Timer Master/Slave Controller

Model:M/TM04.1

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

* Voltage recovery

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

* EIB / KNX 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
For assignment of the physical address
* 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 (unit kg) 0.2394

Installation Use 35 mm mounting rail

Mounting position As required

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

Application table

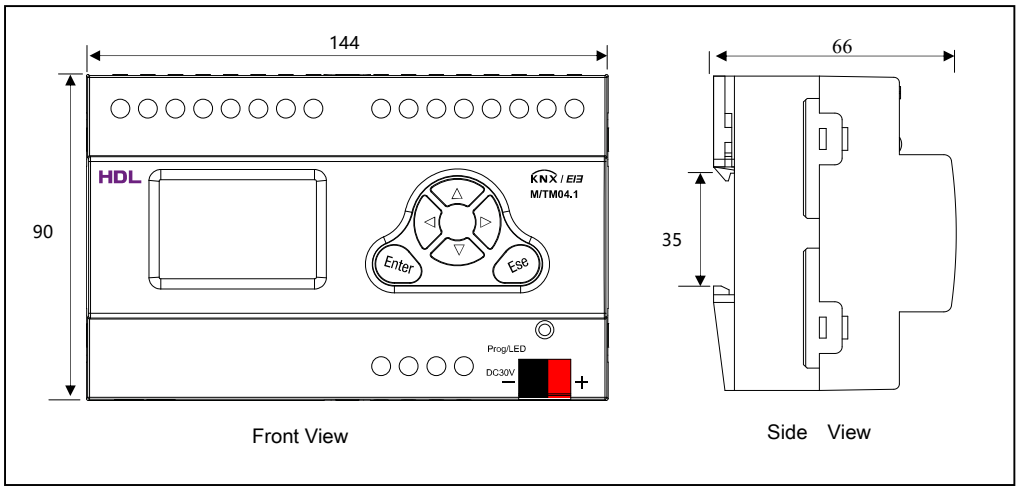
Type M/TM04.1

Max. number of communication objects **210**

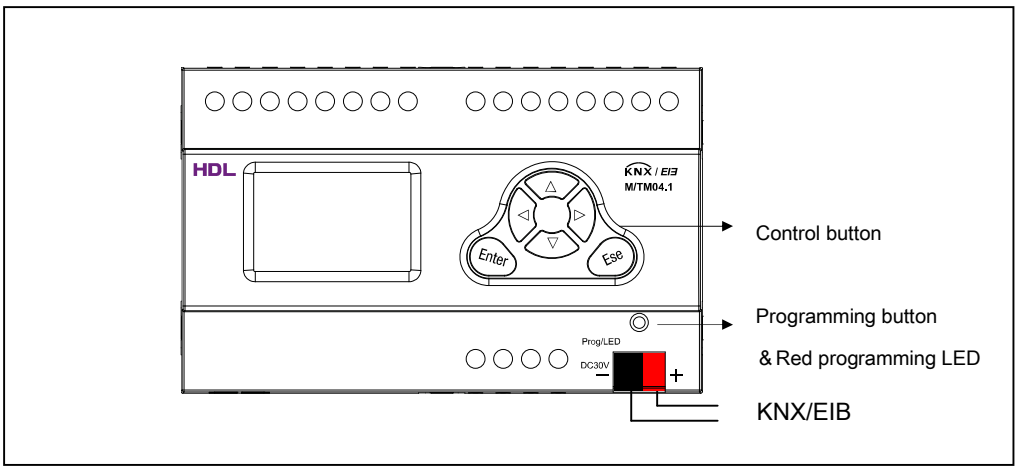
Max. number of group addresses **254**
Max. number of associations **254**

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

【▽】 Page down，Used for modify by manual, will decrease when pushing

【<】 Left Move—Used for selecting of item and cursor location

【>】 Right Move-- Used for selecting of item and cursor location

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:

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

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

Name	type	Max. number of communication objects	Max. number of associations	Max. number of group addresses
Timer Master/Slave 4CH Controller	M/TM04.1	210	254	254

Table2: Overview the max. number of the objects, max. number of associations and max. number of the group addresses

3.3 Function parameter “General”

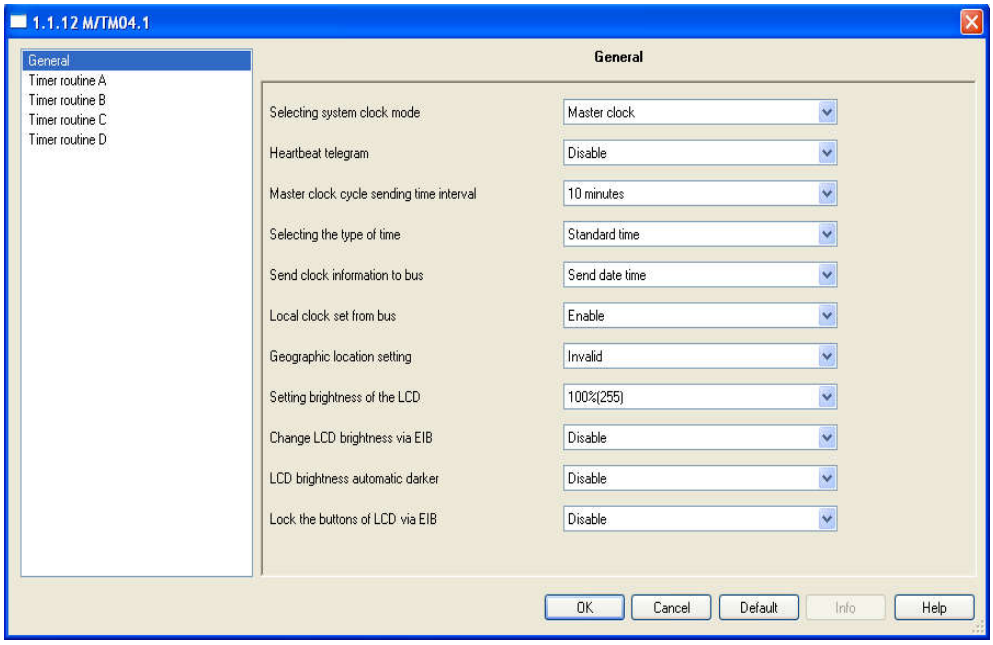


Fig1:“General” parameter windows

--Selecting system clock mode

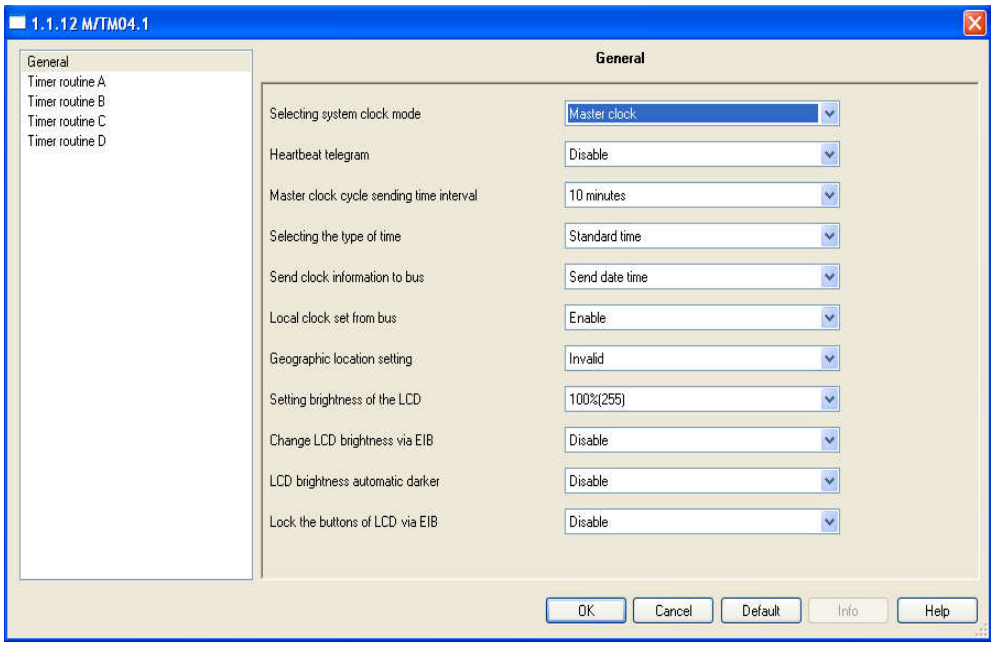
Select system clock mode, selection of parameter configuration has two kinds of combination.

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)
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 brightness of LCD.

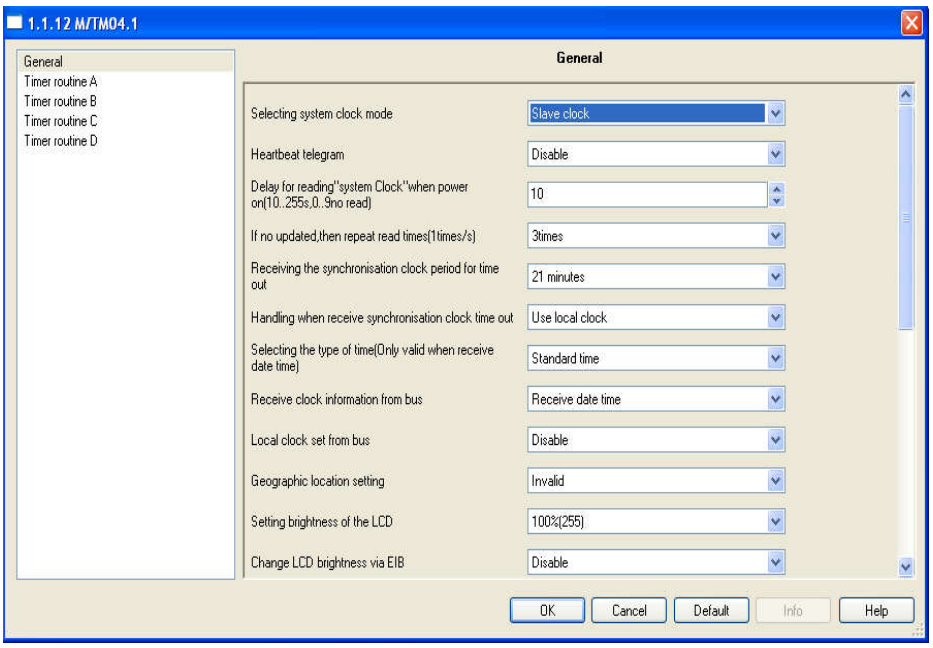
--Lock the buttons of LCD via EIB

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

3times

Setting to reading times if date time object no updated.

--Receiving the synchronous clock period for time out

Options: 10minutes
20minutes
30minutes
60minutes
120minutes

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.

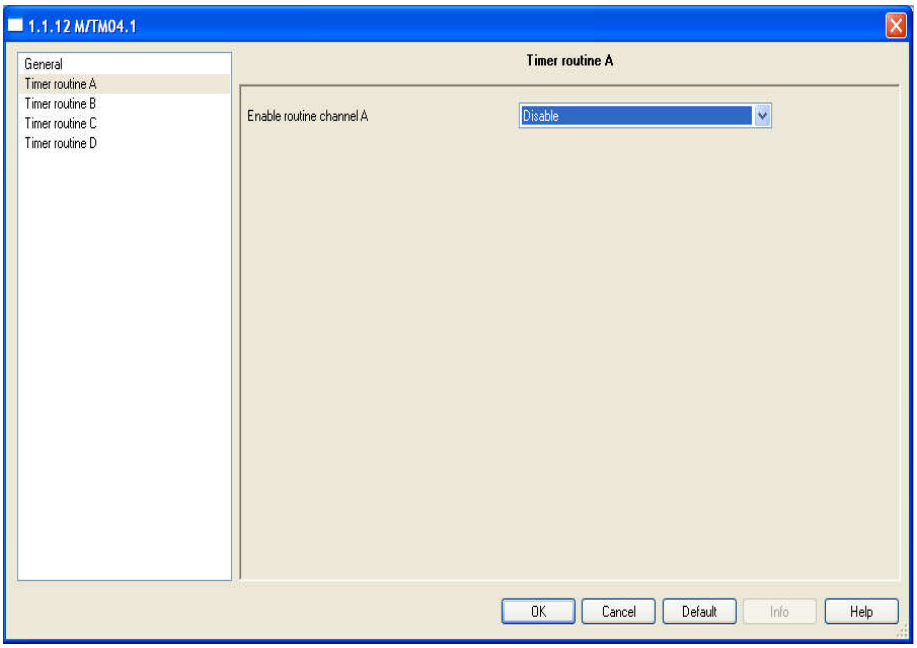
--Lock the buttons of LCD via EIB

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”



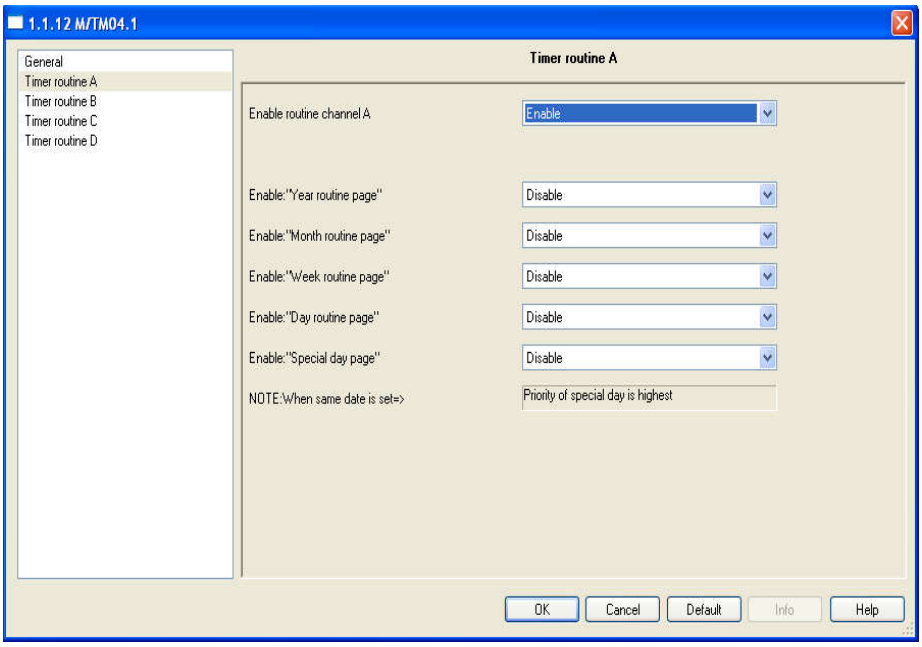
--Enable routine channel A

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.

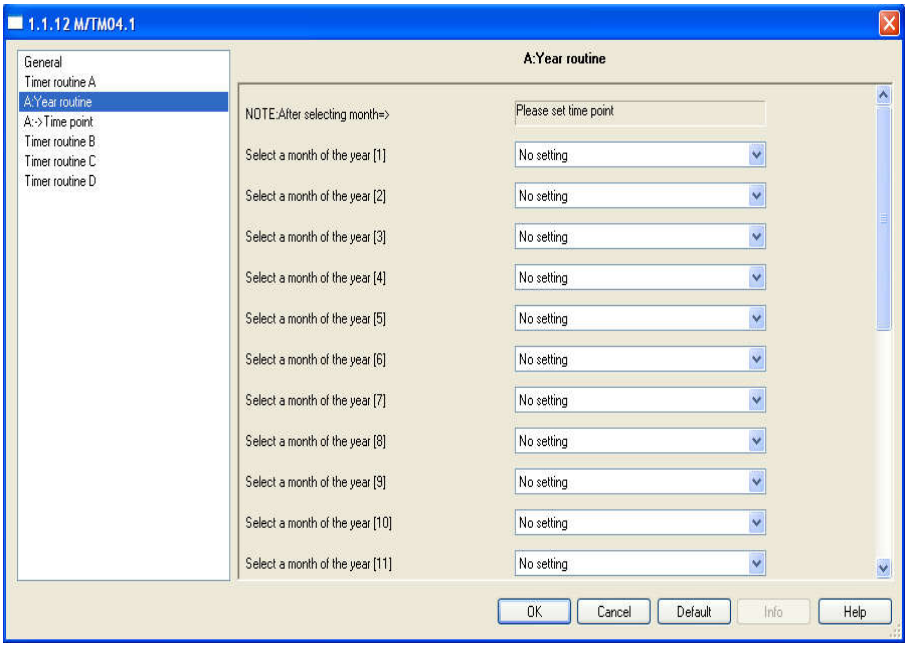
--Enable: “Special day page”

Options: Disable
Enable

Disable: Disable the function.

Enable: Special day is displayed.

3.5- **Channel function** “Year routine”

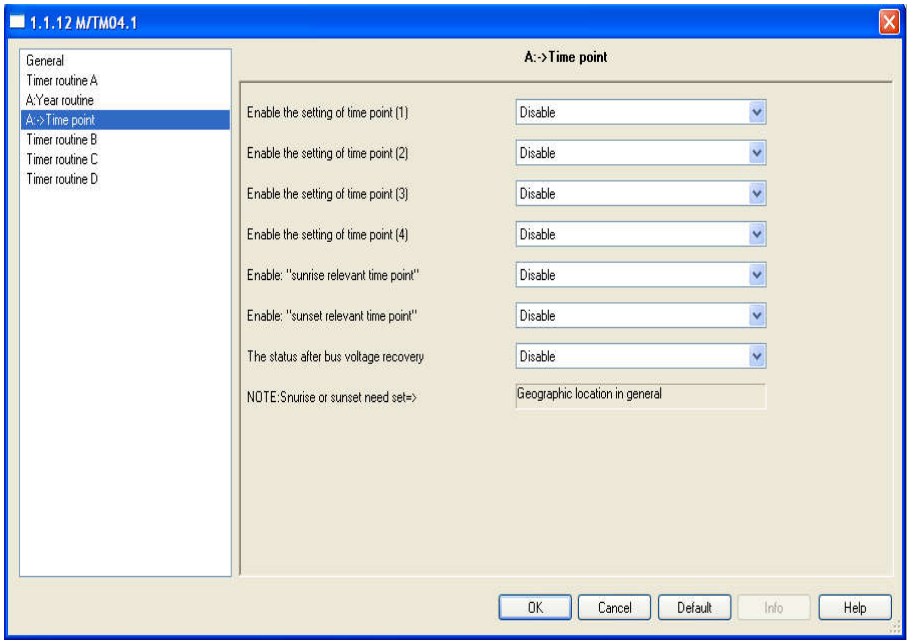


--Select a month of the year[1-12]

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 DOWM telegram.

--Scene value

Options: Invalid
Scene NO.01
Scene NO.02
……..
Scene N0.64

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

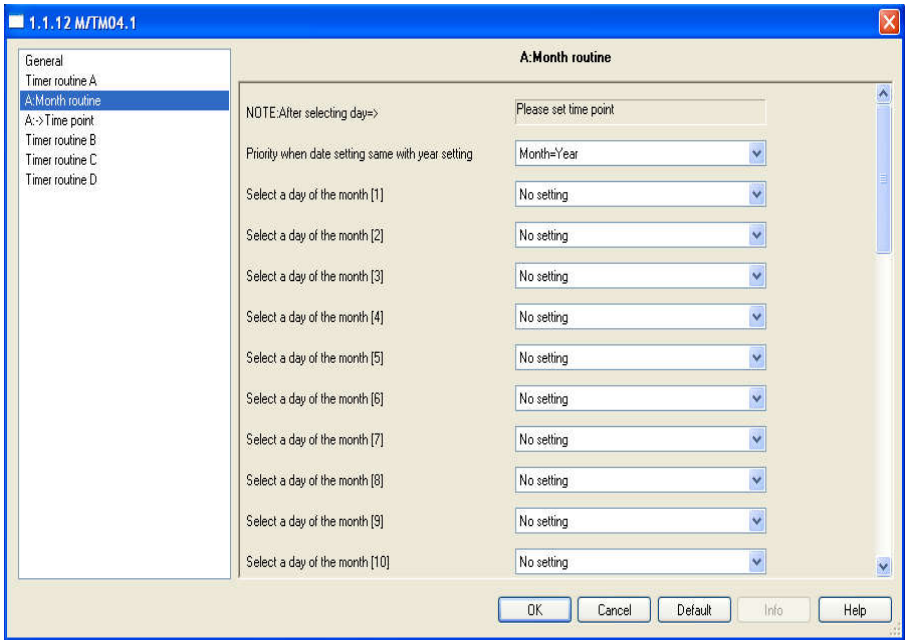
Options: Invalid
1 byte threshold
2 bytes threshold
The same as last time point

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

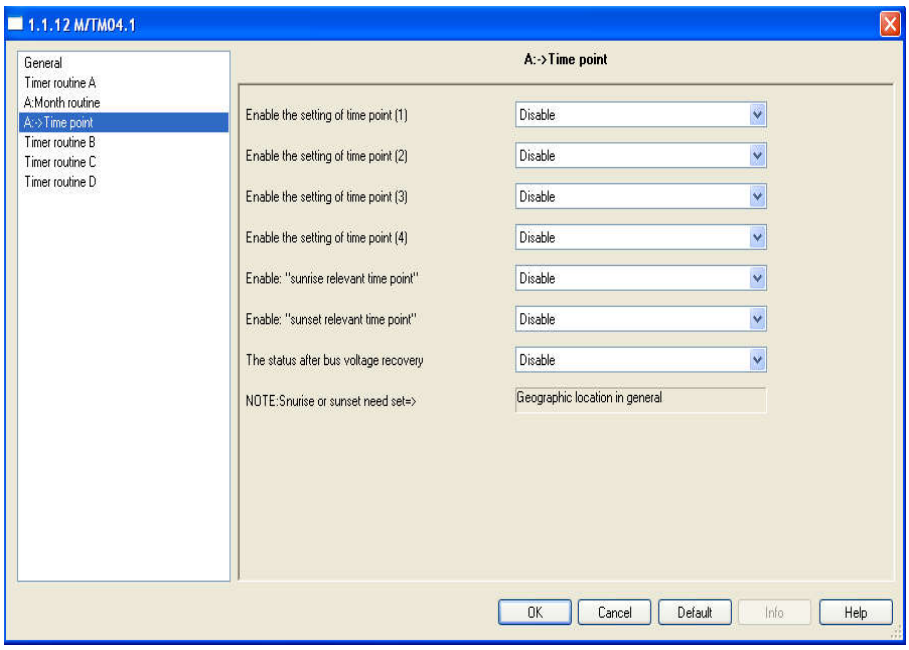
Month=Year: Year routine is normal running on this day, when date setting of year routine is same as month routine.
Month>Year: Year routine stop running on this day, when date setting of year routine is same as month routine.

--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 DOWM telegram.

--Scene value

Options: Invalid
Scene NO.01
Scene NO.02
……..
Scene N0.64

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 vale

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

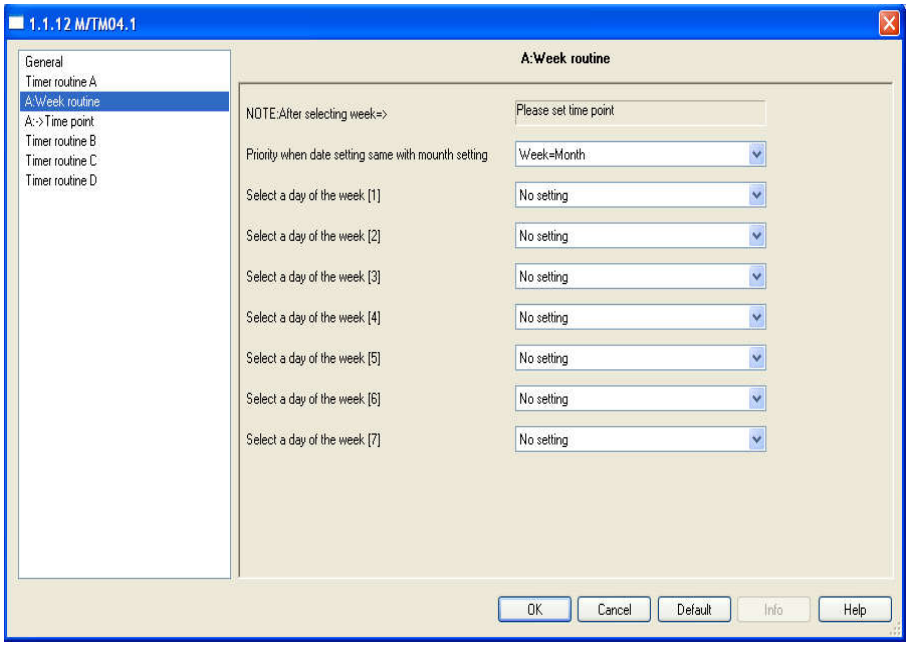
Invalid: NO output after bus voltage recovery.

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

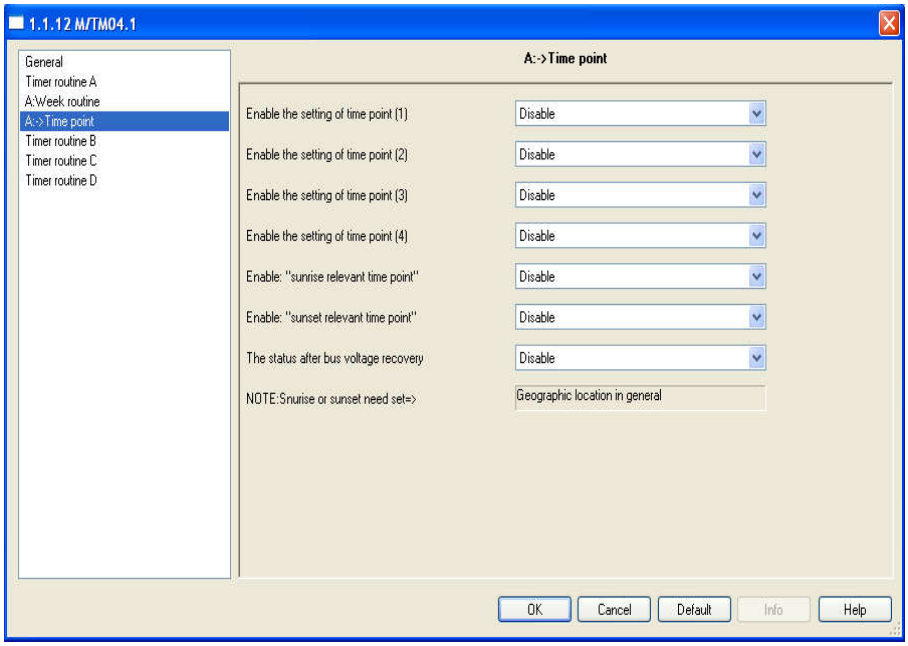
Tuesday

…….

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 N0.64

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 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 vale

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

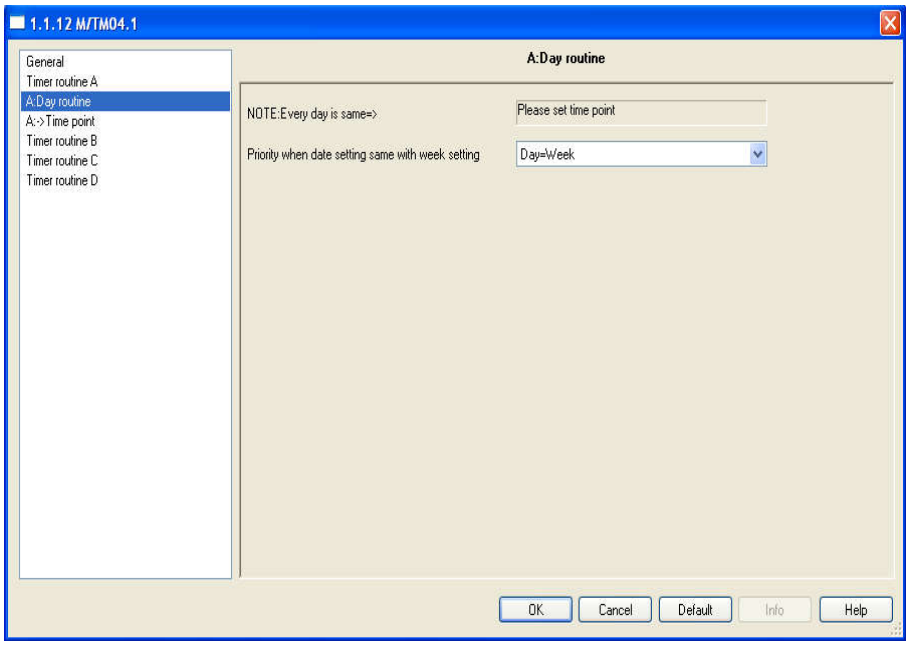
Invalid: NO output after bus voltage recovery.

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

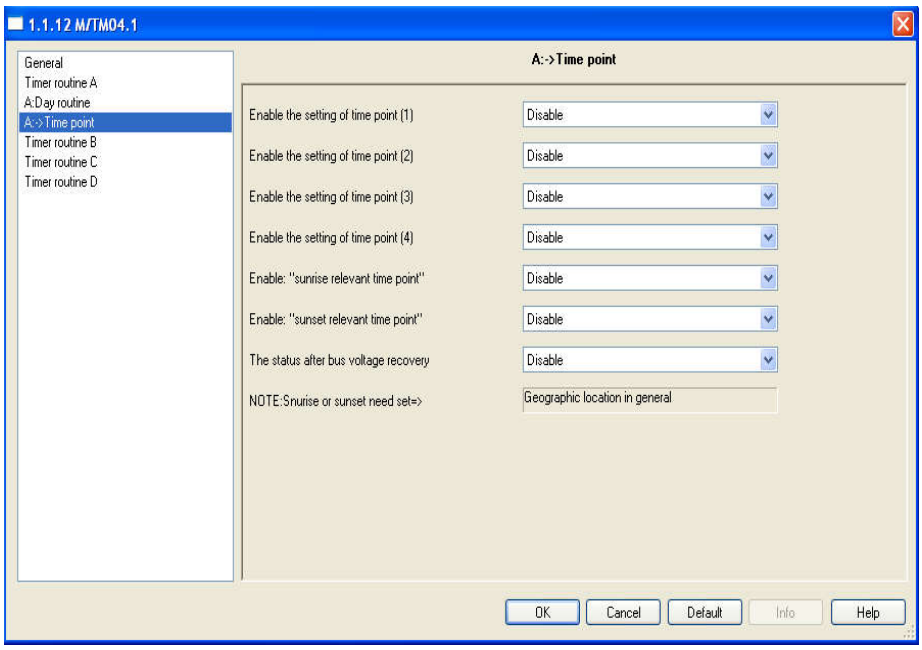
Day>Week

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 N0.64

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 y 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 vale

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

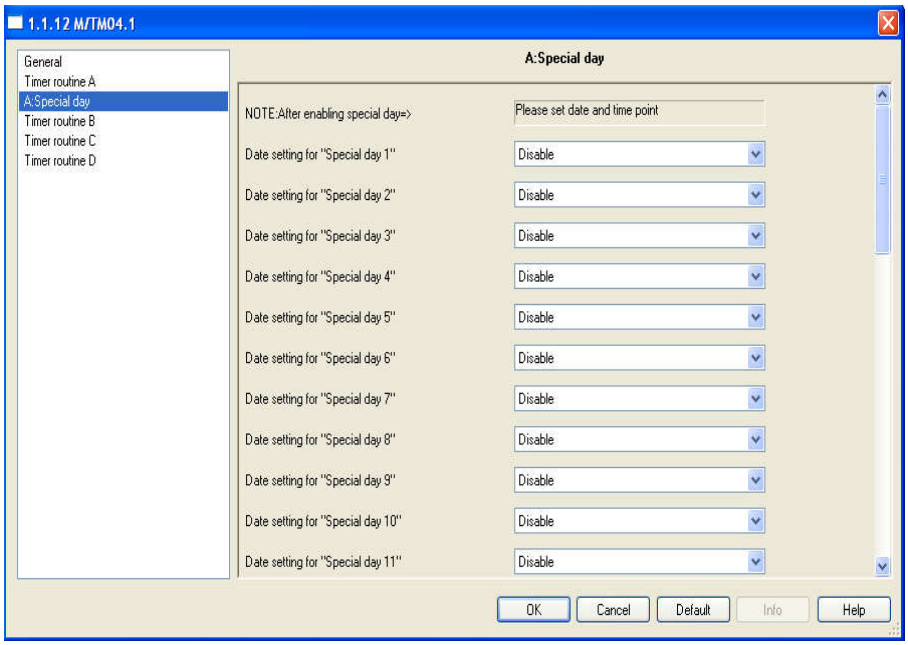
Invalid: NO output after bus voltage recovery.

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"



--Date setting for “special day 1-25”

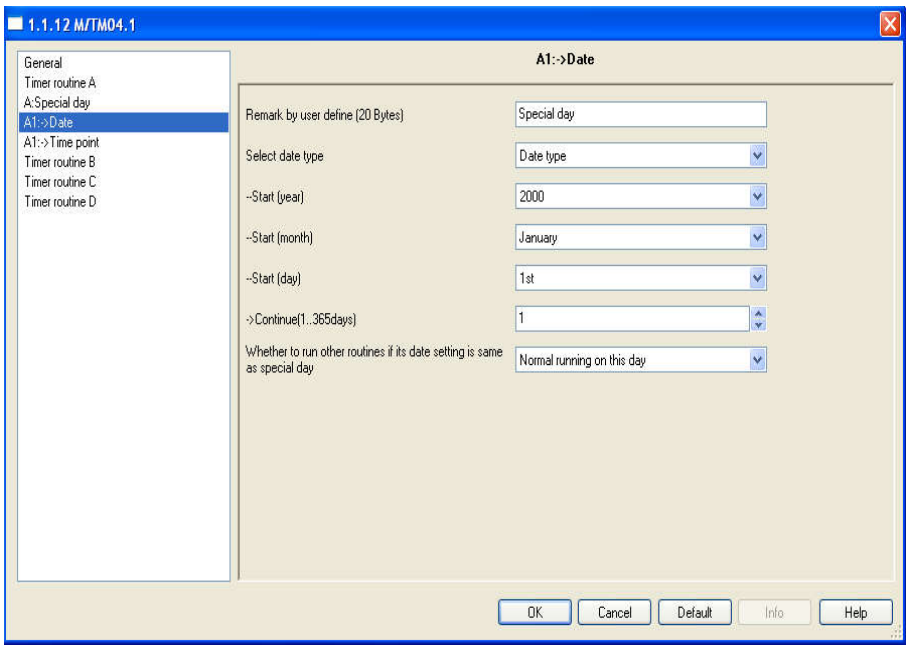
Options: Disable

Enable

Disable: Disable the “special day 1-25”.

Enable: Date and time point is displayed.

3.9.1 - Special day parameter “Date”



--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

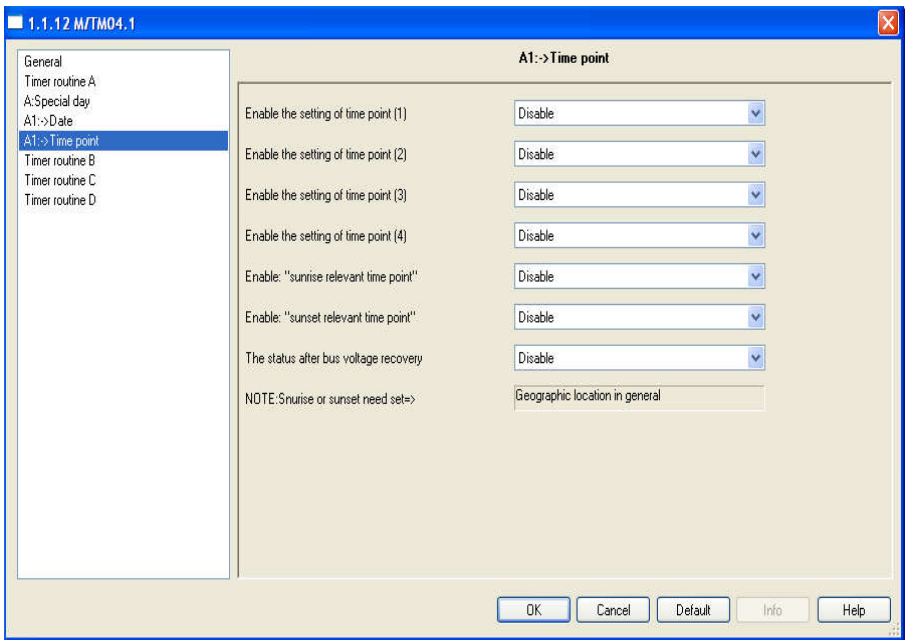
Options: Normal running on this day

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 N0.64

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…

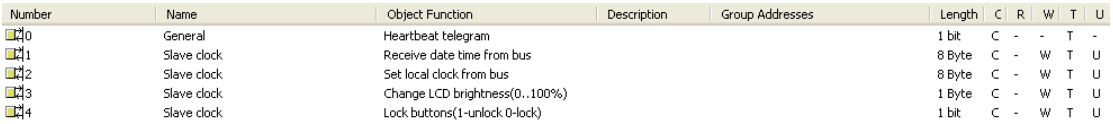
4.1.1 Object "General and Master clock"

Number	Name	Object Function	Description	Group Addresses	Length	C	R	W	T	U
0	General	Heartbeat telegram			1 bit	C	-	-	T	-
1	Master clock	Send date time to bus			8 Byte	C	R	-	T	U
2	Master clock	Set local clock from bus			8 Byte	C	-	W	T	U
3	Master clock	Change LCD brightness(0..100%)			1 Byte	C	-	W	T	U
4	Master clock	Lock buttons(1-unlock 0-lock)			1 bit	C	-	W	T	U

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-unclock 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-unclock 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”



Number	Name	Object Function	Description	Group Addresses	Length	C	R	W	T	U
0	General	Heartbeat telegram			1 bit	C	-	-	T	-
1	Slave clock	Receive date time from bus			8 Byte	C	-	W	T	U
2	Slave clock	Set local clock from bus			8 Byte	C	-	W	T	U
3	Slave clock	Change LCD brightness(0..100%)			1 Byte	C	-	W	T	U
4	Slave clock	Lock buttons(1-unlock 0-lock)			1 bit	C	-	W	T	U

NO.	Object name	Function	Flags	Data type
1	**Slave clock**	**Receive date time from bus**	C W T U	DPT 19.001 8 byte
This communication object is used to receive date time from bus when select master clock mode, and select date time to send.				
1	**Slave clock**	**Receive date from bus**	C W T U	DPT 11.001 3 byte
This communication object is used to receive date from bus when select master clock mode, and select only date to send.				
1	**Slave clock**	**Receive time from bus**	C W T U	DPT 10.001 3 byte
This communication object is used to receive date from bus when select master clock mode, and select only date to send.				
2	**Slave 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	**Slave** clock	Change LCD brightness(0..1**00%)**	C W T U	DPT 5.001 1 byte
This communication object is used to LCD brightness from bus.				
4	**Slave** clock	Lock buttons(1-unclock 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	**Slave** clock	Lock buttons(0-unclock 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”,				

4.2 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.

Number	Name	Object Function	Description	Group Addresses	Length	C	R	W	T	U
1	Master clock	Send date time to bus			8 Byte	C	R	-	T	U
10	Year routineA	Switching			1 bit	C	R	-	T	-
11	Year routineA	Alarm			1 bit	C	R	-	T	-
12	Year routineA	Shutter			1 bit	C	R	-	T	-
13	Year routineA	Scene			1 Byte	C	R	-	T	-
14	Year routineA	Sequence			1 bit	C	R	-	T	-
15	Year routineA	Percentage			1 Byte	C	R	-	T	-
16	Year routineA	Threshold(1 byte)			1 Byte	C	R	-	T	-
17	Year routineA	Threshold(2 bytes)			2 Byte	C	R	-	T	-
20	Month routineA	Switching			1 bit	C	R	-	T	-
21	Month routineA	Alarm			1 bit	C	R	-	T	-
22	Month routineA	Shutter			1 bit	C	R	-	T	-
23	Month routineA	Scene			1 Byte	C	R	-	T	-
24	Month routineA	Sequence			1 bit	C	R	-	T	-
25	Month routineA	Percentage			1 Byte	C	R	-	T	-
26	Month routineA	Threshold(1 byte)			1 Byte	C	R	-	T	-
27	Month routineA	Threshold(2 bytes)			2 Byte	C	R	-	T	-
30	Week routineA	Switching			1 bit	C	R	-	T	-
31	Week routineA	Alarm			1 bit	C	R	-	T	-
32	Week routineA	Shutter			1 bit	C	R	-	T	-
33	Week routineA	Scene			1 Byte	C	R	-	T	-
34	Week routineA	Sequence			1 bit	C	R	-	T	-
35	Week routineA	Percentage			1 Byte	C	R	-	T	-
36	Week routineA	Threshold(1 byte)			1 Byte	C	R	-	T	-
37	Week routineA	Threshold(2 bytes)			2 Byte	C	R	-	T	-
40	Day routineA	Switching			1 bit	C	R	-	T	-
41	Day routineA	Alarm			1 bit	C	R	-	T	-
42	Day routineA	Shutter			1 bit	C	R	-	T	-
43	Day routineA	Scene			1 Byte	C	R	-	T	-
44	Day routineA	Sequnence			1 bit	C	R	-	T	-
45	Day routineA	Percentage			1 Byte	C	R	-	T	-
46	Day routineA	Threshold(1 byte)			1 Byte	C	R	-	T	-
47	Day routineA	Threshold(2 bytes)			2 Byte	C	R	-	T	-
50	Special dayA	Switching			1 bit	C	R	-	T	-
51	Special dayA	Alarm			1 bit	C	R	-	T	-
52	Special dayA	Shutter			1 bit	C	R	-	T	-
53	Special dayA	Scene			1 Byte	C	R	-	T	-
54	Special dayA	Sequence			1 bit	C	R	-	T	-
55	Special dayA	Percentage			1 Byte	C	R	-	T	-
56	Special dayA	Threshold(1 byte)			1 Byte	C	R	-	T	-
57	Special dayA	Threshold(2 bytes)			2 Byte	C	R	-	T	-

4.2.1 Object "Switching"

NO.	Object name	Function	Flags	Data type
10…	**Year routine N**	**Switching**	C R T	DPT 1.001 1 bit
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"

NO.	Object name	Function	Flags	Data type
11…	**Year routine N**	**Alarm**	C R T	DPT 1.005 1 bit
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"

NO.	Object name	Function	Flags	Data type
12…	Year routine N	Shutter	C R T	DPT 1.008 1 bit
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"

NO.	Object name	Function	Flags	Data type
13…	Year routine N	Scene	C R T	DPT 17.001 1 byte

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

Telegram value:

C	R	N	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"

NO.	Object name	Function	Flags	Data type
14…	Year routine N	Sequence	C R T	DPT 1.010 1 bit
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.				

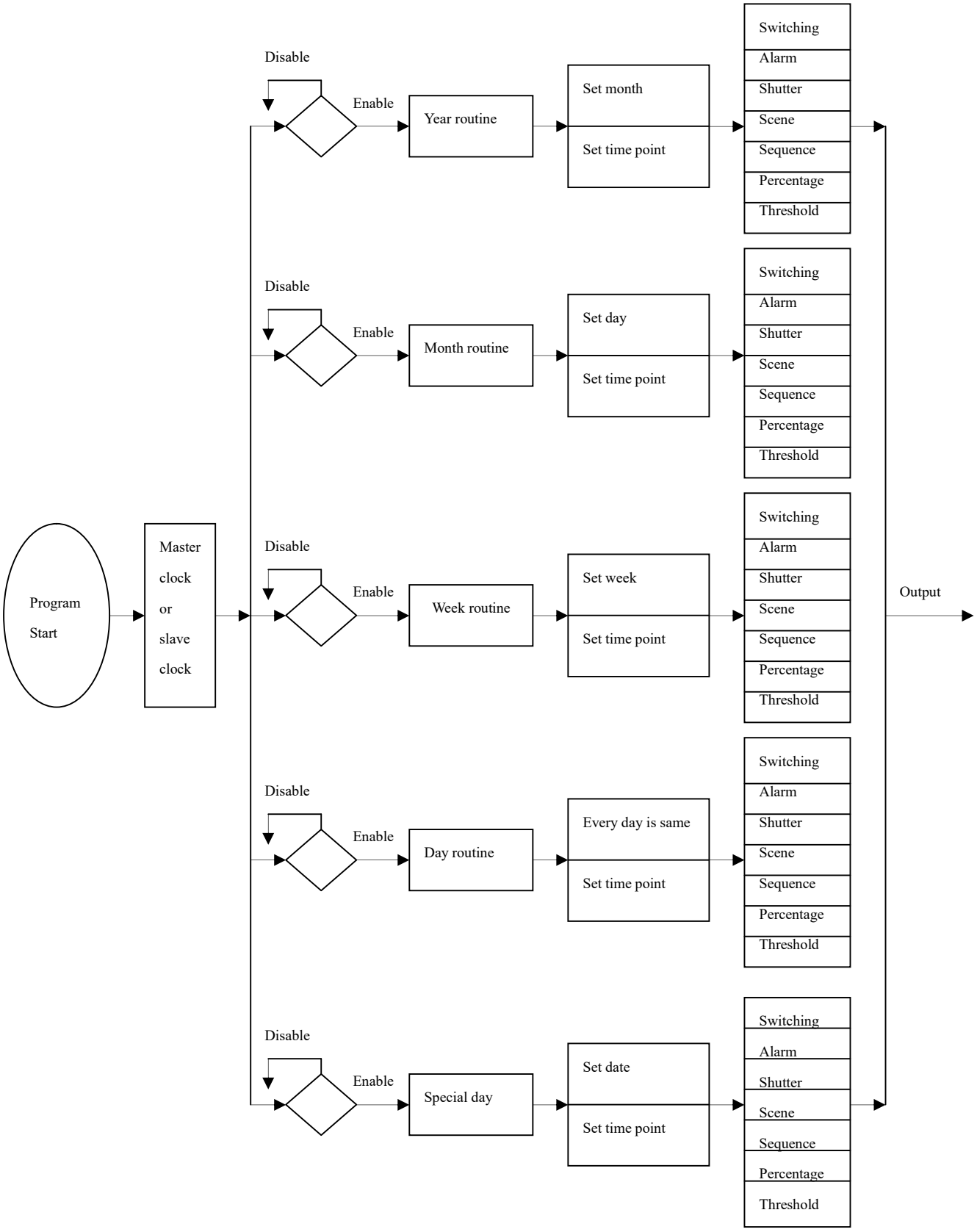
4.2.6 Object "Percentage"

NO.	Object name	Function	Flags	Data type
15…	Year routine N	Percentage	C R T	DPT 5.001 1 byte
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"

NO.	Object name	Function	Flags	Data type
16…	Year routine N	Threshold(1 byte)	C R T	DPT 5.004 1 byte
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"

NO.	Object name	Function	Flags	Data type
17…	Year routine N	Threshold(2 byte)	C R T	DPT 7.001 2 byte
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