


Universal Timer SK10L-GPS-SC-L		Product Group 1
Universal timer in the KNX-Bus  Applications:  KNX- Timer system Daily, weekly and annual time switch in the KNX Bus Sun Guided control of shading and lighting Light intensity or sun position controlled KNX twilight switch Outdoor temperature sensor for temperature measurement with output of the minimum and maximum temperatures Outdoor light intensity sensor for lighting control		
ETS-Application:	ARC_GPSC_v17.knxproj	

SK10L-GPS-SC-L	Article	Article Description	Article-No.
KNX		Document: 7020_ex_SK10L-GPS-SC-L.pdf	
	SK10L-GPS-SC-L	Universal timer in the KNX-Bus Daily and weekly timer switch Light intensity and temperature sensor Time of sunset GPS coordinates  Operating temperature: -25 .. +55 °C Plastic housing: 72 x 64 x 44 mm  The unit is shaded outdoors but mounted with good view of the sky. IP54/65	66100001

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## 1 Application Description

### Assembly and Operating Principles

The module **SK10L-GPS-SC-L** is a GPS-controlled real time clock for the KNX bus.

The device in the outdoor area is shaded and protected from the weather, but fitted with a good view of the sky.

From the GPS signals, the time and the local coordinates can be determined. With these values, timer functions, the Sun direction and elevation angles as well as the times of dawn and Day / night beginning are calculated and are available for switching functions.

Any necessary mounting in the outdoor area must be done in close to the combined use with light intensity and temperature measurement.

The different states of the logic functions can be combined.

The KNX module **SK10L-GPS-SC-L** is used via the ETS4 ( KNX Tool Software ) in conjunction with the associated application programs.

On delivery, the device is unprogrammed.

All functions are parameterized and programmed via the ETS.

Some functions can be activated or deactivated by locking them via the KNX bus.

### Functions

- GPS-based timer 12 weekly and annual time switches
- Output of the local coordinates and calculation of the sun position
- Definable five sun sectors
- Output of the sunrise and sunset times or twilight and night conditions
- Outdoor temperature sensor with Minimum/ Maximum values and 2 limit values
- Outdoor light intensity sensor with Minimum/Maximum values and 2 limit values
- 6 logic blocks, each with an output of 1-bit or 1-byte values  
and
- 10 dedicated logic inputs / outputs can also be used as a (de) activation input for other functions

### Areas of Application

- KNX system timer
- Daily, weekly and annual time switch in the KNX Bus
- Sun Guided control of shading and lighting
- Light intensity or sun position controlled KNX twilight switch
- Outdoor temperature sensor for temperature measurement with output of the minimum and maximum temperatures
- Outdoor light intensity sensor for lighting control

## 2 ETS Parameters and Objects

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### 2.1 General

Device: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Calendar / Week Timer
- Day & Night
- Temperature Sensor
- Light Intensity Sensor
- Logic

Transmission Delay after Restart 10 sec

---

Coordinates

Transmission Period 10 sec

---

Local Time

Time Zone 1

European Daylight Saving Zone

---

Time & Date

Transmission Period 1 h

#### General - Parameter

Parameter	Setting	Description
Transmission Delay after Restart	0 second to 2 hours	After reboot, the first telegrams are sent after this time.

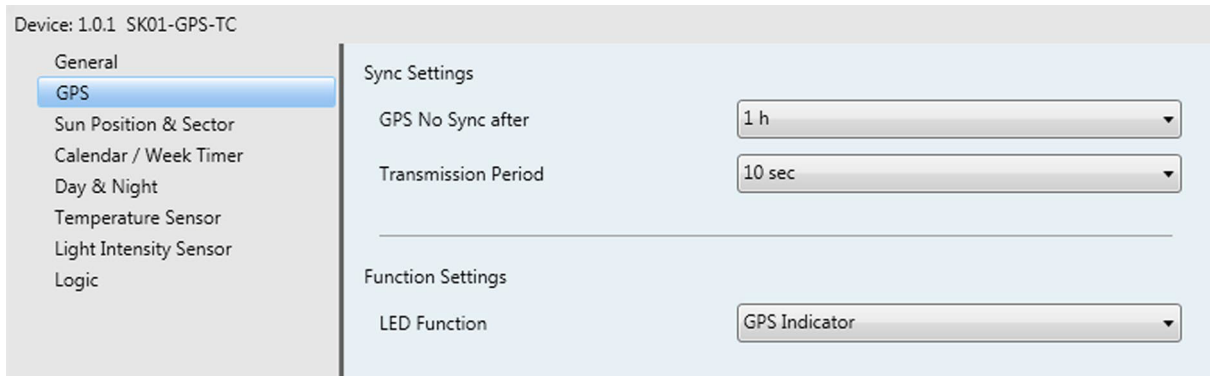
## General - Parameter ( continue )

Parameter	Setting	Description
<b>Coordinates</b>		
Transmission Period	5s .. 24h	After the GPS coordinates were determined for the first time, they are sent immediately, then periodically according to the configured interval.
<b>Local Time</b>		
Time Zone	-12h .. +12h	The GPS time is the UTC time (formerly GMT). The local time is defined by the time offset in hours (time zone).
European Daylight Saving Zone	Yes No	If European daylight saving time is selected, 1h in the summer time zone is added. In Germany, the time zone (+1) and DST applies.
<b>Time &amp; Date</b>		
Transmission Period	1h .. 24h	After the GPS date / time were determined for the first time, they are sent immediately, then periodically according to the configured interval.

## GPS - Objects

Object	Description
1 : GPS Date	Indicates the UTC date without time zone
2 : GPS Time	Indicates the UTC time with weekday but without time zone
3 : Local Date	Indicates the local date with time zone and Daylight Saving Time
4 : Local Time	Indicates the local time with time zone and day of the week
5 : Comb. Date & Time	Combined Date / Time format
6 : GPS Sync	Indicates whether the date and time are synchronized with GPS

2.2 GPS



GPS - Parameter

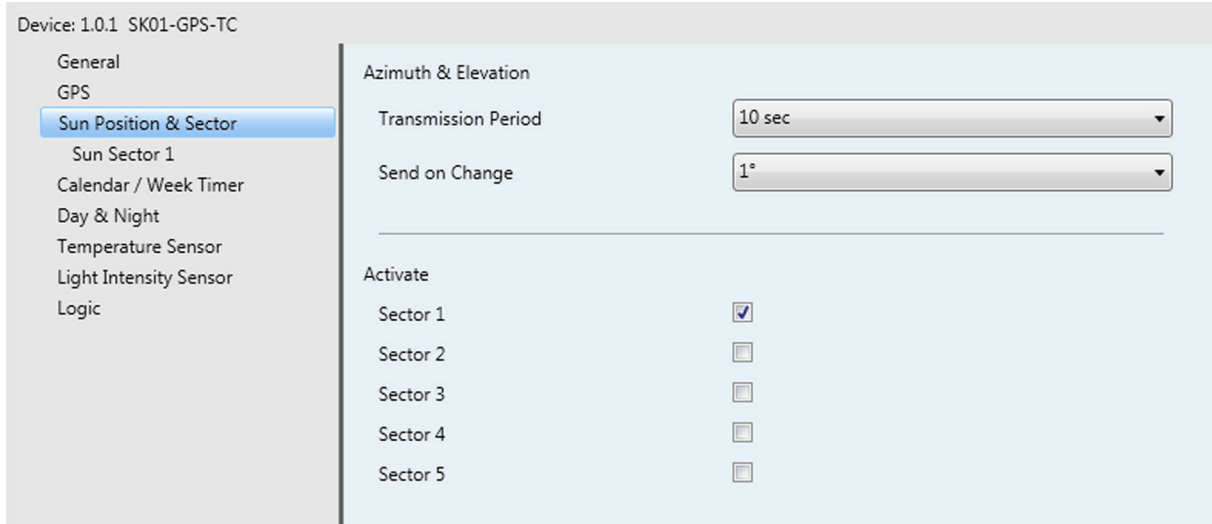
Parameter	Setting	Description
<b>Sync Settings</b>		
GPS No Sync after	1h .. 24h	If within this period no resynchronization is done, this time is assumed "Not synchronized to GPS time" and object 6 is set to 0.
Transmission Period	on change only 5s .. 24h	The object 6 indicates a correct GPS time synchronization. This information can be sent after a change of the state or periodically.
<b>Function Settings</b>		
LED Function	GPS-Indicator  OFF ON 1 Hz flash LED Input	ON for 1s - OFF for 1s : No satellite reception n-short flashes - Pause : n satellites are received Steady - ON: stable GPS signal with synchronization LED is permanently off LED is permanently on LED flashes continuously 1 time per second The LED can be turned on and off by object 0.

GPS - Objects

Object	Description
0 : GPS LED	The green LED can be used to indicate the GPS state.
8 : Longitude	Output of longitude, eastern longitude
9 : Latitude	Output of latitude, northern latitude

### 2.3 Sun Position & Sectors

From the time and the local coordinates, the position of the sun is determined.



#### Sun Position & Sectors - Parameter

Parameter	Setting	Description
<b>Azimuth &amp; Elevation</b>		
Transmission Period	on change only 5s .. 24h	The sun position angle (0 to 360 ° relative to north) and the elevation angle are sent periodically and / or after a change. Send Sun angle after a change.
Send on change	0.5° .. 15°	
<b>Activate</b>		
Sector #	Yes / No	When the sun is located within the defined sector, switching operations can be performed. The sectors must be activated and then parameterized. see parameter, sun sector #

#### Sun position & Sectors - Objects

Object	Description
10 : Azimuth	the Sun's angle relative to the north
11 : Elevation	the Sun's angle above the horizon

## 2.4 Sun Sector #

This page appears only if the corresponding sector is selected.

Device: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
  - Sun Sector 1
  - Calendar / Week Timer
  - Day & Night
  - Temperature Sensor
  - Light Intensity Sensor
  - Logic

Transmission Period 10 sec

---

Active Settings

START Azimuth [°] 0

END Azimuth [°] 360

START Elevation [°] -90

END Elevation [°] 90

---

PowerUp

Send on PowerUp

---

Activation/Deactivation

Input IO, Logic 1

Enable at 1

If disable send 0

### Sun Sector # - Parameter

Parameter	Setting	Description
Transmission Period	on change only 5s .. 24h	The information inside/outside sector "N" can be sent once or periodically when the Sun enter / exit the sector.

**Sun Sector # - Parameter** ( continue )

Parameter	Setting	Description
<b>Active Settings</b>		
START Azimuth [°]	0° .. 360°	If the Sun is within these angles, the corresponding object value is 1. For example, if the start angle is 270 ° and the final angle is 30 ° , the active sector is from 270° over 360 ° to 30 ° .
END Azimuth [°]	0° .. 360°	
START Elevation [°]	-90° .. 90°	
END Elevation [°]	-90° .. 90°	
<b>PowerUp</b>		
Send on PowerUp	yes / no	After the time lag from the General Settings, but not before reliable GPS coordinates, the sector information is sent once.
<b>Activation / Deactivation</b>		
Input	None IO, Logic 1..10	One of the logic inputs can be used as an activation object. The value for the activation can be chosen. Either the change of state is just delayed, or the state is reset during the deactivation.
Enable at	0 / 1	
If disable	do not change state Send 0	

**Sun Position & Sectors - Objects**

Objects	Description
12 : Sector 1 13 : Sector 2 14 : Sector 3 15 : Sector 4 16 : Sector 5	Output of the sector information  When the sun enters the parameterized sector is a 1 is sent, when leaving a 0.



2.5 Timer

Device: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Sun Sector 1
- Calendar / Week Timer**
- Timer 1
- Timer 2
- Timer 3
- Day & Night
- Temperature Sensor
- Light Intensity Sensor
- Logic

Activate	
Timer 1	calendar timer
Timer 2	week timer
Timer 3	calendar week timer
Timer 4	none
Timer 5	none
Timer 6	none
Timer 7	none
Timer 8	none
Timer 9	none
Timer 10	none
Timer 11	none
Timer 12	none

Timers - Parameter

Parameter	Setting	Description
<b>Activate</b>		
Timer 1 : : Timer 12	none  calendar timer  weekly timer  calendar / weekly timer	For each timer, the function can be selected.  Within an adjustable calendar period and on parameterizable weekdays,an object value "true / false" is outputted.  At configurable time points and selectable weekdays, a value is sent on the bus.  This timer is similar to the weekly timer,but additionally an active calendar period can be set.

Timers - Objects

Object	Description
17-28 : Timer 1-12	The output of the timers
29-40 : Activation time 1-12	Input / output for the switching time
41-52 : Weekdays 1-12	Input / output for the active weekdays

2.6 Timer #

Calendar Timer

Device: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Sun Sector 1
- Calendar / Week Timer
  - Timer 1**
  - Timer 2
  - Timer 3
- Day & Night
- Temperature Sensor
- Light Intensity Sensor
- Logic

---

**Description**

---

**Calendar Timer Settings (included)**

START Month

START Day [1 - 31]

END Month

END Day [1 - 31]

---

**Used Days**

Sunday	<input checked="" type="checkbox"/>
Monday	<input checked="" type="checkbox"/>
Thursday	<input checked="" type="checkbox"/>
Wednesday	<input checked="" type="checkbox"/>
Thursday	<input checked="" type="checkbox"/>
Friday	<input checked="" type="checkbox"/>
Saturday	<input checked="" type="checkbox"/>

---

**PowerUp**

Send on PowerUp

---

**Transmission Period**

---

**Output Settings**

Output Invert

---

**Activation/Deactivation**

Input

Enable at



## Calendar Timer - Parameter

Parameter	Setting	Description
Description	32 Characters	Here a short text can be stored, which describes the desired function.
<b>Calendar Timer Settings (included)</b>		
Start Month Start Day End Month End Day	January - December 1 - 31 January - December 1 - 31	Within this period, the associated objects belong to the active days of the week have the value 1. Start and end dates belong to the active period. The start date may be after the end date, for example, October 1 to March 3.
<b>Used Days</b> Sunday - Saturday	Yes / No	Definition of active weekdays
<b>Powerup</b> Send on PowerUp	Yes / No	After the time lag from the General settings, but not before reliable GPS time information is available, the current state is sent once. After that transmission may be periodically sent or is not sent until the next state change take place.
Transmission Period	On change only 5s .. 24h	The current value of the timer can be sent once on a change or periodically.
<b>Output Settings</b> Output Invert	Yes / No	The output value for each timer is inverted. The output value during deactivation is always 0.
<b>Activation / Deactivation</b>		
Input	None IO, Logic 1-10	One of the logic inputs can be used as (de) activation object.
Enable at	0 / 1	The value for the activation can be chosen.

**Weekly Timer**

Gerät: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
  - Sun Sector 1
- Calendar / Week Timer
  - Timer 1
  - Timer 2**
  - Timer 3
- Day & Night
- Temperature Sensor
- Light Intensity Sensor
- Logic
  - Logic 1
  - Logic 2

---

**Description**

---

**Week Timer Settings**

Hour  [hh : xx]

Minute  [xx : mm]

---

**Used Days**

Sunday

Monday

Thursday

Wednesday

Thursday

Friday

Saturday

---

**PowerUp**

Send on PowerUp

---

**Output Settings**

Output Type

Output Value

---

**Activation/Deactivation**

Input

Enable at



**Weekly Timer - Parameter**

Parameter	Setting	Description
Description	32 Characters	Here a short text can be stored, which describes the desired function.

**Weekly Timer - Parameter** ( continue )

Parameter	Setting	Description
<b>Weekly Timer Settings</b>		
Hour [ hh : xx ]	0 - 24	The event is executed at the configured time on the defined weekdays.
Minute [ xx : mm ]	0 - 59	
<b>Used Days</b> Sunday - Saturday	Yes / No	Definition of active weekdays.
<b>PowerUp</b> Send on PowerUp	Yes / No	After the time lag from the General settings, but not before reliable GPS time information is available, the configured value is sent once when the current weekday is active.
<b>Output Settings</b>		
Output Type	1 Bit [0/1] 1 Byte [%] 1 Byte [0-255] 2 Byte [float]	The datapoint type of the output can be selected.
Output Value	0 / 1	The transmitted value, depending on the type of data point, can be parameterized.
<b>Activation / Deactivation</b>		
Input	None IO, Logic 1-10	One of the logic inputs can be used as (de) activation object.
Enable at	0 / 1	The value for the activation can be chosen.

**Calendar / Weekly Timer**

The functions of the Calendar / Weekly timer correspond to those of the weekly timer.  
 In addition, the active date range can be limited.

**Calendar Timer - Parameter**

Parameter	Setting	Description
Start Month Start Day End Month End Day	January - December 1 - 31 January - December 1 - 31	The timer is inactive outside the valid period. Start and end date belong to the active period.

## 2.7 Night & Twilight

The twilight / night switching is the transition of the sun into or out of a parameterizable twilight zone (elevation angle of the sun), the signal "Twilight", with the transition under a night angle the signal "night" / 1 or "Day" / 0.

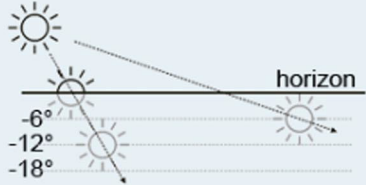
Proposed angles are for the dawn  $-0.8^\circ$  to  $-6^\circ$ , which corresponds to the civil twilight to the nautical twilight.  $-6^\circ$  are suggested for the Night angle, which corresponds to the end of twilight. By using the sun angle, it is independent of the season and the weather conditions change is achieved in getting similar lighting conditions.

Gerät: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Calendar / Week Timer
- Night & Twilight**
- Temperature Sensor
- Light Intensity Sensor
- Logic
  - Logic 1
  - Logic 2

Transmission Period: on change only

Function Select: Twilight and Night



Twilight Settings

Invert Output:

START [°]: -0,800000011920929

END [°]: -6

Send on PowerUp:

Activation/Deactivation: IO, Logic 1

Enable at: 0

If enable: delay of Event

Night Settings

Invert Output:

START [°]: -6

Send on PowerUp:

Activation/Deactivation: IO, Logic 2

Enable at: 0

If enable: delay of Event

### Night & Twilight - Parameter

Parameter	Setting	Description
Transmission Period	on change only 5s .. 24h	The information about twilight and night can be sent once or regularly when entering/exiting areas.

**Night & Twilight - Parameter** ( continue )

Parameter	Setting	Description
Function Select	Twilight and night Day and night	
<b>Twilight Settings</b>		
Invert Output	yes / no	When inverted in the twilight time, a 0 is sent, otherwise a 1 is sent.
Start [°]	-20 .. 20	Setting of the sun elevation angle for the condition. twilight starts
End [°]	-20 .. 20	Setting of the sun elevation angle for the condition. Twilight ends
Send on PowerUp	yes / no	
Activation/Deactivation	None IO, Logic 1-10	One of the logic inputs can be used as an activation object.
Enable at	0 / 1	The value for the activation can be chosen.
If enable	delay of Event  set OFF	Either the output of the event "Dawn" in deactivation is only delayed, or there will be a 0 output. Distinction: If the deactivation during the "Twilight" takes place is either happened nothing (Delaying event has not occurred) or it is a new event "Dawn OFF" is displayed.
<b>Night Settings</b>		
Invert Output	Yes / No	When inverted in the night time, a 0 is sent otherwise a 1 is sent.
Start[°]	-90 .. 90	Setting of the sun elevation angle for the condition. Night starts
Send on PowerUp	Yes / No	
Activation/Deactivation	None IO, Logic 1-10	One of the logic inputs can be used as an activation object.
Enable at	0 / 1	The value for the activation can be chosen.
If enable	delay of Event  set OFF	Either the output of the event "Dawn" in deactivation is only delayed, or there will be a 0 output. Distinction: If the deactivation during the "night" takes place is either spent nothing (no to Delaying event has occurred) or it is a new event "Dawn OFF" is displayed.

## Night &amp; Twilight - Objects

Object	Description
53 : Night	Output of information "night"
54 : Twilight	Output of information "Twilight"





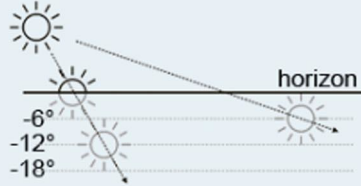
## 2.8 Day & Night

The day / night switching is the transition of the sun under a configurable night angle (elevation angle of the sun), the signal "night", with the crossing of one day angles, the signal "day". Proposed angle for both functions is  $-0.8^\circ$  below the horizon, which corresponds to the complete disappearance of the Sun below the horizon. By using the sun angle is independent of the season and the weather conditions change is achieved in getting similar lighting conditions.

Gerät: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Calendar / Week Timer
- Day & Night**
- Temperature Sensor
- Light Intensity Sensor
- Logic
  - Logic 1
  - Logic 2

**Function Select** Day and Night



**Day Settings**

START [°]

Output Value

Activation/Deactivation

Enable at

If enable

**Night Settings**

START [°]

Output Value

Activation/Deactivation

Enable at

If enable

### Day & Night - Parameter

Parameter	Setting	Description
Function Select	Twilight and Night Day and Night	
<b>Day Settings</b>		
START[°]	-20 .. 20	Setting of the sun elevation angle for the event "day"
Output Value	0 / 1	This value is sent with the event "day"

## Day &amp; Night - Parameter ( continue )

Parameter	Setting	Description
Activation/Deactivation	None IO, Logic 1-10	One of the logic inputs can be used as an activation object.
Enable at	0 / 1	The value for the activation can be chosen.
If enable	delay of Event  new Event	Either the output of the event "day" is only delayed when activated, or a new event is created. distinction: If deactivation / activation during the "day" occurs is either happened nothing (delaying event has not occurred) or it is a new event "day" in output.
<b>Night Settings</b>		
START[°]	-90 .. 90	Setting of the sun elevation angle for the event "Night".
Output Value	0 / 1	This value is sent with the event "Night".
Activation/Deactivation	None IO, Logic 1-10	One of the logic inputs can be used as an activation object.
Enable at	0 / 1	The value for the activation can be chosen.
If enable	delay of Event  new Event	Either the output of the event "Night" is only delayed when activated, or a new event is created. Distinction: If deactivation / activation during the "night" occurs is either happened nothing (delaying event has not occurred) or it is a new event "Night" in output.

## Day &amp; Night - Objects

Object	Description
53 : Night	Output of information "night"
54 : Day	Output of information "day"

**2.9 Temperature Sensor**

Gerät: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Calendar / Week Timer
- Day & Night
- Temperature Sensor**
- Light Intensity Sensor
- Logic
- Logic 1

---

**Measured Temperature**

Transmission Period: on change only

Send on Change: 1.0°

Offset [°C]: 0

---

**Measured Min/Max Temperature**

Transmission Period: on change only

---

**Limit Settings**

Transmission Period: on change only

Hysteresis: 0.1°

Lower Limit [°C]: 5

Upper Limit [°C]: 20

Output enabled by: IO, Logic 1

Enable at: 0



**Temperature Sensor - Parameter**

Parameter	Setting	Description
<b>Measured Temperature</b>		
Transmission Period	on change only 5s .. 24h	Temperature value is sent
Send on Change	0,1° .. 5°	Temperature value is sent after a change of ...
Offset [°C]	-5 .. 5	Temperature offset Output temperature value = Measured temp + offset
<b>Measured Min/Max Temperature</b>		
Transmission Period	on change only 5s .. 24h	The minimum / maximum values can be sent on change (corresponding to "temperature values send") and / or sent periodically.

**Temperature Sensor - Parameter** ( continue )

Parameter	Setting	Description
<b>Limit Settings</b>		
Transmission Period	on change only 5s .. 24h	The boundary crossing objects are sent on a change or periodically.
Hysteresis	0,1° .. 5°	In order to prevent multiple switching operations, the hysteresis can be adjusted.
Lower Limit [°C]	-40 .. 60	The limits are parameterized and can be changed through objects. If the temperature value drops below the lower limit or it is exceeded the upper limit, the limit values will be set.
Upper Limit [°C]	-40 .. 60	
Output enabled by	none IO, Logic 1-10	One of the logic inputs can be used as (de) activation object. The value for the activation can be chosen.
Enable at	0 / 1	

**Temperature Sensor - Objects**

Object	Description
55 : Measured Temperature	Output of the temperature sensor
56 : Measured Minimum Temperature	Output of the minimum temperature since last reset
57 : Measured Maximum Temperature	Output of the maximum temperature since last reset
58 : Reset Min/Max Temperature	Reset the minimum / maximum temperatures
59 : Upper Limit	Value of the temperature upper limit
60 : Lower Limit	Value of the temperature lower limit
61 : Upper Limit Exceeded	Is set when the upper limit value is exceeded
62 : Lower Limit Exceeded	Is set when the lower limit value is exceeded

**2.10 Light Intensity Sensor**

Gerät: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Calendar / Week Timer
- Day & Night
- Temperature Sensor
- Light Intensity Sensor**
- Logic
- Logic 1

---

**Measured Light Intensity**

Transmission Period: on change only

Send on Change [%]: 10

Multiplier: 1

Offset [lux]: 0

---

**Measured Min/Max Light Intensity**

Transmission Period: on change only

---

**Limit Settings**

Transmission Period: on change only

Hysteresis [%]: 10

Lower Limit [lux]: 100

Upper Limit [lux]: 10000

Output Delay: 2 min

Output enabled by: IO, Logic 10

Enable at: 0



**Light Intensity Sensor - Parameter**

Parameter	Setting	Description
<b>Measured Light Intensity</b>		
Transmission Period	on change only 5s .. 24h	The current light intensity value can be sent once on change by more than xx% or periodically.
Send on Change [%]	0 .. 50	
Multiplier	0.1 .. 100	Output light intensity value : = measured light intensity x multiplier + offset
Offset [lux]	-100000 .. 100000	

**Light Intensity Sensor - Parameter** ( continue )

Parameter	Setting	Description
<b>Measured Min / Max Light Intensity</b>		
Transmission Period	on change only 5s .. 24h	The minimum / maximum values can be sent on change (corresponding to "Send light intensity values") or sent periodically.
<b>Limit Settings</b>		
Transmission Period	on change only 5s .. 24h	The boundary crossing objects are sent on a change and/or sent periodically.
Hysteresis [%]	0 .. 50	In order to prevent multiple switching operations, the hysteresis can be adjusted.
Lower Limit [lux]	0 .. 200000	The limits are parameterized and can be changed through objects. If the light intensity value drops below the lower limit or it is exceeded the upper limit, the limit values will be set.
Upper Limit [lux]	0 .. 200000	
Output Delay	5s .. 2h	The change of the limit states can be issued with a time delay.
Output enabled by	None IO, Logic 1-10	One of the logic inputs can be used as (de) activation object. The value for the activation can be chosen.
Enable at	0 / 1	

**Light Intensity Sensor - Objects**

Object	Description
63 : Measured Light	Output of the light intensity sensor
64 : Measured Minimum Light	Output of the minimum light intensity since the last reset
65 : Measured Maximum Light	Output of the maximum light intensity since the last reset
66 : Reset Min/Max Light	Reset of minimum / maximum light intensity
67 : Upper Limit	Value of the upper limit light intensity
68 : Lower Limit	Value of the lower limit light intensity
69 : Upper Limit Exceeded	Is set when the upper limit value is exceeded
70 : Lower Limit Exceeded	Is set when the lower limit value is exceeded

**2.11 Logic**

Gerät: 1.0.1 SK01-GPS-TC

General	Activate
GPS	Logic 1 <input checked="" type="checkbox"/>
Sun Position & Sector	Logic 2 <input type="checkbox"/>
Calendar / Week Timer	Logic 3 <input checked="" type="checkbox"/>
Day & Night	Logic 4 <input type="checkbox"/>
Temperature Sensor	Logic 5 <input type="checkbox"/>
Light Intensity Sensor	Logic 6 <input type="checkbox"/>
<b>Logic</b>	
Logic 1	
Logic 3	



**Logic - Parameter**

Parameter	Setting	Description
Activate Logic 1-10	yes / no	6 logical blocks can be activated

### 2.12 Logic #

Each activated logic block has a Parameter page. Each block controls one output.

**Logic 1** - Object 71 - IO/Logic 1 etc.

Gerät: 1.0.1 SK01-GPS-TC

- General
- GPS
- Sun Position & Sector
- Calendar / Week Timer
- Day & Night
- Temperature Sensor
- Light Intensity Sensor
- Logic
- Logic 1**

---

**Description**

---

**Transmission Period**

---

**Logic Inputs**

- Select A
- Select B
- Select C
- Select D
- Select E
- Select F

---

Function	Command
GROUP	()
AND	&
OR	
XOR	^
NEGATE	~
SEND, IF EQUAL	=
ADD	+
SUBSTRACT	-
MULTIPLY	*
VALUE	0 ... 255

---

**Combination**

**Output Behavior**

**Output Type**

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**Gate Control**

**Input**

**Enable at**

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**PowerUp**

Send on PowerUp





## Logic # - Parameter

Parameter	Setting	Description
Description	32 Characters	Here a short text can be stored, which describes the desired function.
Transmission Period	on change only 5s .. 24h	The current value of the logic output can be sent once on a change or periodically.
<b>Logic Inputs</b> Select A-F	None Different objects  <i>Sun Sectors 1..5</i> <i>C/W Timers 1..12</i> <i>Night</i> <i>Twilight/ Day</i> <i>Temperature Upper Limit</i> <i>Temperature Lower Limit</i> <i>Light Intensity Upper Limit</i> <i>Light Intensity lower limit</i> <i>Exceeded</i> <i>IO, Logic 1..10</i>	Logical expression is formed in a line as text in which the 6 possible inputs A..F can be combined.  <i>The output of the position of the sun sectors</i> <i>The output of the timers</i> <i>The information "Night"</i> <i>The information "Twilight"</i> <i>Exceeded the Temperature limit</i> <i>Exceeded Below the Temperature limit</i> <i>Exceeding the Light Intensity limit</i>  <i>Below the Light Intensity limit</i> <i>Inputs of the logic objects / outputs of other logic blocks</i>
Combination	max. 16 Characters	For example : (A&B) (C^D)  ( ) Expressions in parentheses are solved first & Logical AND operation   Logical OR operation ^ Logical exclusive-OR operation ~ Logical negation = Gate function: (A = 1) update only run when A = 1 + Arithmetic Plus - Arithmetic minus * Arithmetic multiplication 1..9 Number to 3 digits A..F The logical inputs
Output Behavior	Send on any Input updates Send only on change of Output State	Specifies whether output messages are sent only when the output value is changing or every time a logical input is updated.
Output Type	1 Bit [0/1] 1 Byte [-128 - 127] 1 Byte [0 - 255]	The data length of the output can be selected.
<b>Gate Control</b>		
Input	None IO, Logic #	Here, the logic can be chosen via which a gate function can be used.
Enable at	0 / 1	Sets the state for the gate function

## Logic # - Parameter ( continue )

Parameter	Setting	Description
<b>PowerUp</b> Send on PowerUp	yes / no	After the time lag from the General Settings of the current state is sent once. After the release may periodically or until the next update or state change take place.

## Logic # - Objects

Object	Description
71 - 76 : IO, Logic 1-6	Outputs of the logic blocks or universal inputs
77 - 80 : IO, Logic 7-10	Universal inputs

Example 1: Output 1 Bit "A & B"  
The output is only 1 if input A = 1 and B = 1

Example 2: Output 1 Bit "A = 1"  
If A = 1, then a 1 is sent, nothing else

Example 3: Output 1 Byte "A \* 120"  
If A = 0, the output value is 0 and when A = 1, the output value is 120

Example 4: Output 1 Byte "44 + (A ^ B) \* 18"  
If A = B then the output value is 44, or 62

In addition to the IO inputs, Logic1 .. 6 can assume only the values 0 or 1 for all inputs.

Logic1 .. 6 can assume as outputs 1 byte "0 to 255" as logic then the value 0 is 0 and all nonzero values are as 1.

### 3 Product Page

The KNX module **SK10L-GPS-SC-L** is a GPS-controlled real time clock. It has an integrated temperature and brightness sensor.

The device has an integrated bus coupling unit and requires no additional voltage.

The lower housing part of the timer consists of a white impact resistant, glass-ball reinforced plastic housing and a transparent lid with gasket.

The degree of protection is corresponds to IP54/65.

The sensor will configured with the ETS4 ( KNX Tool Software ) and the application program.



### Areas of Application

- KNX- Timer system
- Daily, weekly and annual time switch in the KNX Bus
- Sun Guided control of shading and lighting
- Light intensity or sun position controlled KNX twilight switch
- Outdoor temperature sensor for temperature measurement with output of the minimum and maximum temperatures
- Outdoor light intensity sensor for lighting control

<p><u>Sensors</u></p> <p>Temperature: NTC Thermistor</p> <p>Measurement Range: -25 .. +55 °C</p> <p>Resolution: ± 0,1 °C</p> <p>Accuracy: ± 0,3 °C + Accuracy of the sensor (± 0,1 °C)</p> <p>Light Intensity: Digital Ambient Light Sensor 3 .. 220k lux</p> <p>Operating Temperature: -25 .. +55 °C</p> <p>Storage Temperature: -25 .. +85 °C</p> <p>Protection Class: IP54/65</p>	
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## 4 Technical Data

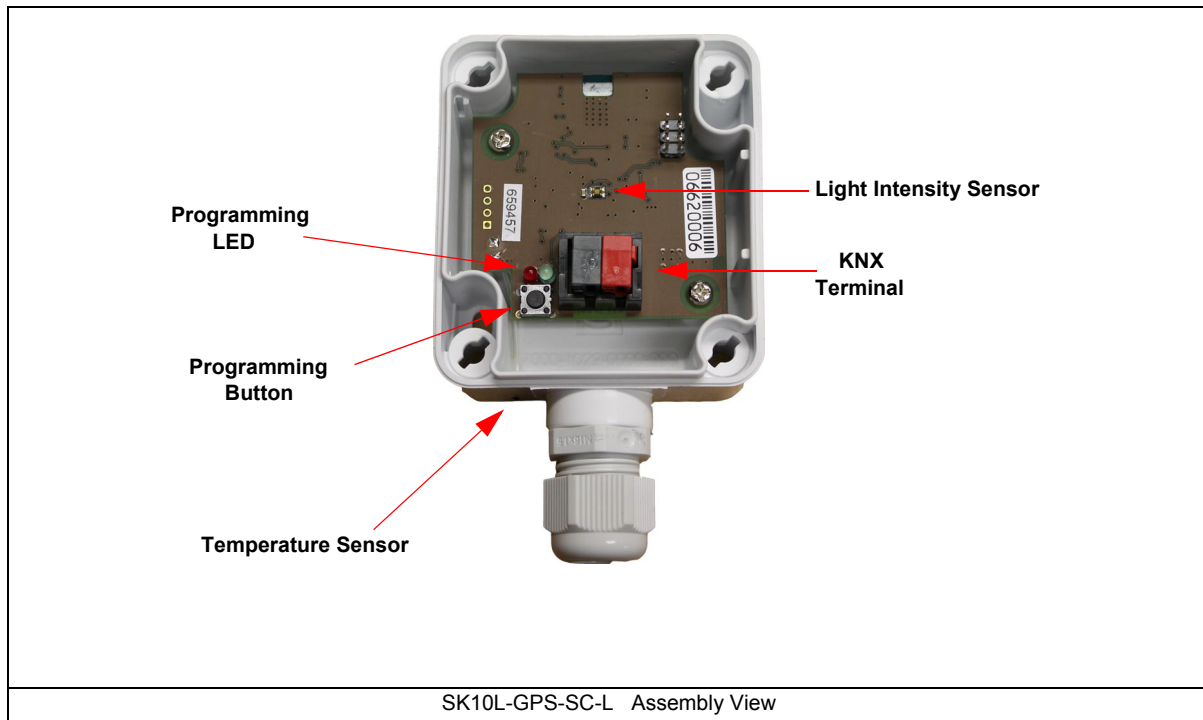
### Technical Data - SK10L-GPS-SC-L

Operating voltage	KNX bus voltage 21 .. 32VDC
Power consumption (KNX)	about 120mW (at 24V DC)
Terminal bus voltage	KNX 2-pin terminal ( red / black )
Bus coupler	integrated
Ambient temperature	storage    -25 .. +85°C operation -25 .. +55°C
Humidity	to 90% non-condensing
Commissioning with the ETS	<b>ARC_GPSC_v17.knxproj</b>
Light Intensity Sensor	integrated 3 .. 220000 lux ± 20%
Temperature Sensor	integrated -25 .. +55 °C ± 0.1°C
Time Clocks	12
Logic Funktion	5
Protection	IP54/65
Mounting KNX module	Surface mounted
Housing KNX module	Plastic white with side panel window
Dimensions KNX module	( 72 x 64 x 44 ) mm ( L x W x H )
Article number	66100001

## 5 Startup

The KNX Sensor is set up using the ETS ( KNX Tool Software ) and the applicable application program.  
The sensor is delivered unprogrammed.  
All functions are programmed and parameterized with ETS.  
Please read the ETS instructions.

The unit is shaded outdoors but mounted with good view of the sky.



### Response to the Bus voltage

The ETS parameter settings are retained.  
The output starts with the current values.

### Delete program and reset sensor

To clear the program (configuration) and to reset the module back to the factory settings, it must be done in switched voltage-free (Disconnect the KNX bus terminal ).

Now hold down the programming button while connecting the KNX bus terminal and wait until the programming LED lights (about 5-10 seconds).

Now you can release the programming button again and the module is ready for a new project.

If you release the programming button too early, repeat the procedure.

## imprint

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