence 4
- Sequence 5

Staircase light
- Flashing
- Scene
- Threshold
- Heating

Channel A
Channel B
Channel C
Channel D