Timer Master/Slave Controller

Model: M/TM04.1
HDL KNX / EIB

HDL KNX / EIB-BUS
(Intelligent Installation Systems)

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1-General

HDL KNX / EIB series Timer controller output modules are developed by HDL. Using KNX/EIB BUS communicate with other KNX devices. Database need to be downloaded to the timer controller by using ETS2 V1.3/ETS 3.0. The document descript how to use the products. Our products use standard according to EMC, electrical safety, environmental conditions.

The timer controller are used to control objects, such as:

* Switch
* Alarm
* Shutter
* Scene
* Sequence
* Percentage
* Threshold
* Other Equipments

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1.1-Product Function

This timer controller is embedded with RTC, can run real time itself, can used as master timer and slave timer.

The following functions can be set individually for each output channel:

* Year routine
* Month routine
* Week routine
* Day routine
* Special day
* Switch control
* Alarm control
* Shutter control
* Scene control
* Sequence control
* Percentage control
* Threshold control
**2-Hardware**

The technical properties of HDL KNX/EIB Timer controller as the following sections

### 2.1 Technical data

**Power supply**
- Operating voltage (supply by the bus) 21...30 V DC,
- Current consumption EIB / KNX (operate) < 10 mA
- Power consumption EIB / KNX < 300 mW

**Connections**
- **Bus Connection Terminal** 0.8 mm Ø, single core
- **cable shoe** 12 mm
- **Tightening torque** Max. 0.8 Nm

**Operating and display**
- Red LED and EIB / KNX push button all in one
- Contact position indication Relay lever

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

**Environment conditions**
- Humidity max. 95 % Non-condensing

**Appearance design**
- Dimensions (H x W x D) 144 x 90 x 66

**Weight**
- 0.2394 kg

**Installation**
- Use 35 mm mounting rail

**Mounting position**
- As required

**Material and Colour**
- Plastic, black

**Standard and Safety**
- 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

**Application table**

<table>
<thead>
<tr>
<th>Type</th>
<th>M/TM04.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of communication objects</td>
<td>210</td>
</tr>
</tbody>
</table>
Max. number of group addresses 254
Max. number of associations 254
Note: The programming requires the EIB Software Tools ETS2 V1.3 or ETS3.0. If use ETS2 V1.3, then import "*.vd2". If use ETS3.0, then Import "*.vd3"

2.2 Dimension drawings

2.3 wiring diagram

Control button
【Enter】Confirm Button
【Esc】Esc button
【△】Page up. Used for modify by manual, will increase when pushing
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.
*For security, each circuit to connect an MCB or fuse
*Installation location should be well-ventilated, pay attention to moisture, shock, dust proof.
3- Software

HDL KNX/EIB timer controller database use ETS3.0 to do the design. The device type is M/TM04.1, and the database name is “Timer Master/Slave 4CH Controller”. All Interface and the functions Apply parameters please overview the following description of the paragraph.

Each channel output of the Timer controller is independent and the same. So, Understand only one channel output is enough. The following paragraph will description of the first channel output in detail.

3.1 Database functions Overview

The following table provide an overview of the functions and some parameters with the Timer controller:

<table>
<thead>
<tr>
<th>Timer function</th>
<th>M/TM04.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td>---</td>
</tr>
<tr>
<td>Clock mode</td>
<td>---</td>
</tr>
<tr>
<td>Master clock</td>
<td>Y</td>
</tr>
<tr>
<td>Slave clock</td>
<td>Y</td>
</tr>
<tr>
<td>Time type</td>
<td>---</td>
</tr>
<tr>
<td>Standard time</td>
<td>Y</td>
</tr>
<tr>
<td>Summer time</td>
<td>Y</td>
</tr>
<tr>
<td>Routine type</td>
<td>---</td>
</tr>
<tr>
<td>Year routine</td>
<td>Y</td>
</tr>
<tr>
<td>Month routine</td>
<td>Y</td>
</tr>
<tr>
<td>Week routine</td>
<td>Y</td>
</tr>
<tr>
<td>Day routine</td>
<td>Y</td>
</tr>
<tr>
<td>Special day</td>
<td>Y</td>
</tr>
<tr>
<td>Control type(output objects)</td>
<td>---</td>
</tr>
<tr>
<td>Switching control</td>
<td>Y</td>
</tr>
<tr>
<td>Alarm control</td>
<td>Y</td>
</tr>
<tr>
<td>Shutter control</td>
<td>Y</td>
</tr>
<tr>
<td>Scene control</td>
<td>Y</td>
</tr>
<tr>
<td>Sequence control</td>
<td>Y</td>
</tr>
<tr>
<td>Percentage control</td>
<td>Y</td>
</tr>
<tr>
<td>Threshold control</td>
<td>Y</td>
</tr>
</tbody>
</table>

Table1: Database application overview.
3.2 Object/Association/Group address define

In following table, the objects is assigned to the some function of the channel output pages, if active some functions and the object will be valid. One or more group addresses can be assigned to a object. The association will connect group addresses to the object.

<table>
<thead>
<tr>
<th>Name</th>
<th>type</th>
<th>Max. number of communication objects</th>
<th>Max. number of associations</th>
<th>Max. number of group addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timer Master/Slave 4CH Controller</td>
<td>M/TM04.1</td>
<td>210</td>
<td>254</td>
<td>254</td>
</tr>
</tbody>
</table>

Table2: Overview the max. number of the objects, max. number of associations and max. number of the group addresses.
3.3 Function parameter “General”

---

**Selecting system clock mode**

Select system clock mode, selection of parameter configuration has two kinds of combination.

Options: Master clock

Slave clock

The timer controller has two work modes. The following will detail these two modes.
3.3.1 Function parameter “Master clock”

--- Heartbeat telegram
Options: Disable
    Send value “0” cyclically
    Send value “0” cyclically
    Send value “0/1” inverted cyclically
Disable: Disable the function.
Send value “0” cyclically: Device will send a telegram data cyclically when time out. Send the value “0”, and time interval of telegram is displayed.
Send value “1” cyclically: Device will send a telegram data cyclically when time out. Send the value “1”, and time interval of telegram is displayed.
Send value “0/1” inverted cyclically: Device will send a telegram data cyclically when time out. Send the value alternately between 0 and 1, and time interval of telegram is displayed.
->Telegram is sent time interval (1…65535s)
Options: (1…65535s)
Set time interval when telegram is sent.

--Master clock cycle sending time interval
Options: 10minutes
    20minutes
    30minutes
    60minutes
    120minutes
Set time interval of master clock cycle sending.

--Selecting the type of time
Options: Standard time
    Always summer time
    Summer time (Manual setting)
    Summer time (Europe standard)
    Summer time (New Zealand standard)

Standard time: Setting system clock to standard time.
Always summer time: Setting system clock to summer time.
Summer time (Manual setting): Set start date and end date of summer time by manual setting.
Summer time (Europe standard): Set start date and end date of summer time by Europe standard.
Summer time (New Zealand standard): Set start date and end date of summer time by New Zealand standard.

--Send clock information to bus
Options: Send date time
    Send only date
    Send only time

Send date time: Send date and time to bus.
Send only date: Send only date to bus.
Send only time: Send only time to bus.

--Local clock set form bus
Options: Disable
    Enable

Disable: Disable “Set local clock” communication object.
Enable: Enable “Set local clock” communication object.

--Geographic location setting
Options: Invalid
    Manual setting

Invalid: The function is invalid. Sunrise and sunset function is invalid.
Manual setting: Latitude, Longitude, and time zone setting is displayed.

Options: Latitude for degree (-90..90)
    Longitude for degree (-90..90)
    Time zone for degree (-90..90)

Setting to the range of latitude, longitude, and time zone, these are used for calculate sunrise and sunset time.

--Setting brightness of the LCD
Options: (0%..100%)
Set the range of LCD brightness.

--Change LCD brightness via EIB
Options: Disable
   Enable
Disable: Disable change LCD brightness communication object.
Enable: Enable change LCD brightness communication object.

--LCD brightness automatic darker
Options: Disable
   Enable
Disable: Disable the function.
Enable: “LCD automatic darker after delay” and “LCD automatic darker brightness” setting is displayed.

--LCD automatic darker after delay (3..255s)
Options: (3..255s)
Setting to LCD automatic darker delay time when buttons of LCD is no operation.

--LCD automatic darker brightness
Options:(0%..100%)
Set brightness of LCD.

--Lock the buttons of LCD via EIB
Options: Disable
   Enable
Disable: Disable lock the buttons of LCD communication object.
Enable: Enable lock the buttons of LCD communication object.
3.3.2 Function parameter “Slave clock”

--- Heartbeat telegram
Options: Disable
- Send value “0” cyclically
- Send value “0” cyclically
- Send value “0/1” inverted cyclically

Disable: Disable the function.

Send value “0” cyclically: Device will send a telegram data cyclically when time out. Send the value “0”, and time interval of telegram is displayed.

Send value “1” cyclically: Device will send a telegram data cyclically when time out. Send the value “1”, and time interval of telegram is displayed.

Send value “0/1” inverted cyclically: Device will send a telegram data cyclically when time out. Send the value alternately between 0 and 1, and time interval of telegram is displayed.

->Telegram is sent time interval(1…65535s)
Options: (1…65535s)
Set time interval when telegram is sent.

--Delay for reading ”system Clock” when power on(10..255s, 0..9no read)
Options: (0..255s)
Set delay time of reading ”system clock” when power on.

--If no updated, then repeat read times(1times/s)
Options: 1times
2times
3 times
Setting to reading times if date time object no updated.

--- Receiving the synchronous clock period for time out
Options: 10 minutes
         20 minutes
         30 minutes
         60 minutes
         120 minutes
Set time interval of master clock cycle sending.

--- Handling when receive synchronous clock time out
Options: Use local clock
         Stop work
Use local clock: Use local when receive synchronous clock time out.
Stop work: Stop work when receive synchronous clock time out.

--- Selecting the type of time (only valid when receive date time)
Options: Standard time
         Always summer time
         Summer time (Manual setting)
         Summer time (Europe standard)
         Summer time (New Zealand standard)
Standard time: Setting system clock to standard time.
Always summer time: Setting system clock to summer time.
Summer time (Manual setting): Set start date and end date of summer time by manual setting.
Summer time (Europe standard): Set start date and end date of summer time by Europe standard.
Summer time (New Zealand standard): Set start date and end date of summer time by New Zealand standard.
Note: Type of time is only valid when receive date time.

--- Receive clock information from bus
Options: Receive date time
         Receive only date
         Receive only time
Receive date time: Receive date and time from bus.
Receive only date: Receive only date from bus.
Receive only time: Receive only time from bus.

--- Local clock set form bus
Options: Disable
         Enable
Disable: Disable “Set local clock” communication object.
Enable: Enable “Set local clock” communication object.

--- Geographic location setting
Options: Invalid
Manual setting

**Invalid:** The function is invalid. Sunrise and sunset function is invalid.

**Manual setting:** Latitude, Longitude, and time zone setting is displayed.

Options: Latitude for degree(-90..90)
Latitude for minute(0..59)
Longitude for degree(-90..90)
Longitude for minute(0..59)
Time zone for degree(-90..90)
Time zone for minute(0..59)

Setting to the range of latitude, longitude, and time zone, these are used for calculate sunrise and sunset time.

--**Setting brightness of the LCD**

Options: (0%..100%)
Set the range of LCD brightness.

--**Change LCD brightness via EIB**

Options: Disable
Enable

**Disable:** Disable change LCD brightness communication object.

**Enable:** Enable change LCD brightness communication object.

--**LCD brightness automatic darker**

Options: Disable
Enable

**Disable:** Disable the function.

**Enable:** “LCD automatic darker after delay” and “LCD automatic darker brightness” setting is displayed.

--**LCD automatic darker after delay(3..255s)**

Options: (3..255s)
Setting to LCD automatic darker delay time when buttons of LCD is no operation.

--**LCD automatic darker brightness**

Options: (0%..100%)
Set the brightness of LCD.

--**Lock the buttons of LCD via EIB**

Options: Disable
Enable

**Disable:** Disable lock the buttons of LCD communication object.

**Enable:** Enable lock the buttons of LCD communication object.
3.4 - Function parameter routine channel “N”

---Enable routine channel A
Options: Disable
Enable

Disable: Disable routine channel A.
Enable: Year routine, month routine, week routine, day routine and special day page is displayed.

---Enable: “Year routine page”
Options: Disable
Enable

Disable: Disable year routine.
Enable: Year routine and time point is displayed.
--Enable: “Month routine page”
  Options: Disable
       Enable
 Disable: Disable month routine.
 Enable: Month routine and time point is displayed.
--Enable: “Week routine page”
  Options: Disable
       Enable
 Disable: Disable the function.
 Enable: Week routine and time point is displayed.
--Enable: “Day routine page”
  Options: Disable
       Enable
 Disable: Disable the function.
 Enable: Day routine and time point is displayed.
--Enable: “Special day page”
  Options: Disable
       Enable
 Disable: Disable the function.
 Enable: Special day is displayed.

3.5- Channel function “Year routine”
---Select a month of the year[1-12]
Options: No setting
    January
    February
    ..........
    December
Set a month of the year.

3.5.1 - Year routine parameter “Time point”

---Enable the setting of the time point(1-4)
---Enable:” sunrise relevant the time point”
---Enable:” sunset relevant the time point”
Options: Disable
    Enable
    Disable: Disable the setting of the time point.
    Enable: Enable the setting of the time point. Sunrise or sunset relevant the time point need set geographic location in general.
---Time for hour
Options: (00h-23h)
Set hour for time point.
---Time for minute
Options: (00-59m)
Set minute for time point.
---Switching value
Options: Invalid
OFF
ON
Invalid: At the time point, no output telegram.
OFF: At the time point, output OFF telegram.
ON: At the time point, output ON telegram.

--Alarm value
Options: Invalid
   No alarm
   Alarm
Invalid: At the time point, no output telegram.
No alarm: At the time point, output No alarm telegram.
Alarm: At the time point, output Alarm telegram.

--Shutter value
Options: Invalid
   UP
   DOWN
Invalid: At the time point, no output telegram.
UP: At the time point, output UP telegram.
DOWN: At the time point, output DOWN telegram.

--Scene value
Options: Invalid
   Scene NO.01
   Scene NO.02
   .................
   Scene NO.64
Invalid: At the time point, no output telegram.
Scene NO.01.. Scene NO.64: At the time point, Output specified scene.

--Sequence value
Options: Invalid
   Stop
   Start
Invalid: At the time point, no output telegram.
Stop: At the time point, output Stop telegram.
Start: At the time point, output Start telegram.

--Percentage value
Options: Invalid
   0%(0)…100%(255)
Invalid: At the time point, no output telegram.
0%(0)…100%(255): At the time point, output setting percentage telegram.

--Threshold value
Options: Invalid
   1 byte threshold
2 bytes threshold

Invalid: At the time point, no output telegram.

1 byte threshold: At the time point, output 1 byte threshold telegram.

2 bytes threshold: At the time point, output 2 bytes threshold telegram.

--The status after bus voltage recovery
Options: Disable
Enable

Disable: Disable the function.
Enable: Enable voltage recovery setting.

--Switching status
Options: Invalid
OFF
ON
The same as last time point

Invalid: Switching no output after bus voltage recovery.
OFF: In the range of year routine date, switching will send OFF telegram after bus voltage recovery.
ON: In the range of year routine date, switching will send OFF telegram after bus voltage recovery.

The same as last time point: In the range of year routine date, switching will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Alarm status
Options: Invalid
No alarm
Alarm
The same as last time point

Invalid: Alarm no will send after bus voltage recovery.
No alarm: In the range of year routine date, alarm will send No alarm telegram after bus voltage recovery.
Alarm: In the range of year routine date, alarm output Alarm telegram after bus voltage recovery.

The same as last time point: In the range of year routine date, alarm will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Shutter status
Options: Invalid
UP
DOWN
The same as last time point

Invalid: Shutter no output after bus voltage recovery
UP: In the range of year routine date, shutter will send UP
telegram after bus voltage recovery.

**DOWN:** In the range of year routine date, alarm will send DOWN telegram after bus voltage recovery.

**The same as last time point:** In the range of year routine date, shutter will send telegram which is same as last time point (only can recover the previous day's status at most).

--Scene status

Options: Invalid
- Define scene
- The same as last time point

**Invalid:** No output after bus voltage recovery.

**Define scene:** Scene value is displayed.

--Scene vale

**Scene value:** In the range of year routine date, output specified scene after bus voltage recovery.

**The same as last time point:** In the range of year routine date, output scene telegram which is same as last time point (only can recover the previous day's status at most).

--Sequence status

Options: Invalid
- Stop
- Start
- The same as last time point

--Percentage status

Options: Invalid
- Define percentage

**Invalid:** No percentage telegram output after bus voltage recovery.

**Define percentage:** Percentage value is displayed.

--Percentage value

**Percentage value:** In the range of year routine date, percentage telegram will be sent after bus voltage recovery.

**The same as last time point:** In the range of year routine date, percentage telegram will be sent telegram which is same as last time point (only can recover the previous day's status at most).

--Threshold status

Options: Invalid
- 1 byte threshold
- 2 bytes threshold
- The same as last time point

**Invalid:** NO output after bus voltage recovery.

**1 byte threshold:** In the range of year routine date, threshold will send 1 byte telegram after bus voltage recovery.
2 bytes threshold: In the range of year routine date, threshold will send 2 bytes telegram after bus voltage recovery.

The same as last time point: In the range of year routine date, threshold will send telegram which is same as last time point (only can recover the previous day’s status at most).

3.6- Channel function “Month routine”

--Priority when date setting same with year setting
Options: Month=Year
          Month>Year

Month=Year: Year routine is normal running on this day, when date setting of year routine is same as month routine.
Month>Year: Year routine stop running on this day, when date setting of year routine is same as month routine.

--Select a day of the month [1-31]
Options: No setting
          1st
          2nd
          ....
          31st
Set a day of the month.

3.6.1 - Month routine parameter “Time point”
---Enable the setting of the time point (1-4)
---Enable:” sunrise relevant the time point”
---Enable:" sunset relevant the time point”
   Options: Disable
   Enable
   Disable: Disable the setting of the time point.
   Enable: Enable the setting of the time point. Sunrise or sunset relevant the time point need set geographic location in general.

---Time for hour
   Options: (00h-23h)
   Set hour for time point.

---Time for minute
   Options: (00-59m)
   Set minute for time point.

---Switching value
   Options: Invalid
   OFF
   ON
   Invalid: At the time point, no output telegram.
   OFF: At the time point, output OFF telegram.
   ON: At the time point, output ON telegram.

---Alarm value
   Options: Invalid
   No alarm
   Alarm
   Invalid: At the time point, no output telegram.
No alarm: At the time point, output No alarm telegram.
Alarm: At the time point, output Alarm telegram.

--Shutter value
Options: Invalid
  UP
  DOWN
Invalid: At the time point, no output telegram.
UP: At the time point, output UP telegram.
DOWN: At the time point, output DOWN telegram.

--Scene value
Options: Invalid
  Scene NO.01
  Scene NO.02
  ..........
  Scene NO.64
Invalid: At the time point, no output telegram.
Scene NO.01.. Scene NO.64: At the time point, Output specified scene.

--Sequence value
Options: Invalid
  Stop
  Start
Invalid: At the time point, no output telegram.
Stop: At the time point, output Stop telegram.
Start: At the time point, output Start telegram.

--Percentage value
Options: Invalid
  0%(0)...100%(255)
Invalid: At the time point, no output telegram.
0%(0)...100%(255): At the time point, output setting percentage telegram.

--Threshold value
Options: Invalid
  1 byte threshold
  2 bytes threshold
Invalid: At the time point, no output telegram.
1 byte threshold: At the time point, output 1 byte threshold telegram.
2 bytes threshold: At the time point, output 2 bytes threshold telegram.

--The status after bus voltage recovery
Options: Disable
  Enable
Disable: Disable the function.
Enable: Enable voltage recovery setting.

--Switching status
Options: Invalid
OFF
ON
The same as last time point

Invalid: Switching no output after bus voltage recovery.
OFF: In the range of month routine date, switching will send OFF telegram after bus voltage recovery.
ON: In the range of month routine date, switching will send OFF telegram after bus voltage recovery.

The same as last time point: In the range of month routine date, switching will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Alarm status
Options: Invalid
No alarm
Alarm
The same as last time point

Invalid: Alarm no will send after bus voltage recovery.
No alarm: In the range of month routine date, alarm will send No alarm telegram after bus voltage recovery.
Alarm: In the range of month routine date, alarm output Alarm telegram after bus voltage recovery.

The same as last time point: In the range of month routine date, alarm will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Shutter status
Options: Invalid
UP
DOWN
The same as last time point

Invalid: Shutter no output after bus voltage recovery
UP: In the range of month routine date, shutter will send UP telegram after bus voltage recovery.
DOWN: In the range of month routine date, alarm will send DOWN telegram after bus voltage recovery.

The same as last time point: In the range of month routine date, shutter will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Scene status
Options: Invalid
Define scene
The same as last time point
Invalid: No output after bus voltage recovery.
Define scene: Scene value is displayed.

--Scene value
Scene value: In the range of month routine date, output specified scene after bus voltage recovery.
The same as last time point: In the range of month routine date, output scene telegram which is same as last time point (only can recover the previous day’s status at most).

--Sequence status
Options: Invalid
Stop
Start
The same as last time point

--Percentage status
Options: Invalid
Define percentage
Invalid: No percentage telegram output after bus voltage recovery.
Define percentage: Percentage value is displayed.

--Percentage value
Percentage value: In the range of month routine date, percentage telegram will be sent after bus voltage recovery.
The same as last time point: In the range of month routine date, percentage telegram will be sent telegram which is same as last time point (only can recover the previous day’s status at most).

--Threshold status
Options: Invalid
1 byte threshold
2 bytes threshold
The same as last time point
Invalid: NO output after bus voltage recovery.
1 byte threshold: In the range of month routine date, threshold will send 1 byte telegram after bus voltage recovery.
2 bytes threshold: In the range of month routine date, threshold will send 2 bytes telegram after bus voltage recovery.
The same as last time point: In the range of month routine date, threshold will send telegram which is same as last time point (only can recover the previous day’s status at most).

3.7- Channel function “Week routine”
--Priority when date setting same with month setting
Options: Week=Month
Week>Month

**Week=Month:** Month routine is normal running on this day, when date setting of month routine is same as week routine.

**Week>Month:** Month routine stop running on this day, when date setting of month routine is same as week routine.

--Select a day of the week[1-7]
Options: No setting
Monday
Tuesday
............
Sunday
Set a day of the week.

3.7.1 - Week routine parameter “Time point”
--Enable the setting of the time point(1-4)
--Enable:” sunrise relevant the time point”
--Enable:” sunset relevant the time point”
  Options: Disable
  Enable
  Disable: Disable the setting of the time point.
  Enable: Enable the setting of the time point. Sunrise or sunset relevant the time point need set geographic location in general.
--Time for hour
  Options: (00h-23h)
  Set hour for time point.
--Time for minute
  Options: (00-59m)
  Set minute for time point.
--Switching value
  Options: Invalid
  OFF
  ON
  Invalid: At the time point, no output telegram.
  OFF: At the time point, output OFF telegram.
  ON: At the time point, output ON telegram.
--Alarm value
  Options: Invalid
  No alarm
Alarm
Invalid: At the time point, no output telegram.
No alarm: At the time point, output No alarm telegram.
Alarm: At the time point, output Alarm telegram.

--Shutter value
Options: Invalid
  UP
  DOWN
Invalid: At the time point, no output telegram.
UP: At the time point, output UP telegram.
DOWN: At the time point, output DOWM telegram.

--Scene value
Options: Invalid
  Scene NO.01
  Scene NO.02
  ............... Scene NO.064
Invalid: At the time point, no output telegram.
Scene NO.01.. Scene NO.064: At the time point, Output specified scene.

--Sequence value
Options: Invalid
  Stop
  Start
Invalid: At the time point, no output telegram.
Stop: At the time point, output Stop telegram.
Start: At the time point, output Start telegram.

--Percentage value
Options: Invalid
  0%(0)...100%(255)
Invalid: At the time point, no output telegram.
0%(0)...100%(255): At the time point, output setting percentage telegram.

--Threshold value
Options: Invalid
  1 byte threshold
  2 bytes threshold
Invalid: At the time point, no output telegram.
1 byte threshold: At the time point, output 1 byte threshold telegram.
2 bytes threshold: At the time point, output 2 bytes threshold telegram.

--The status after bus voltage recovery
Options: Disable
Enable
Disable: Disable the function.
Enable: Enable voltage recovery setting.

--Switching status
Options: Invalid
OFF
ON
The same as last time point
Invalid: Switching no output after bus voltage recovery.
OFF: In the range of week routine date, switching will send OFF telegram after bus voltage recovery.
ON: In the range of week routine date, switching will send OFF telegram after bus voltage recovery.
The same as last time point: In the range of week routine date, switching will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Alarm status
Options: Invalid
No alarm
Alarm
The same as last time point
Invalid: Alarm no will send after bus voltage recovery.
No alarm: In the range of week routine date, alarm will send No alarm telegram after bus voltage recovery.
Alarm: In the range of week routine date, alarm output Alarm telegram after bus voltage recovery.
The same as last time point: In the range of week routine date, alarm will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Shutter status
Options: Invalid
UP
DOWN
The same as last time point
Invalid: Shutter no output after bus voltage recovery
UP: In the range of week routine date, shutter will send UP telegram after bus voltage recovery.
DOWN: In the range of year routine date, alarm will send DOWN telegram after bus voltage recovery.
The same as last time point: In the range of week routine date, shutter will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Scene status
Options: Invalid
Define scene
The same as last time point

Invalid: No output after bus voltage recovery.
Define scene: Scene value is displayed.

--Scene value
Scene value: In the range of week routine date, output specified scene after bus voltage recovery.
The same as last time point: In the range of week routine date, output scene telegram which is same as last time point (only can recover the previous day’s status at most).

--Sequence status
Options: Invalid
Stop
Start
The same as last time point

--Percentage status
Options: Invalid
Define percentage
Invalid: No percentage telegram output after bus voltage recovery.
Define percentage: Percentage value is displayed.

--Percentage value
Percentage value: In the range of week routine date, percentage telegram will be sent after bus voltage recovery.
The same as last time point: In the range of week routine date, percentage telegram will be sent telegram which is same as last time point (only can recover the previous day’s status at most).

--Threshold status
Options: Invalid
1 byte threshold
2 bytes threshold
The same as last time point
Invalid: NO output after bus voltage recovery.
1 byte threshold: In the range of week routine date, threshold will send 1 byte telegram after bus voltage recovery.
2 bytes threshold: In the range of week routine date, threshold will send 2 bytes telegram after bus voltage recovery.
The same as last time point: In the range of year routine date, threshold will send telegram which is same as last time point (only can recover the previous day’s status at most).
3.8- Channel function “Day routine”

--Priority when date setting same with week setting
Options: Day=Week
        Day>Week

**Day=Week:** Week routine is normal running on this day, when date setting of week routine is same as day routine.

**Day>Week:** Week routine stop running on this day, when date setting of week routine is same as day routine.

If enable day routine and it is run every day.

3.8.1 - Day routine parameter “Time point”
---Enable the setting of the time point(1-4)
---Enable:" sunrise relevant the time point"
---Enable:" sunset relevant the time point"
  Options: Disable
    Enable
  Disable: Disable the setting of the time point.
  Enable: Enable the setting of the time point. Sunrise or sunset relevant the time point need set geographic location in general.

---Time for hour
  Options: (00h-23h)
  Set hour for time point.

---Time for minute
  Options: (00-59m)
  Set minute for time point.

---Switching value
  Options: Invalid
    OFF
    ON
  Invalid: At the time point, no output telegram.
  OFF: At the time point, output OFF telegram.
  ON: At the time point, output ON telegram.

---Alarm value
  Options: Invalid
    No alarm
    Alarm
  Invalid: At the time point, no output telegram.
**No alarm**: At the time point, output No alarm telegram.

**Alarm**: At the time point, output Alarm telegram.

**--Shutter value**
Options: Invalid
   - UP
   - DOWN

**Invalid**: At the time point, no output telegram.

**UP**: At the time point, output UP telegram.

**DOWN**: At the time point, output DOWM telegram.

**--Scene value**
Options: Invalid
   - Scene NO.01
   - Scene NO.02
   - .................
   - Scene NO.64

**Invalid**: At the time point, no output telegram.

**Scene NO.01..Scene NO.64**: At the time point, Output specified scene.

**--Sequence value**
Options: Invalid
   - Stop
   - Start

**Invalid**: At the time point, no output telegram.

**Stop**: At the time point, output Stop telegram.

**Start**: At the time point, output Start telegram.

**--Percentage value**
Options: Invalid
   - 0%(0)...100%(255)

**Invalid**: At the time point, no output telegram.

**0%(0)...100%(255)**: At the time point, output setting percentage telegram.

**--Threshold value**
Options: Invalid
   - 1 byte threshold
   - 2 bytes threshold

**Invalid**: At the time point, no output telegram.

**1 byte threshold**: At the time point, output 1 byte threshold telegram.

**2 bytes threshold**: At the time point, output 2 bytes threshold telegram.

**--The status after bus voltage recovery**
Options: Disable
   - Enable

**Disable**: Disable the function.
**Enable:** Enable voltage recovery setting.

**--Switching status**
Options: Invalid
OFF
ON
The same as last time point

Invalid: Switching no output after bus voltage recovery.
OFF: In the range of day routine date, switching will send OFF telegram after bus voltage recovery.
ON: In the range of day routine date, switching will send OFF telegram after bus voltage recovery.
The same as last time point: In the range of day routine date, switching will send telegram which is same as last time point (only can recover the previous day’s status at most).

**--Alarm status**
Options: Invalid
No alarm
Alarm
The same as last time point

Invalid: Alarm no will send after bus voltage recovery.
No alarm: In the range of day routine date, alarm will send No alarm telegram after bus voltage recovery.
Alarm: In the range of day routine date, alarm output Alarm telegram after bus voltage recovery.
The same as last time point: In the range of day routine date, alarm will send telegram which is same as last time point (only can recover the previous day’s status at most).

**--Shutter status**
Options: Invalid
UP
DOWN
The same as last time point

Invalid: Shutter no output after bus voltage recovery
UP: In the range of day routine date, shutter will send UP telegram after bus voltage recovery.
DOWN: In the range of year routine date, alarm will send DOWN telegram after bus voltage recovery.
The same as last time point: In the range of day routine date, shutter will send telegram which is same as last time point (only can recover the previous day’s status at most).

**--Scene status**
Options: Invalid
Define scene
The same as last time point
Invalid: No output after bus voltage recovery.

Define scene: Scene value is displayed.

--Scene value
Scene value: In the range of day routine date, output specified scene after bus voltage recovery.
The same as last time point: In the range of day routine date, output scene telegram which is same as last time point (only can recover the previous day's status at most).

--Sequence status
Options: Invalid
Stop
Start
The same as last time point

--Percentage status
Options: Invalid
Define percentage
Invalid: No percentage telegram output after bus voltage recovery.
Define percentage: Percentage value is displayed.

--Percentage value
Percentage value: In the range of day routine date, percentage telegram will be sent after bus voltage recovery.
The same as last time point: In the range of day routine date, percentage telegram will be sent telegram which is same as last time point (only can recover the previous day's status at most).

--Threshold status
Options: Invalid
1 byte threshold
2 bytes threshold
The same as last time point
Invalid: NO output after bus voltage recovery.
1 byte threshold: In the range of day routine date, threshold will send 1 byte telegram after bus voltage recovery.
2 bytes threshold: In the range of day routine date, threshold will send 2 bytes telegram after bus voltage recovery.
The same as last time point: In the range of day routine date, threshold will send telegram which is same as last time point (only can recover the previous day's status at most).

3.9- Channel function “Special day”
3.9.1 - Special day parameter “Date”

--Date setting for “special day 1-25”

Options: Disable
            Enable

Disable: Disable the “special day 1-25”.
Enable: Date and time point is displayed.
--Remark by user define(20 Bytes)
--Select date type
  Options: Date type
    Week type
    Date type: Set to start date. year, month and day is displayed.
    --Start(year)
    --Start(month)
    --Start(day)
    Set start date of special day.
    Week type: Set to start date. month, week and day of week is displayed.
    --Start(month)
    --Start(week)
    --Start(day of week)
    Set start date of special day.
    --Continue(1..365days)
    Options: (1..365days)
    Set days of last day, the range is 1..365. End date is start date add last day. For example, start date is January 1,2000. If last day is set to “1”, and end date is January 1,2000. If last day
is set to “2”, and end date is January 2, 2000, and so on.

--Whether to run another routine if its date setting is same as special day
Options: Normal running on this day
Stop running on this day

**Normal running on this day**: Other routines are normal running on this day, when date setting of other routines is same as special day.

**Stop running on this day**: Other routines stop running on this day, when date setting of other routines is same as special day.

3.9.2 – Special day parameter “Time point”

---Enable the setting of the time point (1-4)
---Enable: ”sunrise relevant the time point”
---Enable: ”sunset relevant the time point”
Options: Disable
Enable

**Disable**: Disable the setting of the time point.

**Enable**: Enable the setting of the time point. Sunrise or sunset relevant the time point need set geographic location in general.

--Time for hour
Options: (00h-23h)
Set hour for time point.

--Time for minute
Options: (00-59m)
Set minute for time point.

---Switching value
Options: Invalid
  OFF
  ON
Invalid: At the time point, no output telegram.
OFF: At the time point, output OFF telegram.
ON: At the time point, output ON telegram.

---Alarm value
Options: Invalid
  No alarm
  Alarm
Invalid: At the time point, no output telegram.
No alarm: At the time point, output No alarm telegram.
Alarm: At the time point, output Alarm telegram.

---Shutter value
Options: Invalid
  UP
  DOWN
Invalid: At the time point, no output telegram.
UP: At the time point, output UP telegram.
DOWN: At the time point, output DOWM telegram.

---Scene value
Options: Invalid
  Scene NO.01
  Scene NO.02
  ................
  Scene NO.64
Invalid: At the time point, no output telegram.
Scene NO.01.. Scene NO.64: At the time point, Output specified scene.

---Sequence value
Options: Invalid
  Stop
  Start
Invalid: At the time point, no output telegram.
Stop: At the time point, output Stop telegram.
Start: At the time point, output Start telegram.

---Percentage value
Options: Invalid
  0%(0)...100%(255)
Invalid: At the time point, no output telegram.
0%(0)...100%(255): At the time point, output setting percentage telegram.
--Threshold value
Options: Invalid
  1 byte threshold
  2 bytes threshold
Invalid: At the time point, no output telegram.
1 byte threshold: At the time point, output 1 byte threshold telegram.
2 bytes threshold: At the time point, output 2 bytes threshold telegram.

--The status after bus voltage recovery
Options: Disable
  Enable
Disable: Disable the function.
Enable: Enable voltage recovery setting.

--Switching status
Options: Invalid
  OFF
  ON
  The same as last time point
Invalid: Switching no output after bus voltage recovery.
OFF: In the range of special day date, switching will send OFF telegram after bus voltage recovery.
ON: In the range of special day date, switching will send OFF telegram after bus voltage recovery.
The same as last time point: In the range of special day date, switching will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Alarm status
Options: Invalid
  No alarm
  Alarm
  The same as last time point
Invalid: Alarm no will send after bus voltage recovery.
No alarm: In the range of special day date, alarm will send No alarm telegram after bus voltage recovery.
Alarm: In the range of special day date, alarm output Alarm telegram after bus voltage recovery.
The same as last time point: In the range of special day date, alarm will send telegram which is same as last time point (only can recover the previous day’s status at most).

--Shutter status
Options: Invalid
  UP
  DOWN
The same as last time point

**Invalid:** Shutter no output after bus voltage recovery

**UP:** In the range of special day date, shutter will send UP telegram after bus voltage recovery.

**DOWN:** In the range of special day date, alarm will send DOWN telegram after bus voltage recovery.

**The same as last time point:** In the range of special day date, shutter will send telegram which is same as last time point (only can recover the previous day's status at most).

---

**Scene status**

Options: **Invalid**

Define scene

The same as last time point

**Invalid:** No output after bus voltage recovery.

**Define scene:** Scene value is displayed.

---

**Scene vale**

**Scene value:** In the range of special day date, output specified scene after bus voltage recovery.

**The same as last time point:** In the range of special day date, output scene telegram which is same as last time point (only can recover the previous day's status at most).

---

**Sequence status**

Options: **Invalid**

Stop

Start

The same as last time point

---

**Percentage status**

Options: **Invalid**

Define percentage

**Invalid:** No percentage telegram output after bus voltage recovery.

**Define percentage:** Percentage value is displayed.

---

**Percentage value**

**Percentage value:** In the range of special day date, percentage telegram will be sent after bus voltage recovery.

**The same as last time point:** In the range of special day date, percentage telegram will be sent telegram which is same as last time point (only can recover the previous day's status at most).

---

**Threshold status**

Options: **Invalid**

1 byte threshold

2 bytes threshold

The same as last time point
Invalid: NO output after bus voltage recovery.

1 byte threshold: In the range of special day date, threshold will send 1 byte telegram after bus voltage recovery.

2 bytes threshold: In the range of special day date, threshold will send 2 bytes telegram after bus voltage recovery.

The same as last time point: In the range of special day date, threshold will send telegram which is same as last time point (only can recover the previous day's status at most).

4- Communication objects description

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

Note: In following sections the N=A,B,C…

4.1.1 Object “General and Master clock”

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Object Function</th>
<th>Description</th>
<th>Group Addresses</th>
<th>Length</th>
<th>C</th>
<th>R</th>
<th>W</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>General</td>
<td>Heartbeat telegram</td>
<td>Send date to the bus</td>
<td>0 Byte</td>
<td>1 Bit</td>
<td>C</td>
<td>-</td>
<td>T</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>Master clock</td>
<td>Send date to the bus</td>
<td>Send local clock from bus</td>
<td>0 Byte</td>
<td>1 Byte</td>
<td>C</td>
<td>W</td>
<td>T</td>
<td>U</td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>Master clock</td>
<td>Change LCD brightness(0...100%)</td>
<td>Lock button(1: unlock 0:lock)</td>
<td>0 Byte</td>
<td>1 Byte</td>
<td>C</td>
<td>W</td>
<td>T</td>
<td>U</td>
<td>-</td>
</tr>
</tbody>
</table>
### NO. | Object name | Function | Flags | Data type |
--- | --- | --- | --- | --- |
0 | General | Heartbeat telegram | C T | DPT 1.003 1bit |

This communication object is always active and valid. Invert the value send telegram to bus, the telegram value is "0/1".

### NO. | Object name | Function | Flags | Data type |
--- | --- | --- | --- | --- |
1 | Master clock | Send date time to bus | C R T U | DPT 19.001 8 byte |

This communication object is used to send date time to bus when select master clock mode, and select date time to send.

1 | Master clock | Send date to bus | C R T U | DPT 11.001 3 byte |

This communication object is used to send date to bus when select master clock mode, and select only date to send.

1 | Master clock | Send time to bus | C R T U | DPT 10.001 3 byte |

This communication object is used to send date to bus when select master clock mode, and select only date to send.

2 | Master clock | Set local clock from bus | C W T U | DPT 19.001 8 byte |

This communication object is used to set local clock from bus.

3 | Master clock | Change LCD brightness(0..100%) | C W T U | DPT 5.001 1 byte |

This communication object is used to LCD brightness from bus.

4 | Master clock | Lock buttons(1-unlock 0-lock) | C W T U | DPT 1.003 1 bit |

This communication object is used to unlock or lock buttons, buttons unlock if receive telegram value “1”, button lock if receive telegram value “0”,

4 | Master clock | Lock buttons(0-unlock 1-lock) | C W T U | DPT 1.003 1 bit |

This communication object is used to unlock or lock buttons, buttons lock if receive telegram value “1”, button unlock if receive telegram value “0”,
### 4.1.2 Object “General and Slave clock”

<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>1</td>
<td>Slave clock</td>
<td>Receive date time from bus</td>
<td>C W T U</td>
<td>DPT 19.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 byte</td>
</tr>
</tbody>
</table>

This communication object is used to receive date time from bus when select master clock mode, and select date time to send.

<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>1</td>
<td>Slave clock</td>
<td>Receive date from bus</td>
<td>C W T U</td>
<td>DPT 11.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 byte</td>
</tr>
</tbody>
</table>

This communication object is used to receive date from bus when select master clock mode, and select only date to send.

<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>1</td>
<td>Slave clock</td>
<td>Receive time from bus</td>
<td>C W T U</td>
<td>DPT 10.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 byte</td>
</tr>
</tbody>
</table>

This communication object is used to receive time from bus when select master clock mode, and select only date to send.

<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>2</td>
<td>Slave clock</td>
<td>Set local clock from bus</td>
<td>C W T U</td>
<td>DPT 19.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 byte</td>
</tr>
</tbody>
</table>

This communication object is used to set local clock from bus.

<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>3</td>
<td>Slave clock</td>
<td>Change LCD brightness(0..100%)</td>
<td>C W T U</td>
<td>DPT 5.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 byte</td>
</tr>
</tbody>
</table>

This communication object is used to LCD brightness from bus.

<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>4</td>
<td>Slave clock</td>
<td>Lock buttons(1-unclock 0-lock)</td>
<td>C W T U</td>
<td>DPT 1.003</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 bit</td>
</tr>
</tbody>
</table>

This communication object is used to unlock or lock buttons, buttons unlock if receive telegram value “1”, button lock if receive telegram value “0”.

<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>4</td>
<td>Slave clock</td>
<td>Lock buttons(0-unclock 1-lock)</td>
<td>C W T U</td>
<td>DPT 1.003</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 bit</td>
</tr>
</tbody>
</table>

This communication object is used to unlock or lock buttons, buttons lock if receive telegram value “1”, button unlock if receive telegram value “0”.
4.2 All objects with channel “N”

The function of all routine objects(year routine, month routine, week routine, day routine, special day) is same, if understand year routine objects and other routine objects is naturally understood.

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Object Function</th>
<th>Description</th>
<th>Group Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>10…</td>
<td>Year routine N</td>
<td>Switching</td>
<td>C R T</td>
<td>DPT 1.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 bit</td>
</tr>
</tbody>
</table>

This communication object is used for switching function. When clock time is same as time point, it will send ON or OFF telegram to bus. After bus voltage recovery, it will send status setting value.

4.2.2 Object “Alarm”

<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>Year routine N</td>
<td>Alarm</td>
<td>C R T</td>
<td>DPT 1.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 bit</td>
</tr>
</tbody>
</table>

This communication object is used for alarm function. When clock time is same as time point, it will send Alarm or No alarm telegram to bus. After bus voltage recovery, it will send status setting value.
4.2.3 Object “Shutter”

<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>12…</td>
<td>Year routine N</td>
<td>Shutter</td>
<td>C R T</td>
<td>DPT 1.008 1 bit</td>
</tr>
</tbody>
</table>

This communication object is used for shutter function. When clock time is same as time point, it will send UP or DOWN telegram to bus. After bus voltage recovery, it will send status setting value.

4.2.4 Object “Scene”

<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>13…</td>
<td>Year routine N</td>
<td>Scene</td>
<td>C R T</td>
<td>DPT 17.001 1 byte</td>
</tr>
</tbody>
</table>

This communication object is used to control the scene. The scene control see following explain:

Telegram value:

```
 C R N N N N N
```

- **C**: 0-Call scene
  - 1-Store scene (If scene assigned and the scene is the current switch state)
- **R**: Reserved
- **N**: Scene NO.(bin:000000…111111=NO.1…64)
e.g: Hexadecimal
  - 00h------call scene 1 (If scene assigned)
  - 01h------call scene 2 (If scene assigned)
  - 3Fh------call scene 64 (If scene assigned)
  - 80h------store scene 1 (If scene assigned)
  - 81h------store scene 2 (If scene assigned)
  - BFh------store scene 64 (If scene assigned)

4.2.5 Object “Sequence”

<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>14…</td>
<td>Year routine N</td>
<td>Sequence</td>
<td>C R T</td>
<td>DPT 1.010 1 bit</td>
</tr>
</tbody>
</table>

This communication object is used for sequence function. When clock time is same as time point, it will send Start or Stop telegram to bus. After bus voltage recovery, it will send status setting value.
4.2.6 Object “Percentage”

<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>15…</td>
<td>Year routine N</td>
<td>Percentage</td>
<td>C R T</td>
<td>DPT 5.001 1 byte</td>
</tr>
</tbody>
</table>

This communication object is used for percentage function. When clock time is same as time point, it will send 1 byte threshold value to bus. After bus voltage recovery, it will send status setting value.

4.2.7 Object “Threshold”

<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>16…</td>
<td>Year routine N</td>
<td>Threshold(1 byte)</td>
<td>C R T</td>
<td>DPT 5.004 1 byte</td>
</tr>
</tbody>
</table>

This communication object is used for threshold function. When clock time is same as time point, it will send ON or OFF telegram to bus. After bus voltage recovery, it will send status setting value.

4.2.8 Object “Threshold”

<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>17…</td>
<td>Year routine N</td>
<td>Threshold(2 byte)</td>
<td>C R T</td>
<td>DPT 7.001 2 byte</td>
</tr>
</tbody>
</table>

This communication object is used for threshold function. When clock time is same as time point, it will send 2 bytes threshold value to bus. After bus voltage recovery, it will send status setting value.
5- Program functions diagram

- Master clock or slave clock

- Every day is same

- Special day

Enable

Disable

Enable

Disable

Enable

Disable

Enable

Disable

Set month

Set day

Set week

Every day is same

Set date

Year routine

Month routine

Week routine

Day routine

Special day

Set time point

Set time point

Set time point

Set time point

Output

Switching

Alarm

Shutter

Scene

Sequence

Percentage

Threshold

Switching

Alarm

Shutter

Scene

Sequence

Percentage

Threshold

Switching

Alarm

Shutter

Scene

Sequence

Percentage

Threshold

Switching

Alarm

Shutter

Scene

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Scene

Sequence

Percentage

Threshold